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Review of the energy supply status for sustainable development in the Organization of Islamic Conference

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ABSTRACT

This review describes the situation and the varying potential of energy supply utilization of countries in the Organization of Islamic Conference (OIC). This exercise reveals that the increase in energy consumption is associated with economic growth and population expansion. The interconnectivity between energy use and national level, as well as the connection between energy utilization and gross domestic product (GDP), which is an indicator of economic development, must be explained to determine the significance of national energy utility in these countries. Therefore, alternative energy source utilization is necessary for the provision of an appreciable constituent of imminent energy requirements in sectors that utilize energy. Alternative energy source utilization is a crucial factor in ensuring the total capacity of energy sources in various growing economies of the world where clean energy is unavailable. Furthermore, some of these countries also possess alternative energy sources such as hydropower, solar, wind, geothermal, and biomass. This paper provides details on sustainable energy supply developments in OIC countries. These countries must sustainably develop energy despite their sufficient wealth in crude oil and natural gas. The main purpose of this study is to determine economic growth in relation to energy supply to facilitate sustainable development. In addition, this paper suggests necessary requirements to sustain the energy development processes in OIC countries and as well as some stages that must be adopted to enhance development at a sustainable rate.

Contents

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1. Introduction

Energy has become a vital component of human life, particularly in terms of economic activities. Energy is also an indicator of economic and social improvement. Most of the energy supply utilized worldwide is produced from non-renewable energy resources, which are not used sustainably [1,2]. Therefore, the relationship between energy supply and economic growth and development is evident. This close association has been observed between energy production and energy consumption levels on the one hand and between economic growth and development on the other [1,44]. Conventional energy sources still dominate the commercial energy market, with coal occupying the highest market share. Despite having the least share among conventional energy sources, oil seems the most important. The movements of oil prices are among the most closely followed variables in the world. Oil variables remain at the center of world international relations and policy-making debates. The diminished contribution and weight of oil should have reduced the interest and attention paid to it, but in reality, the opposite is true [1,2]. Indeed, the increase in energy demand may be premised on economic growth and on the non-linear changes in social status. These growths could also be controlled by industrialized countries. To meet future demand, a continuous exhaustion of local resources is necessary. Fossil fuels alone cannot supply global energy needs. Consequently, studies are being undertaken to replace energy sources worldwide [1–3].

Sustainable energy development requires the long-term sustainability of energy resource. Sustainability also refers to the performance of all required tasks without causing passive social effects. Energy sources such as fossil fuels, natural gas, and other energy resources such as solar, wind, and hydro are assumed to be renewable. Therefore, sustainability will exceed the relative outlying term strategies [3]. Fig. 1 shows a schematic of sustainability for long-term development.

Renewable energy sources are responsible for meeting 15–20% of the total world energy demand [3]. All renewable energy sources produced nearly 2900 TWh in 2001, which is approximately 24% of the total global electricity supply. If the conventional utilization of biomass is also considered, then most efforts in the renewable field with respect to the current electricity supply will be made possible by hydroelectric mechanisms, of which a huge percentage has been in existence for a long time [2,3]. Nevertheless, the significance of recent engineering work in this field is only starting to unfold. From a pilot scale perspective in the 1970s, the latest class of renewable energy such as biomass, geothermal, small-scale hydro, solar thermal, and others, has been increasing exponentially and has become even more important than technology as far as the supply of electricity is concerned. However, in terms of the utility of these new resources, several steps are being undertaken by people across different races, regions, and geographical areas [2,3].

This study will investigate the effects of energy supply on sustainable development, as well as the necessary requirements for sustainable development processes based on the energy supply of OIC countries. The majority of the data used in the study are based on those obtained from the energy section of the World Bank Development Indicators (WBDI) and the Statistical, Economic, Social Research Training Centre for Islamic Countries (SESRIC). Energy data from different sources are converted to a standard unit based on the Metric Ton of Oil Equivalents (MTOE). These conversion factors are used to standardize countries. Some data were unavailable for some OIC member countries (MCs).

1.1. OIC: selection of countries and population

The aftermath of an arson attack on 21 August, 1969 facilitated the establishment of the OIC on 25 September, 1969 in Rabat, Morocco. The Secretariat's work gradually expanded during the 1970s. The Mecca declaration in 1981, which was centered on enhancing trade and commercial collaboration among the participating states, resulted in a total turn around. With 57 member states, the OIC is the largest organization aside from the United Nations (UN). The OIC is made up of countries with peoples who are mainly followers of Islam. OIC countries represent a substantial portion of the world's developing countries or approximately 21.60% of the world's population, thus possessing significant human, material, and natural resources and exhibiting considerable potential for cooperation and exchange with various sectors [4,5]. Fig. 2 shows the structure of cooperation between OIC countries with their corresponding flags.

According to recent information, Muslims constitute approximately 22% of the global population of 1.5 billion people. The overall global population was approximately 6.6 billion in 2009, with an increase rate of 1.8% from 2000 to 2006. A faster rate of population growth was observed in Muslim nations compared with western nations over the same period. A 3.3% average increase in the rate of population growth was observed in 57 OIC countries [4]. Notably, the demography of the OIC MCs differs noticeably. For example, Pakistan, Bangladesh, and Nigeria are among the world's most crowded countries with populations exceeding 100 million, including Indonesia with over 200 million people. By contrast, eight OIC MCs have less than 1 million people, including Suriname, Brunei, and Maldives, which have fewer than 500,000 people. Based on the 2008 world population, five other countries with populations less than 1 million are Qatar, Djibouti, Bahrain, Guyana, and Comoros. The growth rate of the world population has been declining [4–6].

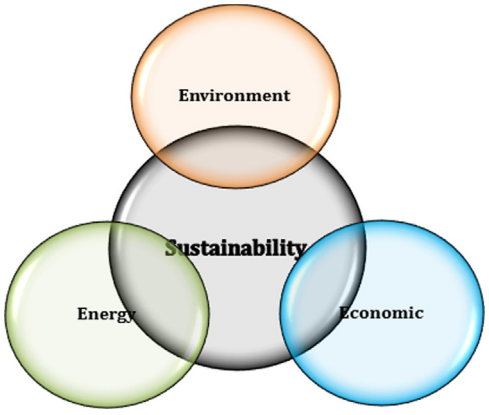

Fig. 1. A schematic of sustainability for sustainable development.