

## **The Real Crisis Waiting for the World: Oil Problem and Energy Security**

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**ABSTRACT:** It can be said that the global crisis in the world in 2008 deeply affected all states and changed almost all balances. Such crises experienced in the world during this period and possible same crises in the future are important. However, such crises have monetary solutions although they have resulted in serious destruction of economic and social structures of the countries. Nevertheless, if the necessary measures are not taken, a more serious crisis will arise in a future not too far from now. The difference of this crisis that will arise compared to the former ones is that there won't be a monetary solution for it. Continuous growth in the increase of energy consumption in the world is an inevitable problem. This situation makes many countries around the world face the problem of energy independence and energy security. In this study, the classification and characteristics of energy sources will be discussed first. Then, energy independence and security problem created by termination of energy sources and their being under control of specific countries will be examined by comparative analysis method based on statistical data.

**Keywords:** Energy Security; Oil Problem; Energy Crisis; Real Crisis; Energy Policy

**JEL Classifications:** Q42; Q43; Q48

### **1. Introduction**

It is seen that the 2008 global crisis has affected all of the governments deeply and has nearly changed all balances. Such crises and possible future crises are important. However, although these cause serious ravages in economic and social structures of countries, they can all be solved by money. If necessary precautions are not taken, a more serious crisis is awaiting the world in future. The crisis will be a different one, and cannot be solved by money. The crisis awaiting the world is energy crisis. In this context, the consumption of fossil fuels and energy security are the primary problems to be solved in 21st century.

The world is about to face a crisis which threatens the existence of civilization. This is an energy crisis which will arise when there are not enough energy sources to cope with the demand of world as the demand for energy increases. Energy crisis may be defined as a great strait in supply of energy sources in an economy. It is very difficult to say that the solution of this crisis, which will leave the world in a big economic crisis, will not be solved by the technology. The need for energy in the world increases 1.6 % in average annually. If the countries go on with their present politics, the need for energy will be half as much in 2030 as it is today (Biro, 2007: 1-2). That is, the continuous development in global consumption of energy is an inevitable problem. Till today, the dominance of fossil fuels on energy production has caused serious problems globally. These problems are;

- The climate change caused by greenhouse gas emission
- The breakdown of the ozone layer and the increase in level of ultraviolet light
- Acid rains
- The decrease in biodiversity
- The increase in soil erosion
- The contamination caused by wastes in industry and life styles (Fyfe et al., 1993: 187–196)

Energy is one of the basics of our education, health, nutrition, transportation and communication systems. However, taking into consideration the environmental ravage caused by energy production process, the problems in access to resources and the decrease in reserves, it can be said that the use of fossil fuels today is unsustainable.

The decreasing fossil fuel resources cause both insufficiency in providing demand and increase in prices and it triggers the structural change in energy production and resources. In this context, the innovations in encouraging the use of renewable energy sources will make it possible to manage the passage from an unsustainable structure to a more sustainable structure (Schindler and Zittel, 2007: 1-7).

Another important problem in energy is the energy security. This concept describes the relation between national security and achievement of natural resources for energy consumption. It is of vital importance to get energy resources continuously and cheaply (IEA, 2013). A large portion of metal oils, gas reserves and petrol are in the borders of a group of country. This makes many countries face the problems of energy independence and energy security. The gradual arrival of energy resources into their borders and the fluctuation it causes on energy prices increases the effect of these countries globally (Hamelinck et al., 2005: 114–134).

## **2. Classification of Energy Resources and the Future of Oil**

Energy resources can be divided into two groups: renewable and nonrenewable energy resources. The renewable energy includes the energy obtained from non-consumable resources coming from natural process such as sun, wind, biomass, wave, geothermal and hydroelectric energy; nonrenewable energy includes coal, oil, gas and nuclear energy. Before the industrial revolution, people used only renewable energy resources. However, in the last 150 years, people have become increasingly dependent on fossil fuels. In recent years, despite technological developments, the use of renewable energy resources still holds a very small place in the global energy table.

**Table 1. Annual World Electricity Generation by Energy Resources**

<b>Energy Resources (TWh)</b>	<b>1973 (%)</b>	<b>2004 (%)</b>	<b>2010 (%)</b>
<b>Coal</b>	38.3	39.6	40.6
<b>Natural Gas</b>	12.1	19.5	22.2
<b>Nuclear Energy</b>	3.3	15.6	12.9
<b>Oil</b>	24.7	6.6	4.6
<b>Total Amount of Nonrenewable Energy Resources</b>	<u>78.4</u>	<u>81.3</u>	<u>80.3</u>
<b>Hydro Energy</b>	21.0	16.4	16.0
<b>Other</b>	0.6	2.3	3.7
<b>Total Amount of Renewable Energy Resources</b>	<u>21.6</u>	<u>18.7</u>	<u>19.7</u>

Source: Prepared using International Energy Agency data.

The share of renewable energy resources in the electric energy generation is seen to be 19.7% in 2010. The part of 80.3% is still met by nonrenewable energy resources that are fossil fuels (Table 1). While the uses of renewable energy resources have increased in terms of amount in world electricity generation, it can be said that this increase is not so important in terms of share. It is estimated that there will not be a significant increase in the near future. The share in electric generation of hydroelectric energy potential, 33% of which is used globally, is about 16%. Although the uses of other renewable energy other than hydroelectric energy have increased, its share in electric generation in 2030 is estimated not to exceed 5% (TMMOB, 2010).

The environmental degradation caused by fossil fuels, the depletion of reserves, high and volatile energy prices and growing concerns about renewable energy resources are emerging as a

major component of energy consumption all over the world (Apergis and Payne, 2012: 733-734). Within the next 25-30 year period, a large part of the increase in energy demand and use of fossil fuel and therefore the intensity in greenhouse gas emission are expected to result from developing countries. In this sense, it is estimated that the energy consumption will be 14% in OECD countries and 84% in non-OECD countries (Wolfram et al., 2012).

Fossil fuels constitute the large part of global energy supply. These fuels forming more than millions of years are consuming and not renewing. The role of fossil fuels in modern economy is quite vital. However, it is necessary to open a separate paragraph on oil (MacKenzie, 1998: 97-98).

People have been using naturally obtained crude oil for thousands of years. For instance, ancient Chinese and Egyptians used the oil to light their homes. Before the 1850s, Americans used whale oil to light their homes. When whale oil became scarce, people started to seek other resources. Although technology and researches have developed since the first oil well drilled by Edwan Drake in the USA in 1859, the discovery of oil is still a risky business field. Geologists are working to find new areas, but only 25-30% of the discovered wells have necessary qualification (Need Project, 2011).

The oil demand is continuously growing all the time. The fact that the petroleum will consume some day offers a unique risk method to the world about when the peak point in its production will realize. It can be said that there are numerous studies on this subject in literature (Hirsch et al., 2006: 2). The first study on this subject was carried out by geologist Marion King Hubbert in 1956. In his study, Hubbert made predictions on the peak point of oil production in the USA (Barry, 2005). There have been a number of episodes over the last half century in which conflicts in the Middle East have led to significant disruptions in production of crude oil. These include closure of the Suez Canal following the conflict between Egypt, Israel, Britain, and France in October 1956, the oil embargo implemented by the Arab members of OPEC following the Arab-Israeli War in October 1973, the Iranian revolution beginning in November 1978, the Iran-Iraq War beginning in September of 1980, and the first Persian Gulf war beginning in August 1990 (Hamilton, 2012). In the industrial world dependent on the cheap crude oil, prices showed continuously increasing inconstant fluctuations following these events. Prices first tripled in response to an Arab embargo in 1973 and then nearly doubled again when Iran dethroned its Shah, sending the major economies sputtering into recession (Campbell and Laherrère, 1998). In the second half of 2000, oil prices dramatically went up again and it increased from 10 dollars per barrel in February 1999 to 35 dollars per barrel in September 2000 (Heinberg, 2003). The empirical literature suggests that the oil shocks have an important effect on economic activity (Conraria and Wen, 2012: 132).

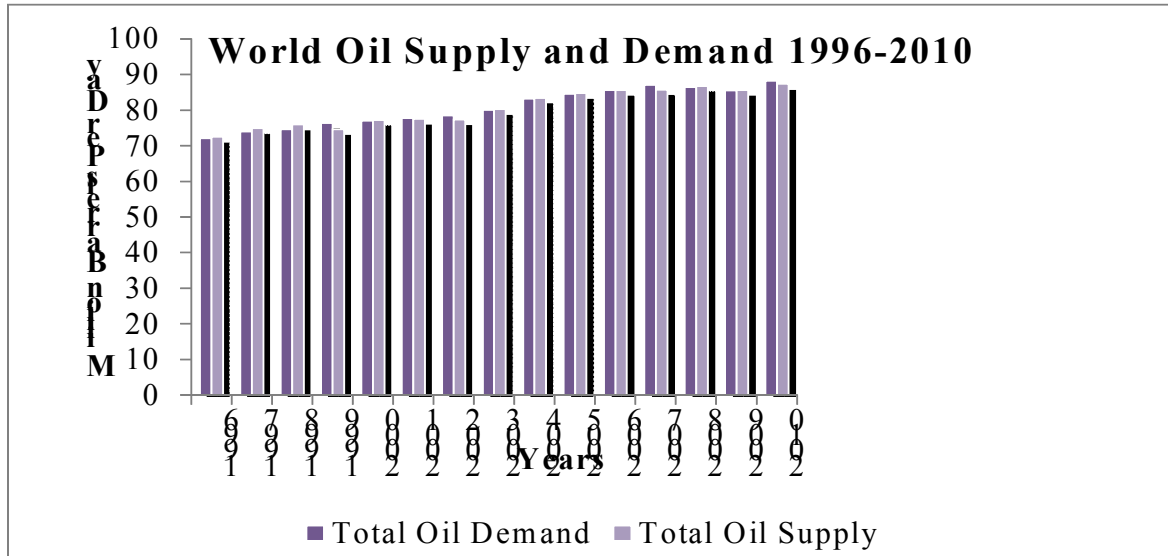
The necessary conditions for the world oil supply can be said to enter into a new era with the increasing demand pressure. Concerns of the main oil-producing countries about security of supply, speculative factors and clear indications on the supply-side constraints cause unexpected high and inconsistent price increases. When taken into account the fact that the increase in oil production is becoming harder, the continuous increase in oil demand is an indication that the supply will have more serious problems to meet the demand (Figure 1). It is known that almost all of the world's largest oil fields were discovered more than 50 years ago and the annual oil discoveries have declined on the surface since 1960s (Schindler and Zittel, 2007: 1-44). Despite the instability in weight of energy consumption of oil and in world's dependence on this source, there is no and will not be significant change in near future (TMMOB, 2010).

### **3. The Issue of Energy Security**

Another serious issue that developed and developing countries face is energy security. The issue of energy security is seen to become a relatively common and permanent problem especially in recent years. It is clear that the world needs to develop a long run and coordinated security architecture on this issue (Elbaradei, 2008). Concentration of energy resources in certain areas and military and civil interventions for controlling these areas have made the world energy supply sensitive and made the energy prices highly volatile (Figure 2). In this context, concerns about energy security are caused by both deterioration in physical supply and sudden increase in energy prices (Houses of Parliament, 2012). Rising of world energy costs creates increased demand for energy especially in newly developing economies and the production resources of oil and natural gas producing countries lagging

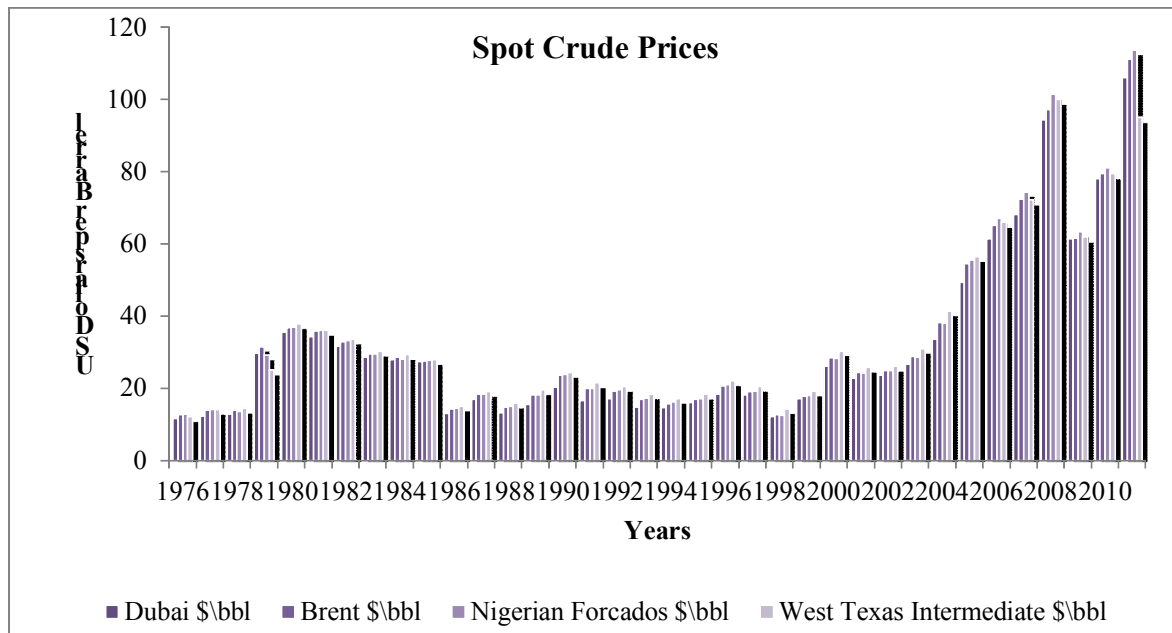
behind the increased demand pose national and international problems on energy security (Hughes, 2007). The ongoing instability in the Middle East and fluctuation in oil demand in developing and transition countries, especially China, have made the energy security high political priority in both the EU and the USA (Frondel and Schmidt, 2008).

**Figure 1. World Oil Supply and Demand 1996-2010**



Source: BP, BP Statistical Review of World Energy, June 2012, [http:// bp.com/statisticalreview](http://bp.com/statisticalreview)

**Figure 2. Change of Prices of Crude Oil 1976-2011**



Source: BP, BP Statistical Review of World Energy, June 2012, [http:// bp.com/statisticalreview](http://bp.com/statisticalreview)

The quest for energy security can be said to gain acceleration after the oil shock in 1973. This and subsequent shocks have set the issue of energy security on the center of energy policies of developed and developing countries. The increase in oil prices during the period 2007-2008 caused the energy security policies to reshape, and the countries focused more on the expanding of incentives regarding energy investments and on diversifying of energy supply resources (Cohen et al., 2011).

Energy security has become a serious concern over a period of nearly a century. While the concept of energy security was closely associated with fuel supply for the army in the first-half of 20th century that resulted in the Second World War, oil did not lose its significance and it became more and

more important for many industrialized societies. Countries became dependent on oil in many fields such as passenger transportation, food production, health, heating, electricity generation, mechanized farming. However, a large part of the countries did not have necessary production potential to meet the increase in oil dependence. The vulnerability of this system emerged with the oil crisis in 1970s and the fragility of the oil supply system were better understood. In the last periods of 25-30 years, another line of thought on this subject has been seen to develop. The first thought on this subject is that energy resources are limited. The ideas of limited resources include concerns about whether the resources will be sufficient to meet the world's energy need in the coming years. The second thought on this subject is the security vulnerability of complex technical systems. It is claimed that electrical systems of countries are vulnerable because they are exhaustible and usually dependent on large-scale energy generation technologies fed by imported energy resources (Cherp and Jewell, 2011). However, the vulnerabilities of the systems are not limited to only power plants based on fossil fuels. The energy generation especially provided by dams on common international rivers is usually perceived to be unsafe in the light of climate change affecting the seasonal water availability. Concerns about energy security are the main driving force of energy policy. These concerns are related to the flexibility of energy system, protection from potential threats caused by external factors and soundness (GEA, 2012).

Energy security has many aspects: the long-term energy security is mainly linked to timely investments to supply energy in line with economic developments and environmental needs. On the other hand, the short-term energy security focuses on the ability of the energy system to react promptly to sudden changes in the supply-demand balance (International Energy Agency, 2013).

Energy security is an important goal of energy policy within the framework of sustainable energy development. The development of sustainable energy includes the subjects of diversification of energy supply, energy autonomy, low level of energy import in energy supply, efficient use of energy in energy industry, the quality of energy supply, the suitable cost in energy supply, sufficient investment financing and renewable contribution (Bariloche, 2008). The energy should be both adequate and sustainable for social, economic and military needs. So, the energy security is a basic prerequisite for sustainable development.

#### **4. Conclusion**

Although the different forms of energy have gained importance from time to time since the world existed, the energy has always been one of the cornerstones of the continuation of civilization. When taken into the account of the environmental degradation in energy generation process in the face of continuous increase in world energy demand, challenges in access to resources and declines in reserves, it is seen that the sustainability of today's power structure based substantially on fossil fuels will be quite difficult in the future. Increasing the share of renewable energy sources in world energy consumption is of vital importance in this respect.

Another important issue on energy is the energy security. Concerns about the energy security first emerged in the USA, Europe and Japan at the beginning of the 1970s. The oil crisis during this period revealed the weakness of advanced economies against the oil price shocks. Due to the ongoing importance of fossil fuels in energy production, the energy security occupies an importance place on the agenda of energy policies. In this sense, the energy security and the increase in world energy demand have become a priority for the policies of both developing and developed countries.

The energy security is not just about energy price shocks. It is also related to the availability and attainability of the energy. However, it can be said that many problems about this issue are still unclear.

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