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The role of coal in energy policy and sustainable development of Turkey: Is it compatible to the EU energy policy?

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ABSTRACT

This paper aims to assess the current and future role of coal in energy strategy of Turkey, and evaluates the compatibility of policies to the EU energy policy and strategy. Coal is regarded as the most important indigenous energy source in Turkey together with hydropower to strengthen the supply security of the country. Turkish government set targets to fully utilize coal reserves of the country in next decades. However, the country is also in the process of becoming an EU Member State, hence, it is expected that the energy policies have to comply with the EU. Moreover, Turkey ratified Kyoto Protocol in 2009, thus the country should limit CO_2 emission together with other greenhouse gases. The probable obstacles that Turkey may face due to the utilization of coal were determined as CO_2 emissions, lack of technology and application in Carbon Capture and Storage (CCS) and health and safety issues. It is concluded that coal is a very important domestic energy source for Turkey but new policies have to be developed and adopted immediately, and more realistic targets for the country should be set accordingly.

1. Introduction

Sustainable development is defined as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (COM(2005) 24, 2005). It is a fundamental and overarching objective of the European Union (EU) set out in the Treaty, governing all the Union's policies and activities (EU-Council, 2006). By linking economic development, protection of the environment and social justice, it aims at the continuous improvement of the quality of life and well-being for present and future generations, and therefore concerns all citizens in the EU, as well as of the whole world.

Among the scope of sustainable development energy, of course, occupies a significant place since it promotes the quality of life and provides economical and social progress. Furthermore, a competitive, reliable and sustainable energy sector is essential for an economy. Accordingly, the EU introduced a concept called "Energy Triangle representing the main elements of a new European Energy Policy (Fig. 1).

As energy has such importance for humanity, a number of issues have been put under spotlight in recent years all around the world. These are: volatility in oil prices, interruptions to energy supply, inefficiency in connections between electricity networks, the difficulties for suppliers in accessing gas and electricity markets and increased attention to climate change. These issues have pushed energy towards the top of national and European agendas. Accordingly, the EU has adopted an energy policy aiming to maximize the use of renewable energy sources to reduce the dependence on fuel from non-member countries, to minimize emissions from carbon sources, and to decouple energy costs from oil prices. Furthermore, the Union's policy targets to constrain the demand by promoting energy efficiency both within the energy sector itself and at end-use. Fig. 2 shows the shares of fuels in gross inland consumption and in production of primary fuels in EU-27 by the year 2007, respectively.

Coal was the main energy source not only in Europe but also worldwide until the 1960s. However, it began to lose its market share to oil due to the advances in oil extraction, conversion and application technologies as well as the entry of natural gas and nuclear power into the market at the beginning of 1970s. Coal started to be considered as an old-fashioned fuel for use in poorer countries since all these new energy sources were cleaner and even cheaper in some occasions. As a result, despite the rising energy demand, gross coal consumption in the EU-27 has been declining since 1987.

Turkey is geographically located in close proximity to 72% of the world's proven gas and 73% of oil reserves, in particular to those in the Middle East and the Caspian basin. Thus, the country is regarded as a natural energy bridge between the source countries and consumer markets. Thus, in case of full membership, Turkey would have an important role in EU energy supply security inevitably.

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In the 9th Development Plan (2007–2013) of Turkey it was stated that supply of the energy required by economical development and social progress continuously, safely and at minimum cost is the main objective of the country. Furthermore, while supplying the energy keeping environmental harms at minimum levels and, efficient and provident use of energy are the main considerations. In the scope of sustainable energy, as parallel to the EU energy policy, Turkey's current energy policy primarily aims to maximize renewable energy potential within the next 15 years as Turkey is one of the EU-candidate countries. However, projections shows that total energy consumption would be much more than domestic energy production between 2010 and 2020 (Fig. 3). Moreover, Turkey is a net energy importing country. Thus, utilization of domestic energy sources is of great importance for the country for the next decades. Since Turkey does not have significant natural gas and oil reserves, coal has an important share (almost 55%) in the domestic energy production whereas its share in gross inland consumption is 29% by the year 2007 as shown in Fig. 4.

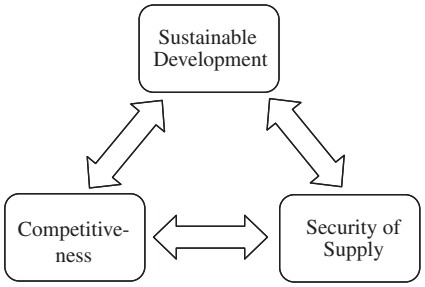

Fig. 1. The energy triangle (Adapted from SEC(2009)1500, 2009).

2. Coal—current facts

Coal has an advantage over other major energy sources as it is plentiful and widely distributed and likely to be in continuing, and increasing demand for the foreseeable future. Economically recoverable coal reserves are available in more than 70 countries worldwide. Moreover, global coal reserves are estimated to last for almost another 150 years at the current rate of production. Hence, a country's or a region's energy security can be enhanced and reliable power can be provided to drive economies by the utilization of coal. For comparison purposes recent trends relating to coal will be discussed separately for the world, the EU and Turkey in this section.

2.1. The world

It is estimated that the world total proved coal reserve is about 825–850 billion tonnes (WEC, 2007; BP, 2009). Table 1 shows the distribution of world proved recoverable coal reserves into different regions. On the country basis, it is seen that only 10

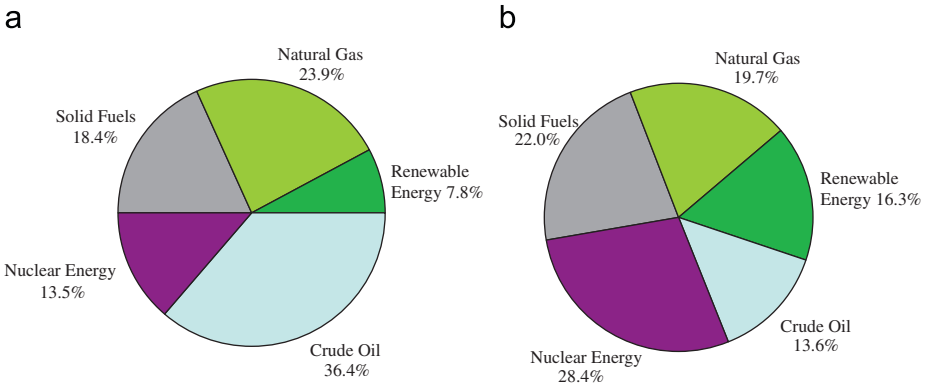

Fig. 2. Share of fuels in (a) gross inland energy consumption and (b) production of primary energy in EU-27 by 2007.
Data source: Eurostat, 2010.

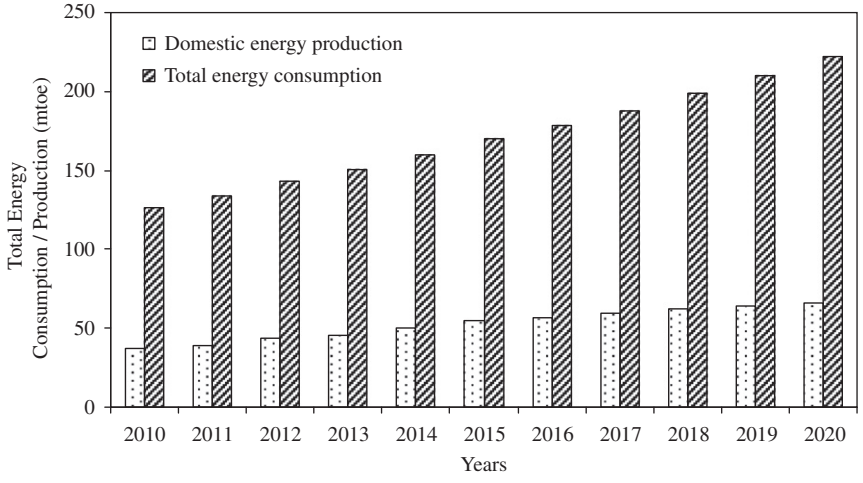

Fig. 3. Projections on domestic energy production and total energy consumption of Turkey between 2010 and 2020.
Data source: EUAS, 2010.