



A new energy paradigm for Turkey: A political risk-inclusive cost analysis for sustainable energy

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ABSTRACT

Implementing sustainable development policies in order to achieve economic and social development while maintaining adequate environmental protection to minimize the damage inflicted by the constantly increasing world population must be a major priority in the 21st century. While the emerging global debate on potential cost-effective responses has produced potential solutions such as cap and trade systems and/or carbon taxes as part of evolving sustainable energy/environmental policies, this kind of intellectual inquiry does not seem to be an issue among Turkish policy-making elites. This is mainly due to their miscalculation that pursuing sustainable energy policies is much more expensive in comparison to the utilization of fossil fuels such as natural gas. Nevertheless, the pegged prices of an energy sector dominated by natural gas are illusive, as both the political risks and environmental damage have not been incorporated into the current cost calculations. This paper evaluates energy policies through a lens of risk management and takes an alternative approach to calculating energy costs by factoring in political risks. This formulation reveals that the cost of traditional fossil-based energy is in fact more expensive than renewable energy. In addition to being environmentally friendly, the paradigm shift towards renewable energy policies would provide Turkey with a significant opportunity to stimulate its economy by being one of the first countries to develop green technologies and as a result this burgeoning sector would prompt job creation as well; mainly due to the externalities.

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The country which succeeds at grading the prices of renewable energy with that of fossil based resources and harnesses the power of clean, renewable energy will be the super power of the future. Barack Obama, February 2009

1. Introduction

The European Union (EU) – to which Turkey has pledged to become a member – aims to increase renewable energy consumption to 20% in 2020. For geographical reasons, even though Germany is far less able to harness solar energy than Turkey, the former has been taking significant steps to develop its solar energy capabilities. Generation of electricity from non-traditional renewable sources such as solar and wind is not financially competitive with traditional means in the current prevailing market conditions without subsidies. Hence, governments have resorted to supporting enterprises for renewable energy development. For instance, Greece has been granting subsidies from 26 to

50 Euro cents/kW h for renewable energy development with guarantees of purchase, Bulgaria from 38 to 39 Euro cents/kW h, and Italy from 36 to 49 Euro cents/kW h (DEK-TMK). In comparison to these subsidies, the renewable energy bill proposed to the Turkish Parliament in November of 2010 is far too modest, from 5.5 to 10 Euro cents/kW h (Dunya Bulteni). In contrast to this meager subsidy, Turkey should set objectives that would ultimately lead to the capability for independent energy production, promote the development of local energy sources, and save 50 billion dollars spent on imported energy. However, Turkish policy-makers' conservative approach to energy has not allowed for such a shift in energy policies.

According to Thomas Kuhn's well-known conceptualization, a paradigm is a coherent pattern of research designed around commonly held theoretical propositions and models, and a paradigm shift is the emergence of an alternative framework of common and shared analysis. As a philosopher of science, Kuhn (1962, p. 10) stressed the development of science and intellectual ideas; nevertheless, a paradigm is a sufficiently open-ended concept "to leave all sorts of problems for the redefined group of practitioners to resolve". Thus, paradigm shifts can occur in policy as well. Several significant events such as environmental degradation due to climate change can lead to

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changes in the existing mind-set of policy-makers and eventually pave the way for new policy objectives and means. In order for the materialization of this paradigm shift in policy to occur, a change of ideas is essential.

This paper's main objective is to contribute to a growing body of academic literature concerning shifts in prevalent ideas on energy and environmental policies (Eriş, 2002; Helm, 2007) to achieve sustainable energy/development (Tester et al., 2005; Podobnik, 2006; Elliott, 2007), thereby, fostering a paradigm shift towards sustainable policies with a special reference to Turkey's hydro-carbon based energy infrastructure. Utilizing risk-management as a means to take into account political risks, this paper ultimately aims to propose a formula that will reveal that the cost of the traditional fossil energy is indeed higher than the costs associated with renewable energy.

The first part of the paper will make a conceptual analysis of energy sustainability by applying Richard Duncan's 'Olduvai Theory'. Against this theoretical backdrop, the paper will go on to argue that since traditional energy policies prioritizing fossil fuels are not sustainable, policies should be adopted that emphasize renewable energy resources to make this transition. This will be elaborated upon with figures and data on energy projections. The second section will examine the state of renewable energy in Turkey and provide detailed information on the local potential for renewable energy sources. The third section will propose a political risk-inclusive approach for the adoption of sustainable energy policies in Turkey. Adding up political risks to the classic cost equation, we have tried to corrupt the orthodox cheap/un-risky fossil energy understanding. According to our proposition, sustainable energy policies would not only produce environmentally friendly and politically risk-free outcomes, but also stimulate the Turkish economy. Ultimately, renewable energy and related technologies will shape the future of the world and Turkey should shift its energy paradigm to secure its place among the first green economies.

2. Sustainability in energy and the effect of renewable energy on sustainability

Undoubtedly, developing and implementing sustainable energy policies are among the major problems facing humanity in the 21st century. The use of sustainable energy not only entails providing sufficient energy for present and future energy needs, but also protecting the environment and the integrity of ecosystems. In addition, it provides measures to avoid security threats and potential geopolitical conflicts that might occur from increasing competition for the improperly scheduled distribution of energy resources (IAC, 2008).

Many developed and developing countries in the world are energy importers and these countries are searching for new ways to develop and implement new sustainable energy policies and strategies. Four main issues should be considered in detail in order to create sustainability in energy production and consumption:

- i. Making new investments in order to respond to increasing demand and enhancing the infrastructure.
- ii. Rehabilitating current resources, and efficient usage of such resources.
- iii. Developing new/alternative energy technologies at competitive prices.
- iv. In terms of energy supply, not being dependent on a single source, region, or country.

If these four points are taken as one integrated issue, the necessity of renewable energy becomes apparent. Renewable

energy resources, such as those obtained from sunlight, wind, water (hydropower), biologic processes and geothermal resources are most commonly defined as sources which are able to replenish themselves at the same rate or more quickly than the energy they consume. For example, a car utilizing solar energy consumes this energy but the energy that it consumes is trivial in comparison to the amount of solar power available. In this way, renewable energy cannot be depleted. In contrast, fossil-based resources are theoretically renewable in the long term but are prone to depletion in the short and medium terms. On average, dependence on fossil resources is around 85% and nuclear-based energy is 6%. Renewable resources comprise a mere 8% of total energy consumption. Fig. 1 demonstrates the average proportions of energy resources today (while these proportions fluctuate from year to year, they hover around an average). It is estimated that 50% of fossil energy resources are used in electricity production.

According to the 'Olduvai Theory' coined by Richard Duncan, the current dependence on fossil resources is not sustainable. After 1930, which is considered as the beginning of the oil based industrialization, energy consumption per capita (\hat{e}) reached its peak in 1979 and started to decrease as of this date. If this process continues in this manner, the world will experience black outs as of 2012 and in 2030 the amount of energy consumed per capita will decrease to the same levels as it was in the 1930s (Duncan, 2001). The Olduvai Theory makes this prediction in Fig. 2.

Although the Olduvai theory has been seen as being excessively utopian, nonetheless it reminds us that the current traditional energy policies are not sustainable and that renewable energy resources should play a key role in the process of transitioning to a sustainable system for energy production and consumption. Indeed developing renewable energy technologies might well result in significant benefits due to the worldwide availability of these resources (Fig. 2).

Developing renewable energy resources is desirable for the following reasons:

- i. They have numerous benefits for the environment and public health (most have nearly zero carbon emissions and produce minimal waste).
- ii. They contribute to the supply and security of energy (i.e., decreasing fluctuation in prices and less dependency on imported resources, as well as the availability of a diversity of resources).

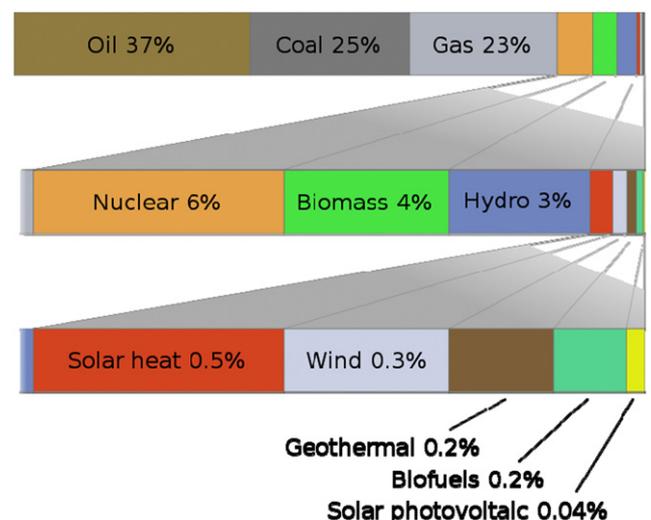


Fig. 1. Energy usage per resources.
Source: (Wikipedia).

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