

Good article review on renewable energy resources in turkey

[Countries](#), [Germany](#)



1. Introduction

Energy is a vital resource for production in industries. It also measures the development of a country. Thus, inadequacies in power supply could adversely impact the economic, political and social aspects of a government. In this regard, overall planning must be made to maximize the resource. Third world countries must create a good cost-benefit analysis to ensure that there is an ample supply of power to keep their economy afloat. Policy makers must also take into account the future direction of energy sector and consider factors such as cost, technical potential for capacity and availability of sites to develop to meet the growing demand on energy (Nalan, Murat and Nuri, 1429).

As reports of global warming and climate change started to circulate, governments and scientists throughout the world became very aggressive to explore the potential of renewable energies; that is to abate carbon dioxide emission. Many countries based their policies under the framework of renewable energy resources. The technology to harness power from the wind, water, sun and the like has increased rapidly. At the moment, there are 109 countries that ratified their policies regarding renewable power while there are 118 countries that set their targets for renewable energy (Gallagher, 59).

Sustainable energy technology (i. e. hydropower, wind turbines and solar panels) plays a pivotal role in the world energy market. These tools were significant in strengthening regional developments. However, non-renewable sources such as oil, coal, nuclear power and fossil fuel still remain to be the most utilized resources having 86% of total global energy generated in 2005.

Renewable sources on the other hand make up 13.6% of the total energy produced where developing countries consumes most of the energy produced (Nalan, Murat and Nuri, 1433). The lopsided statistics on non-renewable versus renewable energy market has been ascribed to: insufficient cost effectiveness of renewable energy technology; possibility of imbalance in the system of technology; and the lack of government support. These barriers are among those that halt the production and exploration of renewable energy technologies. Gallagher (59) enumerated four factors that affect yields in renewable energy resources among different countries in the world: (1) economic motives; (2) high benefits of renewable resources and/or low benefits of nonrenewable resources; (3) politics; and (4) cultural factors and attitudes. In this paper we review the underlying factors which affect energy output of renewable sources in Turkey. We will also compare Turkey's attitude to that of Germany towards investing in green technologies which are used to harvest energy from hydro, solar, wind and biomass.

2. Current Situation of Renewable Energy Sources in Germany and Turkey

Germany's location limits the generation of renewable energy, but their existing technologies and energy demand covers 128% of energy consumption with renewable sources. The country does not have oil reserves and their natural gas reserves are but insufficient to meet the demands of the local Germans. However, Germany has 4.7% coal reserves. Because of its huge industry, its net import accounts to 76.2 billion cubic meters of natural gas in 2011. This high demand for energy prompted the government to subscribe to renewable energy markets. The renewable energy potential for electricity in Germany is 9.7 MWh per capita per year (Gallagher, 60).

Similarly, the bulk of Turkey's energy supply comes from imported petroleum. The increase in international petroleum prices profoundly affected Turkish economy. Given the dire consequences of volatile oil prices, Turkey is gearing towards nuclear power and other energy resources. This is opposite to the present policy of enhancing domestic lignite and hydro resources (Nalan, Murat and Nuri). To date, Turkey depends greatly on hydroelectric power as an alternative source for petroleum. Turkey has 53 hydropower plants which generate 5 MW of electricity to several GW while Germany has generated 4.40 GW of energy from hydropower plants in 2010 alone (Nalan, Murat and Nuri, 1433; Pregger, Nitsch and Naegler, 355). Unlike Germany, Turkey receives a high rate of solar radiation that makes it suitable to use photovoltaic system. The photovoltaic system has the capacity to produce a 0.5 MW of electricity. At present, Turkey lacks policies and programs to manage the commerce and trade involve in photovoltaic systems while Germany produces 1229 MW of energy from photovoltaic source which is tantamount to 84% of installed photovoltaic power all over Europe.

The current wind energy projects of Turkey yields 727.96 and 817.96 MW while in Germany, 27.1 GW of energy derived offshore and 0.09 GW derived onshore were accounted in 2010 (Nalan, Murat and Nuri, 1433; Pregger, Nitsch and Naegler, 355).

Biomass is the biggest source of renewable energy today. It also has the highest technical potential for expansion among renewable energy technologies. While Nalan, Murat and Nuri estimated the potential of biomass produced in Turkey, Germany capped both solid biomass and biogas

generation in Europe in 2009 (Fernandez, Ortiz and Bernat, 554).

3. Projection and Feasibility of Potential Renewable Energy Resources in Turkey

The construction of additional 485 dams in potential sites will add more 19 GW of energy produced in Turkey. An addition 7476 MW will be added to the energy reserves of Turkey once the Southeastern Anatolia Project (GAP) ends. However, the project requires US\$30 billion investment. While hydro resources promise the advantage of low operation cost and pollution load and the potential for irrigation projects and flood controls, there are still some environmental concerns that require further assessment such as changes in river flows and inundation of extensive land areas. Mini-hydro dams may lessen the environmental impact but large reduction of power supply may also be expected during drought seasons (Nalan, Murat and Nuri).

Small photovoltaic systems cost about 9 euro cents per watt hour when installed. A 20-year lifetime discount at about 52 euro cents per kilowatt hour suggests that small photovoltaic systems would have no profit period. Factors that hamper the feasibility of photovoltaic systems in Turkey include economic and institutional aspects. The economic factors include high cost of power generation and the lack of financial assistance for manufacture and distribution. Institutions on the other hand deal with problems such as the lack of understanding about the technology and stability of long-term policy framework. One of the major environmental problems is the use of toxic chemical and its disposal (Nalan, Murat and Nuri).

The estimated potential of wind energy in Turkey accounts up to 88, 000 GW

while its economic potential is 10, 000 MW. By 2020, 1000 M is expected to be produced upon installing the technology. At optimum condition, a wind turbine can generate at least 500kW. However, it requires a 13, 700 hectare of land and an initial investment of about US\$500, 000 dollars, and an annual operating cost of US\$40, 500. Aside from cost, the disadvantages associated with turbine developments include intrusion into areas of shallow water, thereby affecting other economic activities, electromagnetic interference of television and radio signals and habitat loss of wildlife. There has been a tradition of failed projects on wind energy because of lack of infrastructural support, social compatibility and trained technicians (Nalan, Murat and Nuri).

The theoretical gross biomass potential is estimated at 135-150 mtoe per year. Electricity generated from methane gas is 40% efficient. The economic potential, however, is estimated at 25 mtoe per year. While biomass fuel cycle was estimated to have near-zero net emissions of carbon dioxide, the outturn of energy requires a huge land area. Some scientists reported that wastes used for fuel may degrade soil quality. Further, biomass production may result to competing land use for fuel and feed. Another disadvantage in biomass sector is the difficulty in collecting large amounts of biomass wastes because of the dispersive nature (Nalan, Murat and Nuri).

4. Attitude towards Renewable Energy Resources

There has been a widespread support on renewable energy in Germany throughout the years. Of the total German population 90% promoted a rapid scale-up of renewable energy, regardless of increased costs in electricity (for 73% of the advocates). Wind energy is widely accepted in Germany unlike

solar photovoltaic systems. Germany believed that they should not subsidize a technology that has a low energy output potential despite the fact that they receive poor solar insulation. In 2000, the government decided to enforce a nuclear phase-out and focused on harnessing renewable energy resources. However, the government decided to revise its nuclear policies. Yet the Germans hope that by 2050 renewable energy sources would contribute to 80% of the total energy output (Gallagher; Bruninx et al.). While renewable energy enjoys a widespread support in Germany, Turkey seems to be apprehensive about investing on sustainable technologies for power production. Their attitude toward such technology is reflected on the lack of organized commercial and domestic photovoltaic program. That is the government has no intention to support photovoltaic technology. Further, wind turbines have not yet been included in the legislation. The market for wind energy is limited because manufacturing cost and low net income returns make it unattractive for investors. Apart from the lack of financial support, the cost of technology itself discourages the government to invest to renewable energy resources. It also takes time to recover the investments in this type of energy resource. Scientific and technical barriers along with the current environmental policy of the Turkish government impede the introduction of renewable energy. The government failed to assess the economic development benefits of renewable energy resource.

5. Conclusion

Works Cited

Bruninx, Kenneth, Darin Madzharov, Erik Delarue and William D'haeseleer. "Impact of the German Nuclear Phase-out on Europe's Electricity Generation—

<https://assignbuster.com/good-article-review-on-renewable-energy-resources-in-turkey/>

A Comprehensive Study.” *Energy Policy*, 60 (2013): 251-261.

Fernandez, Pablo F., Eunice V. Ortiz and Jorge X. Bernat. “ The Deployment of Electricity Generation from Renewable Energies in Germany and Spain: A Comparative Analysis Based on a Simple Model.” *Energy Policy*, 57 (2013): 552-562.

Gallagher, Kelly S. “ Why & How Governments Support Renewable Energy.” *Dædalus, the Journal of the American Academy of Arts & Sciences*, 142. 1 (2013): 59-77.

Nalan, Cicek B., Ozturk Murat and Ozek Nuri. “ Renewable Energy Market Conditions and Barriers in Turkey.” *Renewable and Sustainable Energy Reviews*, 13 (2009) 1428-1436.

Pregger, Thomas, Joachim Nitsch and Tobias Naegler. “ Long-term Scenarios and Strategies for the Deployment of Renewable Energies in Germany.” *Energy Policy*, 59 (2013): 350-360.