

Industrial Engineering 2016: Analysis of the potential of renewable energy development in Saudi Arabia- Majid Jaridi-West Virginia University

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Saudi Arabia is a nation that has been exploring the potential of renewable energy for many years. Saudi authorities, scientists and researchers view renewable energy as a preferable long-term energy strategy. Despite this, because Saudi Arabia is one of the leading oil producing nations and relies heavily on it as a form of energy, solar energy has not been given much serious consideration. Solar and wind energy are the best sources of renewable energy in Saudi Arabia; however, because of the large amount of oil in the country, most do not want to explore the option of renewable energy. Hence, it is essential to explore the alternative sources to insure reliable supply for potential future need. The main objectives of this research were to: Establish the potential of solar and wind energy generation as a suitable, cost-effective alternative to petroleum products and; to establish the potential for maximizing renewable power generation to support the grid supply to Saudi cities. We developed three different forecasting models for 32 Saudi cities: the decomposition method, multiple linear regressions (linear trend model) and multiple linear models (seasonal model). We then selected a preferred model that can best forecast the amount of renewable energy capacity in the forecasting horizon. Using software written for this research, we developed an economic model to evaluate the cost of generation and transmission of solar as well as wind energy at the select cities in Saudi Arabia.

Saudi Arabia lies along coordinates 24.0000°N and 45.0000°E in the Asian continent, placing it in a desert environment where temperatures can arrive at 70 degrees Celsius. For this reason, Saudi Arabia has been elaborating the capability of utilizing solar energy for a several years. Solar energy has been viewed by Saudi authorities, researchers, and scientists as a favored other option source of energy. In spite of this, the way that Saudi Arabia is additionally one of the leading oil-products delivering countries and depends intensely on it as a type of energy, solar energy has not been given serious consideration in the past. This exploration expects to re-examine the circumstance and help realize a renewed interest in solar energy in Saudi Arabia. Saudi Arabia's oil accumulate is one of the largest in the world, which has prompted significant improvement in this section. This substantial center has partly been motivated by the fact that oil deals are high, and form a significant part of the nation's foreign earnings. The oil industry has offered various remote direct investment openings, generally from Britain and the United States. This center has made oil significant as a non-renewable energy resource. Statistics from 2010 show that the monetary effect of Saudi Arabia's oil sector can't be reduced. The oil earnings makes up about 90% of the nation's total revenue. Obviously oil is a significant product, thus the large contribution of the state-owned firm Saudi Aramco in the business. Ghawar oil field is the largest on the world, and has an remaining accumulate potential expected at 70 billion barrels. This is a relatively large amount contrasted with other oil-

producing countries, and is a part of the challenge associated with concentrating on renewable energy sources. Saudi Arabia is the largest producer and exporter of oil based commodities in the world. This puts It is oil industry in ahead of other related businesses. Another significant item is natural gas, which Saudi Arabia was expected to be the fourth biggest producer after Iran, Russia, and Qatar. Clearly Saudi Arabia has important potential in the non-renewable energy sector, something that has gotten it far from important exploration of renewable energy source.

Saudi Arabia remains the biggest exporter of oil related items in the Middle East. In spite of the focus on renewable energy by buyers, explore has demonstrated that there is little inspiration by several occupants to energy sources. For instance, at the household unit level there has been a low rate in receiving solar energy as a reasonable other option. The accessibility of non-renewable energy at a lower value places a combining in the method of advancing renewable energy source as a viable energy source. This high dependence on non-renewable energy sources among consumers combined with the production advantage implies that the domestic prices for petroleum products, for example, fuel and Natural gas, are about 40% less than worldwide prices.

The largest potential source of renewable energy in Saudi Arabia is solar. The Convergence of a few factors that would appear to make solar power a viable source remains to a great extent unutilized, or underutilized. The issue isn't only the utilization of solar energy consumer, but also a significant lack of production. Research shows that there is little investment in solar energy, particularly by the state, which is in compare to its heavy involvement interest in oil based commodities. This implies there is little motivation among state stakeholders, energy sector engineers, and different experts in the division to develop an effective policy that can be depended upon to push forward the far reaching adoption of solar energy in Saudi Arabia. The renewable energy source issue in Saudi is additionally complicated by the high reliances among Consumers on oil based Petroleum products. This is a result of the present low cost of petroleum energy; just as the high beginning speculation required to arrangement sun based vitality creation focuses. It is worth noting that the average investment required for non-renewable energy surpasses that of renewable energy, which means that high consumption plays a role in driving the growth of non-renewable energy at the expense of solar energy. In fact, most of existing solar power generating ventures is supported from the private division where the costs end up being high and unsustainable over the long run.

This work is partly presented at 3rd International Conference and Exhibition on Industrial Engineering, November 14-15, 2016 Dubai