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Wind Energy in Iran

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Abstract: The potential of wind energy in Iran approximately is 6.5 GW.Menjil is the just wind energy station in Iran that has 9.7 MW capacity .The biggest wind turbines station is making in Gilan that has 90MW capacity .For this project spe nd about 40 million dollars yet .World energy association want to increased wind energy capacity to 75000MW in 2010, and 180.000MW in 2020. The potential of wind energy is very big in Iran and if it is used effectually it is effect on econ omy and air pollution will be very important in addition Iran has ability, for making some part of turbines. Therefore the price of turbines and electricity will be decreased in Iran wind turbines will prevent the big amount of emission of carbon in Iran and around the world .There is many new project that working on it now.

Keywords: Wind Energy, Wind Turbines, Renewable Energy.

Introduction

History of Wind Machines and Wind Energy

Throughout history people have harnessed the wind. Over 5,000 years ago, the ancient Egyptians used wind power to sail their ships on the Nile River. Later people built windmills to grind their grain. The earliest known windmills were in Persia (the area now occupied by Iran).The early windmills looked like large paddle wheels.

Centuries later, the people in Holland improved the windmill. They gave it propeller –type blades and made it so it could be turned to face the wind .Windmills helped Holland become one of the world's most industrialized countries by the 17 th century.

American colonists used windmills to grind wheat and corn, to pump water, and to cut wood at sawmills. In this century, people used windmills to generate electricity in rural areas that did not have electric service. When power lines began to transport electricity to rural areas in the 1930s, the electric windmills were used less and less.

Then in the early 1970s, oil shortages created an environment eager for alternative energy sources, paving the way for the re-entry of the electric windmill on the American landscape.

Heymann's 518 page book in German on the history of wind energy from the late 19th century to the early 1990 s will surely raise the hackles of some in the some in the wind energy community. Heymann, a historian of technology and the environment, meticulously documents the political and technological thought toward wind energy in several countries across two continents during the past 100 years.

By the end of the war there were six turbines at Ventimotor's test field, including a 50 kw Aero motor from the Danish firm F.L .Smidth.It is interesting to speculate how the 18-meter turbine could have influenced Hutter 's later work and led German wind turbine designers down a path far different than that taken by Hutter in later years. The F.L.Smidth turbines of the war years were direct antecedents of Johannes Juul's Gedser mill during the post-war period. How would the international wind turbine market look today if Hutter had pursued a Gedser-like design instead of the University of Stuttgart's two-blade, downwind w34 that hemade famous? In 1895 windmills provided 1.8% of the power in Germany (equivalent to 87 MW), steam provided 78%.

On the economic front, there is a lot of good news for wind energy. First, a wind plant is far less expensive to construct than a conventional energy plant. Wind plants can simply add wind machines as electricity demand increases.

Second, the cost of producing electricity from the wind has dropped dramatically in the last two decades. Electricity generated by the wind cost 30 cents per KW/h in 1975, but now costs less than five cents per KW/h. In comparison, new coal plants produce electricity at four cents per KW/h.

Wind Energy & The Environment

In the 1970s, oil shortages pushed the development of alternative energy sources. In the 1990s, the push came from a renewed concern for the environment in response to scientific studies indicating potential changes to the global climate if the use of fossil fuels continues to increase. Wind energy offers a viable, economical alternative to conventional power plants in many areas of the country.Wind is a clean fuel; wind farms produce no air or water pollution because no fuel is burned.

The most serious environment drawbacks to wind machines may be their negative effect on wild bird populations and the visual impact on the landscape. To some, the glistening blades of windmills on the horizon are an eyesore; to others, they're a beautiful alternative to conventional power plants.

Wind Energy in Iran

Electric power generation installed in Iran is about 32.5 Giga Watts (GW)with more than 87%being from thermal natural gas fired power plant .Currently ,Iran has five small nuclear reactors used for peaceful purposes. Nuclear and renewable energy will enable Iran to export more gas and oil and increase its revenue, since 80% of Iran's revenue is based on oil and gas export.

The most important aspect of wind energy in Iran is to produce electricity .The potential of wind energy obtained from 26 meteorological sites through Iran and estimated by two organizations ,Centre of Renewable Energy Research and Application (CRERA)and MOE, has been set at about 6500 MW.

Iran's first experience in installing and using modern wind turbines dates back to 1994. Two sets of 500 KW NORDTANK wind turbines were installed in MANJIL and ROODBAR .They produced more than 1.8 million KW/h per year. These two sites are in the north of the Iran, 250 km from Tehran, the capital of Iran. the average wind speed is 15 m/s for 3700 hours per year in ROODBAR, and 13 m/s for 3400 hours per year in MANJIL .After this successful experience, in 1996 the contract for 27 wind turbines was signed and they were installed by 1999 in MANJIL, ROODBAR and HARZEVIL. HARZEVIL is the third wind farm site near to MANJIL in Iran. MANJIL and HARZEVIL, these two sites are 7 km apart at different altitude. MANJIL is about 800 meters above sea level and HARZEVIL is about 500 meters higher there are 21 installed wind turbines in MANJIL, 1*500kw, 5*550 KW and 15*300 KW . The output voltage of the 300 KW turbines is 0.4 KW, but it is 0.69 KW for the 500 KW and the 550 KW . All the turbines are connected to a higher voltage level, 20kV, by step up transformers. The total energy produced since 1994 is about 134.6 GW/h.

The Potential of Wind Energy and Projects In Iran

The wind potential in Iran has examined is a bout 6.5GW.Right now the Manjil Electricity power is the only place which we hove got wind Energy and we produce 9.7 MW Energy. The other wind energy power has been making in Gilan which we delicate 40 million us dollars and 500 billion RSL for it and the place will be work in 2004.Up to 2020 the consumption of wind Energy in Europe will be 180000 Mega Watt .The energy comity in Europe has decided to rising the state capacity of Energy to 75000mw in 2010 and 180000 mw in 2020.By transfering from "Renewable Energy world " the Energy community in Europe has thought the capacity of wind Energy in Europe will be 150000MW in 2002 but by making 23000 MW wind energy in Europe. They have decided to increase the Energy production

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The Project Design Which They Have Been Working On It

1. The 250 MW projection
2. 60 MW , Transfering Technology from Japon
3. Choosing the best farmland for making the wind energy with the 60 MW capacity.
4. Counting the each time energy in Mangil and Roodbar.

Table 1 The capacity of wind energy production in different region

The capacity of wind energy production (W/m2)	Wind powerty (W/m2)	Region location
38.1	317.39	Manjil
17.5	145.72	Ardabil
35.6	296.63	Zabol
13.7	113.99	Jask
6.1	51.09	Abaidan
4.4	36.33	Chabahar
7.9	65.48	Biriand
4.8	40.12	Hamadan
8.2	68.25	Zahadan
3.2	26.86	Ahwauf
2.6	21.37	Shahrood
2.2	18.60	desfool

Conclusion

The potential of wind and solar energy is about 6500 MW and 19.23 mega joules per square meter in Iran. From 1994 to 1998, 10.5MW of wind turbines have been installed and more than 134.6 GW/h electricity has been produced by them. By this amount of production, wind turbines have prevented 4.18 million metric tons of emission of carbon around the world. In addition, because of the ability of Iran to make some parts of wind turbine, total installed generation will be added of wind, solar and geothermal sources. Iran is one of the country with the middle wind .But some parts of Iran has the best place for wind energy. Totally we have been starting 4 MW wind surfing in Manjil and Rodbar. We have 17 state in Manjl which each 3 stands produce 550 KW and the other has300 KW.

Refernces

[1] Energy Information Administration (2000) Iran *energy oil information*.

[2] Energy Information Administration (2000) *Environmental issues*.

[3] Energy Information Administration (2000) *Word energy prospects to 2020*.

[4] BTM Consultant (2000) *International wind Energy Developments*, ASP-Denmark.

[5] Energy, Power Projects and Services Market in Iran, Energy –Iran –Profit.

[6] Windicator (2002) Wind power monthly.

[7] Kavak, E., Akpma C. and Akpinor, S. (2004) Energy conversion and management, Issues **18-19**, November.

[8] Development of wind energy systems for New England islands, Renewable energy, volume **29**, Issue 10, August 2004, pargey 1707-1720.

[9] Fames, F., Manwell and Ton G.M.GOWON Enc Hirst and Jephry Hild, *The Electricity Fond*, Vol. 17, Issue 6, July 2004, p. 20.