The Potential Of Wind Power In Pemba

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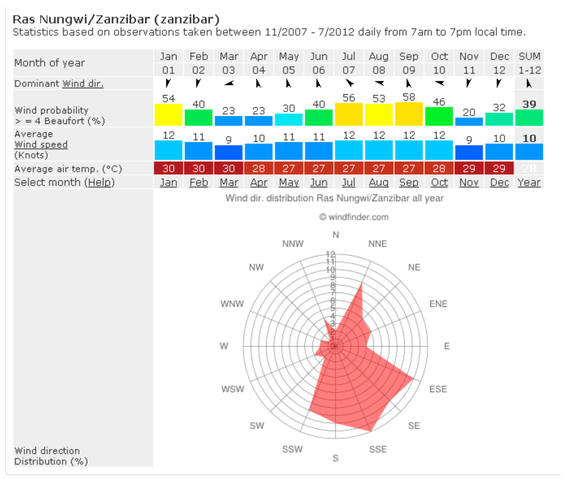
Introduction:
Windmill generator is the device which convert wind mechanical energy to electrical energy. The energy from the wind is trapped by the rotating blades attached to the rotating turbine which consists of coils and magnets. Either the coils or magnets are made to rotate for generation of electricity. But for our simple Windmill generator we made the magnets to rotate for more simplicity. In general the batteries are needed for wind energy because it does not provide constant power.
The production of power depends much on the size of e rotor(coils) as well as speed of the wind. The average wind speed of Zanzibar is 5m/s which produce 1KW with rotor size 5.5m.Approximatetly 700KW can be generated per month by the turbine sufficient for residential house. Also the mean wind speed of Pemba itself is 5m/s. However some periods
Pemba can experience the wind speed up to 10m/s which can produce the power of 2KW with the rotor size 5.5m.
Most of the interior villages of Pemba such as Panza island, Tironi, Makoongwe island etc are faced with the problem of power supply and make thousands of people be unable to operate their social and economic activities efficiently. About 40% of people from Pemba have no power supply and 5MW is needed to fulfill this problem. But it becomes very expensive to solve the problem since some areas of the island has not even wired for electricity. Also about 14% of Tanzanians access for electricity of whom 12% live in urban areas. So, the problem seems to be serious countrywide. Therefore, wind energy should be simple solution for this major problem.
Actually, wind energy is sustainable source of energy. It is better energy for our county rather than solar energy. Although both are clean sources of energy, wind energy is cheaper since it does not involve complex technology for its establishment. Additionally, more power is usually available from wind than from solar.

Methods:

Zanzibar is considering the possibility of turning Indian Ocean currents and waves into electric power to make the utmost of its geological position as an archipelago off east Africa.
If the initial study proves viable, the Zanzibar Utilities Company will build a power plant on the Pemba Island, one of the three major islands consisting the archipelago, which enjoys a history of strong currents and tidal waves.
The company expects to resort to power generated from tidal waves or ocean currents to turn the table against its loss-making situation. It now spends an average of 200 million Tanzanian shillings (200,000 US dollars) per month to generate power via gas turbines whereas it collects 60 million shillings (60,000 dollars) for its power supply.
Ocean energy constitutes to a large unexploited source of renewable energy and wave power therefore commands a good economical potential.
The Zanzibar Utilities Company will wait for the initial study to decide on whether to benefit from the wave power or the tidal power, which dictate two different energy converters to transform wave energy or tidal energy into electricity.
With prices of non-renewable natural gas rising in many countries around the world as readily accessible supplies dwindle, those countries which have a suitable stretch of coastline and are unwilling to invest the huge sums of money some of the world's richest countries are spending on LNG (liquid natural gas) terminals may find wave and/or tidal power to be a viable and renewable alternative.

Results:
Volts: 24, 32, 48 DC
Watts: 4000
cut-in speed: 1.5 m/s
Blades: 3 Carbon reinforced fiberglass blades
Rotor Size: 5.5 m
Overspeed Shutdown: side furling
Tower height: 12 m

wind generator starts at 2m/s
3m/s 200w
5-6m/s 1000w
8 m/s 2200w
10m/s 4000w
12m/s furling out of the wind



Average wind speed on Zanzibar is 5m/s, which produces 1KW, so the turbine generates approximately 700KW per month, sufficient for a residential house. See here windstatistics of Zanzibar:

http://www.windfinder.com/windstats

The system comes complete with 12 m steel tower and charge controller. It is for off-grid (stand-alone) systems, where you still need solar batteries and inverter (which we also can deliver)
In high winds a unique side furling mechanism turns the turbine and blades out of the wind, to protect it from overspeeding. This wind turbine can be visited at a domestic home in the north of Zanzibar, just let us know!

Conclusions:
It is plain that wind energy is more beneficial to our societies. This energy can be used to fulfill the higher scarcity of power supply in our regions, So it is advised that, the meteorological department should make wind data readily available at affordable fees to persons and organizations interested in starting wind energy activities. For reliable power production, modern equipment should be used.

On top of all, the establishment of wind energy project in our country can eradicate much the existing problem of deforestation especially in rural areas. The wind energy can serve the residents for power which can be used as fuel instead of using wood fuel. It must be noted that increasing the practice of deforestation contributes the problem of global warming.

References:
1.Physics books for Zanzibar secondary school(book 1 and book 2)
2.Geography book for Zanzibar secondary school(book 1)
3.Internet (Google)

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Further information:
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