FABRICATION OF ELECTRICITY AND WATER PUMPING SYSTEM USING WIND MILL

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Abstract

The design and model of hybrid power system, consisted of renewable energy source (wind energy). Itconverts wind power into mechanical energy. Burden on national grid over comes,electricity bill reducesand we get energy in environmental friendly manner. This work explains the mechanism to utilize therenewable energy as first option,whether other conventional source are available or not. For irrigation,farm, home and community water supply. Excellent for filling lakes, reservoirs and tanks. All mechanicaldesign is simple and efficient.It is perfect solution for providing a lifetime of free water.Wind energysystems used world wide since1970. Pakistan have a huge renewable energy potential to meet their energyneeds. This type of turbine is unusual and its application for obtaining useful energy from air stream is analternative to the use of conventional wind turbines. Simple construction, high startup and full operationmoment,wind acceptance from any direction, low noise and angular velocity in operation, reducing wearon moving parts, very low cost are some advantages of using this type of machine. In this research, windwaterpumpisdesignedtosupply drinkingwatertoforplaces.Thedesignandmodelofwindmillconsistedof renewable resource. This work explains the mechanism to utilize the renewable energy as first optionwhether conventional sources are available or not. It is simply based on wind. It ensures the optimumutilization ofresources.This projectdealswith the generation ofelectrical energy usingwindmillsmounted on the median ofthe highways. Aswe know that wind energy is produced toa certain amountduring vehicle movementdue to the difference in pressure created by them in both the sides of highways. The energy produced canbe harnessed in an efficient manner using Vertical Axis Wind Turbine. The VAWT is installed in themedian of the roads in such a way the wind would act tangentially on the blades in opposite direction

oftheturbinethuseffectivelyharnessingthewindenergyfromeithersidesofthemedian.Electricalenergyis generated by a generator coupled to the turbine. The generated energy is stored in battery during daytime.Thisenergyissuppliedtostreetlightsduringnighttimethrough DC-DCconverterandinverter

KeyWords: Horizontalaxiswindmill, shaft,bevelgears,dynamo,pump,storage battery,stand.

1. INTRODUCTION **Demand of Renewable Energy** Today

Renewable energy is energy that is generated from naturalprocesses that are continuously replenished. This includes sunlight, geothermal heat, wind, tides, water, andvariousformsof biomass.This energy cannot be exhausted and is constantly renewed. Alternative energyis a term used for an energy source that is an alternative to using fossil fuels. Generally, it indicates energiesthat are non-traditional and have low environmental impact. The term alternative is used to contrast withfossil fuels according to some sources. By most definitions alternative energy doesn't harm the environment,adistinctionwhichseparatesitfro mrenewableenergywhichmayormaynothavesi gnificantenvironmental impact. Renewable energy is good for customers, the environment and the bottom line ofcorporations that run their operations with it. In the United States, though, renewables (including solar,wind, hydropower and biomass) account for only about 10 percent of all energy used and 13 percent of totalelectricitygenerated– evenascorporatecontractsforrenewableenergy nearlytripledfrom2014to2015.Iftherearechalle ngesnow,whencapacityandusearelow,whatwil lhappentobusinessmodels,technologyand financing when renewable power penetration reaches 30, 40 or even 50 percent of the U.S.market?Since there's plenty of corporate demand, the problem is supply, which inturndependson adequateinfrastructure to deliver it. Historically, U.S. utilities have decided what fuels to use to generate electricity,with scant incentive to increase the percentageof renewables in the energy mix or to explore technology toencouragethatkindofshift.Weknowthere'san appetiteformanymoregigawattsofrenewableca pacity,butit's excessively difficult for large companies in the United States to buy as much renewable energy as theywant. While retail customers in many states can arrange to buy solar or wind power from local utilities,companiesneedalarge,sophisticatedtea mtoget accessto renewableenergyoptionsat thescaletheyneedif those options are available at all. To change this picture, it's time to look to the demand side, wheremultinational corporations are joining together to make their preference for more renewable power felt. 2Facebook and Microsoft are among 60 companies and over 50 leading project developers and serviceproviders participating in a new network, the Renewable Energy Buyers Alliance, known as REBA thataims to break down barriers to lower-carbon energy. The alliance aims to see 60 gigawatts – the sameamount of total generating capacity of Turkey — of renewable energy deployed in the U.S. by 2025. That'sa huge jump from the 3 gigawatts of renewable power purchases companies signed in 2015, which wasabouttripletheamountfrom thepreviousyear.**Wind Mill** A wind mill is a rotary device that extracts energy from the wind. The wind mill convertskinetic energy from the wind, also called wind energy, into

mechanical energy. If the mechanical energy isusedtopumpthewater,thedevicemaybecalled waterpumpingwindmill.Inthedevelopmentofa nyeconomy,useofnaturalresourcesisveryimpor tant.Various types(horizontal& verticalaxis)ofWindmillsare used for same purpose. Generally, in the past horizontal axis wind mills were used. The multi-bladedwind pump or wind turbine atop a lattice tower made of wood or steel hence became, for many years, afixtureofthelandscapethroughout ruralAmerica.Thesemills,madebyavarietyofm anufacturers,featureda large number of blades so that they would turn slowly with considerable torque in moderate winds and beself-regulatinginhighwinds.Atower-topgearboxandcrankshaftconvertedtherotarym otionintoreciprocating strokes carried downward through a rod to the pump cylinder below. Today, rising energycostsandimprovedpumpingtechnologya reincreasinginterestintheuseofthis oncetechnology.

AimandObjectives

- Designingawaterpumpwhichcanworkwithoute lectricity.
- Thereisthepossibilitythatthispro jectwillcreateasystemthatisactual lymoreaffordablethanstandardwa terpump.
- Providing waterpumpstoindividualslivingoffthegridandi nbackwardareas.
- TogeneratepowerfromWind energy– Renewableenergyinhighways.
- Tostoretheexcessgeneratedenergyforfurtherus e.
- Toincorporatemorerenewableenergytothepow ersystem.
- Tousethe sufficientwind energysource inhighwaysinanoptimized way.

ProblemStatement

The goal is to design and fabricate a wind mill based on electricity and water pumping system thatcaneffectivelygenerateelectricity andpumpwaterforremotelocationsw herethereisnoaccessto a stable electrical grid or a consistence water source. The system should be able to with standharsh weather conditions and operate in low wind speeds to ensure maximum efficiency.

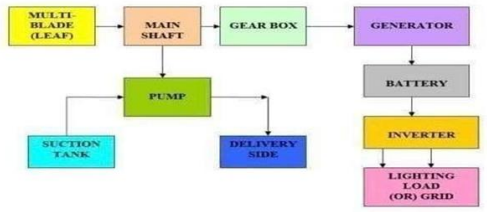
Thedesignshouldalsobesimpleandea sytomaintainwithlocallyavailablema terials.

2. BLOCKDIAGRAM

This is the block diagram of an horizontal axis wind mill where there is capable to make two functionswhich are water pumping and power generation as well. There is a main shaft which was connected to rotorblades and gear box. The bevel gear system which consists of perpendicular system which connects thewater pumping and power generation. The pumping is connected tosuction tank anddelivery

sideandtherebythegearboxtogeneratorand bybatterytouseandstorepower.

BLOCK DIAGRAM



ELECTRICITY AND WATER PUMPING SYSTEM

3. METHODOLOGY

i. In fabrication of electricity by using wind mill there would be a rotors and multi blade turbine , areconnected together and the first major component is main shaft that too which was split into twodifferent possibleworks

ii. Water Pumping System has the main shaft which was connected to the pump which grabs thewaterfromsuction tankandtransfertothedeliveryside

iii. GENERATION OF ELECTRICITY: Themainshaft which was connected to gear box andgeneratorthere by the electricity generates which was stored in batteries or else for variation of electricityvoltstransformerisused

4. Fabrication

PartsDetail

Blades

Figure1:blades

Most turbines have three to five blades which are made mostly of fiberglass. When windflowsacrosstheblade,theairpressure ononesideofthebladedecreases.Thediffer enceinairpressureacrossthetwosidesofth ebladecreatesbothliftanddrag.

Hub

Figure2:HUB

Therotorhubis the component that usually holdsthe blades and connectsthem tothemainshaftofthewindmachine.Itisa keycomponentnotonlybecauseitholdst heblades in their proper position for maximum aerodynamic efficiency, it also rotatestodrivethegenerator.

Final ModelPicture

Figure3:Finalmodel

5. WORKING

Windmillsutilizethepowerofthewindtogenerate electricityorpumpwater,usingthemovementoft heairthattakesplacenaturallyintheearth'satmos phere.Thewindmill'sturbinebladescapturethee nergy fromthewindandturnitintomechanicalenergyby spinningageneratorthatcreateselectricity.Most ofthewindmillsinthepasthavebeenusedfornon-electricalapplications,andwindwaterpumpswer emerelymechanical mechanismslocatedontopofawoodentower,pu mpingwaterforwateringlivestockandirrigation.

6. EXPERIMENTALVALUES

TABLE:OUTPUTOFPOWER

wind speed (m/s)	voltage(v)	current (A)	revolution(RPM)	power (watt)
7.59	3	1	150	3
8.94	3	1.6	300	5
12.07	4	1.75	500	7
20.56	5	1.8	750	9
25.6	6	2	1000	12

TABLE:OUTPUTOFDISCHARGE

time	Discharge(lit/s)	Velocity(m/s)
145	0.010345	4.39
160	0.009375	3.39
190	0.007897	3
240	0.006224	2.5

7. CONCLUSION:

Inconclusion,thefabricationofanelectric ityandwaterpumpingsystemusingawind millis a sustainable and eco-friendly solution that can provide reliable and affordable energyand water access to remote areas or off-grid communities. By harnessing the power ofthe wind, this system can generate electricity to power homesand businesses, as well aspumpwaterfromwellsorothersourceso rirrigation, livestock,or householduse.Thedesignandconstructio nofsuchasystemwouldrequirecarefulpla nningandconsiderationoffactorssuchast hesizeandtypeofwindmill,thelocationan

dorientation of the system, and the energy and water demand of the community. It isimportant to ensure that the system is efficient, reliable, and cost-effective over itslifespan.Overall, a windmill-based electricity and water pumping system has the potential toimprove the quality of life for people living in remote or off-grid areas, reduce theirdependence on fossil fuels and grid-based infrastructure, and contribute to a moresustainablefuture.

8. FUTURESCOPE

Thisprojectcanbeimplementedinalargescaleandexcessenergyproducedcanbetransmittedtothegrid. Thissystemcanbecombinedwithasolarpanelforhigherenergyproduction. Theexcessenergycanalsobegiventothebuildingsnearbythehighways.

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