

UTILIZATION OF WIND MILL MOBILE CHARGER FOR AUTOMOBILES

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ABSTRACT

In current day's power generation by means of renewable energy sources gained more attraction. The solar and wind are nearly everyone frequently obtainable and used energy resources. The idea offered here is charging of low power electronic appliances by means of the wind energy available during travelling. To decrease dependency on fossil fuels electric vehicles invented. This article mostly focuses on application of renewable source of energy for energy storage in battery. Vehicle speed taken in to concern for this intention. The power generation is a DC that's why, easy storage in battery with insignificant charge of grid.

Index Terms-Renewable energy, Wind energy, Two wheeler, Energy storage, Vehicle speed, Voltage Regulator, Wind Energy.

I. INTRODUCTION

WIND ENERGY is a cause of renewable power which comes from air current flowing corner to corner of the earth's exterior. Wind turbines produce kinetic energy and convert it into power.

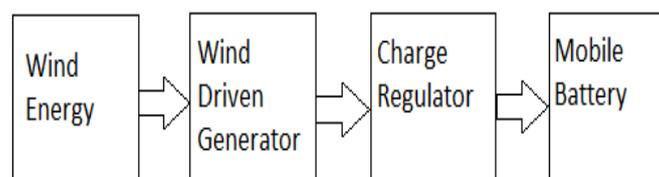


Figure 1: Block diagram of whole setup.

At present we have come with a solution of maintaining sustainability of energy stored in the phone battery by "Wind Driven Mobile Battery Charger" [6-7]. This concept utilizes wind generated electrical energy to charge the mobile phones battery.

The electrical energy is transfer from one place to another place through transmission and distribution lines to load areas. Wind power generation is one of the fastest growing sources of electricity and one of the highest emergent platform in the world nowadays. The world installed capacity of wind power generation has increased from 60 GW in year 2000 to 160 GW in June 2010, and it is anticipated to be 460 GW by the end of year 2015

[1]. With a standard annual growth rate is than 25% more than the earlier period, Wind power generation is the best emergent energy adaptation system in view of the fact that the last two decades, principally owing to the growing consideration regarding global warming, economic incentives from governments, and encroachment in power electronic design and industrialized. The furthestmost difficulty of wind power addition in the accessible power system is the flashing nature of wind power because of high association with varying wind speed. Wind incorporation inflict scores of dispute to system operators such as operational troubles (frequency stability, power equilibrium, voltage stability, and superiority of power), scheduling and economic troubles (including improbability in wind power in to unit dedication, economic load forecast, and revolving reserve calculations), etc [2]. Wind Energy Conversion Systems (WECSs) are swiftly emerging as one of the most hopeful renewable energy resources just about the world. Their infiltration in existing energy systems is extremely imperative to crack the global warming and other fossil fuel problems. At the end of 2006, worldwide wind electrical power generating ability amplified to 74223 MW from 59091 MW in 2005[3]. At the end of 2020, it is anticipated that this outline will have bigger to well over 1260000 MW, which will be adequate for 12% of the total world electricity utilization [4].

II ADVANTAGES OF WIND ENERGY

Wind energy is the most grown-up and economic renewable energy technology presented today, costing between 3 and 5 cents / (kWh), which depends upon the wind resource and sponsorship of that project. Wind generating station competitive with conventional power plants. Unlike the electrical energy from fossil-fuel-operated sources, those are run by fuels whose worth's are costly and may differ considerably; the cost of wind energy is comparatively stable. Wind energy is a transformed form of solar energy. Thus wind energy is inexhaustible and need no "fuel." Wind turbines do not induce greenhouse gas so that may cause global warming. Wind turbines can be upright on farms, therefore advantageous the financial system in rural areas. Farmers and ranchers can carry on work on the land since the wind turbines utilize only a portion of the ground.

III DISADVANTAGES OF WIND ENERGY

Excellent wind power plants are frequently situated in inaccessible areas; it may need noteworthy infrastructure enhancement to bring the wind power to the load area. Even though wind power plants have comparatively minute crash on the atmosphere evaluated to other predictable power plants, there are a number of concerns over the noise, visual brunt, and, from time to time, birds have been murdered when flying strikes with the rotor blades. These troubles have been determined or significantly minimized through technological enhancement [5].

IV RESEARCH EXPLANATION

4.1 Wind Theory

There is a momentous amount of energy present in the wind, in the form of kinetic energy, which can be taken out as utilizable power. When a turbine is used to taken out power from a wind inflowing a turbine at U it eliminate energy from the wind turbine. Due to this development of the flow tube, the maximum power that is



taken out from the feature of wind hence it must inflate. Consequently, if every part of the energy could be taken out, there would be no current of air available the turbine contravention the law of conservation of mass which defines mass with canal be produced, or damaged. Albert Betz tentatively finds out the utmost probable percentage of the energy that can be taken out from a revolving column of wind, In the 1920s (11). His result understood a perfect rotor with no hub and completely axial flow. In addition, the rotor experienced was measured to be mass less, and the wind flow was considered to be not compressible. By using these postulations, Betz resulted that preferably 59.3% of the energy can be taken out from air inflowing the wind turbine. By this study, there is no probable way to take additional energy in a wind system. The mathematical formulation the highest power yield is lower when rotating flows are integrated in the investigation.

4.2 Energy In The Wind

Wind is just air in movement. It is formed by uneven warmth of the surface of the earth by energy coming from the Sun. In view of the fact that the Earth's surface is prepared by several types of soil and water; the Sun's radiant energy absorbed by the Earth at dissimilar charge. Mostly part of this energy is transformed into heat as it is consumed by ground regions, sea water, and the wind above these formations. The wind has mass; in spite of the fact that its density is low down, and the resultant wind has kinetic energy if mass has motion, which is comparative to $\frac{1}{2}[\text{mass} \times (\text{velocity})^2]$. In unit time the mass of air passing is ρAV and the kinetic energy passing through the area in unit time (available power in the wind) is where ρ is the air density (more or less 1.225 kg/m^3 at the sea level). V is the wind (m/sec) and A is the area through which the wind passes normally. The total available energy in the wind (more or less $3.6 \times 10^{12} \text{ kW}$) evidently, only a little bit of this energy can truly is taken out. The energy produced by a wind turbine can therefore be given as, Power in the Wind = $\frac{1}{2}\rho AV^3$. Where, A is swept area, V is wind speed, and ρ is the air density.

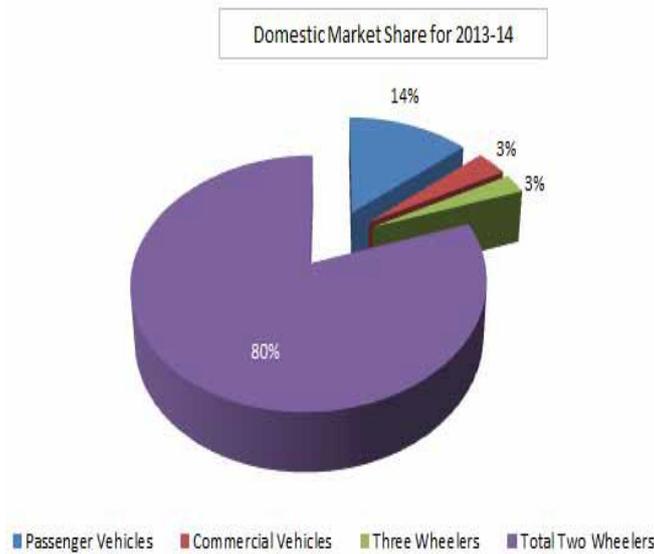
4.3 Two and Four Wheeler's in India

India hold fifth ranked in the World's in terms of two wheelers per 1000 peoples. There are 72.3 two wheelers per 1000 people. The registered motor vehicle has grown at a CAGR of 10.6 % from 1951 to 2011 [6]. For the period of the last decade, 2001 to 2011, the registered motor vehicles recorded a CAGR of 9.9 % [7]. Prevalence of two-wheelers including approx. 72 % in India's total vehicle calculation as on 31.8.2011, track by passenger cars (together with jeeps & cabs) at 13.3% and other motor vehicle (a mixed group which take account of 3 wheelers [Light Motor Vehicle (LMV) – Passengers], trailers, tractors, etc. at 8.4 %. In 2011 the registered motor vehicles in India about 141.8 million [8]. According to Motor Transport information, the yearly rate of enlargement of motor vehicles in India was just about 11 % for the duration of the most recent decade. A greater part of motor vehicles in India are intense in metropolitan centers and it is frightening to note that 32% of these vehicles are pursue in urban cities alone, which comprise very soon approximately 11% of the entirety population. It is attractive to memorandum that Delhi, which hold approximately 1.4% population of India, financial records for more than 7% of each and every one motor vehicles in the nation. There are before now more than 2.6 million registered motor vehicles in Delhi and about 600 vehicles are being registered per day.

Traffic work of art in India is of a varied character. There is a broad multiplicity of concerning a dozen kinds of both low and high speed motor vehicle. The modal split point out that in 1977, about 39% of entirety vehicles were two-wheelers, which rose up to 69% in duration of just about two decades. The contribution of two-wheelers and four wheelers is to be expected to rise incessantly. Continued financial development has brought concerning spreading out of the transportation division.

4.4 Energy Storage In Two Wheeler

Electrical Energy storage is one of the leading market chances in uncontaminated energy, mandatory for electric vehicles, incorporation of renewable and supplementary grid uses. It is as well one of the fastest-moving region of improvement, with various technologies challenging to outperform the others. The perceptible unpredictability of fossil fuel worth, the oil need and the anticipated lack of basic oil are driving worry regarding the future safety of energy sources. Instantly, Green House Gas (GHG) productions are reason of drastic changes of the globe environment that are affectation a severe hazard for the atmosphere and the human physical condition. These circumstances are increasingly wants for non-fossil invention and well-organized use of energy.¹ being both the major oil-consuming economic sector and the backbone of globally competitive industries in Europe, mobility and transport will thus soon undergo step changes of technologies, business models and user behavior. Furthermore, fossil fuels will progressively be harmonized by renewable, low-carbon substitutes similar to biomass, solar and wind energy as resource of energy for transportation. First automobiles operation on alternative energies like bio fuel mix together previously stay alive, and a few other customized or entirely fresh power train idea are presently under improvement, e.g. high degrees of bio fuels on traction based, hybrid, plug-in-hybrid, and electric vehicles, in addition to hydrogen and fuel cell cars. There is continuing research desired to discover the paramount grouping of fuel category and vehicle perception for a specified requirement, site and user summary. An in general evaluation has to reflect on factors ranging from GHG release, air greenhouse gasses and energy safety measures to basic production matter, as well as the ease of use and reuse of unprocessed materials in well-two wheel learning and life cycle assessments. In most of the cases, battery electric motor vehicle energized by regenerative power are evidently the most excellent opportunity. The only section in the domestic marketplace that demonstrate positive outcomes for FY 2013-14 was two wheelers with both creation and auction figures in all other groups on the way out evaluate to the earlier year.



As a result, the advanced maximum infiltration of two wheelers was supplementary strengthen as it consider for concerning 80% of the domestic market contribute to (in conditions of number of vehicles sold) during 2013-14.

V AUTOMOBILE PRODUCTION

According to Society of Indian Automobile Manufacturers, overall automobile production for the duration of 2013-14 observed growth of 4%, on account of manufacturing of two wheelers with more than 7 % enhance as all additional section observed a turn down.

Automobile Production Trends (Number of Vehicles)						
Category	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14
Passenger Vehicles	18,38,593	23,57,411	29,82,772	31,46,069	32,31,058	30,72,651
Commercial Vehicles	4,16,870	5,67,556	7,60,735	9,29,136	8,32,649	6,98,864
Three Wheelers	4,97,020	6,19,194	7,99,553	8,79,289	8,39,748	8,30,120
Two Wheelers	84,19,792	1,05,12,903	1,33,49,349	1,54,27,532	1,57,44,156	1,68,79,891
Grand Total	1,11,72,275	1,40,57,064	1,78,92,409	2,03,82,026	2,06,47,611	2,14,81,526

VI RESULTS

To provide the need of battery charging we adopted small wind mill system that can produce power which in turn to utilize to charge the battery. For this purpose we used vehicle’s speed for mathematical calculation of wind power. Here for calculation purpose rotor diameter considered as 304mm. The power available in wind is noted below:

Sr.No.	Vehicle Speed ,in m/s	Available Power in wind, in watts
01	2.77	0.94
02	5.55	7.569
03	8.33	25.59
04	11.11	60.71
05	13.88	118.39
06	16.67	205.103
07	18.05	260.37

VII CONCLUSION

We imagine about the purpose of wind energy for profit-making or household power production. Therefore we look at the difficulty of grid connectivity. The premeditated model gives on site function of wind generated energy at low cost with insignificant cost of grid.

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