

KITE ENERGY GENERATION

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ABSTRACT

The world dependence on fossil fuels and the emissions of greenhouse gases is the use of renewable energy sources. Recent studies showed that wind energy is a significant source of renewable energy which is capable to meet the global energy demands. However, such energy cannot be harvested by today's technology, based on wind towers, which has nearly reached its economical and technological limits. The major part of the atmospheric wind is inaccessible to the conventional wind turbines and wind at higher altitude is the major source of potential energy which has not been fully exploited yet. The thesis paper has presented a study aimed to devise a new class of wind generator based on extracting energy from high altitude wind.

Keywords: Analysis, Investigation, Research.

I. INTRODUCTION

The Kite Energy generation method more economical and efficient methods to produce more electrical energy by using renewable energy sources. Kite Energy Generation is used for generate the power by using wind energy. It reduces the draw back of wind energy generation. It produces the more Power than the wind energy generation. Kite-powered generators have many advantages over windmill generators, assuming the same power can be produced. First, the actual generator is located on the ground instead of on top of an 80 meter tower, greatly simplifying engineering and reducing costs.

II. METHODOLOGY

Kite Energy Generation

Generally stronger and more persistent wind is obtained at higher altitudes. This idea has led to many researches about extracting the huge energy available from the strong wind at higher altitudes. As a result of these researches, a number of solutions came out regarding high altitude wind energy extraction. The concepts for extracting energy from high altitude wind can be categorized according to the position of the electrical generator namely "flygen" concept and "groundgen" concept.

Chain Drive

The chain drive consists of two sprocket and a standard chain of required number of links. One of the sprockets is mounted with the centrifugal clutch. The others sprocket carries the drive shaft. The sprocket size selected according to torque/speed requirements.

III. MODELING AND ANALYSIS

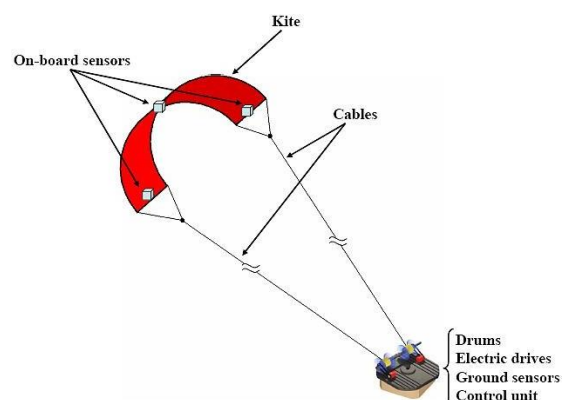


Figure 1: 3D view of building.

IV. RESULTS AND DISCUSSION

Today the world is the global world. In this world of the globalization the time is most important factor in day to day life. Current best estimates for this technology, projects a life cycle cost of 0.5 to 1.5 cents per Kilowatt hour compared to traditional wind turbine which current costs 5 to 12 cents per kilowatt hour. Use of Energy Kites opens a new world of opportunities in the field of wind power generation by making complete use of air at high altitude too. If such technology is implemented on a large scale, the use of power plants that burn out conventional resources could be decreased to a great extent, thereby decreasing air pollution. With Energy Kites, when electric power will be available at cheaper rates, the day of electric cars is not much far. Use of this clean energy will decrease the rate of global warming significantly. If more Research is carried out in the field of Energy Kites, the power generation rate may also be increased to more than 40 KW/m² of wing area.

Table 1. Design Constrains

Kite area, A	25 m ²
Projected kite area	16 m ²
Lift coefficient, C _L	1
Drag coefficient, C _D	0.2
Tether diameter, d	4 mm
Tether drag coefficient, C _{D,c}	1.2
Operating altitude, h	700 m
Line length, L	15 m
Maximum line velocity, v _L	4.3 m/s



Figure 2: Conventional Wind Mill and Kite Wind Mill

V. CONCLUSION

The intended objectives were successfully achieved in the prototype achieved in the prototype model developed. The paper has presented a study aimed to devise a new class of wind generator based on the innovative high altitude wind energy technology which exploits the aerodynamic forces generated by tethered air foils to produce power. Theoretical studies, design calculations, modelling and simulations have been employed to achieve the results presented in this work.

The thesis work started with studying various high altitude wind energy extraction concepts available and conceptualizing a kite power system for the design purpose. The selected concept concerns using single kite

undergoing two alternating phases while generating power in traction phase and consuming power in recovery phase. The purpose was to design a drive line for continuous power output regardless of the kite's phases. A non-interrupting power supply is achieved by using a flywheel as an energy.

VI. REFERENCES

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