



¹Lenka MAGULÁKOVÁ, ²Lenka RUSINOVA, ³Ladislav BARTKO

WIND TURBINE M.A.R.S. AS A NONSTANDARD SOURCES OF WIND ENERGY

ABSTRACT:

Energetic economy measure has high influence on decreasing pollutive emission of materials as well as green house gasses which are conducive to fulfill state's strategies in environment area and climate changes. Wind is a clean energy; wind power plants do not produce any emissions. They do not pollute surrounding air, water nether the soil, because there is no fuel burning to produce energy. This article highlights the positive effect of a nonstandard source of wind energy used by the M.A.R.S. turbine.

KEYWORDS:

Wind energy, offshore wind energy, turbines M.A.R.S.

INTRODUCTION

Offshore Wind Energy (OWT) stations produce clean energy without any emissions, which neither cases any climatic changes nor pollute the air. This kind of electric energy production represents the home source of energy production, that we have not have to pay for it to the foreign companies and we become more self-sustaining and energy independent.

OFFSHORE WIND ENERGY

Currently are mostly construct OWT with watts in the range of 1,5 - 2,5 MW. Modern OWT are less noisy than the old one, that's why they are also accepted by vicinetum. The designed life of those OWT is 20 till 25 years. During the designed life, the OWT should work at least 120 thousands of hours.

Suitable areas for an OWT are areas where the average wind speed is at least 6 m/s in the high of 60m above the terrene. The areas with lower average wind speed are not suitable due to lower power of a wind. The best areas are the mountain areas and the lowlands. The construction of an OWT is forbidden in the national parks which decreases the amount of suitable areas with enough wind power. This kind of restriction eliminates a huge part of suitable areas in Slovakia to construction an OWT, nevertheless there are a lot of areas where they can be built the OWT ranches. It is also important to mention, that the enough wind power is just one part of requirements to build an OWT ranch. The other requirements are: ability to connect to the distribution network, area that does not affect the national parks or the

diversity of human population in near by areas. Those factors also eliminate a lot of suitable areas [1].

MAGENN AIR ROTOR SYSTEM (M.A.R.S.)

The system Magenn air rotor system (M.A.R.S.) is one of the types of OWT. This kind of turbine is lighter than the air. It uses the wind power to produce electric energy. The reason why it is possible to stay in higher level of atmosphere is the Helium that is used to fulfill the turbine. This helps the turbine to be in areas where wind has higher speed, than on the lower levels of atmosphere. The M.A.R.S. spins around the horizontal axis following the wind direction. This way is produced more energy from the wind power, which is transferred to the surface transformer station using the cables. It has a lot of advantages comparing to the conventional OWT e.g. low cost of produced electric energy, lower noise, turbine is placed in higher location, lower constrains where it can be placed, high mobility level, it is not required to use a heavy duty machines, lover risk to harm a birds or bats.

The OWT M.A.R.S. can be taken out higher over the surface, than the conventional systems, so it can catch more power full wind. The conventional systems are placed in areas where the wind is higher over the surface e.g. coastlines or mountain terrenes. The most suitable areas are in national parks, areas far away from the consumers of the electric energy, which raise up the energy losses during the long-distance power transmission. This mentioned problems are able to be solved using the M.A.R.S.

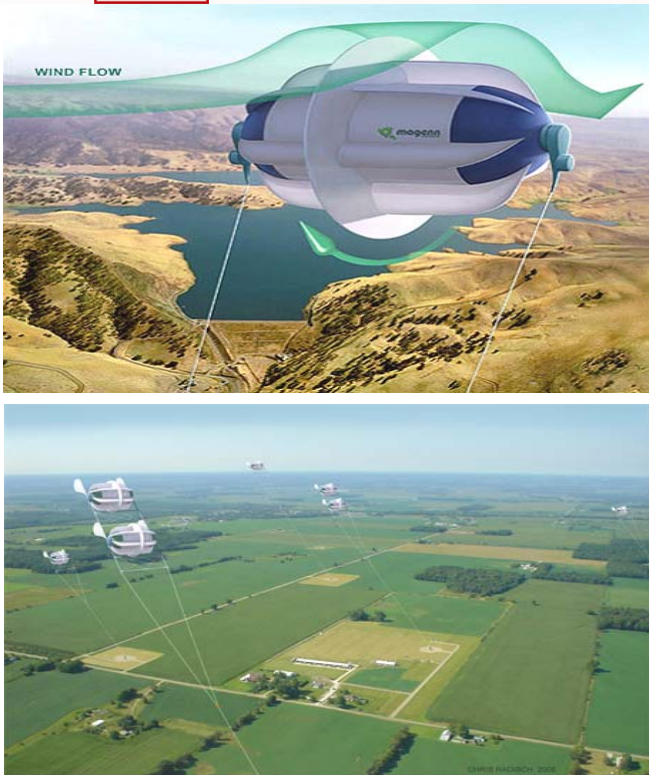


Figure 1. Turbine M.A.R.S. [2]

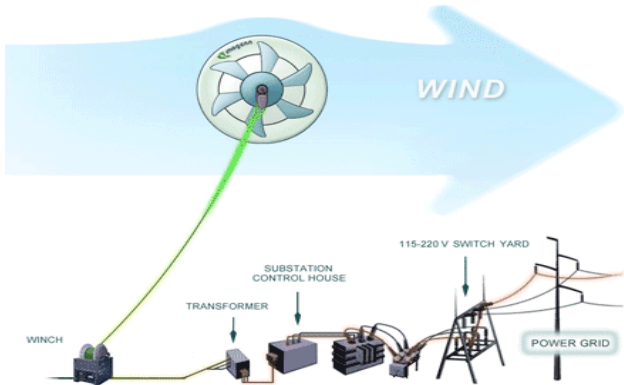


Figure 2. Schema of wiring connection for the M.A.R.S. [2]

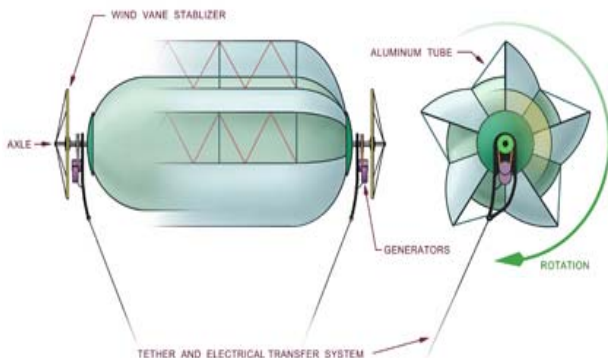


Figure 3. System functioning fundamentals of M.A.R.S. [2]
The OWT M.A.R.S. cannot be placed in any air-space nor closer than 8km from the airport. The caring balloon contains the reflex material and also radar using the frequency in the range 200 - 2700 MHz. The cover and backband of the M.A.R.S. system is made of material that are lighter and stronger than the steel, has almost no absorbability, abrasively resistance and UV rays.

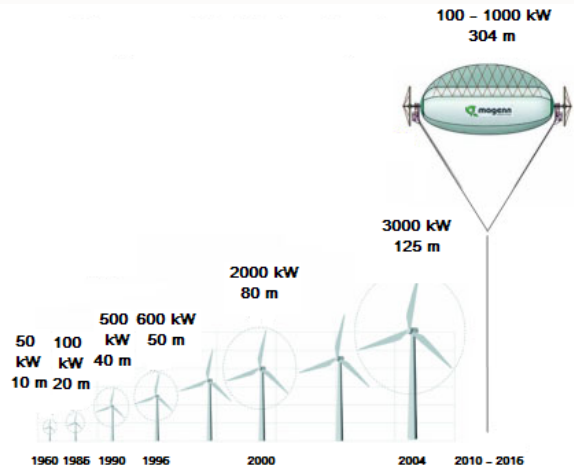


Figure 4. Overview of wind turbines. [2]

IMPACT OF WIND TURBINES ON THE ENVIRONMENT

The biggest problem of the classical OWT is that there is a direct contact with birds and bats that end by death. The rotors of turbines are moving, which cause a lot of problems to avoid for them. The advantage of the M.A.R.S. is that it stays on one place without moving, which allows the birds and bats to easily avoid it.

CONCLUSION

The OWT M.A.R.S. is suitable to produce the electric energy due to its ability to use in the developing countries with reduced infrastructure or in the areas of country where is no infrastructure. This approach of energy producing is also able to use on islands, outlying farms, during the nature catastrophes.

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AUTHORS & AFFILIATION

- ¹ Lenka MAGULÁKOVÁ,
- ² Lenka RUSINOVA,
- ³ Ladislav BARTKO

¹⁻³ TECHNICAL UNIVERSITY IN KOŠICE, FACULTY OF MECHANICAL ENGINEERING, DEPARTMENT OF ENVIRONMENTAL STUDIES AND INFORMATION ENGINEERING, KOŠICE, SLOVAKIA