EOLIAN TURBINE OR OTHER NEGATIVE ENERGY SOURCE

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ABSTRACT: *In this paper there is a review of the non-polluting sources of energy, how to obtain the energy and their history. Later, a comparison is made between the wind turbine and other non-polluting energy sources, presenting the advantages and disadvantages of using them.*

KEY WORDS: *wind turbine, energy source, non-polluting, solar energy, hydropower.*

1. INTRODUCTION

Renewable energy is the energy obtained from inexhaustible natural resources, which are constantly regenerated at very short time intervals.The importance of obtaining electricity from renewable sources has increased lately, especially due to the combination of two factors: increasing the total amount of electricity required and the current ways of obtaining it with harmful impact on the environment.

The predominant use of fossil fuels to generate electricity pollutes the environment with the huge amount of carbon dioxide resulting from combustion, risking an irreversible climate change. In order to avoid the disastrous consequences of the current energy production, alternatives with lower impact on the environment have been studied to obtain energy: solar energy, wind energy, hydropower, geothermal energy and biomass.

Solar energy can be argued to be the planet's main source of energy, the rest being derived from it. The wind potential is due to the uneven heating of certain areas, resulting in air expansion and hence the dilated air mass movement in the form of wind. Evaporated water from the oceans due to sunbathing is transported in the form of clouds in cooler areas where condensation and precipitation occur. The precipitation water reaches rivers, providing hydropower potential. Also, plants grow and develop through photosynthesis, also under the action of sun rays. It can therefore be argued that biomass is also a derivative of solar energy.

Solar energy has two main effects that can be exploited for conversion to electricity: brightness and thermal radiation effect.

The thermal effect of solar energy can be exploited by a system of solar radiation concentration in a certain area that has direct contact with the thermal agent of the installation. Solar energy can be captured and converted into electricity and using solar panels. This method is preferable because compared to the use of the thermal effect, photovoltaic photon capture is not thermal or mechanical. Thus, the risks resulting from the handling of the heat agent at very high temperatures and pressures and the risks of turbine and generator handling disappear.

Also, the maintenance investment and the personnel needed to handle the panels are smaller.Wind energy is the kinetic energy of the mass of air captured by a wind turbine and used to obtain electricity.

The potential of wind energy has been discovered since antiquity, and used to navigate the ships. Subsequently, the wind was used by the windmills to grind the seeds to produce the flour. Once discovered the

method of transforming the wind force into a useful mechanical work, it was only necessary to discover the electricity and the generator to create the wind turbine and to obtain electricity with the wind as an inexhaustible primary source. Hydro energy is the energy obtained by exploiting the potential energy of the masses of water. The potential energy of the masses of water is the direct result of the gravitational forces of attraction of the planets.The hydropower potential of the rivers has been discovered and used since antiquity.

The mounds near the rivers have used water. The man used the river to transport the boat or logs downstream without making any effort, even before he even understood what the water was attracting in that direction. Strength of running water is the easiest to use for power generation. Depending on the geographical area along a river, dams can be placed to capture water as reservoirs. Dams offer the possibility of storing energy in the form of potential energy of water, which can be used when it is necessary to produce electricity.Turbines in a hydroelectric power plant may start to generate electricity, interrupt production, reduce or increase the amount of energy produced as needed in a very short time compared to a thermoelectric plant or a nuclear power plant.

Rapidity in response to dispatcher requests as well as the potential reservoir of water retained by the storage dam transforms hydropower plants with reservoir reservoirs into the perfect way to supply SENs during the daily peak of the national network.

Large-scale power plants are power stations that use the force of the waves, or the movement of the masses of water under the gravitational action of the moon to capture the mass of water with the help of a dam, whose potential energy is later transformed into electricity. To use the tides and the flow-reflux cycle, the dam must be placed at the mouth of a bay. Due to this condition necessary to make usable tidal power, the large-motor stations are quite rare. A second condition would be the existence of tides with high level differences between flow and reflux. In Constanta, tide has a maximum amplitude of 20 centimeters, compared to 19.6 meters in the Fundy Bay of North America. The more the gulf is placed next to the equator, the higher will be the tides.

The use of this type of plant is a cyclic one. During the flow the water is allowed to enter the bay, and during the reflux the water is allowed to flow out of the bay by moving the turbines to generate electricity.

Geothermal energy is the energy obtained by exploiting the thermal and pressure parameters of a geothermal spring.

Mainly, geothermal water is used for heating the dwellings, and a little less for the production of electricity. For electricity production in geothermal water, certain parameters of water or steam in the geothermal spring must be met. Dry geothermal plants use steam from the geothermal spring, and flash ones use water at temperatures of 182ºC injected into surface equipment at high pressures.

Nearly all of Iceland's homes are heated with geothermal water. Also, the electricity production is based mainly on geothermal water that has temperatures of 150ºC at depths of 500m and 300ºC at depths of 1000m. Biomass is the biodegradable fraction of agricultural waste, forestry and related industries, plant and animal substances, and the biodegradable fraction of industrial and urban waste.

Biomass is the most abundant renewable source of the planet, including all organic matter produced by the metabolic processes of living organisms. Also, biomass is the oldest type of energy used by humans, being discovered with the use of fire.

Biomass can occur in all states of natural aggregation: solid, liquid and gaseous. From the fermentation of sugary products, biogas can be produced that can be burned directly, and benzene can be obtained from bietanol. Alcohol-treated vegetable oil turns into biodiesel that once purified can be used in diesel engines. Being represented by everything living on the planet, biomass is diversified in shape, but the way it is used to produce energy is the same, burning.

Due to the extraction of biomass energy by combustion, compared to other renewable energies, the electricity produced from biomass pollutes the environment. It is also necessary to have a large number of

qualified personnel for tampering, and the high temperatures and pressures in the installations present a potential accident risk.

The ways of using biomass are classified according to the fuel aggregation state. Biomass can be used in any aggregation state in CTE, the only differences being the focal point adapted to the needs of each type of fuel. Biomass has other uses besides the production of electricity in thermal power plants. Liquid biomass can be converted into gasoline or diesel, which can also be used in transport. Solid and gaseous biomass can be used to heat homes.

2. COMPARISON OF WIND TURBINES WITH DIFFERENT WIND TURBINES

2.1. Comparison with solar powered thermal power plant

Another thermal power plant compared to a wind turbine is powered by the sun's thermal radiation effect.

In terms of location, both the wind turbine and the solar power plant are located where the primary energy is available.By comparing the operating constancy of the two power plants, the electrical energy obtained from the use of the thermal effect of solar energy is more stable. The production of solar electricity will, however, be influenced by the weather conditions, any cloud influencing the amount of heat received and used by the installations. For this reason, these kind of plants are located in desert areas, where the clouds are very rare, almost nonexistent. Both types of power plants use inexhaustible energy sources, similar to the influence of weather conditions on the amount and constancy of available primary energy.

The most obvious difference between primary energy sources is that solar energy can only be used by the day, but a wind turbine can also work at night. When using the thermal effect of solar energy, this night-day cycle influences the production of electricity in a negative and strong way.

A solar thermal plant that uses the sun as a source of heat will stop operating at night, and in the morning, energy production will not be resumed immediately, the thermal agent in the installations, cooled overnight, having first brought to the parameters required for operation, this process can take hours. From this point of view, a wind turbine is superior, because it can start to generate electricity as soon as the wind blows. Also, given the location of the thermal solar thermal plant in a desert, water-free area, the thermal agent chosen is oil. This makes possible damage with heat loss to have important financial effects. Solar thermal in the desert area is a much more constant source of primary energy than the wind, resulting in a much more constant supply of electricity than in wind turbines.

2.2. Comparison with photovoltaic solar energy

The photovoltaic effect of solar radiation is the conversion of light energy into electrical energy by absorbing the subatomic particles of sunlight by special materials, creating an electron driven stream.This method of obtaining electricity is unique, specific to solar energy, and should not be confused with other methods of solar energy conversion. Photovoltaic cells are marked with the PV symbol.Photovoltaic panels are typically photovoltaic cell structures clustered in flat modules of about 40 cells. They can be mounted with a south-facing exposure angle, fixed, or clustered on a self-adjusting sun-tracking device that allows more efficient sunlight capture throughout the day. The self-adjusting sun-tracking device is a resemblance to wind turbines, which can change direction when the wind direction changes.Several interconnected panels are sufficient for home use of a home, but for industrial applications or public utility, hundreds of interconnected panels are required as a larger unitary system.

The amount of electricity generated from solar panels is influenced by photovoltaic cell output and light intensity.

The yield of a photovoltaic cell started at 4% efficiency in 1950 when it was first produced. Today, the most common solar panels have a 15% efficiency. Recently, a third generation of photovoltaic panels containing cells with a 20% efficiency has been developed. In the field of solar panels, the greatest effort is being made in studying

and developing new types of photovoltaic cells with increasing efficiency. In a wind turbine, the increase in yield is very simple. Every 10 meters add to the height of the wind turbine, electricity production increases by 20-25%. Of course, the construction costs of the turbine also increase by 10% for every 10 meters added to the height. Likewise, both modes of power generation depend on the intensity and consistency of the primary energy source, the solar panels depend on the sun, and the wind turbines depend on the wind.The intensity of the sunlight varies depending on the distance from the equator, and the geographical area. Romania has the potential for energy development based on solar panels especially in the southern area, Oltenia and Dobrogea. This potential decreases with the distance from the Equator and the elevation to the Carpathians, as can be seen in Fig. 1. By comparing Figures 1. and 2., it is possible to differentiate between the wind potential and the photovoltaic potential for observing the areas where the installation of each type of plant in Romania is recommended.It can be seen that the only area that has both very good wind potential and a large photovoltaic potential is Dobrogea.

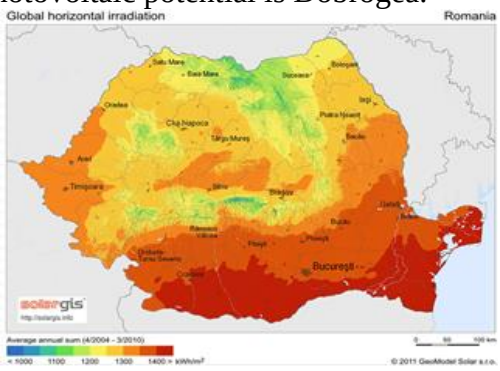

Figure 1. Solar radiation map in Romania

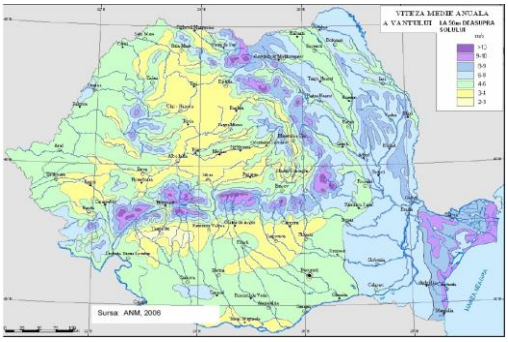

Figure 2. Map of Romania's Theoretical Wind Potential - Wind Speed

2.3. Comparison with hydropower

From the point of view of the location chosen for the location of both types of power plants, the primary energy source will be taken into account. Hydro power plants can be on the water line, or with an accumulation reservoir created by the dam. Hydropower plants, such as the Iron Gates, depend on the flow of the river on which they are located. If it is drought, electricity production may be jeopardized. Of course, drought periods can be foreseen so that the lack of the primary energy source and the decrease or shutdown of electricity production is an expected event.

Accumulator reservoirs can be prepared for periods of drought and accumulate enough water in the reservoir to ensure production during the drought. A cascade cascade dams and reservoir system is even more effective for planning the volume of water available for electricity production.

Compared to the wind turbine, which can not store the kinetic energy of the wind, an accumulation lake can store the potential energy of the water, and use it when needed.

This storage capacity of the primary energy source, combined with the ability to quickly start and stop electricity production according to the needs of the National Energy System, turns hydro power plants into the basic energy element.

The fact that the dispatcher can rely on the ability of hydropower plants to add energy to the grid when needed, devotes their electricity to the peak loads of the day, and any problems that may interrupt uninterruptible power sources such as wind and solar. Basically, without hydropower it would be almost impossible to connect to the national grid and use solar and wind energy without endangering the stability of the S.E.N. In terms of pollution and how it affects the environment, wind farms are less influential. Pollution produced by wind farms is visual and auditory, with a very unattractive physical appearance, turbine speeds and wind blows on the propeller blades being heard from quite large distances. The influence of the hydropower plant on the environment is due to the separation of ecosystems upstream and downstream of the dam's location. Likewise, a large dam, changes the

ecosystem entirely. In China, 1.4 million people were relocated to make the construction of the Three Gorges Dike, the largest dam in the world, with a storage capacity of 40 billion cubic meters of water.

After the construction of the dam, there have been landslides, which have led the Chinese authorities to decide to relocate another 100,000 people. Despite these problems, the dam has 2.2 km long, it has 26 turbines, each of which has the capacity to produce 800 MW of renewable, clean energy. After using the primary energy source, the wind is lost in the case of the wind turbine, but in the case of the hydropower plant, the water passed through the turbines of the generator can be used further, stored in a second dam or even for irrigation.A similarity between wind turbines and hydro power plants is that there is no heat. The transformation is done directly at the mechanical level. Retrieving the kinetic energy of the wind or the potential of the water is directly transformed into a useful mechanical work, acting on the turbine.

At present, electricity production is achieved in a very high percentage in the thermoelectric power plants, by the burning of fossil fuels, or in nuclear power plants, by the fission of uranium atoms, polluting the environment with both greenhouse gases, as well as and radioactive waste, with nuclear fuel waste.Against this backdrop of the alarming increase in pollution caused by electricity generation methods, the importance given to renewable energy has steadily increased over the last period.

Wind energy is one of the forms of renewable energy that has recently been sustained and encouraged at both national and global levels. The advantages of wind farms are the zero emission of pollutants and greenhouse gases, the lack of waste produced, the reduced costs of dismantling and the primary source of free energy resulting in a low energy production price.

Energy companies have as their sole motive the profit, which is partly provided by the state through green certificates, to encourage the construction of wind farms.

The low-power wind farm has the ability to store battery energy, providing both profit and energy independence, but the high-wind wind farm needs very large investments in inertial energy storage systems to combat the disadvantage of variation wind speed. The price for such an inertial energy storage system is about $ 1 / Wh. Hence the first disadvantage of the high-power turbine, given by the choice between a very large investment, and the variation in the amount of electricity produced depending on the variation of the wind speed. The inability to produce wind energy at constant parameters makes it dependent on other energy sources that offset variations in wind turbine production. There are also wind installations with the mechanical speed of the constant rotor, but this is done by rotating the nacelle and altering the angle of inclination of the blades and the angle of attack so that the mechanical power captured from the kinetic energy of the wind remains constant irrespective of variations in wind speed. Rotational rotation number rotation is usually less than 1%, thus providing a constant electricity output, but this method loses much of the kinetic energy of the wind.

A number of disadvantages of a wind farm are visual and sound pollution and the large area of land needed for construction.

They make the wind farm impossible to place near the localities.The location of the wind farm close to the national electricity grid is also a factor to be taken into account, the lack of the possibility of delivering the energy produced in the National Energy System (SEN), presenting a major problem. In practice, a wind farm is built because the state has decided to reduce energy sector pollution, and offers financial benefits in the form of green certificates to companies willing to invest in wind power and build these turbines. But the same state that encourages renewable energy, through excessive bureaucracy, lack of organization and the lack of clear laws on the number of necessary approvals or who gives them, hinders the construction of new wind farms.

As a final conclusion, the wind turbine is a method of obtaining non-polluting electricity, relatively inexpensive as an investment and as a production price, but which, due to variation in wind speed, causes

the energy produced to have unpredictable variations. In the case of low-power dwelling turbines, these variations can be countered by storing energy in the batteries. No special construction equipment and cranes are required, and the number of approvals required to install the low power turbine drops significantly, making it much easier to install and use than high-powered turbines.

CONCLUSIONS

In terms of pollution with particulate matter, given that sources of pollution are low rise, influences remain within range of the career, except higher amounts zone conveyor belts scrapping affecting residents, households and dependencies placed at a distance of 50 .... 70 m of conveyor belts.

Dust emissions from the tailings management area are a problem in dry conditions and wind. The most severe problems caused by dust from the dumps appear dry days of activities crushing / grinding, sediment transport and storage of tailings. Wind energy is considered one of the most sustainable options of future variants, wind resources are huge. It is estimated that the recoverable wind power worldwide is approximately 53 000 TWh (TerraWattoră) , which is 4 times the current global consumption of electricity.

In Europe, the potential is sufficient to ensure at least 20 % of electricity needs by 2020, especially if you take into account the new offshore potential .

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