

Floating Windmill Conserving the Useful Land

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ABSTRACT:-

A floating wind turbine with a tower structure includes at least one balancing arm of the tower and is carried out to sea by a rotatable position holding equipment that helps support deep water. The difference in the wind turbine system is provided by the buoyancy chambers, which are an important part of the tower along with the stabilization arms. Transport services include a pump to adjust the lifting force for installation, repair and dismantling. The wind turbine rotor is at the pitch of the tower structure, allowing the wind turbine to follow the wind direction without an active yaw drive system. The strut tower and stabilizer arm structure is designed to balance the rope tension with buoyancy, gravity and wind power, so that the top of the strut tower tilts towards the wind direction, thus ensuring a large difference between the strut tower and stabilizer arm strut tower and rotor blade ends. This large clearance facilitates the use of rotor hub materials to reduce damage from dynamic model loads. The main components of the turbine can be assembled onshore and transported to the offshore site.

INTRODUCTION:-

Wind is caused by the movement of air. The circulation of air in the atmosphere is caused by the sun's uneven heating of the earth's surface. Although the nature of the wind changes, the wind pattern at a particular location remains constant from year to year. The average wind speed in the mountains and on the coast is higher than in the interior regions. The wind will blow the same way and stronger on water that has no resistance. Turbines can cause noise by producing noise. Wind can never be predicted. Wind energy may not be used because it requires long-term information about weather and wind. For this reason, areas that need wind energy a lot cannot rely on wind. Most of the potential wind farms where wind energy can be produced on a large scale are far from the best wind energy locations. As a result, the wind energy business will lead to disruption of new stations and transmission lines. Wind turbines have a negative impact on birds, which can be killed or injured as a result of collision with the rotating blades. Wind turbines contribute to the loss of wildlife habitat due to noise, blade movement, changes in food supply, and interference with electromagnetic fields that can interfere with the sonar systems of some species.

PICTORIAL DIAGRAM :-

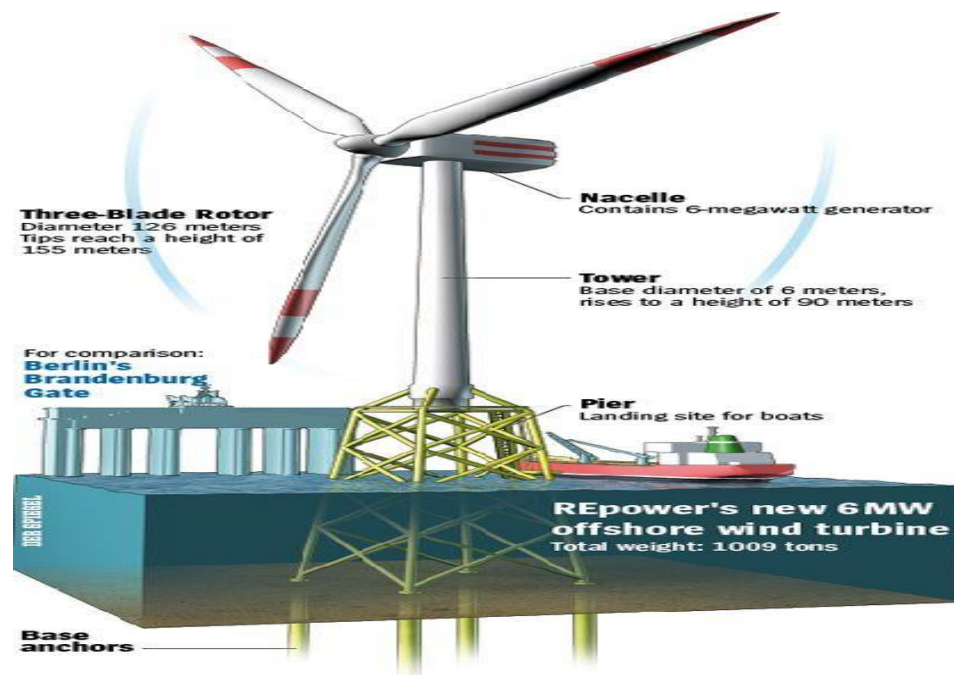


Fig.1 Offshore floating windmill

WORKING PRINCIPLE:-

Floating wind turbines work similarly to other wind turbines; the wind puts pressure on the blades, causing the rotor to spin, which drives the generator to produce electricity. But instead of towers placed directly on land or sea, floating wind turbines sit on platforms with mooring ropes, such as chains or rope, that connect to anchors on the seabed below. These mooring lines keep the turbines out of the wind and are connected to the cables that carry the power back to shore.

There are three main types of platforms:

The mast float platform is a long, hollow cylinder attached to the base of the turbine tower. It floats vertically in deep water with heavy ballast at the bottom of the cylinder to reduce the center of gravity. Then place it in place but use a slack rope so it can move with the water to avoid damage. The oil and gas industry has been using Spar buoys for offshore operations for many years.

The semi-submersible platform has a large hull powered by the tower and also anchored to prevent drift. Designers tried more than one turbine on some hulls.

Low-legged platforms have small platforms with taut wires that connect directly to the ground below. They are lighter but more vulnerable to earthquakes or tsunamis because they are more dependent on ropes and anchors for stability. Each platform must support the weight of the turbine and remain stable while the turbine is operating. It is able to do this in part because the hollow platform usually consists of large metal or concrete structures that provide support to support the turbine. Because some can be mounted on a dock and pulled out for installation, they can be less expensive than standard models that require special boats for on-site installation.

The platform itself provides a great deal of security. The trick is to build a platform so that the turbines do not lean too much during strong winds or storms.

ADVANTAGES:-

Offshore wind speed will be faster than onshore wind speed. 1 A small increase in wind speed results in an increase in energy production: a turbine with a wind speed of 15 mph produces twice as much power as a turbine with a wind speed of 12 mph. Faster winds onshore mean more energy can be produced.

Offshore wind speed tends to be more stable than onshore wind speed. The stable strength of the wind means the power is stronger.

Many coastal areas are in high demand. Half of the US population lives in coastal areas, mostly in large coastal cities. Developing a wind farm in this region could help meet energy demand from nearby areas.

Offshore wind farms have many advantages similar to onshore wind farms; they provide renewable energy; they do not drink water; they provide energy in the house; they create jobs; they do not pollute the environment and greenhouse gases.

FUTURE SCOPE:-

Floating wind turbines hold great promise for the future of wind energy.

High Efficiency: Unlike traditional offshore turbines that rest on a fixed foundation at the bottom of the sea, floating wind turbines are built on floating platforms. These platforms can be deployed far from coastal areas, even in harsh areas. This change allows wind energy to be used in previously unexplored areas.

Increased energy production: Floating turbines can produce more power due to cloud Winds are generally higher offshore than in coastal areas. Since their structures produce less noise than fixed foundations in the sea, they have less impact on the environment and marine creatures.

New development: Experts predict that the strength of the Coast will increase every year in the coming years with a growth of more than 20%. Floating wind farms create new growth opportunities by allowing companies to harvest wind energy from larger oceans rather than beaches²³.

Consequently, floating wind turbines offer a sustainable and cost-effective way to harness large offshore wind resources, paving the way for a clean energy future.

CONCLUSION:-

Floating wind energy has gradually become an important part of the development of offshore wind energy. This article examines the phenomenon of floating wind turbines.

The results show that the proposed model can predict the design of wind turbines. Moreover, at the same difference between the fan and air inlet speed, the bottom fan of the floating fan is less affected by the exhaust than that of the fixed fan.

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