



Mains Practice Question

Q. What benefits do projects like the offshore wind energy have in India? Discuss challenges and suggest measures to resolve them. (250 words)

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Approach

- Start your answer by briefly introducing offshore wind energy.
- Discuss benefits of offshore wind energy in India.
- Discuss various challenges posed by wind energy in India.
- Conclude by suggesting measures to resolve these challenges.

Introduction

- Offshore wind energy is the clean and renewable energy obtained by taking advantage of the force of the wind that is produced on the high seas, where it reaches a higher and more constant speed than on land due to the absence of barriers. In order to make the most of this resource, mega-structures are installed that are seated on the seabed and equipped with the latest technical innovations.

Body

- The compound annual growth rate for wind generation has been 11.39% between 2010 and 2020, and for installed capacity, it has been 8.78%.
- Further, the Union Ministry of New and Renewable Energy (MNRE) has set a target of installing **5 GW of offshore capacity by 2022 and 30 GW by 2030.**
- **Benefits of Offshore Wind Energy:**
 - **Efficient compared to Onshore Energy:** It is proven that offshore wind turbines are more efficient compared to onshore ones. Wind speed over water bodies is high and is consistent in direction. As a result, offshore wind farms generate more electricity per installed capacity.
 - Also, fewer offshore turbines are required to produce the same capacity of energy as compared to onshore ones.
 - As the offshore wind is stronger during the daytime, it ensures a more consistent and efficient electricity generation when consumer demand is at its highest. In contrast, wind power on land performs better at night when power consumption is lower.
 - **High Productivity:** In addition to wind availability, the size of the generator and the turbine's swept area will determine its productivity, therefore, higher the area the higher the productivity.
 - **Long Operating Hours:** Offshore wind farms have a higher Capacity Utilisation than onshore wind farms. Therefore, offshore wind power allows for longer operating hours.
 - **Cover Larger Area:** It's possible to build bigger and taller offshore windmills, resulting in increased energy harvest. Furthermore, the wind flow is not restricted by hills or buildings.
- **Challenges of Offshore Energy in India:**
 - Offshore wind assets also present a set of challenges that have prevented them from

taking off in India. Understanding the technical, regulatory and operational challenges is crucial. These include:

- **High Installation Cost:** Local substructure manufacturers, installation vessels and trained workers are lacking in India. Offshore wind turbines require stronger structures and foundations than onshore wind farms. This can cause higher installation costs.
 - Consequently, offshore wind energy tariffs in India are expected to be higher than onshore wind energy.
- **Lack of trained personnel:** Lack of trained personnel with fundamental technical abilities, education, and specialization to design, install the turbine, turbine foundation construction, maintenance of submarine electrical and communication cables, faults, and repair.
- **Wind Fluctuations:** Variations in wind distribution can influence the match between the input of wind energy into the grid and the everyday demand for load.
- **Extreme Climate Condition:** Any extreme incident could destroy infrastructure and make access more complicated. Hurricanes or storm surges can affect offshore farms in that respect and influence on wind turbine lifespan.

Way Forward

- **Lower taxes:** In India, the GST Law exempts electricity and power sales from GST. In contrast, wind power generation companies cannot claim input tax credits when they pay GST to purchase goods and/or services for setting up the project.
 - The majority of wind farm components need to be imported. Turbines, transformers, inverters and evacuation infrastructures are expensive due to the taxes paid for their acquisition. If excise duties and GST could be waived, early project development will be more affordable.
- **Enhance Research & Development:** The government needs to enhance its research facilities and generate various programmes to improve offshore wind energy in India.
- **Increase role of Private Sector:** The government need to open this industry to private sector, as we have seen in recent time that various start-ups had showed their mettle, therefore by increased participation of private sector would embark innovation and reduce price of offshore wind energy in India.

Owing to the vast potential in the entire coastline, offshore wind energy in India can provide the desired results to realize the climate commitment and energy security, the country is thriving for.