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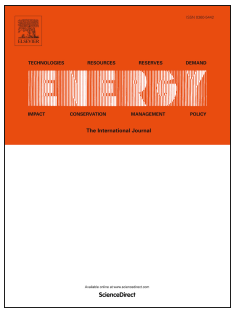

Estimation of technical and economic potential of offshore wind along the coast of India

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Estimation of technical and economic potential of offshore wind along the coast of India

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Abstract

India is rapidly growing in the economy and population leading to a continuous increase in electricity demand. The wind is a better energy source because of its negligible greenhouse gas emissions, cost competitiveness, price stability, and energy security. This paper presents Geospatial Information System (GIS) based methodology to characterise the offshore wind power potential in the western and the eastern coast of India with technical, economical, and marine ecosystem consideration. Spatial distribution of levelized production cost (LPC) and cost-supply curves was developed under different ocean conditions (human impact on marine ecosystem). The influence of project lifetime, discount rate, and assumptions about investment cost, annual energy production, and availability is presented using sensitivity analysis. Results show that total potential available along the shallow waters (50 m water depth) of Indian coast is approximately equal to 12.8% and 42% respectively of the existing renewable power and wind power capacity. In terms of wind resources and economic costs, the shallow waters of Gujarat and Tamil Nadu states are the best suitable regions for offshore wind power development.

Keywords: Offshore wind; India; GIS; Levelized production cost; cost-supply curve

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