

Coastal Wave Energy Utilization Coupled with Coastal Protection

Paimpillil S. Joseph*

Baba.M.

Center for Earth Research and Environment Management

Cochin 17, India, 682017

E-mail Address: paimjose@sify.com

Primary estimates of wave energy indicate that the annual wave energy potential along the southern Indian coast is between 5 MW to 15 MW per meter. The variation of sea-bed topography can lead to the focusing of wave energy in concentrated regions near the shoreline called 'hot spots'. The Kerala state has to depend on the renewable energy in a big way as the neighboring states have wind power generation capacity of 3000 MW and 100 MW OTEC potentials. The "wave energy hot spots" on south West Indian coasts are identified by the computation of significant wave heights using the 2/3 power relationship (Toba, 1972) and from direct wave measurements for the Indian ocean by NIOT. The best spots identified for wave energy are at Vizhinjam, off Tuticorin and off Andaman islands. At these sites, swell waves with mean height of 1.5 m dominate the wave field except during the monsoon season and wind-waves reached up to 6.5m in monsoon months. Based on the wave statistics, a mean monthly wave power of 4 - 25 kW/m is estimated and an Oscillating Water Column type of Wave absorption device of 150 MW capacity was installed at Valiathura (near Trivandrum). This power plant delivers 75 kW during April - November and 25 kW from December - March. During June - September, it has peaks of 150 kW. The monsoon month's average power production was 120 kW. The cost of construction of this power plant was 99 lakhs Indian rupees and it produced 4.45 lakhs units of electricity per year. The unit cost stands 0.73 rupees, while the power from hydroelectric generators cost around 1.5 rupee per unit. The cost of production is comparably less compared to tidal power plants in India. The Tidal Power Project with an installed capacity of about 900 MW is generating electricity at about 90 paise per unit. Of course, these renewable energy projects are not going to help India to tide over any power crises soon, but it is a good attempt to move forward on a technology that is at least as a promising power source. Since India has a lot of potential for new fishing harbours in the near future, the development of new cost effective breakwater systems is useful. A wave energy breakwater becomes profitable because the costs are being shared between the breakwater wall and the power plant.



23-27 November • Manila, Philippines