

Feasibility Study of Tidal Current of the Bay of Bengal to Generate Electricity as a Renewable Energy

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Abstract : Electricity is the pinnacle of human civilization. At present, the growing concerns over significant climate change have intensified the importance of the use of renewable energy technologies for electricity generation. The interest is primarily due to better energy security, smaller environmental impact and providing a sustainable alternative compared to the conventional energy sources. Solar power, wind, biomass, tidal power, and wave power are some of the most reliable sources of renewable energy. Ocean approximately holds 2×10^3 TW of energy and has the largest renewable energy resource on the planet. Ocean energy has many forms namely, encompassing tides, ocean circulation, surface waves, salinity and thermal gradients. Ocean tide in particular, associates both potential and kinetic energy. The study is focused on the latter concept that deals with tidal current energy conversion technologies. Tidal streams or marine currents generate kinetic energy that can be extracted by marine current energy devices and converted into transmittable energy form. The principle of technology development is very comparable to that of wind turbines. Conversion of marine tidal resources into substantial electrical power offers immense opportunities to countries endowed with such resources and this work is aimed at addressing such prospects of Bangladesh. The study analyzed the extracted current velocities from numerical model works at several locations in the Bay of Bengal. Based on current magnitudes, directions and available technologies the most fitted locations were adopted and possible annual generation capacity was estimated. The paper also examines the future prospects of tidal current energy along the Bay of Bengal and establishes a constructive approach that could be adopted in future project developments.

Keywords : bay of Bengal, energy potential, renewable energy, tidal current

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