

SPATIAL AND TEMPORAL DISTRIBUTION OF WAVE ENERGY IN ALGOA BAY, A SOURCE OF POTENTIAL COMMERCIAL SCALE RENEWABLE ENERGY.

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Abstract

In a load-shedding era the search for viable renewable energy resources is of paramount importance to ensure sustainable development. The global wave energy resource sits at an estimated 3.7 TW (terawatts) with a staggering 178GW (gigawatts) of potential wave energy of the coast of South Africa (Mørk et al.). The Department of Energy has set a target of 10 000 GWh of Renewable Energy generation through the South African Renewable Energy Independent Power Producer Procurement Program (REIPPPP) (Ipprenewables.co.za, 2015). This initiative encourages the private sector to identify areas for potential renewable energy recovery. Bids have included large scale wind and solar projects however they have yet to take advantage of the available resource along the South African coastline. Following this opportunity, this study was undertaken to assess whether the available and recoverable wave power density resource at Algoa Bay within the Agulhas System is sufficient to support commercial scale wave energy generation. Two points, one onshore and one offshore, were analysed from 15 years of model wave data from National Centre for Environmental Prediction (NCEP) - WAVEWATCH III. The analysis includes spatial and temporal distribution of the power density in the region. The first stages of commercial viability will be investigated using a fatal flaw analysis technique in order to determine whether factors such as environmental sensitivity are prohibitive to the extraction of the available energy.