

Estimation of tidal electric energy potential of Khowr Doragh estuary

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Abstract

Khowr Doragh located at the northern end of the Khowr Mousa in the southwest of Iran. In present study; tide in Khowr Doragh was simulated by the hydro dynamical part of COHERENS model using the relationship between the potential energy and sea surface. Model was based on a five layers sigma vertical coordinate.

Taking into consideration the connection between Imam Khomeini Port Complex, Special Economic Zone and the presumed location of the plant, various options for energy supply in the study area is defined based on the demand. In the simplest case, without any interference with existing port activities, 32 MW in average and 11.2 MW (35% efficiency) electric energy can be extracted. Electricity production will be possible both in the ebb and flood by installing two directional turbines with more technical complexity and higher price. By dividing area into two separate pools, electricity would be produced throughout day and night.

By constructing a dam at the main entrance of Khowr Doragh a 20 Km² natural pool would be created which can produce 25 MW of electricity per day. By assumption of dredging and clearance of land surrounding by Khowr Doragh and Khowr Zangi, model was run for 29 and 60 Km² pools that would be created. Calculated results show the possibilities of producing 36 and 74 MW of electricity in the 29 and 60 Km² respectively.

Keywords: Renewable energy, tidal, Khowr Doragh, simulation