

Harnessing wave-power in open seas

Abstract: We discuss some of the latent potential for harnessing wave power in open seas. Large farms of wave-energy converters in the open sea may extract energy several times over the course of an ocean basin, allowing the waves to grow under the influence of the wind, and capturing energy otherwise dissipated. Our calculations show that such an approach results in increasing the wave power potential by an order of magnitude compared to coastal capture alone. In order to carry out such calculations one needs the captured, reflected, and transmitted energy transfer-functions of the farms. Here we simulate the functioning of the farms by one simplified two-dimensional converter consisting of two vertical floating plates, for which explicit transfer functions are calculated. Our main goals are to increase the awareness of the scientific community to the importance of harvesting wave-power in open seas, and to provide a preliminary picture for the geometry and size of wave energy farms in open seas.