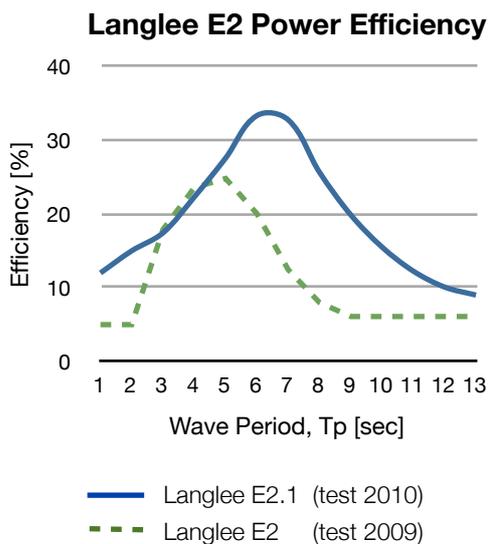
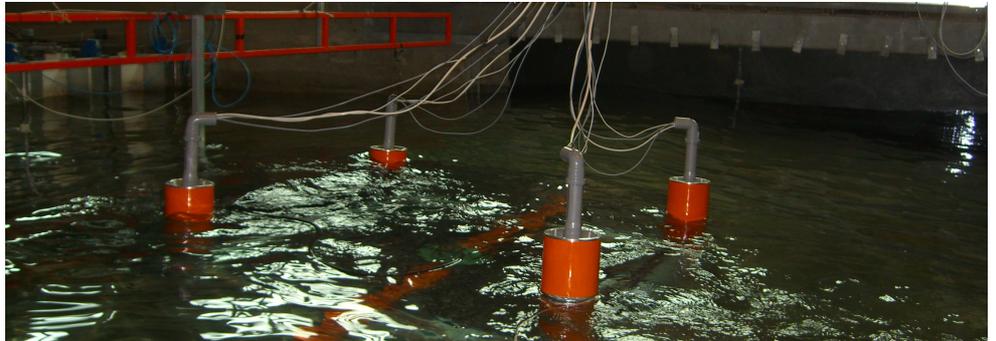




Wave tank testing at Aalborg university August '10

Summary



«The Power efficiency of the Langlee is in the good end of what we could expect»

*Jens Peter Kofoed
 Associate Professor
 Aalborg University*

General

The tests were carried through at Aalborg University (AAU) with an exactly 1:20 scale model of the Langlee E2. The full scale Wave Energy Converter is 25 x 25 meters with rated capacity 360 kW.

The objective of the test programme was to measure and analyse the energy conversion, mooring forces and dynamic response of the device. Four different water wing configurations were tested, to verify the Orcaflex simulations carried out by, NTNU master student, Einar Berentsen.

The model

A new scale model was built for the test, based on the engineering work carried through by 4Subsea and Aker Solutions. In the model, the power take-off system was simulated with microprocessor controlled electric motors, one on each water wing. The control system was designed to respond dynamically to the incoming wave, with various control parameters used to increase the power production.

Energy absorption

With the updated model, a power efficiency of 35% was documented in optimal wave conditions. Compared to the previous model tested at Aalborg University, we have achieved a 40% improvement of peak efficiency and 100% increase in yearly production for an installation at EMEC, (European Marine Energy Centre) at Orkney. The reason for this is mainly due to an improved efficiency over a wider spectrum of wave condition (see graph).

Response analysis

Stability, movements and mooring forces were measured to verify the computer models. The Langlee E2 is stable over a wide range of wave conditions and has been design to survive a 100-year storm.

Yearly production

Calculated yearly production for a Langlee E2 (360 kW) installed at EMEC is 1 GWh. In comparison, the yearly production for the Pelamis (750 kW) is estimated 1,3 GWh.