SeaTwirl

SeaTwirl is a new technology to store and at the same time harvest offshore wind energy. SeaTwirl is using ocean sea water as a roller-bearing and can therefore use cheaper and heavier materials and function as a large low speed flywheel.

The new principles do not need any gearbox, transmission line or roller-bearing to handle the weight. Instead seawater is used as a roller-bearing and by moving water inside the unit direct energy storage is enabled. SeaTwirl can therefore take wind power to a new level of functionality, scale and cost effectiveness.

The Company

The SeaTwirl technology is developed by the company Ehrnberg Solutions AB started during 2010. The company business idea is to produce market and sell SeaTwirl units for the world. The units will be built in docks and towed out in the world ready for installation. Ehrnberg Solutions AB has secured the intellectual property to the principle and patents are pending.

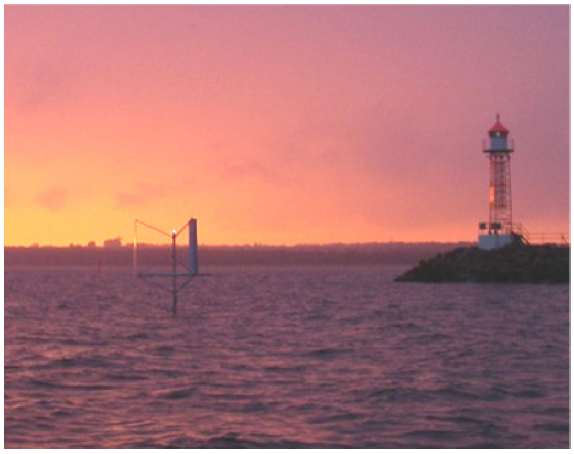

FIGURE 1: A 10 meter prototype was successfully tested on the west coast of Sweden in the autumn of 2011.

The company have during august 2011 built and tested a larger prototype in 1:50 scale. The prototype was successfully tested in rough sea with wind up to 25 m/s and waves between 2 and 3 meters. In parallel theoretical work and tests in 1:500 scale is conducted as well as more extensive economical evaluations.

The Technology

SeaTwirl uses a vertical axis wind turbine and a torus ring to enable storage capability. SeaTwirl rotates from the top all the way down to the generator, seen as the blue part below in figure 2, in direct contact to the water. The only thing that is not rotating is the anchorage system and the generator axis at the bottom of the picture. In this way the ocean water is used as a roller-bearing and the weight of the rotating turbine is absorbed by the water. This arrangement also means that there is no need for transmission line, gearbox and that the weight from the generator is placed where it should be, in the bottom.

SeaTwirl uses the physical law for conservation of momentum to enable the storage capacity. SeaTwirl transports fluids from a less rotationally centred position to a more rotationally centred position to rotate faster, as a skater doing a pirouette. In this way it can store large amounts of energy at low speed and tap it at higher rotational velocity when the energy systems need it. SeaTwirl can in this way produce energy even if the winds have stopped blowing. SeaTwirl could also be used by other renewable energy producers as an energy reservoir and stabilize energy systems. The SeaTwirl will in fact be more stabile the faster it rotates and the more it blows.

Specifications

A large unit could be built with the following specifications:

Rated power: 10 MW, Mean power: 4.5 MW
Yearly production: 39 000 MWh, Sweep area: 24 000 m^2.

Energy storage: 25 000 kWh, could support 8000 households during 1 hour.

Height from water level: 210 m, Depth from water level: 228 m

The SeaTwirl unit could be constructed to increase the energy storage capacity or energy production depending on customer needs.

The Potential

The SeaTwirl is not limited in scale by weight or logistics as current technology. SeaTwirl can therefore be up scaled and reach better cost efficiency than the previous technologies. This combined with the capability of short time energy storage gives SeaTwirl the properties that an energy provider should have in a future sustainable society and energy system.

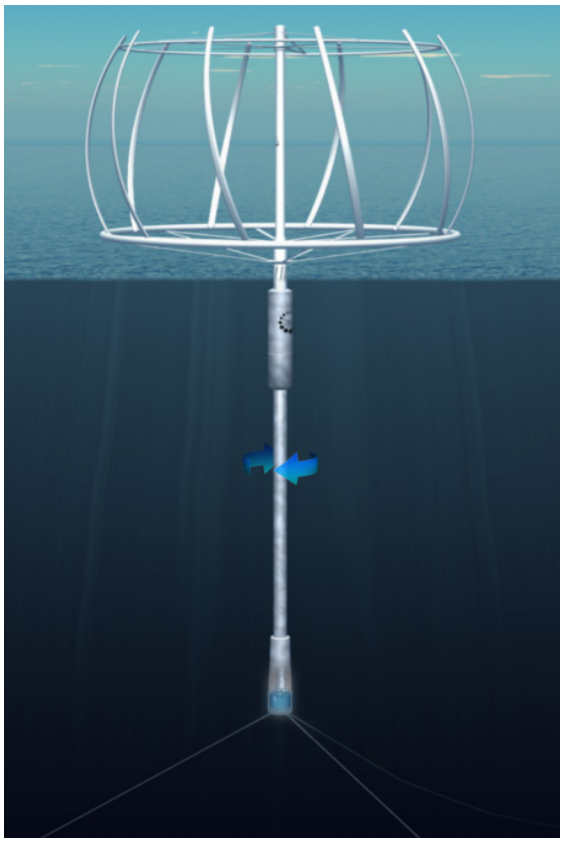

FIGURE 2: A cross sectional figure showing parts of the SeaTwirl. The upper part consists of a vertical axis wind turbine hold by wires and a surrounding torus ring positioned 30 meters above water level. The rotating body stretching all the way down to the rotating generator, blue part.

Ehrnberg Solutions AB will during autumn 2011 form collaborations for the further development of SeaTwirl.

Contact us for more information about SeaTwirl!

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