ΙΝΣΤΙΤΟΥΤΟ ΕΝΕΡΓΕΙΑΣ
ΝΟΤΙΟΑΝΑΤΟΛΙΚΗΣ ΕΥΡΩΠΗΣ

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RECENT DEVELOPMENTS AND TRENDS IN OFFSHORE ENERGY HARVESTING

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Facts about Offshore Wind

- The installation away from residential areas eliminates the problem of noise and visual pollution.
- According to the Global Wind Energy Council, a total of 2,219 MW of new offshore wind power was installed across seven markets globally in 2016.
- Asset financing for wind power projects reached the record of €27.6bn in 2016.
- The reason for this remarkable growth lies in the decrease of the construction cost.
- Indeed, the construction and installation cost of offshore wind farms has fallen 46% in the last five years and 22% in 2016 alone; making the offshore wind sector competitive compared to land-based turbines, solar and nuclear power, even without subsidy.
- The installed offshore wind capacity is expected to increase from ~14GW today to >120GW by 2030.

Water and electric power plants don't mix well naturally, unless you add some wind

A wind turbine in the waters off Block Island, Rhode Island, U.S. *Photographer: Eric Thayer/Bloomberg*

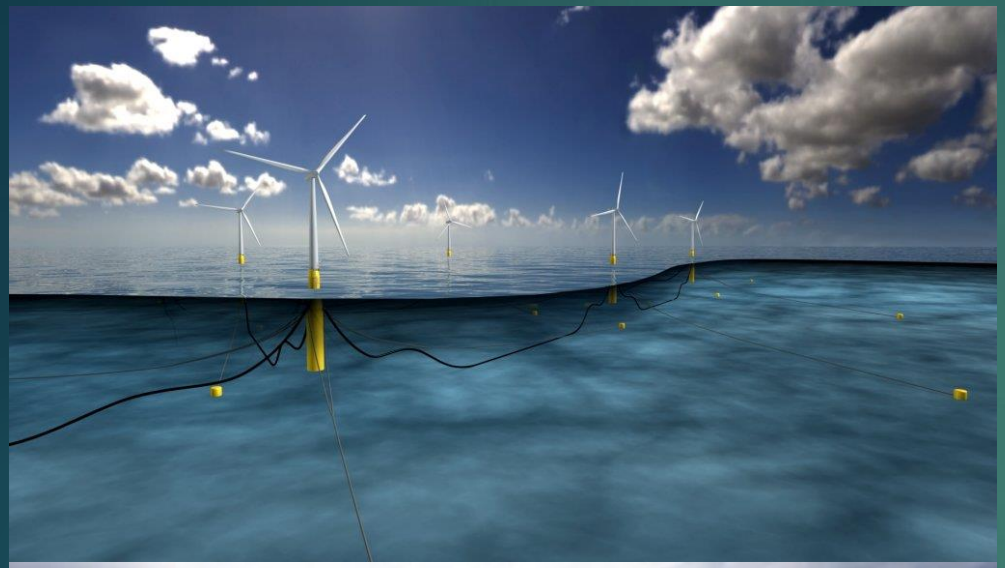
Water tends to corrode and short out circuits. So what's happening in the renewable energy industry, where developers are putting jumbo-jet sized wind turbines into stormy seas, is at very least an engineering miracle

The flagship of Offshore Wind

MHI Vestas Offshore Wind will supply 90 of its flagship V164-9.5 MW turbines for the 860 MW project, its largest MW project to date.

Location: 860 MW Triton Knoll Offshore Wind Farm, confirming the largest MW project in the history.

Going deeper



The world's first floating wind farm, the 3MW Hywind Scotland, is outperforming expectations and operating at levels consistently above that of its seabound offshore brethren.

The wind farm is made up of five 6 MW wind turbines floating 25 kilometers off the coast of Peterhead, in Scotland.

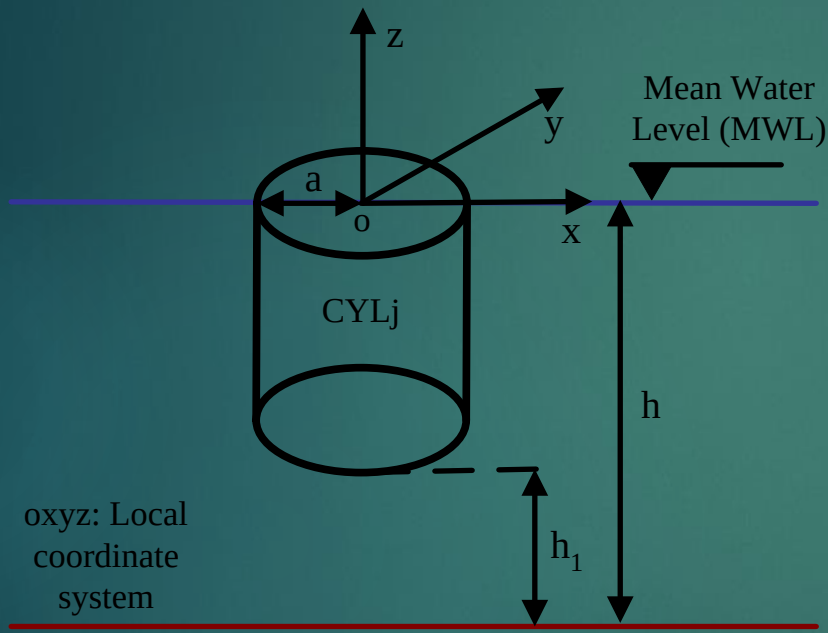
A wind turbine doesn't generate 100% of its potential electricity capacity 24 hours, 7 days a week — to do that would require very disturbing wind conditions that pretty much don't exist anywhere on earth. Wind farms that are affixed to the seafloor generally generate at around 45 to 60% — in other words, they are generating 100% of their potential electricity capacity around 45 to 60% of the time.

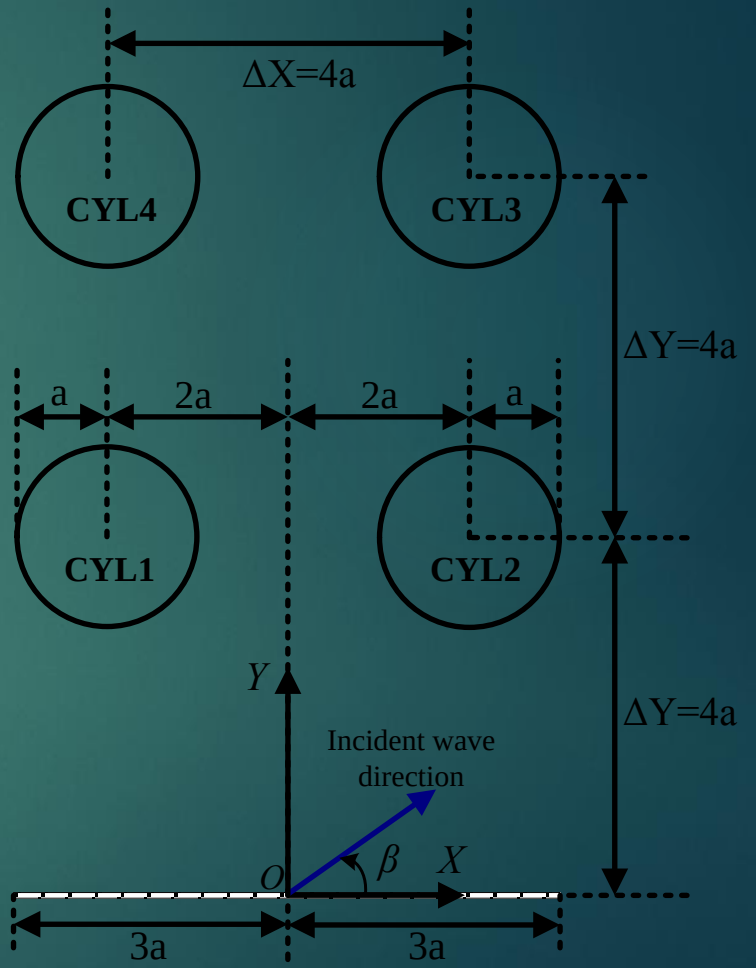
Wave energy project in Grete

Illustration of the planned WEC test modules at the project site in Heraklion, Crete. Image courtesy of SINN Power.

In August 2017, SINN Power was awarded a €1.0 million grant from the German Federal Ministry for Economic Affairs and Energy (BMWi) to expand its research activities on Crete with additional wave energy converters next to its WEC prototype installed in 2015 at the breakwater wall of the Port of Heraklion.

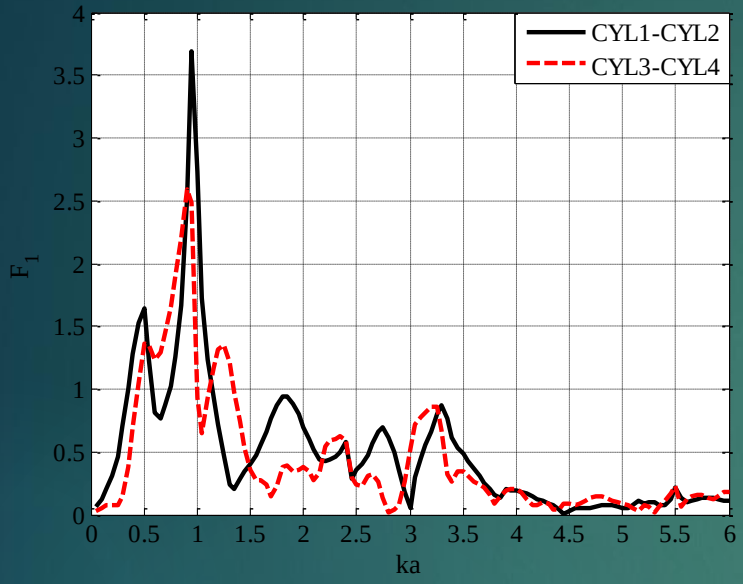
Calculating WECs





OXYZ: Global coordinate system

… and forces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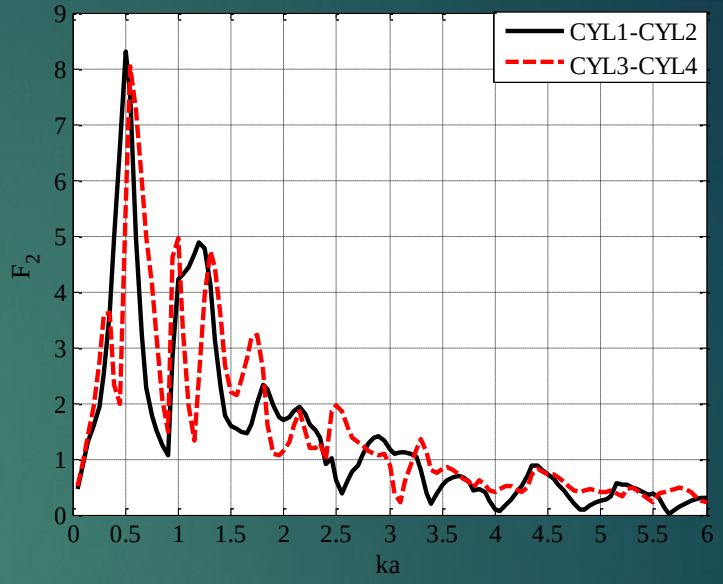
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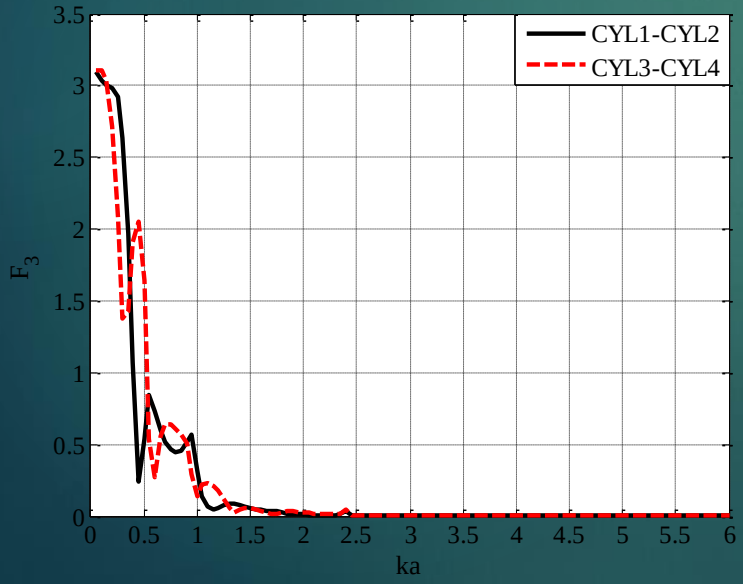
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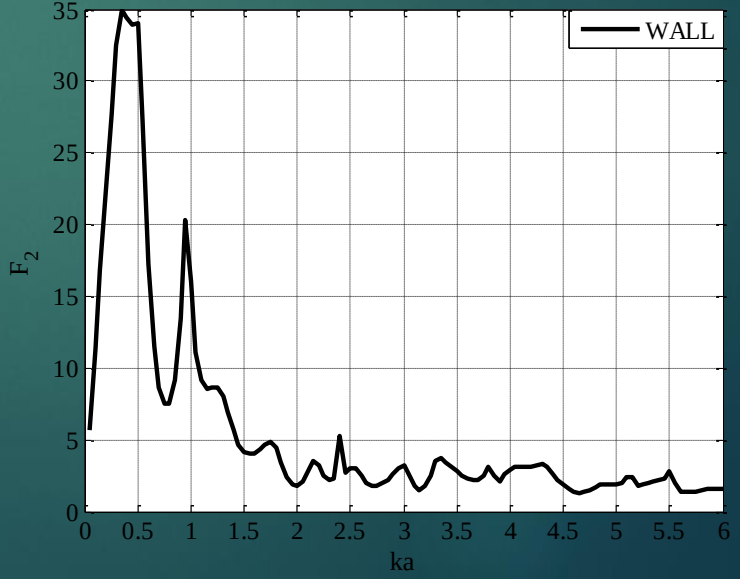
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Thank you for listening