SPACE-EARTH INTERACTIONS

Development of a new multipurpose wave energy converter - REEFS (Renewable Electric Energy From Sea)

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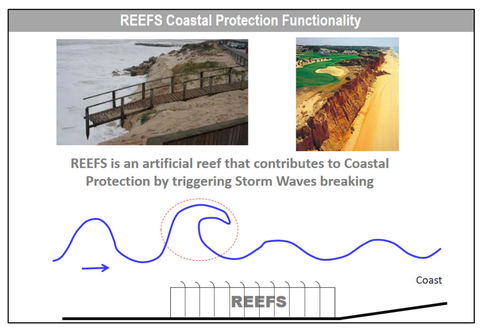
Background

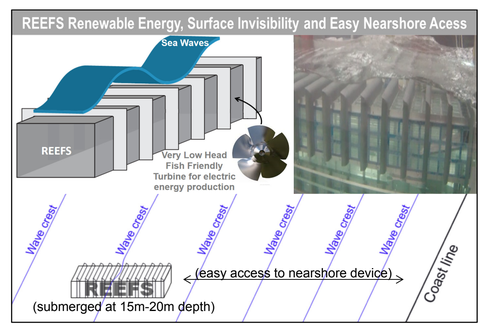
To fight climate change and mitigate coastal erosion, a submerged multipurpose WEC combining coastal protection, aesthetic invisibility and renewable electric energy production named REEFS was proposed.

REEFS concept proof at 1:67 scale was successfully done.

Numerical model is being developed to optimize the device.

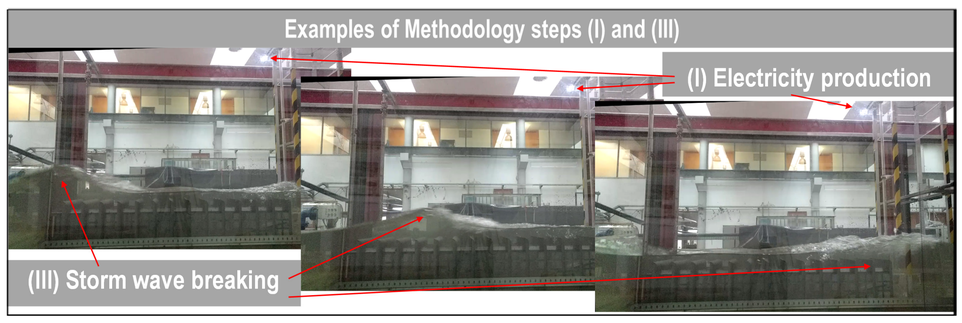
International patent of the concept was recently granted.





Methodology

(I) Concept proof of electricity production (1:67) (done); (II) Numerical wave models (Stokes 2nd order, Cnoidal and CFD) (ongoing); (III) Concept proof of wave breaking (1:67) (done); (IV) Model for assessment of device potential (ongoing); (V) Power take off model to be coupled with CFD wave model; (VI) Fluid-structure interaction model to be coupled with CFD wave model; (VII) Multiparametric numerical optimization of device potential; (VIII) Lab (1:10) and pilot (1:1) tests.



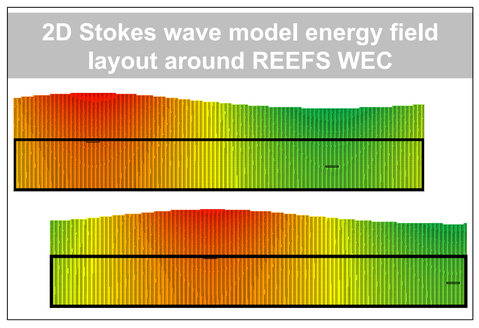
Results

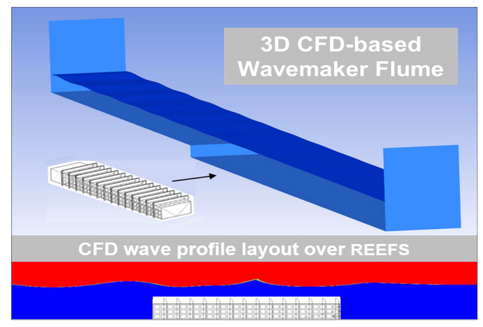
CFD models for wave energy converter analysis.

Optimized design of the REEFS WEC.

Lab model (1:10) and pilot prototype (1:1) testing.

Dissemination of the REEFS concept.





Impact/Conclusions

Increase the knowledge in nearshore multipurpose submerged pressure and kinetic differential wave energy converters.

Disseminate the REEFS concept in the scientific and technical community in order to promote future developments from researchers who might be interested in exploring this concept.

Demonstrate the potential of the REEFS concept, protected by granted international patent owned by the University of Coimbra, to promote future technological transfer to industrial community.

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