NHP-WEC WP4:

Validation and Cost of Energy

-Review: Levelised Cost of Wave Energy

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1. Target

- (1)Replace the share of the fossil energy over time
- (2)Make sure sustainability of energy supply

2.Calculation Model

- (1) Techno-economic model (Model A)

$$LCOE = \frac{CAPEX + \sum\left(\frac{(OPEX}{(1+r)^t}\right)}{\sum \frac{E(t)}{(1+r)^t}}$$

Forward calculation

Cost minimization

Reversed calculation

Allowable cost

2.Calculation Model

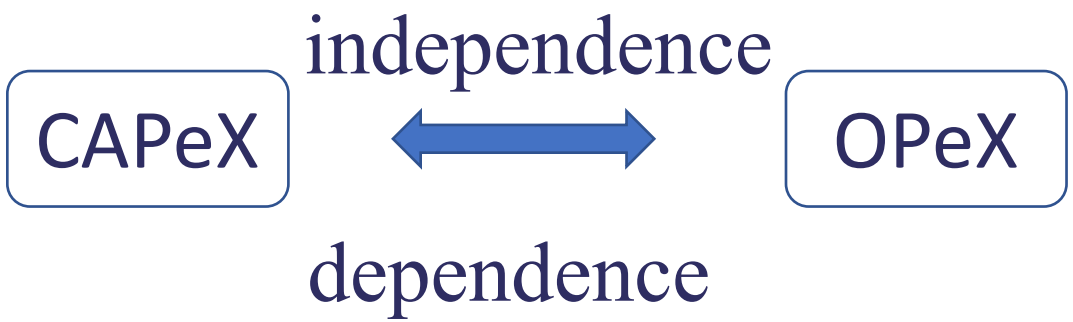
- (2) Economics model based on marginal utility (Model B)
-

$$\text{Element Total Cost} = \text{Element Base Cost}\,(1 + \text{Element Margin})$$

3.Cost element

(1) Cost element in Model A

- ❖CAPeX (Capital Expenditure)
- ❖OPeX (Operational Expenditure)
- ❖AEP (Annual Energy Production)
- ❖Discount Rate



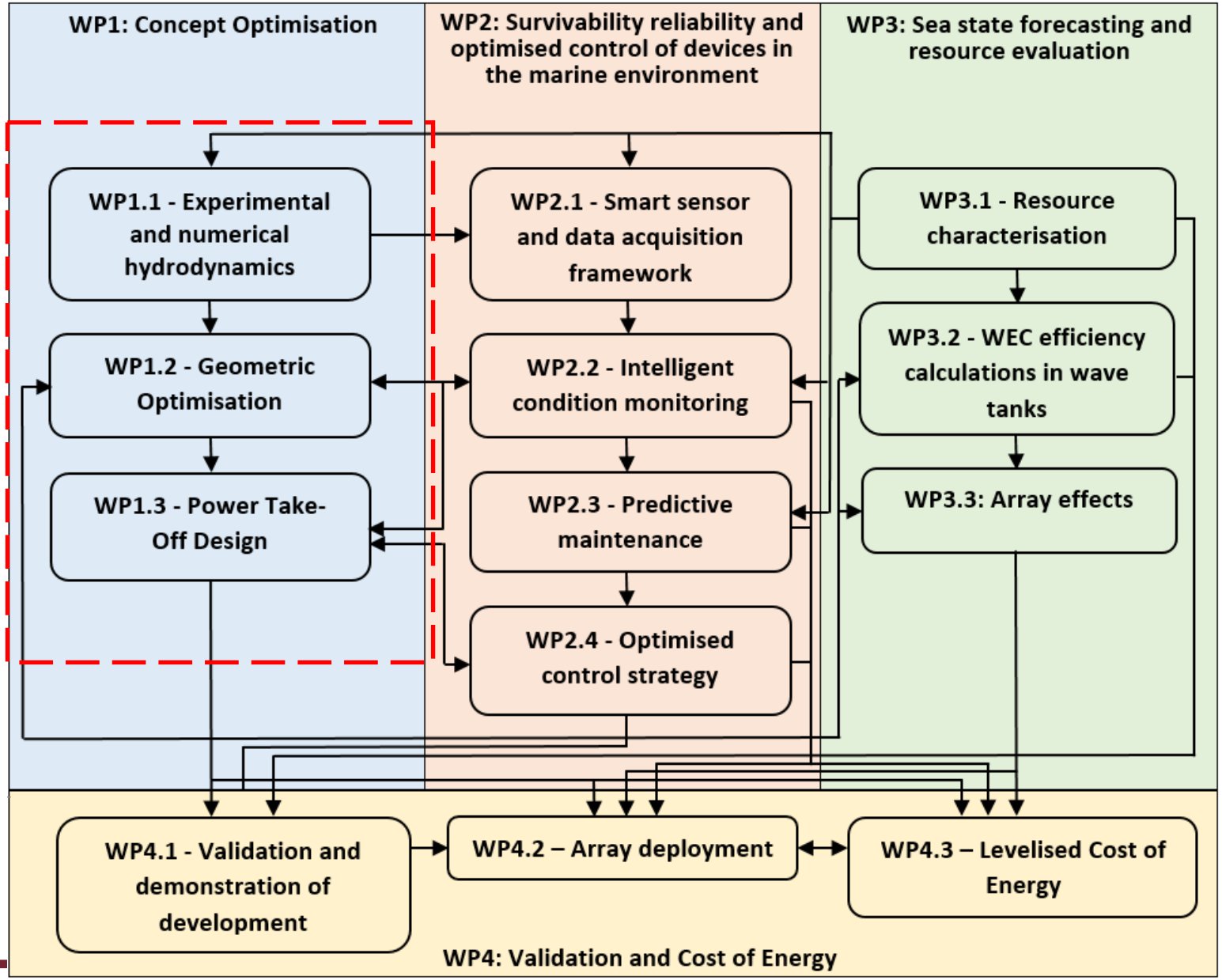
3.Cost element

- (2) Cost element in Model B
  - ❖Base cost
  - ❖Element parameter(e.g. Quantity)

4. Evaluation of wave energy conversion projects

- (1) Constitution
  - ❖Element parameter(e.g. Quantity)

- (2) Results



WP4

- WP 4.1- Validation and demonstration of development
- WP 4.2- Array deployment
- WP 4.3-Levelised Cost of Energy

Collaborations

- National Renewable Energy Laboratory (NREL): an application to funding support to use WEC-SIM to model TALOS wave energy converter
- TALOS model testing in Zhejiang University (China): data sharing and comparison; proposed joint publications
- Hydrodynamics modelling:
  - Dr. ***Constantine Michailides (***International Hellenic University)
  - Dr. ***Eva Loukogeorgaki*** (Aristotle University of Thessaloniki)
- And others

Future work

- Optimisations of the TALOS structure; of the PTOs (and springs)
- Model and PTO design and test in wave tanks
- Work with **WP2**: to provide information for control study
- Work with **WP3**: to examine the yearly outputs of energy extraction by TALOS
- Work with **WP4**: to validate and study the cost of energy…
- Paper preparations: (hydrodynamics studies; implementation of TALOS WEC, joint papers etc)
- And more…