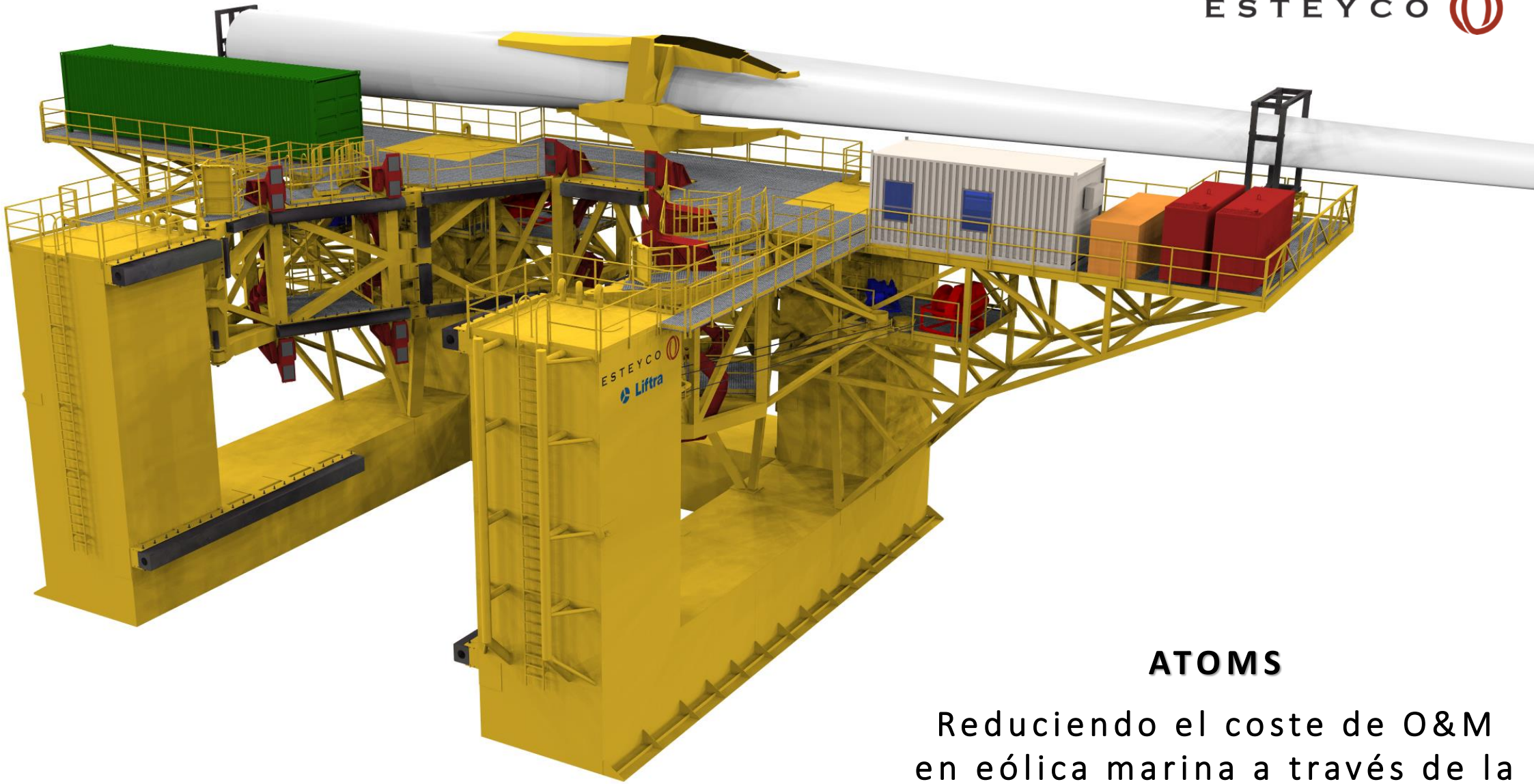
ESTEYCO



ATOMS

Reduciendo el coste de O&M en eólica marina a través de la innovación

8 de noviembre de 2023

CO-ORGANIZADORES

PARTNER INSTITUCIONAL

PARTNER LOCAL

ESTEYCO

Offshore wind technologies

ELISA GBS technology

First and only bottom-fixed solution allowing for the installation of OWT without heavy-lift vessels

WHEEL floating evolution

Floating concept for unparalleled reduction in floater width, harbour draft, material usage and carbon footprint

ATOMS O&M System

Solution for large corrective maintenance of bottom-fixed or floating WTGs with no need for jack-ups

The Opportunity

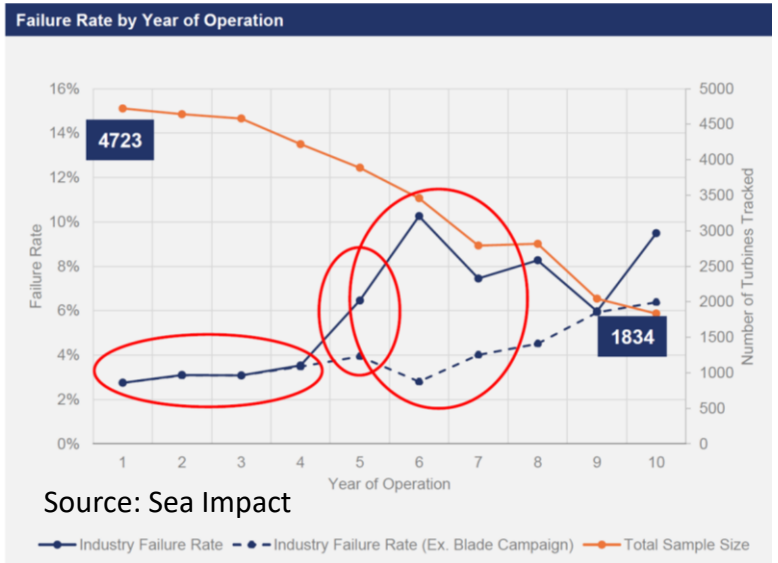
Challenges in offshore wind O&M

TODAY

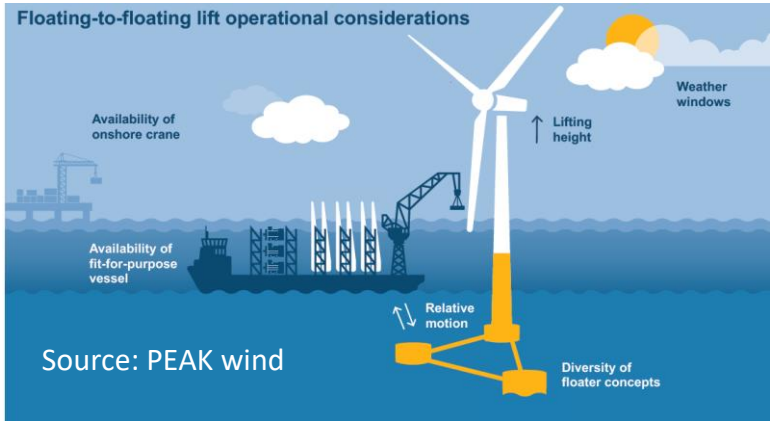
- O&M costs: ~30% of the total of OW energy costs.
- MCR costs: ~25% of O&M costs
- Only commercial option for bottom fixed → jack-ups
- Jack-up intervention failure rate → 6% (45% blades)
- Average duration of jack-up: 3 days (up to 6)
- Only commercial option for FOW: tow-to-port
- Average duration of tow-to-port: up to 40 days

CHALLENGES

- Bottom fixed:
  - Lead time / mobilization costs of jack ups
  - Deeper waters using larger HH / soil conditions
  - Emerging OW markets / new investments
- FOW:
  - Tow-to-port may hold back FOW projects
  - No commercial solution for on-site MC
    - Floating-to-floating lift → relative motion & availability of fit-for-purpose vessel
    - Add-on crane lift → relative motion & support system



Source: Sea Impact



Source: PEAK wind

The technology

ATOMS (Attachable O&M System)

Low-cost and **scalable** solution for **MCR** of both **bottom-fixed** and **FOW** turbines

Capacity to **couple** to the substructure a **solidary working deck**

Proven commercial **add-on cranes** can be installed and operated

Based on a **Coupling Ring System (CRS)** already proven (installation of GBS Elisa)

Specific full-scale **demonstration** in 2024

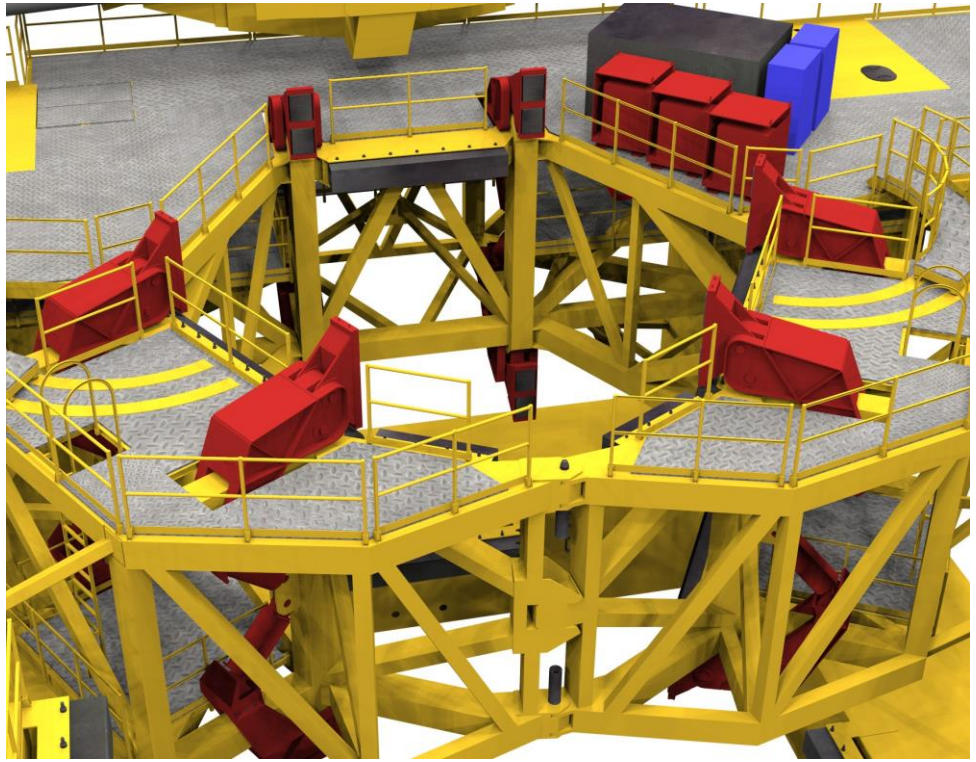
Applicability: monopiles, GBS, ELISA, spar, semi-subs, WHEEL

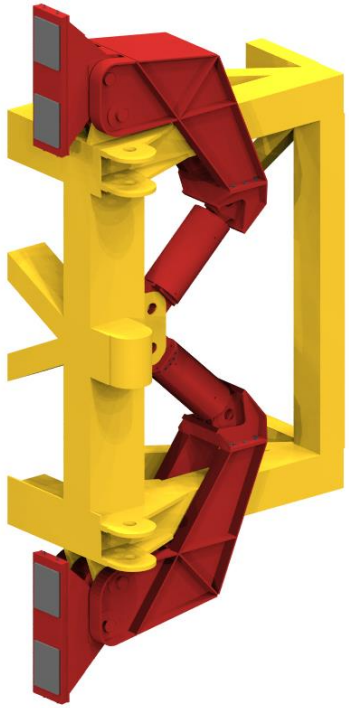
Reduce MCR **cost** significantly

Specifically built and assigned to serve a given WF cluster to remain **available 24/7**

Key elements

The Coupling Ring System (CRS) and the self-hoisting crane





The ATOMS platform uses the Coupling Ring System already developed and proven as a tool for installation of ELISA GBS units as shown in the TIM in pictures above where it is depicted in the ELICAN project..

Performance

Sequence and main topics

3-4 days operation.

Available 24/7.

Significant wave for coupling 1,5-2m, that can be easily increase for transport and crane operation once coupled.

Common towing operation: 80t tugboat.

During the coupling operation, ATOMS remain unmanned.

Pre-installed slings surrounding the substructure.

Winch lines connected to pre-installed slings.

Slow and control approach.

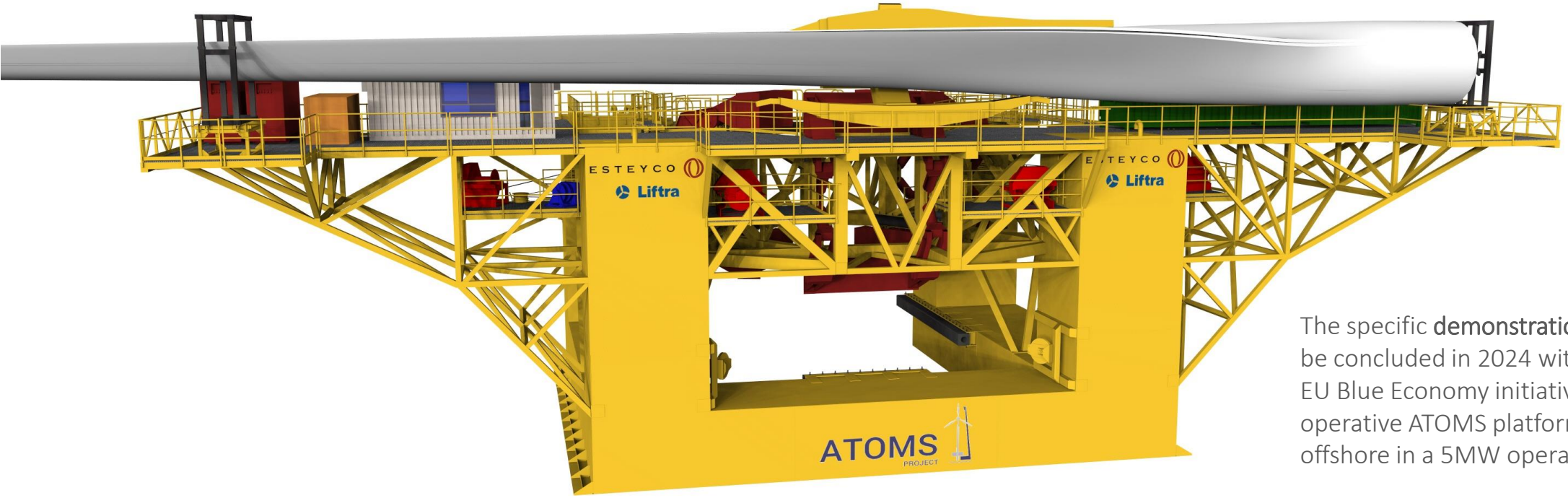
Auxiliary remote-operated winches will be activated to close the CRS around the tower.

Securely attached to the substructure with no relative motions.

Personnel to get on board as a normal OW access operation.

demoATOMS

Operation key figures



The specific **demonstration** of the ATOMS shall be concluded in 2024 with the support of the EU Blue Economy initiative, with a fully operative ATOMS platform that shall be tested offshore in a 5MW operating turbine.

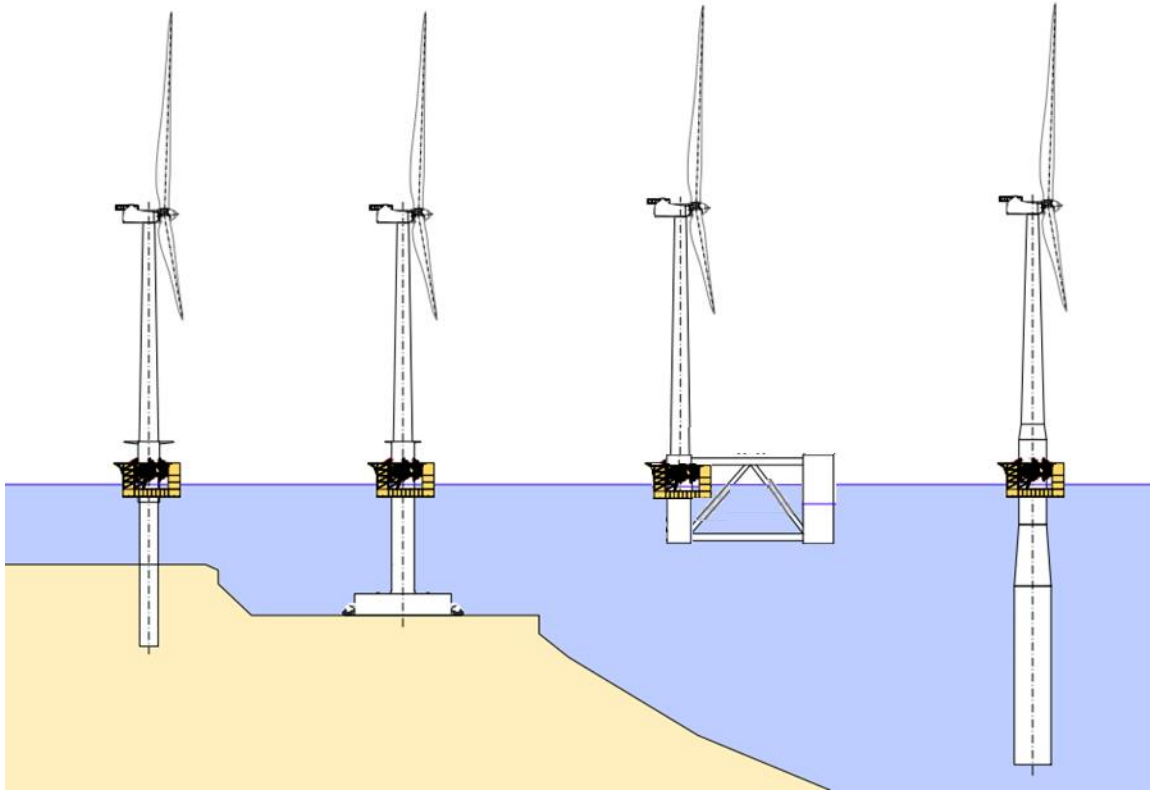
METOCEAN CONDITIONS	2024 DEMO	COMMERCIAL
Significant wave height (m)		
Transport	1.5	>1.5
Coupling operation	1.5	1.5
Replacement operation	1.5	>1.5
Wind speed (m/s)		
Transport	15	As required
Coupling operation	15	As required
Replacement operation	Crane specs	Crane specs
Tides	No limitations	No limitations

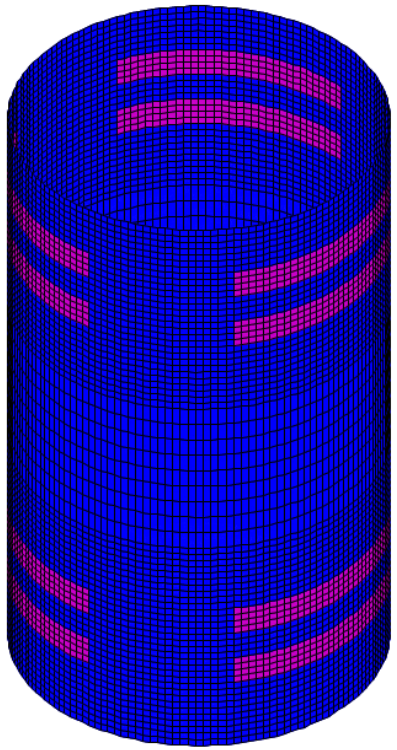
MAIN CHARACTERISTICS	2024 DEMO	COMMERCIAL
Topside dimensions	44 x 11 m	As required
Maximum load (gearbox)	~50 t @ YY m	As required
Largest load (blade)	66 m long, 17 t	As required
Towing speed (no self-propulsion)	3.5 kn	+5.0 kn
Substructure diameter	8.5 m	From 4 to 15 m
Hub height over sea level	90 m	No limitations
Hull dimensions	20 x 20 m	As required
Displacement	490 t	As required

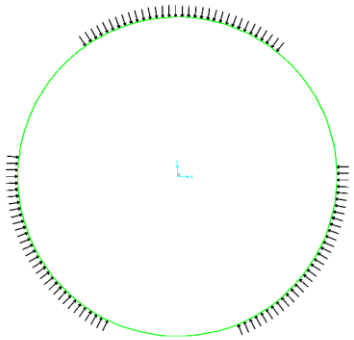
Project funded by the European Maritime and Fisheries Funds
Blue Economy SME Window call
EMFF-BEW-2019

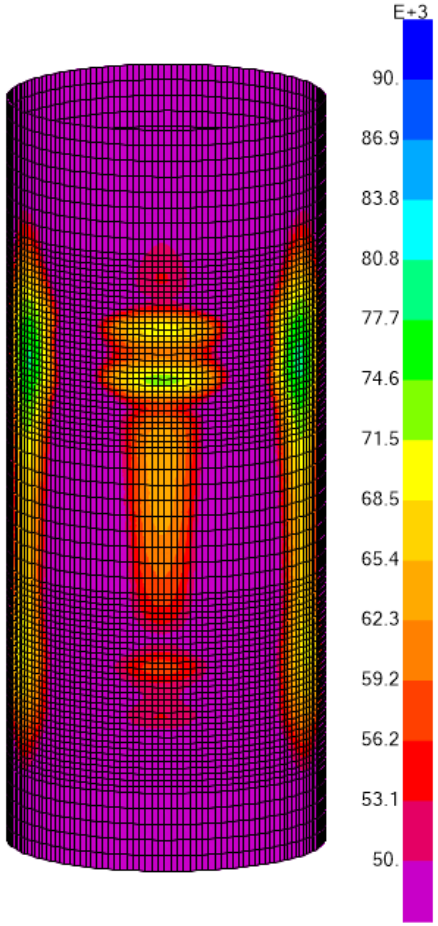
Applicability

From bottom fixed to floating









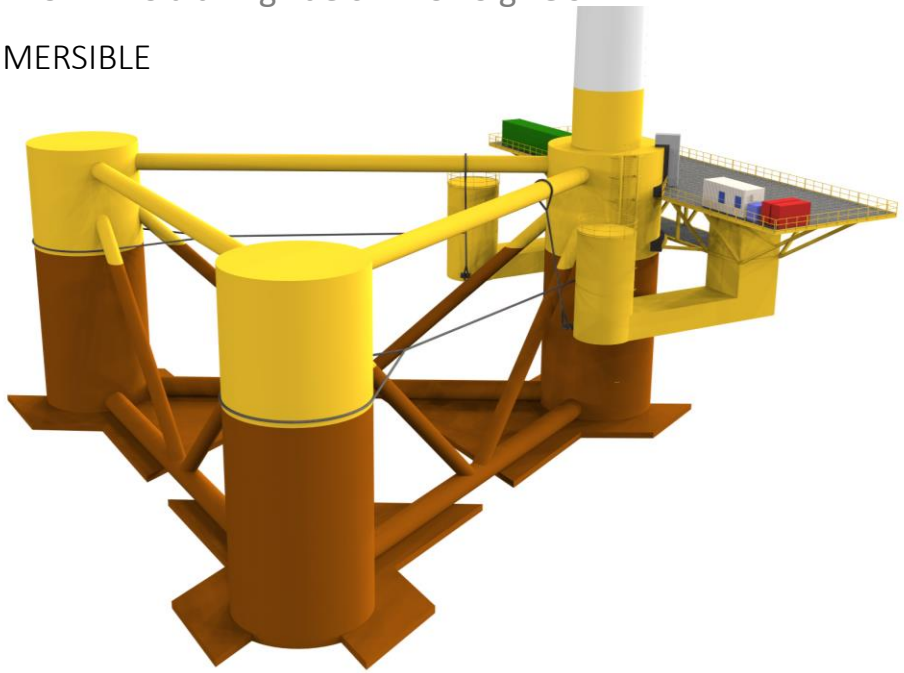
Monopile stress distribution example

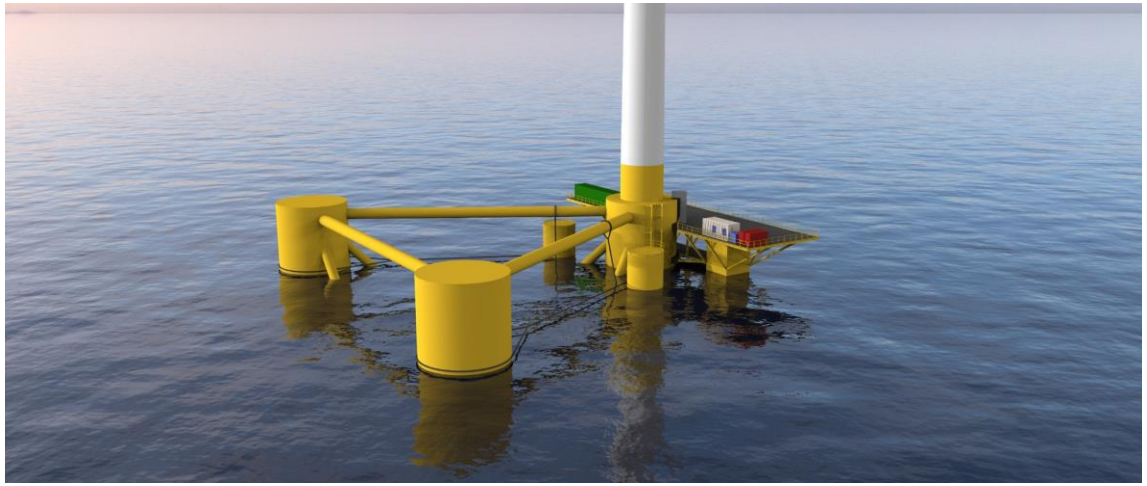
- The CRS (ring) is **easily adaptable to most of the market foundations** and most of the coming floating ones.
- Gripping pads can be modified and/or supplemented to adapt to any requirement, **controlling stress levels on the structure**.
- **Easily scalable** for attending coming larger WTG.
- Soft fender system to smoothen the coupling operation.
- **Example monopile assessed showing good stress distribution under comfortable values**

Applicability

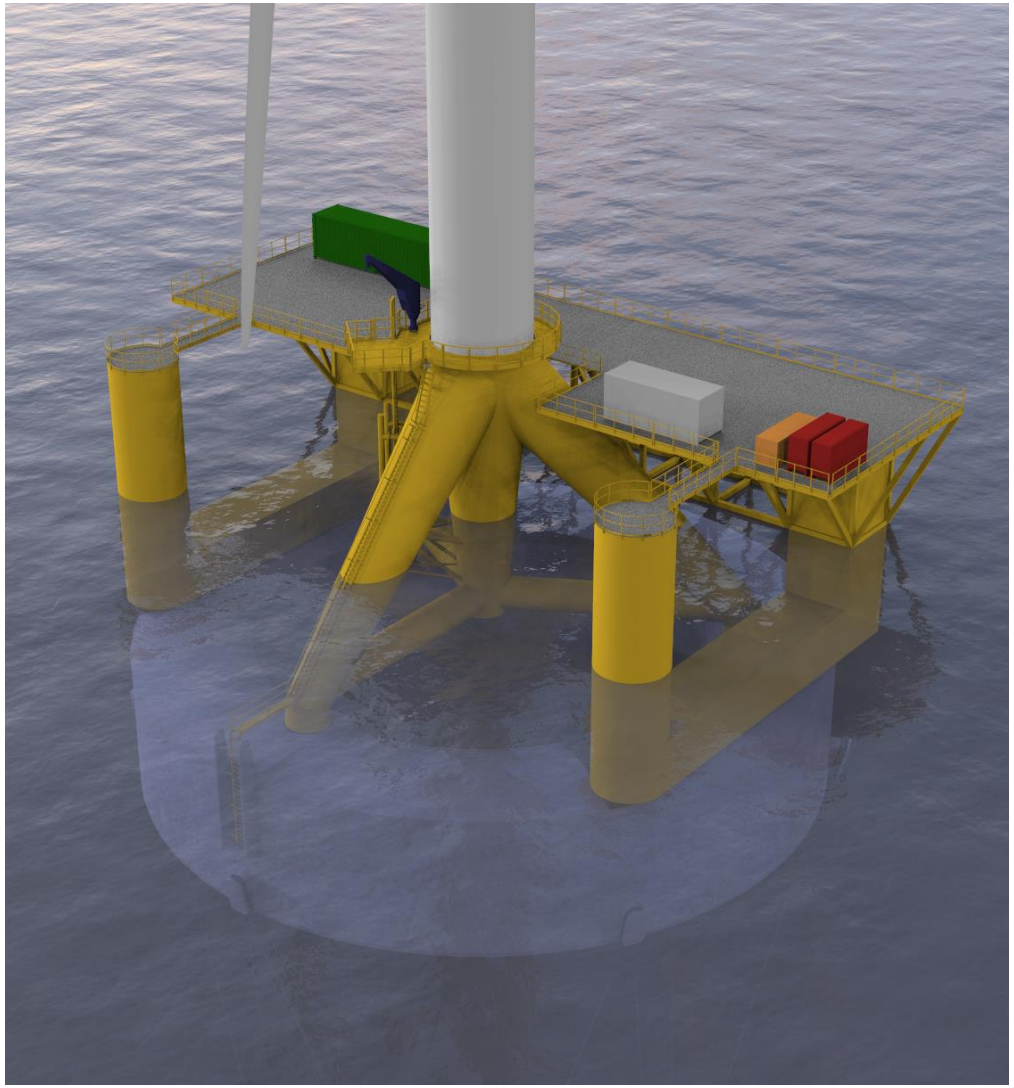
ATOMS for floating technologies

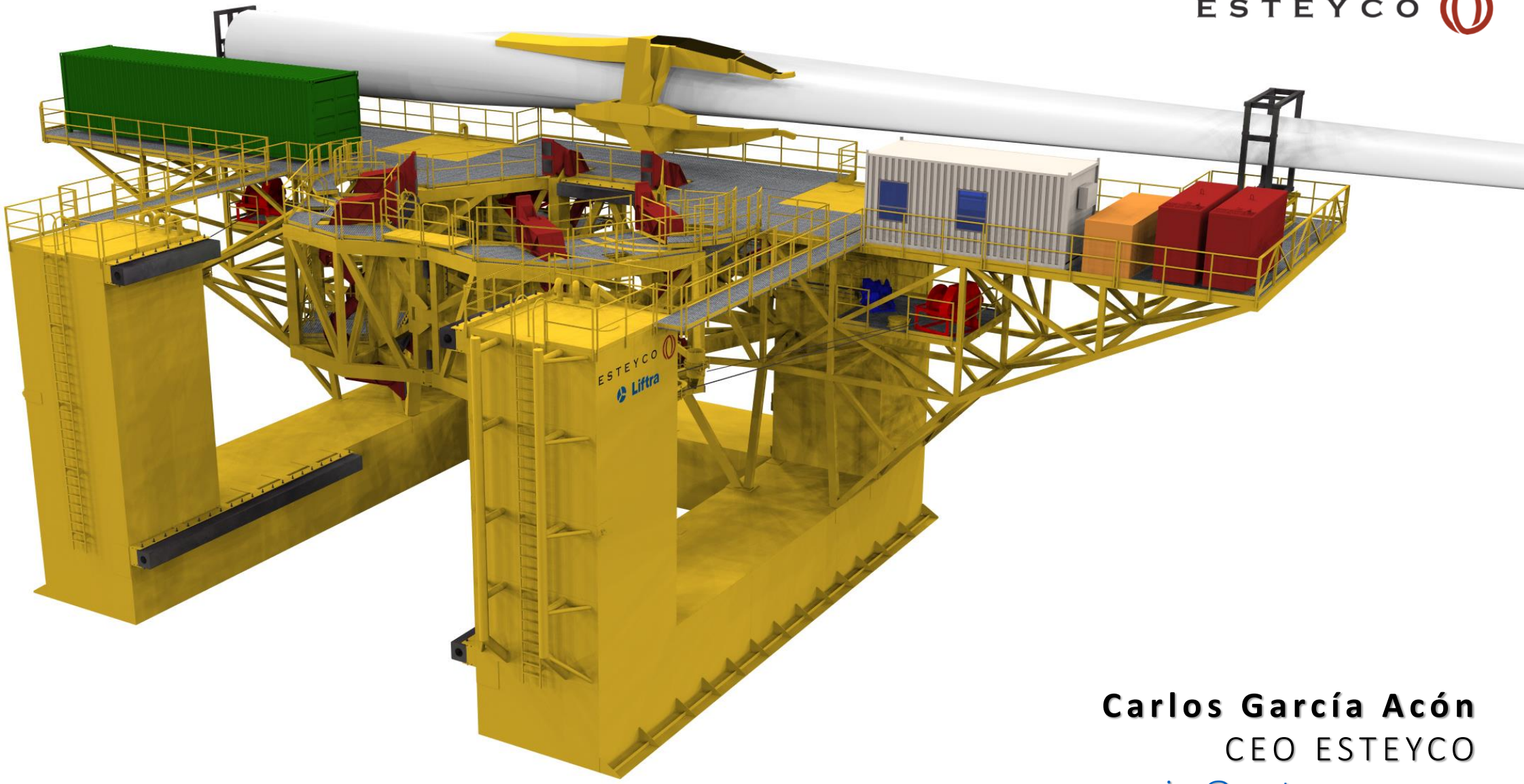
SEMI-SUBMERSIBLE





WHEEL





Carlos García Acón
CEO ESTEYCO
cgarcia@esteyco.com

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