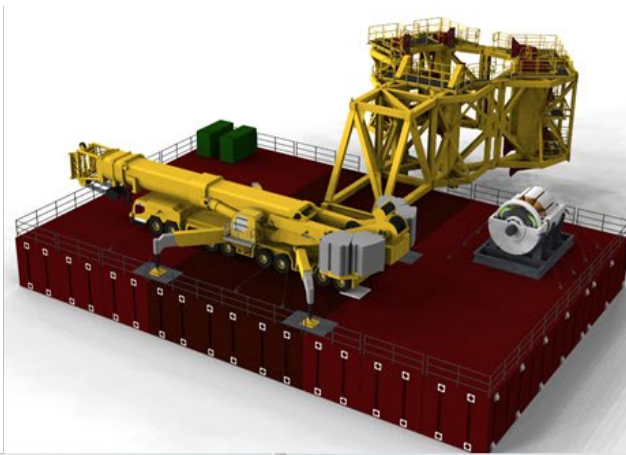




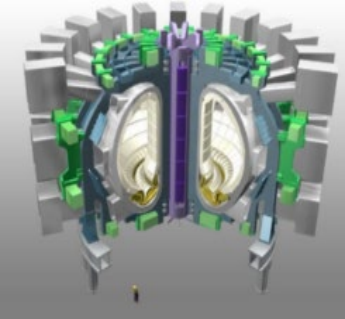
ATOMS O&M TECHNOLOGY (EU PROJECT 958976) Circular Design For The Sustainability Of The Offshore Renewable Energy Sector



Madrid,
22nd June 2021



THE EXPERIENCE BEHIND THE ATOMS TECHNOLOGY



ESTEYCO: Main figures and international presence

MAIN FIGURES



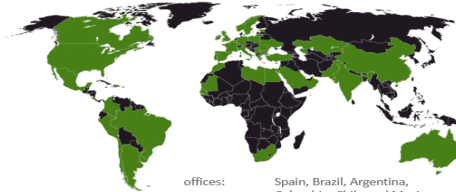
+420 WIND FARMS
+50 GW
+ 40 COUNTRIES



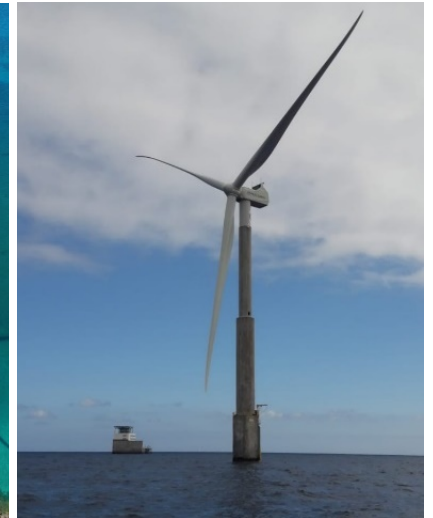
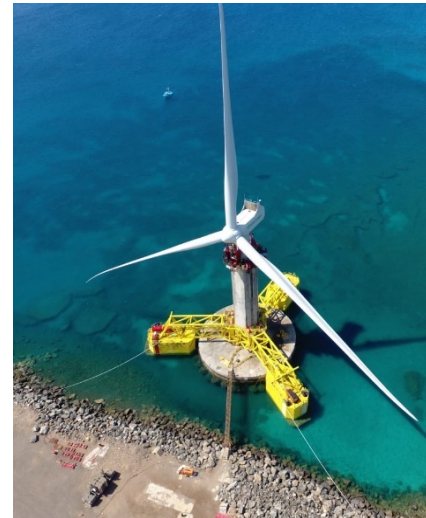
+70 SOLAR PARKS
+ 6 GW
+ 7 COUNTRIES

- Geotechnical works: +75 WWFF
- Detailed engineering of foundations: +215 WWFF
- Detailed engineering of civil works: +70 WWFF
- Detailed electrical engineering: +20 WWFF
- Detailed engineering of precast concrete wind towers: +1.600 units
- Study and evaluation of wind resource: +15 WWFF
- Preliminary engineering: +120 WWFF

- Pull out tests: +15 PSFV
- Detailed engineering of foundations: +10 PSFV
- Engineering of civil works: +85 PSFV
- Study and evaluation of solar resource: +30 PSFV

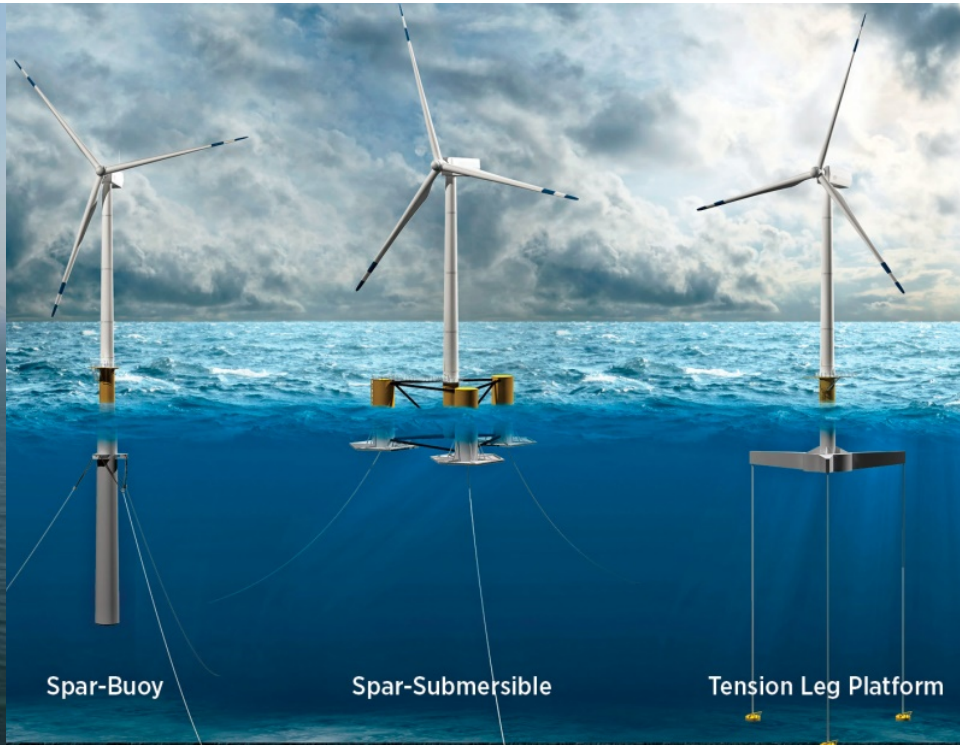


offices: Spain, Brazil, Argentina, Colombia, Chile and Mexico.



BRIEF BACKGROUND ON OFFSHORE LARGE CORRECTIVE MAINTENANCE

THE PRESENT:



Bottom Fixed WTGs:

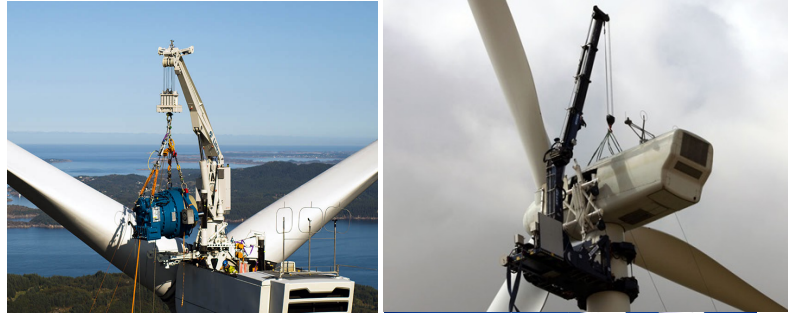
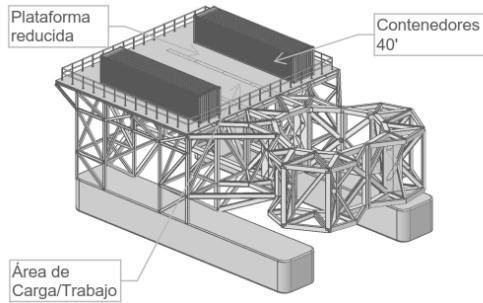
- Large Corrective Maintenance for is monopolized by Jack-Up vessels as the only available solution
- Operating height / water depth will tend to increase their already prohibitive cost

Floating WTGs:

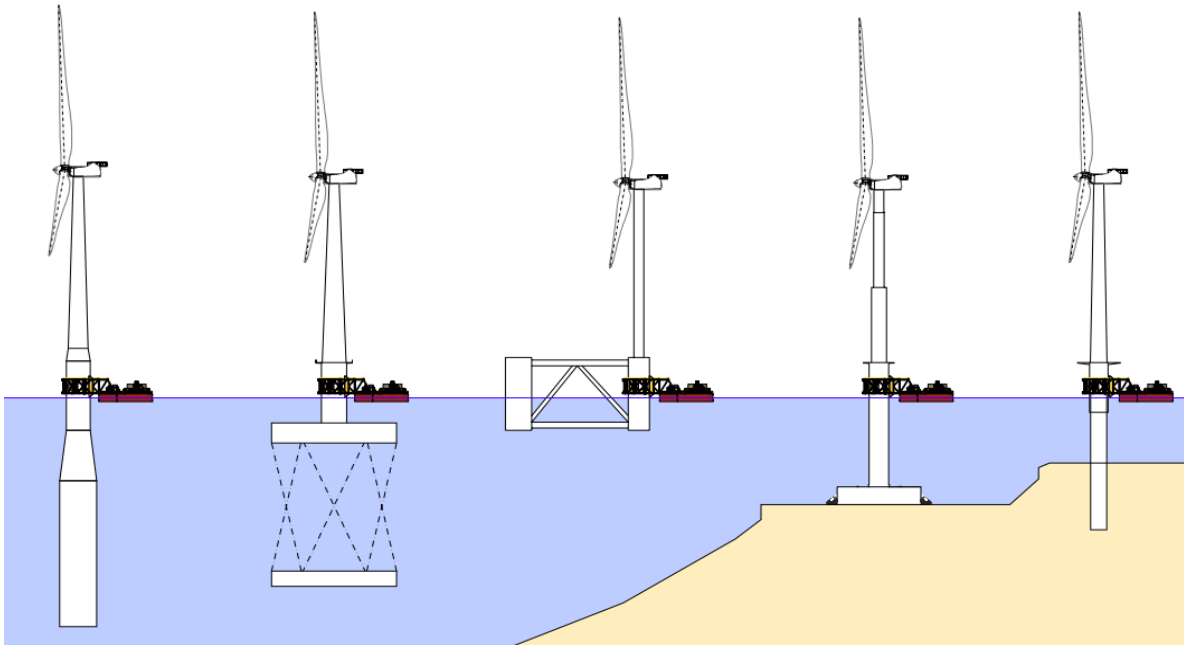
- No existing solution other than tow back to harbor
- Easier said than done, particularly for certain floaters

THE ATOMS TECHNOLOGY (ATTACHABLE O&M SYSTEM)

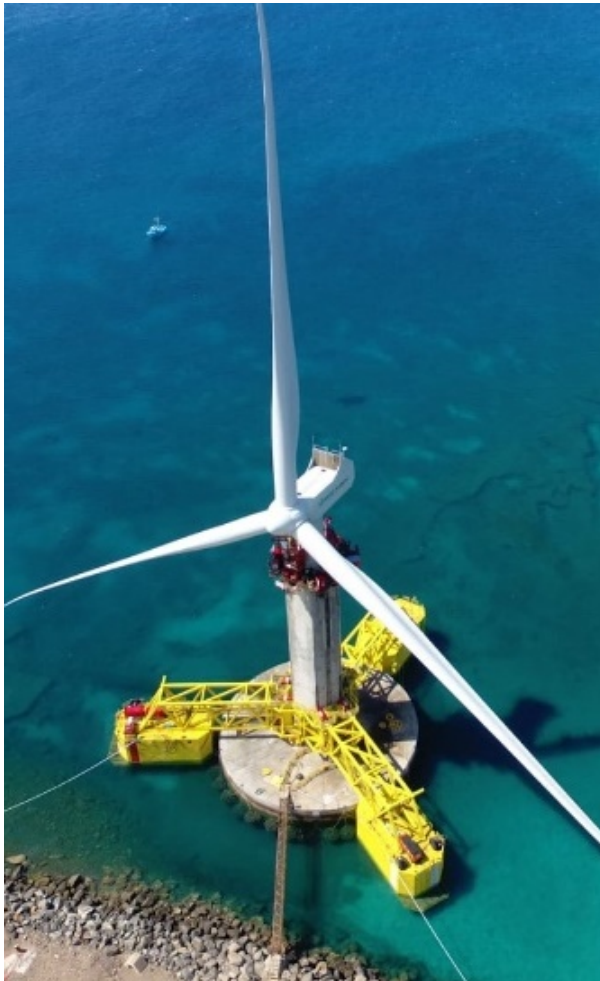
ATOMS gives the capacity to couple a solidary working deck to the substructure



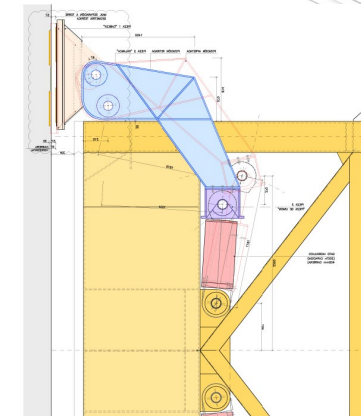
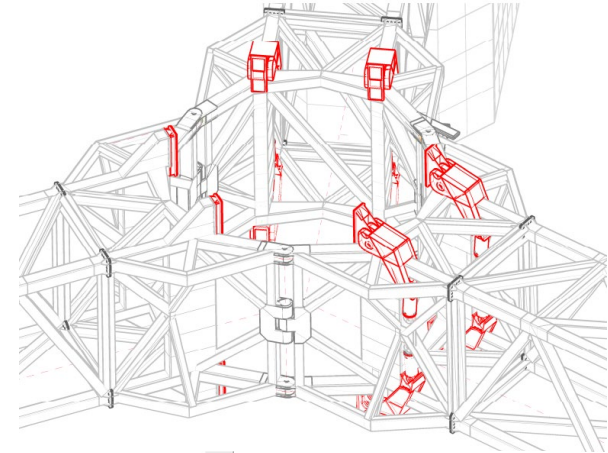
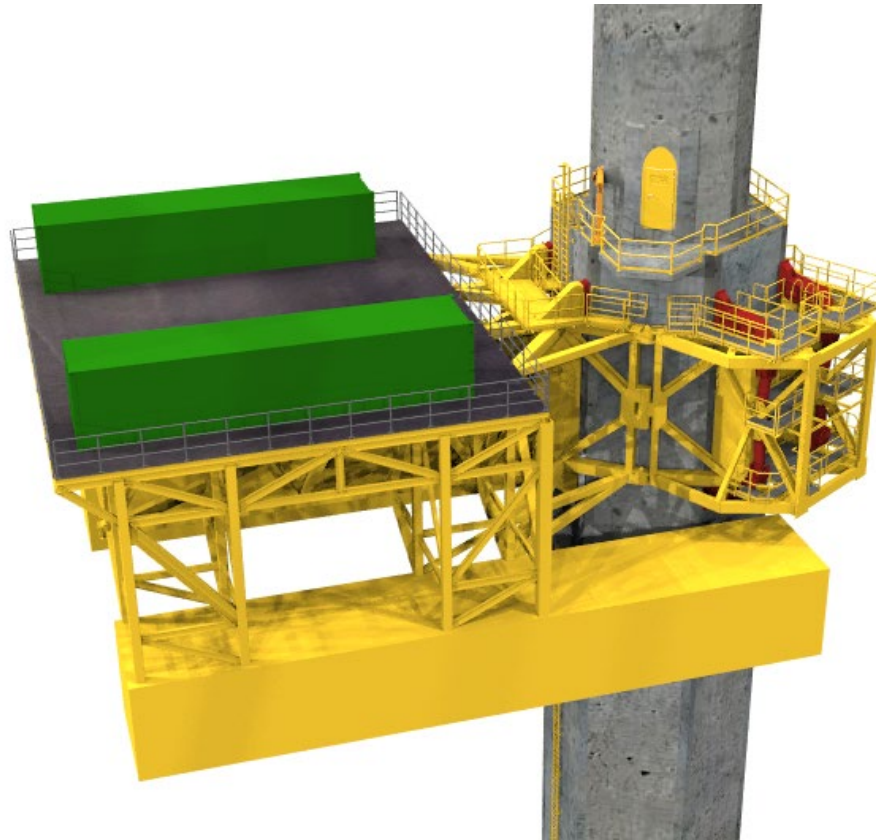
- ATOMS will allow “zero” motions of the deck for bottom-fixed WTGs and “zero” relative motions for floating WTGs
- The Coupling Ring System has already been demonstrated successfully
- ATOMS can be compatible with different types of substructures: **bottom fixed platform and floating platforms.**
- Different configurations and use strategies are being considered. Esteyco holds multiple patents for these.
- **This breakthrough system, shall be pioneer in allowing for vessel-free large corrective operations**



CIRCULAR ECONOMY (I): COUPLING RING STRUCTURE - PROVEN FOR INSTALLATION APPLICATIONS



CIRCULAR ECONOMY (I): COUPLING RING STRUCTURE - PROVEN FOR INSTALLATION APPLICATIONS



- The ring can open and close around the substructure
- Active hydraulic guides can transmit and monitor bending forces acting at coupling interface. High redundancy levels are provided
- The grabbing force can be regulated to allow or impede vertical relative motions as needed
- Number, size and position of contact pads can be varied to control/limit acting forces and adapt to the local structural capacity of different substructures (design global capacity of offshore substructures is as a rule much larger than required for the coupling)

CIRCULAR ECONOMY (II):

OFFSHORE EXPERIMENTAL PLATFORM FULLY AVAILABLE FOR ATOMS DEMONSTRATION



Picture: ELICAN prototype installed in Q3 in 2018 in PLOCAN marine reserve area in the Canaries (Spain)



Render: ATOMS Offshore demonstration in real operative maritime environment in ELICAN H2020 Project (Grant No.691919)

EXPECTED RESULTS AND IMPACTS (SOCIAL, ECONOMIC AND ENVIRONMENTAL)

SOCIAL AND ECONOMIC IMPACT

- Generate jobs and improve local economy
 - 8 new direct jobs
 - 50 new indirect jobs
- All supplies will come from the region where the OWF is located, except the turbine.
- Encourage women's introduction to offshore wind energy field.

ENVIRONMENTAL IMPACT

- ATOMS' full independence of heavy-lift vessels means reduction 50,96% of CO2 emissions
- Circular economy - Re-used materials from other projects.

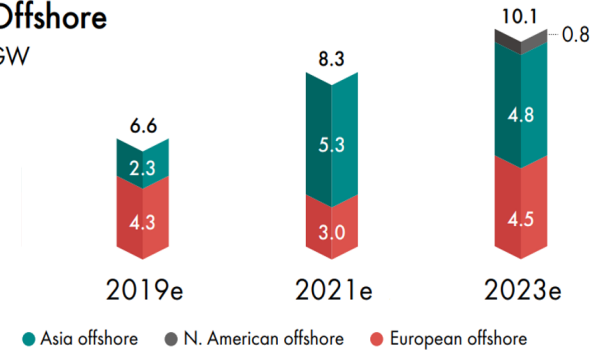
MARKET OPPORTUNITY

- Offshore wind is a growing market → 21% growth since 2013 → 4 GW in 2018 → 200 GW in 2030
- O&M using vessels accounts for more than 50% of the overall O&M costs

EUROPEAN ADDED VALUE

- Atoms' contributes to European added value by providing a differential solution that will allow it to compete in a global market. Ideally, these are designed in the EU to ensure high-quality job creation and then export them to other areas when needed.

Offshore
GW



VS





ATOMS O&M TECHNOLOGY

(EU PROJECT 958976)

Lara Cerdán
Offshore Business
Deputy Manager and R&D Lead
Email: lara.cerdan@esteyco.com

Javier Nieto
Offshore Division Manager
Email: Javier.nieto@esteyco.com