

2023

KOREA EUREKA Day

Meet with **SPAIN**

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R&D Manager, ISATI Engineering Solutions

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Innovative substructure and installation process in deep waters
for the reduction of the cost of offshore wind energy

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ISATI Engineering Solutions

ISATI

General Description

- General Description
- International presence
- Services of the company
- Products and technologies of the company

General Description

ISATI is an engineering company that has been offering services to leading companies in high-tech fields (such as aerospace, wind energy, and rail) since 2005.

With over 120 engineers providing services worldwide, it manages to fulfill its clients' needs in the areas of engineering, aircraft maintenance, R&D, and materials engineering and testing



Countries we operate in:

- Spain
- France
- Belgium
- Italy
- UK
- Germany
- Turkey
- Denmark
- Japan
- USA
- Canada
- Sweden



Headquarters Vitoria-Gasteiz. SPAIN



Services

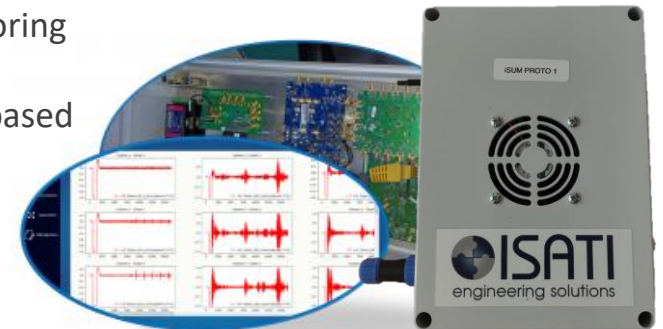
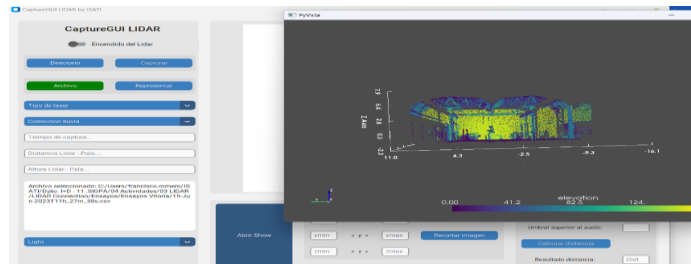
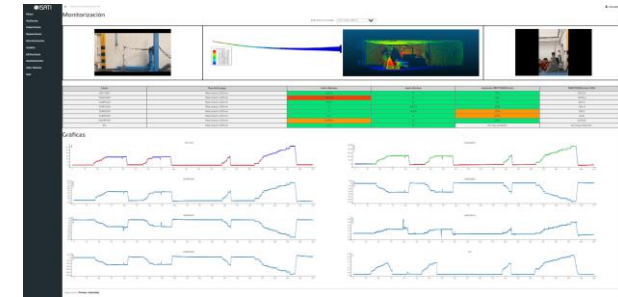
ISATI is an engineering company that offers services to leading companies in high technology fields (aerospace, wind energy and railway...)

- **OUTSOURCING SOLUTIONS**
 - Covering the full engineering spectrum provided by high quality consultants.
- **WORK PACKAGE SOLUTIONS** specializing the following areas:
 - Mechanical components and systems design & Stress Analysis.
 - Quality engineering for WT components (Blades)
- **MATERIALS TESTING LABORATORY SERVICES**
 - Materials & Processes turnkey solutions, standard and customized testing capabilities.
- **R&D SOLUTIONS**
 - Own developments and collaborations with other companies.
- **HEADHUNTING SOLUTIONS**
 - Specialized in technical profiles.



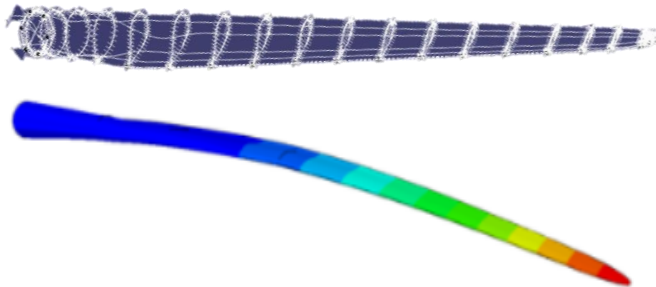
Products and technologies

- Design of complete monitoring and control systems for offshore windfarms
- Development of component management digital tools for quality and maintenance on wind turbines and sub-structures.
- Innovative disruptive technologies to solve functional and health failures and damages needs on systems and structures:
 - iSUM (ISATI Smart Ultrasonic Monitoring): Guided Wave Based monitoring system for Metallic and Composite components (TRL 6)
 - ISATI Laser based Monitoring Systems: multipurpose Laser and LIDAR based monitoring systems for componentes and structures(TRL4)

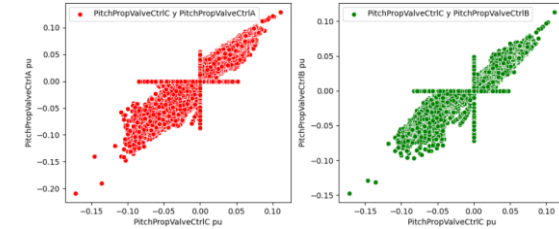


Products and technologies

- R&D on Data science and IA to optimize and improvement of system' s performance
- Advanced predictive and adaptative Algorithm design for early failure detection including IA based



- Partner in multiturbine floating platform W2Power technology



- Structures Digital Twin for components design and performance optimization



ISATI Engineering Solutions

02

ISATI

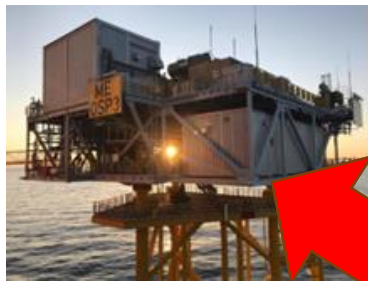
Wind Energy
Projects

- W2P-HERA
W2Power Multipurpose Solutions Project

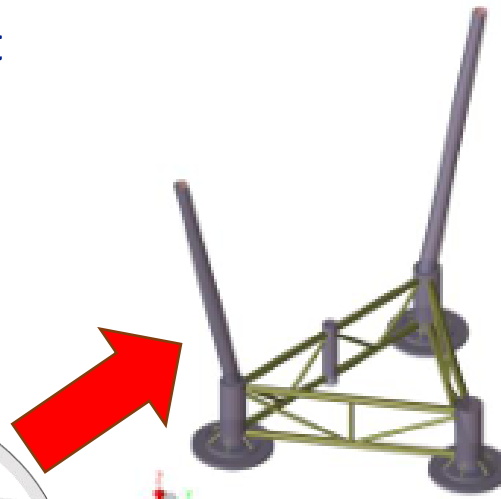
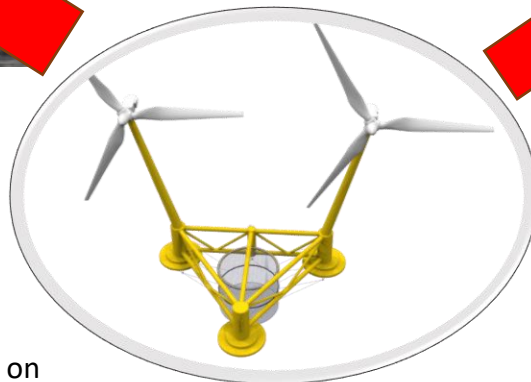
Main challenges and solutions in the W2P-HERA project

GOALS

Development of a version with an integrated substation



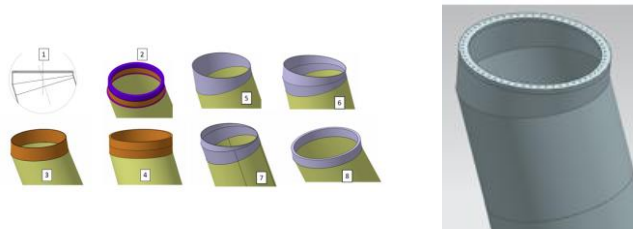
Integration of an aquaculture cage on the W2Power platform



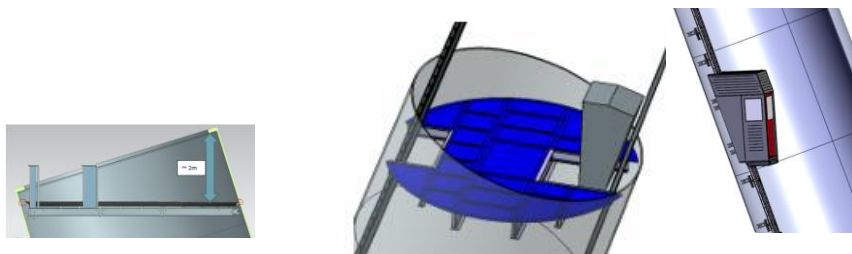
Optimization of key structural elements of the W2Power platform: towers and heave plates

Main challenges and solutions for ISATI in the W2P-HERA project

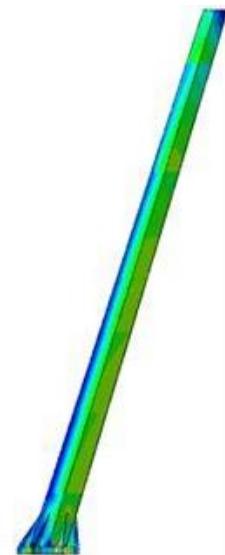
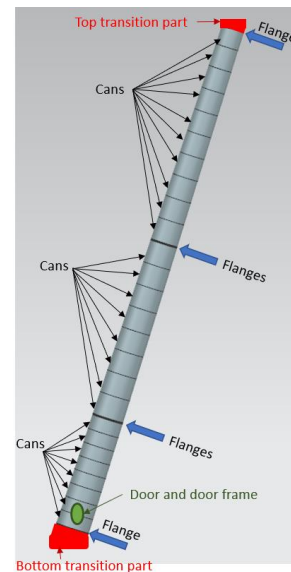
Transition pieces definition, design and stress análisis



Internal components adaptation to the inclination

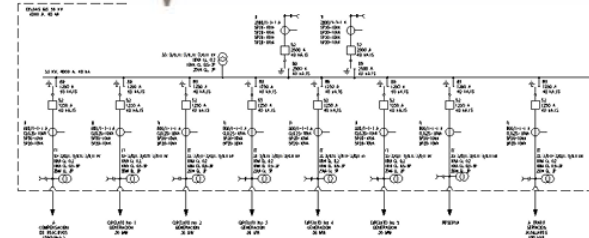
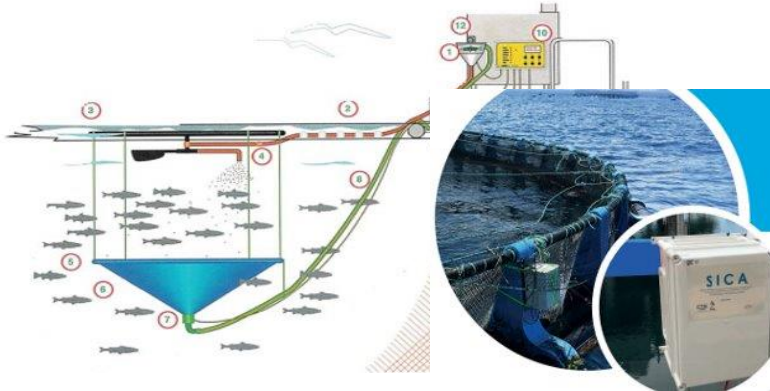
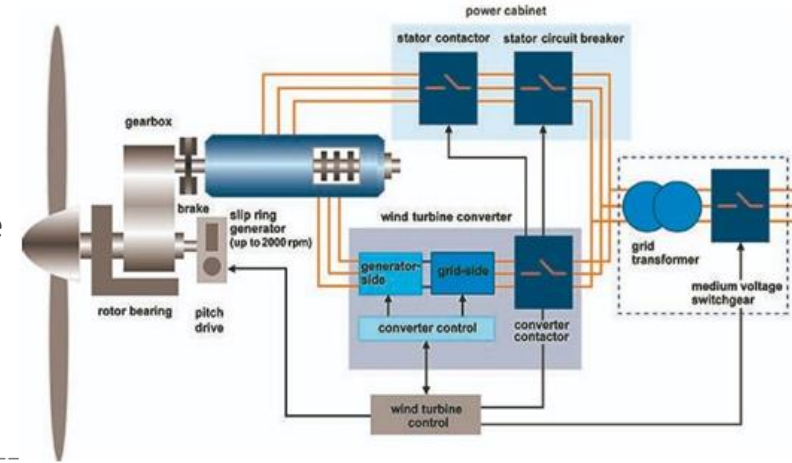


Lean Tower design stress análisis and materials selection



Main challenges and solutions for ISATI in the W2P-HERA project

- Design energy management and power supply system.
- Perform a Failure Mode and Effects Analysis (FMEA) and define the maintenance plan for the platform
- Design the monitoring system to study the behavior at sea of a cage integrated into the W2Power structure.
- Design of an autonomous aquaculture production system.





ISATI Engineering Solutions

02

ISATI

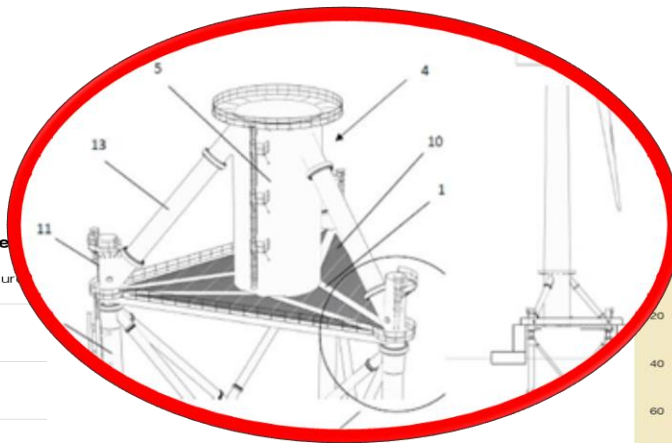
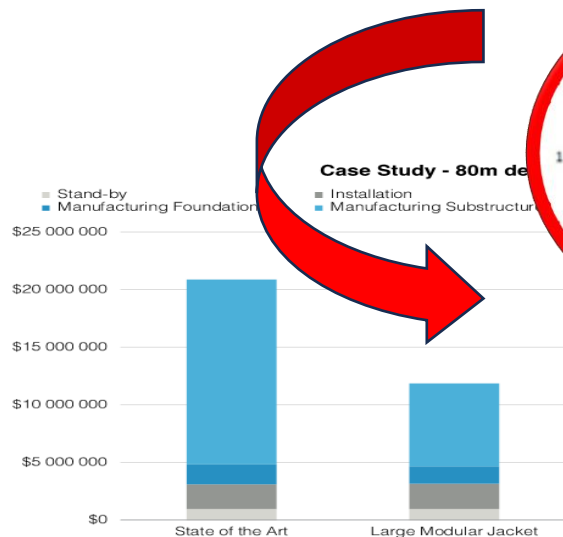
Wind Energy
Projects

- SÍ100

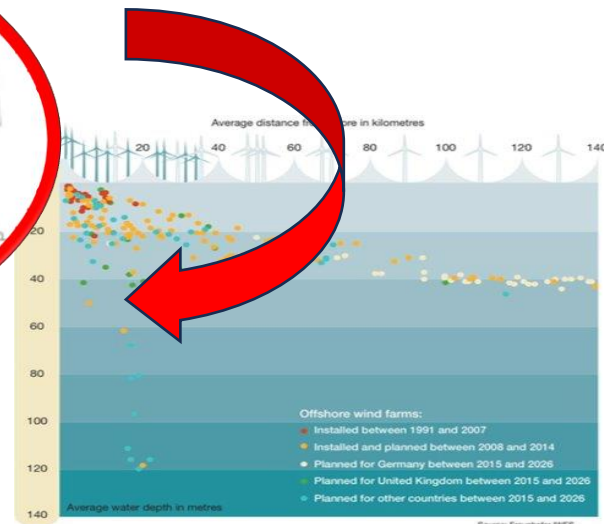
Innovative substructure and installation process in deep waters for the reduction of the cost of offshore wind energy

Main challenges and solutions in the SÍ100 project

Goals



PCT/ES2021/070644.



Disruptive Cost Reduction

Huge Market Unlocked

Main challenges and solutions in the SÍ100 project

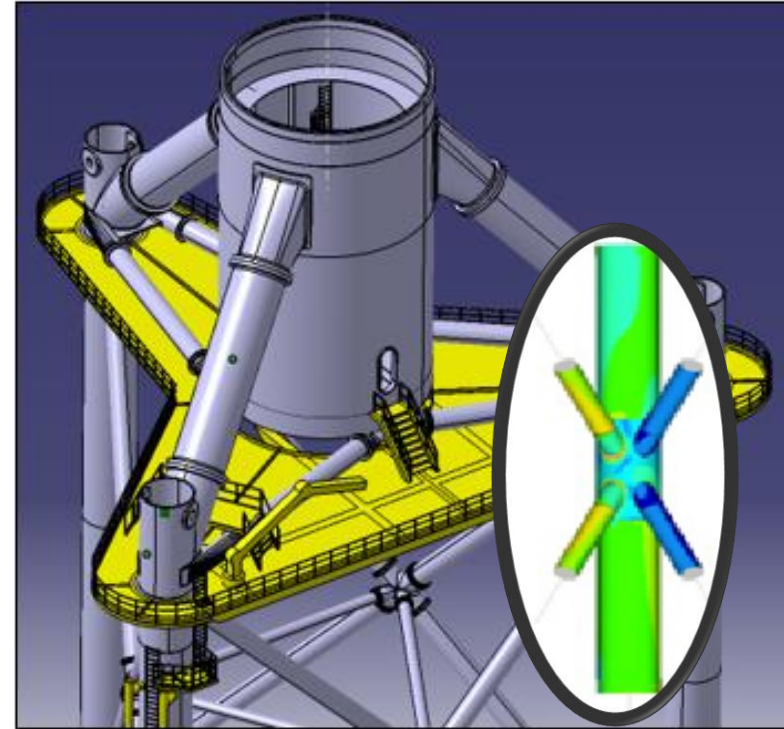
- Definition of assembly and installation processes optimized for the new structure.
- Design of fixed modular substructures for deep-sea wind farms (60-100m).
- Study of materials associated with the structure, enabling the installation and operability of the installed substructure.




Main challenges and solutions for ISATI in the SÍ100 project

Challenges

- Design of the jacket structure based on load analyses, preliminary concepts of logistics and installation, and the preliminary design of the jacket.
- Stress analysis of the whole structure, bolted joints and welded components
- Study of materials for the joints of the modular structure of the jacket
- Assembly, transport and installation processes design and analysis support





Ideas for a Korea – Spain collaboration

03

Ideas for a
Korea – Spain
collaboration

Ideas for a Korea – Spain collaboration

Idea 1

R&D projects in the design and development of innovative structures and materials for energy wind energy projects.

Idea 2

Design “ad-hoc” monitoring and predictive solutions to address failure and damage events

Idea 3

Engineering support of conception, design, and analysis of innovative structures in Korea.

Idea 4

Study of the application of our monitoring technologies on components and structures of Korean partners.

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Thank you!



Ministry of Trade,
Industry and Energy

