INTERNSHIP OFFER @Oxan Energy in 2027
#1 Offshore Wind Monopile Foundation Design

As an intern in the Technical department, you will support the development of engineering tools for the preliminary design of monopile foundations for fixed-bottom offshore wind turbines.

Internship Scope of Work

This internship evolves at the interface between turbine and hydrodynamic loads, structural analysis and geotechnical engineering. You will be supervised jointly by a structural engineering expert and a geotechnical expert.

The work builds on the load calculation and tower design process developed in a parallel internship, and shares geotechnical inputs and modelling principles with a complementary internship focused on anchor design for floating systems.

The scope of the internship will be divided in 3 main tasks, plus an optional one:

Bibliographic research:

- Review the design approaches for offshore monopiles (design standards, soil-structure interaction models, design drivers).
- Review existing preliminary design methods and simplified tools, and identify the most relevant modelling choices with regard to our needs (level of fidelity, computation time).

Model and method development:

- Define a simplified model of the monopile and of the soil-structure interaction (e.g. p-y curves or PISA-type approaches), together with the associated preliminary design method.
- Define the design inputs and load cases, taking as input the interface loads provided by the load calculation process developed for the turbine and tower.

Preliminary design tool:

- Develop in Python a foundation module to size the monopile (diameter, wall thickness, embedded length) as a function of turbine, site and soil parameters.
- Include the main verifications: ultimate limit state (lateral capacity, pile deflection and rotation), local buckling of the pile shell, and natural frequency of the whole system (tower and foundation).
- Design the module with a modular, well-documented architecture so that it can be extended later (e.g. fatigue assessment).
- Qualify the tool against published reference cases and quantify its accuracy.

Optional, if time allows: sensitivity analysis

- Perform sensitivity studies on soil and load parameters and identify the main design drivers.

Synergies with the other internships

- Interface loads and tower properties provided by the turbine and tower internship, with consistent assumptions on environmental conditions and load cases.
- Shared soil data structure and geotechnical modelling principles with the anchor design internship.
- Common Python framework and documentation standards across the tools.

Profile

- Master student graduating in a relevant field of engineering (Geotechnical and Civil Engineering, Structural Engineering, Marine Engineering, Mechanical Engineering…)
- Knowledge in geotechnical design principles, soil-structure interaction and structural mechanics
- Programming skills in Python (required); a first experience with geotechnical or offshore foundation design tools will be appreciated
- Dynamic, curious and open-minded, with a proactive and organized approach to work

General

- Duration: 6 months
- Full-Time
- Start date : February to May 2027
- Location : Oxan Energy office in Nantes or Paris.
- Internship Supervisor: Julien Simon julien.simon@oxan.energy / Benjamin Souviat Benjamin.souviat@oxan.energy

About the company

Oxan Energy is a developer of renewable energy projects specialized in marine energies and particularly in bottom-fixed and floating offshore wind. Created in 2023 and based in France, the company is active internationally, mainly on European markets. With its team of recognised experts, Oxan Energy relies on 15 years of experience in floating offshore wind and gathers all the relevant technical and management skills for the development of bottom-fixed and floating offshore wind projects.

Oxan Energy is genuinely engaged in the energy transition, committed to figuring out solutions for a viable future for energy using offshore natural resources.