VERTI-LAB

HydroQuest

Ifremer

Innovative Vertical Axis Turbine Development

Programme	**LabCom ANR**
Start date	**01/01/2024**
Duration	**4.5 years**
Lead Partner	**IFREMER**
Contact	**Gregory.Germain@ifremer.fr**

Objectives

Verti-Lab aims at accelerating the development of innovative vertical axis tidal turbines for industrial farm projects. The main goal of the project is to develop dedicated design tools through a series of test campaigns conducted both in a wave and current flume tank and at in-situ testing station. A joint approach from small to large scale will facilitate the industrial development. This innovative approach is reinforced by complementary skills of the partners in fluid mechanics, knowledge of the behavior of structures in a marine environment and feedback from in-situ deployments of tidal turbines. All this work should enable the transition from TRL 4 to 9 of vertical axis tidal turbines, including the validation of industrial development tools based on comparisons of experimental, numerical and in-situ data at both small and large scales. Tidal farm projects such as FloWatt will benefit from these results.

Key Activities

- Scale model development
- Experimental campaigns
- Numerical simulations
- Experimental and numerical results comparisons
- Turbine optimization process
- Resource assessment study
- Sensors integration and compatibility

Expected Results

- Next generation turbine validation
- Turbine optimization for farm projects
- Dedicated bottom monitoring station

Project objective: experimental, numerical and in-situ tools development for innovative vertical axis turbine project

WP1: experimental developments	WP 2: numerical developments	WP3: in-situ developments
Activities: scale model development, wave and current flume tank experiments, data analysis	Activities: OpenFoam simulations, experimental and numerical results comparisons, turbine optimization	Activities: extremes characterization, resource assessment study, sensors integration and compatibility
Output: experimental model	Output: numerical model	Output: bottom monitoring station
Results: next generation turbine validation	Results: turbine optimization for farm projects	Results: finer knowledge of design conditions

anr agence nationale de la recherche
AU SERVICE DE LA SCIENCE
PROJET FINANCÉ PAR L'ANR - PROJECT FUNDED BY THE ANR
ANR

HydroQuest

Ifremer