



Farmwise: advanced simulation of offshore wind farms



SENER DIGITAL / ENERGY / INTERNATIONAL

*FARMWISE: ADVANCED
SIMULATION OF OFF-
SHORE WIND FARMS*

Cliente: Parc Tramuntana

País: International

Farmwise is a digital and modular tool that **optimizes the design of offshore wind farms** based on the variables within the environment on which it will be built. Its algorithms enable decision-making for an technically and economically efficient turbines layout.

We at SENER have developed this software, thanks to more than 20 years of experience in premier software for offshore design and parametric evaluation of costs and production in renewable plants. Our engineers also use it to offer innovative, specialized engineering services within the offshore wind farm sector.

Precision and reliability

Farmwise was born out of the need for having a **logical wind turbine layout**. The current design of offshore wind farms is problematic and is leading to solutions that are more costly as opposed to optimal. This is due to the many factors that must be considered during optimization: the direction of the wind, the seabed, the exclusion zone, attachment costs and cable laying and their losses. In addition, many of these parameters, specific to the marine environment, are not sufficiently analyzed by software tools that are currently available.

To respond to these needs, Farmwise offers a **wind farm simulation environment and advanced**

Digital



optimization algorithms that can be implemented within a reasonable calculation time, with reliable accuracy of the optimized variable. Thanks to this, the software deals with layout design optimization at a turbine plant on the basis of two key aspects within the marine environment:

- Production losses due to the dynamics of the slipstreams.
- Cable system, cable losses, transformer losses, and loss of the reactive power of the electricity capturing system.

In addition, Farmwise enables the combined optimization of slipstream losses and layout of the connection cabling, replacing the iteration loops between the different disciplines involved in the farm's design.

Farmwise can work for any offshore wind farm project, whether fixed or floating, in every phase, from the *permit* and bid processes to its actual development.

Technical and financial optimization of the farm

Simulation in a multivariable environment

Finds the best layout design for wind turbines

Digital



WHAT DOES FARMWISE DO

- Designs offshore wind farms.
 - Provides a simulation environment.
 - Includes an algorithm for calculating the optimal environmental variables.
 - Calculates the best layout design for the turbines at the plant.
 - Financial optimization of projects.
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