


A new European project to study the atmospheric flow integrating real climate conditions



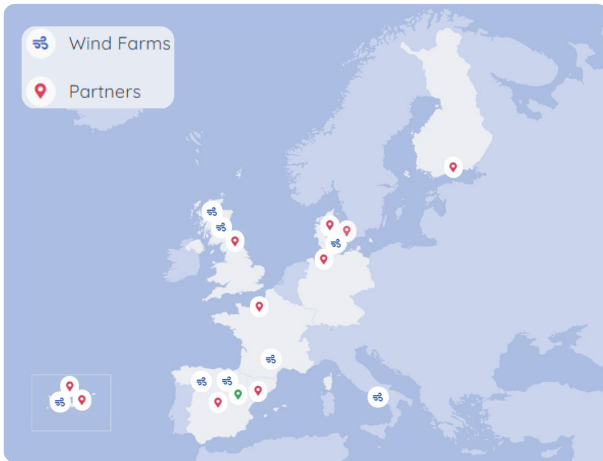
Project

AIRE's **main objective** is to understand the atmospheric flow in low, medium and high altitudes in the whole operation range from mesoscale level to wind farm, wind turbine and blade levels, correlating wind to other climatic events and to create a toolbox to satisfy the **industrial needs** to reduce economic uncertainties, reduce LCOE and increase durability.

AIRE in numbers

48	11	6	6M
Months	Partners	Countries	Funding
			

Sites



Partners

Coordinator

 CENER
CENTRO NACIONAL DE ENERGIA RENOVABLES

   Plataforma Oceánica de Canarias

Affiliated

 ULPAC Universidad de Las Palmas de Gran Canaria


Associated


 CATAPULT Offshore Renewable Energy


Impact


By a better understanding of the blade damage process, we seek to reduce wind energy costs by 5% and blade operational and maintenance costs by 20%, as well as increase annual energy production by 4% and blade durability by 2-3%. Therefore, we will help to reduce CO2 emissions to achieve the European Green Deal objectives.


Goals

 **Open-access knowledge hub of experimental data**
We gather the data on how weather and location affect wind energy production.

 **New blade designs**
Design of solutions to produce more efficient and durable wind turbine blades that are optimal for operation in real-world atmospheric conditions.

 **Develop numerical models**
We evaluate how wind flows alter power production through 5 complex models for mesoscale meteorology, wake effects farms, blade damage, airfoil performance and precipitation impingement.

 **Toolbox application to case studies**
We explore the climate impact in 5 experimental sites at different conditions, where we carry out several tests to assess how weather affects wind turbines.

 **Tools to be rapidly absorbed by the industrial sector**
We develop a set of tools that can be useful for the industry: an erosion risk atlas, wind farm operation and control, a wind turbine annual production and loads prediction, and an erosion safe mode operation.