

Industry for the wind future



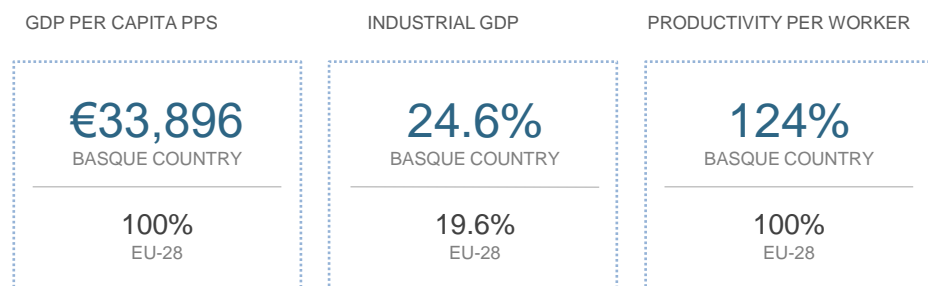
wind
energy

BASQUE COUNTRY

*Perspectives of the wind energy sector in Pomorskie Region (Poland)
and situation in Basque Region (Spain), 22th of June 2021*

The Basque Country, a region with a high level of technological intensity, represents one of the largest industrial clusters in Europe, ...

Located in the north of Spain, the Basque Country is in a central location in relation to main European cities, covering an area of 7,000 km² with 2,188,017 inhabitants. It represents one of the largest industrial concentrations in Europe.



The Basque Country is the Autonomous Community with the highest intensity in R&D in Spain



Source: SPRI – Invest in Basque Country

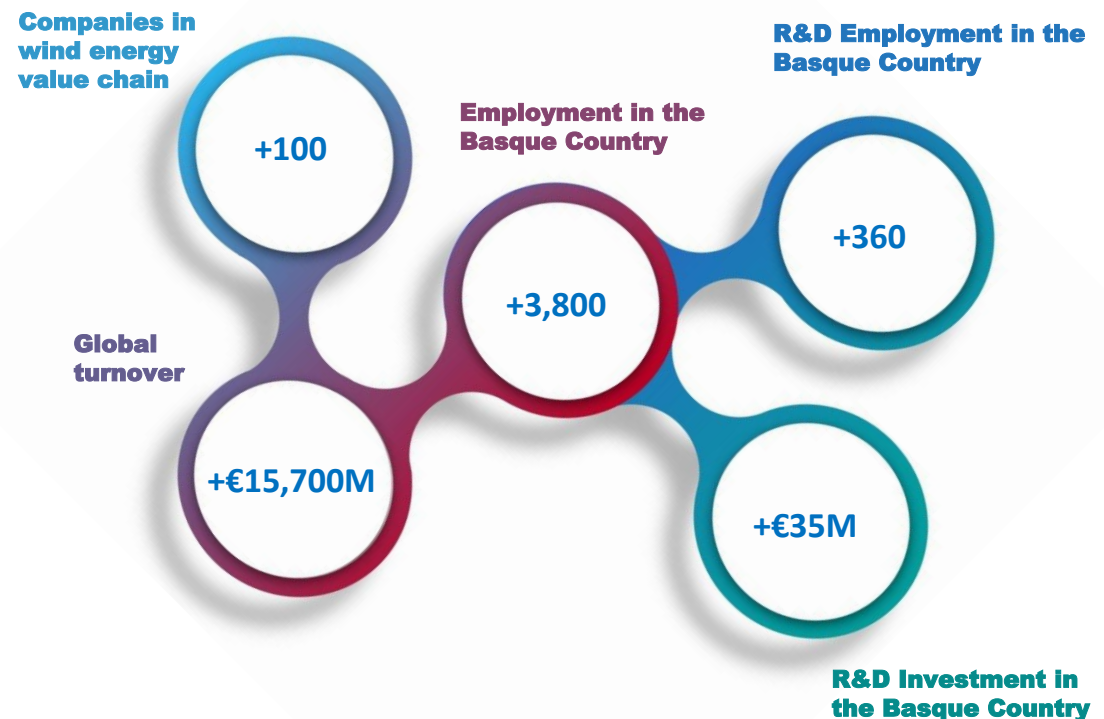
... with a long tradition in the wind energy sector, making it one of the regions of the world with a highest concentration of companies

The Basque Country has developed a **powerful industrial fabric in the wind sector** based on the combined effect of global players leadership, such as Iberdrola and Siemens Gamesa Renewable Energy, with an innovative and competitive supply chain.

The Basque Country is home to more than **100 companies** which compete in different levels within the wind energy value chain, with a clear focus on technology and innovation as key drivers for their competitive advantages.

These companies are present in all major key international markets, with more than 250 delegations all over the world.

Key figures of wind power activity in the Basque Country 2021



Source: Basque Energy Cluster

Basque companies are active in all the links of the wind energy value chain



The Basque Country is home to the headquarters of global leaders in the wind energy market, such as Iberdrola and Siemens Gamesa...

SIEMENS Gamesa RENEWABLE ENERGY

Siemens Gamesa Renewable Energy, based in the Basque Country, is one of the leading global manufacturers of wind turbines, the result of merging Gamesa, a Basque company that was fourth in the global ranking of 2016, and Siemens Wind, a technological leader in offshore projects.

Principales cifras de SGRE (2019)



> 99 GW
Instalado
globalmente



24.500
Empleos



10,2 billones
euros
Ingresos anuales



8,3 billones euros
Capitalización de
mercado



11,5 GW
Orden de
entrada



25,5 billones euros
Pedidos

Source: Siemens Gamesa



IBERDROLA

Iberdrola is one of the largest electric utilities in the world. The company has positioned itself as leader in clean energies: Iberdrola is the top renewable energy producer in Europe, a global leader in terms of installed onshore wind power and a pioneer in offshore wind development.

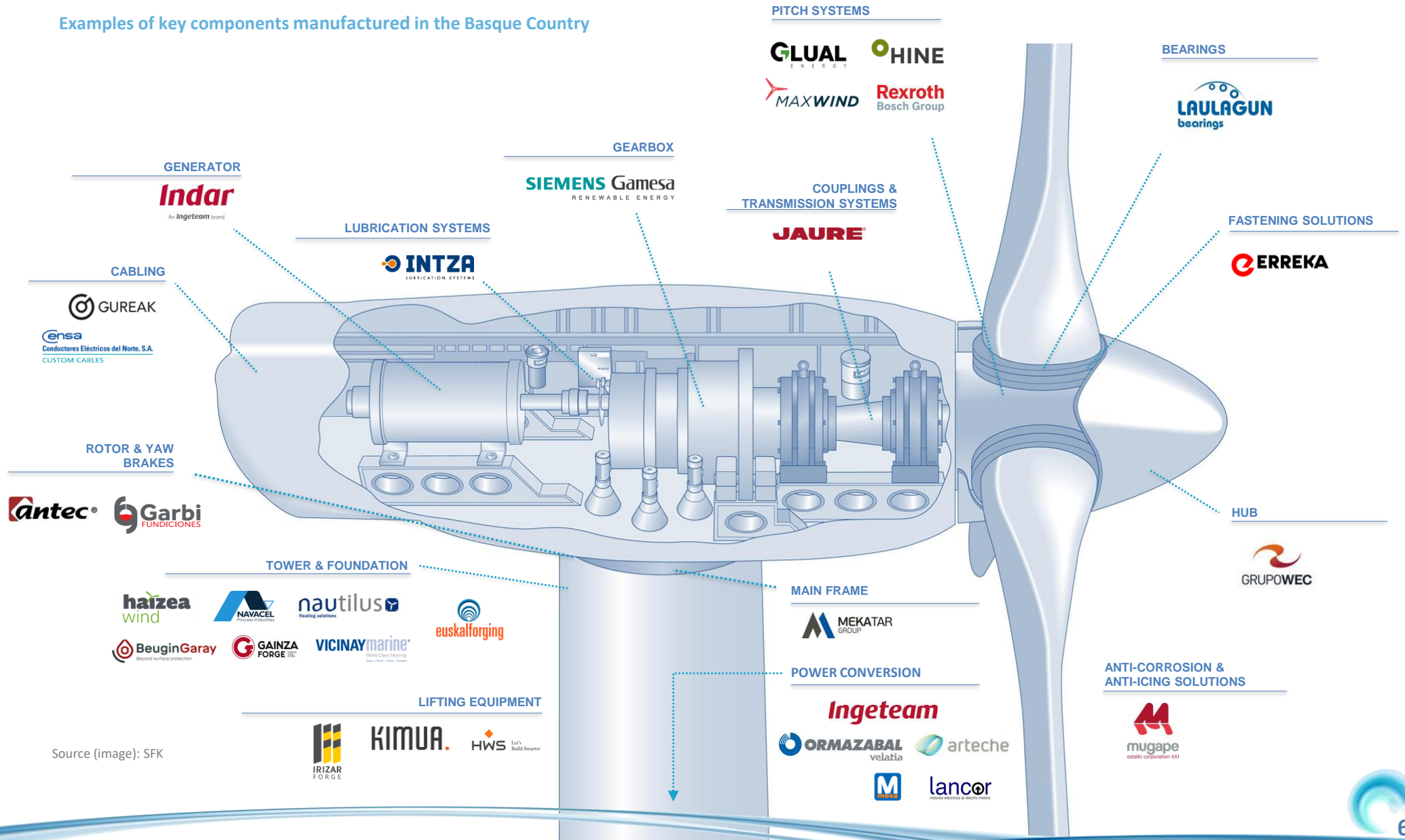
Proyectos clave de energía eólica marina de Iberdrola (2019)

	País	Turbinas	Energía	Inversión	Estado
Wikingier	Alemania	70	350 MW	€1.4b	En operación
WODS (50%IBR)	Reino Unido	108	389 MW	£1.6b	En operación
East Anglia 1	Reino Unido	102	714 MW	£2.5b	En operación
Saint Brieuc	Francia	62	496 MW	€2.4b	Pre-FID
Vineyard (50%IBR)	EEUU	84	800 MW	€2.5b	Pre-FID
Baltic Eagle	Alemania	52	476 MW	N/A	Pre-FID

Source: Iberdrola

... and to manufacturers for every single key component of a wind turbine

Examples of key components manufactured in the Basque Country



Source (image): SFK

Companies are involved in collaborative R&D projects in all major current technology challenges for the wind sector, ...

Key strategic collaborative projects developed by Basque entities

- WIND2GRID** 5m€
HAZITEK 2020
Comprehensive research and development of solutions for new offshore wind substations, suitable for both fixed and floating wind.
- DAEKIN** 1m€
ELKARTEK 2020
Definition of a reference architecture of a digital offshore wind turbine data sharing platform.
- SEAPOWERS** 5m€
HAZITEK 2018
Development of offshore solutions for the foundations, towers and auxiliary systems of high power offshore wind turbines, as well as to improve the positioning of the Basque industry.
- IOENERGY** 3m€
HAZITEK 2018
Digitization of critical components in RREE with support and optimization of digital platforms and test benches
- MODEOL** 4m€
HAZITEK 2017
New technological generation in the Basque Country for wind power modules.
- FLOW** 3m€
HAZITEK 2017
Development of a floating wind turbine for a full-scale demonstration at BIMEP.
- HARSH** 5m€
HAZITEK 2016
Technologies for the design, advanced manufacturing and validation of components for energy facilities in offshore environments.

Main projects with EU collaboration

- ININTERESTING** Horizon 2020 European Union Funding for Research & Innovation
H2020
Development of innovative virtual and hybrid testing methods for prototype validation of large wind components.
- DOCC-OFF** With the contribution of the European Maritime and Fisheries Fund of the European Union
EMFF
Identification of the failure modes of a hydraulic pitch system and development of analytical solutions based on data.
- ELBE+** Co-funded by the COSME programme of the European Union
COSME
Alliance of seven European reference clusters in the field of marine renewable energies for booting the internationalization.
- FLAGSHIP** Horizon 2020 European Union Funding for Research & Innovation
H2020
Development of a 10MW offshore turbine and floating structure capable of operating in North Sea conditions in order to reduce LCOE by 2030.
- DURABLE** Funded by the Interreg Atlantic Area Programme through the European Regional Development Fund
Interreg Atlantic
Transfer of technologies from the aerospace sector (e.g. drones, additive manufacturing) to the RREE sector to reduce operating and maintenance costs.

... with a special focus in digitalization, in order to optimize components design and to reduce the cost of O&M activity, one of the European wind industry main priorities

ININTERESTING

The ININTERESTING consortium is working on the development of new concepts and technologies for larger turbines (disruptive technologies for new pitch bearings and gearboxes, and a third case for significantly extending the lifetime of existing pitch bearings) while also defining a new hybrid methodology to demonstrate the reliability of these systems without the need of building new large and expensive test-benches.

Leader: **ikerlan**



DOCC-OFF is working to outline a condition monitoring strategy which may reduce the impact of some hydraulic pitch system failure modes on the wind turbine's design load cases. In that sense, the consortium is devoted to identifying otherwise critical failure modes on the hydraulic pitch subsystem which may be made non-critical, or whose criticality may be reduced, via condition monitoring, and to develop a digital platform to capture and manage the operating data to detect and predict the identified failure modes in time.

Leader:



The goal of DURABLE is to accelerate the performance of renewable energies through the validation and demonstration of aerospace technologies applied in robotics for operation and maintenance activities of wind and solar energy systems. The application of this technology will automate inspection and repair tasks, reducing costs and favouring production.

Leader:



The Basque Country is a worldwide reference in floating wind development, with up to four platform developers and several suppliers that have participated in existing demo projects

Floating wind test centre



Offshore wind farms developer

Floating foundations



NAUTILUS Floating Solutions has developed a floating foundation for offshore wind energy that presents an optimized semi-submersible four-leg design, that will allow the reduction of the LCOE from current designs.



SAITEC has developed **SATH®**, a concrete floating platform which provides a cost competitive solution. It presents remarkable cost reduction when compared with other floating and bottom-fixed solutions (> 35 m).



W2Power is the first twin turbine floating wind platform in the world to be tested successfully in open sea. It can generate 12 MW on each self-aligning platform using two commercially available wind turbines at a very competitive LCOE.



TELWIND integrates a novel floating substructure and a self-erecting telescopic tower. It allows for a full onshore preassembly of the overall system, ensuring reduction of offshore works and auxiliary means.

Components and service suppliers for floating wind



As an international reference region, the Basque Country was host of the WindEurope Bilbao 2019 Conference, a successful event with over 8,500 participants...



8,500 participants, 300 exhibitors, 30 conference sessions and 155 speakers (including 5 Government Ministers, leading CEOs and experts from the worlds of technology, policy and finance)

... and will host next year again the annual event of WindEurope, to which we gladly invite all Polish wind energy organizations



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