



WHITE Offshore Wind Industry in Spain PAPER **EXECUTIVE SUMMARY**



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The development in recent years of floating offshore wind technology and the reduction in investment costs have led to consider the installation of this type of solution in Spain

EXECUTIVE SUMMARY

The need to reduce reliance on energy supplies from third countries and the risk arising from the volatility of fossil fuel prices, as well as the demand to reduce the environmental impact of electricity production, require access to renewable generation technologies with high availability and capacity. Offshore wind energy meets these requirements.

At present there are more than 57 GW of installed capacity of this technology worldwide. In Spain, however, despite the country's extensive coastline and its ample experience in the development of offshore activities, this technology has not been implemented mainly due to the limited continental shelf available and the lack of a regulatory framework to promote the installation of this type of solutions. Nonetheless, thanks to the existing tradition in the marine environment in Spain and the leading role that Spanish developers play in the wind industry, significant offshore wind energy capacity has been developed in recent years based on demand from other markets.

While the lack of a continental shelf is a limitation for bottom-fixed offshore wind technology, the development of floating offshore wind technology in recent years and the reduction in investment costs have meant that the installation of this type of solution off Spanish coasts is beginning to be considered. The large-scale penetration of this technology in Spain is a necessary requirement to promote an industry along the floating offshore wind value chain, making use of the existing competitive advantages in the wind energy and shipbuilding sectors, and the existing experience in operating in the marine environment.

The regulations governing the installation of offshore wind farms in Spain are still under development. Yet to be published, for example, are the Maritime Spatial Planning (MSP) which,

in accordance with Royal Decree 363/2017 of 8 April, must establish a framework for the management of maritime space. Likewise, the permitting process for offshore wind farms, as defined in Royal Decree 1028/2007, has become outdated, and a moratorium on the processing of projects has been decreed pending the publication of the Maritime Spatial Planning (MSP) and the subsequent regulation ordering the process of auctions, leasing and access to the grid.

On the other hand, the **Roadmap for Offshore Wind Power and Offshore Energy** in Spain, published in December 2021 by the Ministry for Ecological Transition and Demographic Challenge, establishes a framework for the deployment of offshore wind facilities, coordinating the planning of the physical space, access and connection to the grid and the business model. With a clear industrial focus – aimed at strengthening industrial capacities and the value chain – **the Roadmap establishes the goal of reaching an installed offshore wind power capacity of up to 3 GW by 2030**, generating a traction effect on a cutting-edge sustainable industrial sector which already has a leading position worldwide, but which needs this local market to consolidate its competitiveness in the field of floating offshore wind power. In addition, **the long-term vision of the offshore wind power scenario in Spain indicates the country's potential to reach 17 GW by 2050**.

The Roadmap, likewise, safeguards Spain's ambition in terms of R&D&I since, if its objectives are met, it will enable our country to further consolidate itself as a pole of reference for technological development, R&D&I and testing of offshore wind projects and solutions in general, and in floating wind turbines in particular.

Spain currently has an industrial fabric and logistics infrastructures that are capable of absorbing the offshore wind energy value chain. In particular, our country is a leader in the onshore wind industry and, on the other hand, it has a very powerful marine sector, an international benchmark. In particular, several Spanish shipyards have played a leading role in the construction of the bottom-fixed foundations for some of the world's most important offshore wind farms and have monopolised the construction of the floating structures currently in existence. Of the thirteen floating solutions installed in the world – at experimental or pre-commercial level – eleven have been manufactured by Spanish industries. Furthermore, our country is a leader in the construction and repair of support vessels for logistics, assembly and maintenance activities for offshore wind farms.

As an indispensable element for industrial traction, offshore wind farm development activity in Spain has a track record dating back to the first decade of this century, when projects of more than 9 GW were in the pipeline with bottom-fixed technology. At present, developers are also leading the way with floating technology, with numerous projects being analysed at multiple sites along our coasts.

Offshore wind energy can give a new boost to the Spanish economy, helping our country to meet its objectives in terms of renewable energy penetration and reduction of greenhouse gas emissions. On the other hand, **it can be a leading economic and social vector in certain coastal regions with a long shipping tradition, which will be impacted by the energy transition process.**

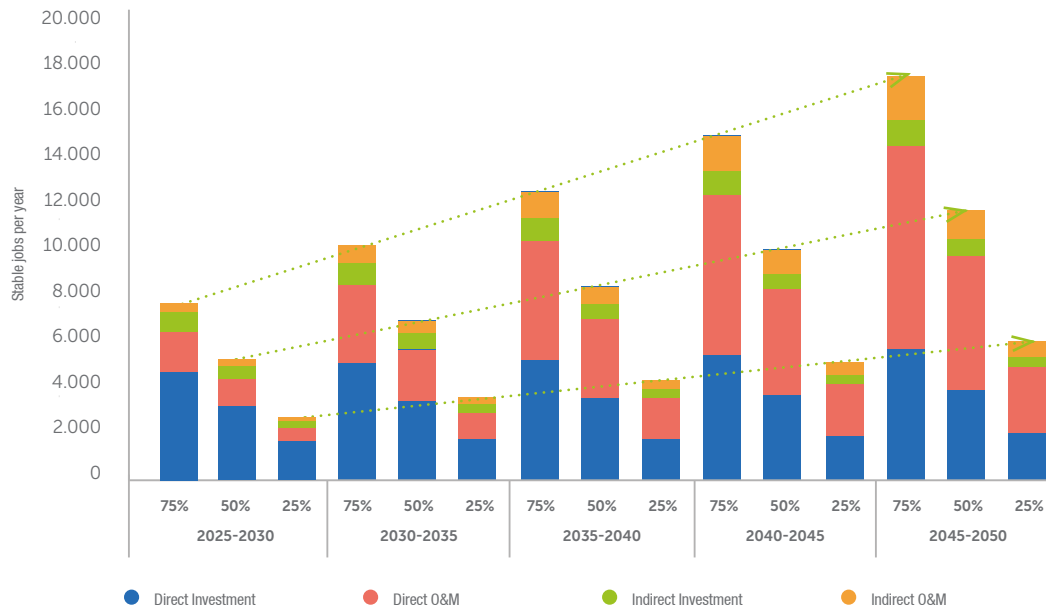
As a result of the foreseen activity and according to a viable scenario, in which most of the activities in the value chain – 75% – would take place in Spain, it is estimated that **during the period 2025-2050 the sectoral contribution of offshore wind energy would amount to €M49,607**, of which €M40,874 would be the contribution of players operating in the sector (direct impact), and €M8,733 would derive from the add-on effect that this industry would have on the rest of the Spanish economy (indirect impact).

It has also been estimated that in the event of reaching the targets for installed offshore wind capacity established for 2050, the impact of this industry on employment would mean **a gradual increase in the number of equivalent annual jobs between 2025 and 2050, from 7,523 jobs per year during the period 2025-2030 to 17,438 in the period 2045-2050.**

Summary of the contribution to GDP of the offshore wind industry in each five-year period, from 2025 to 2050



Summary of the impact of offshore wind industry on employment. Number of equivalent jobs per year in the period 2025-2050



If we use a cumulative equivalent jobs approach (cumulative annual working days) over the period 2025-2050, total employment would amount to 311,284 jobs, of which 258,101 would result from direct employment and 53,183 from indirect employment associated with the demand of other economic activities. This new industry would generate highly qualified and well-paid employment.

If we focus on investment related activities, the sector would employ 152,745 equivalent people accumulated over the period 2025-2050, of which 127,288 would correspond to direct employment and 25,458 to indirect employment. Interpreting these data on a stable annual basis, the scenarios obtained for the investment activity range between 5,478 stable annual jobs for the period 2025-2030 and 6,742 for the period 2045-2050, including both direct and indirect employment.

In relation to other non-investment activities, it has been estimated that the number of equivalent persons accumulated during the analysed period (2025-2050) would amount to 158,539 (annual working days), of which 130,813

would correspond to direct activities and 27,726 to indirect activities. Similarly, interpreting these data on a stable annual basis, we obtain equivalent annual employment scenarios of between 2,044 jobs for the period 2025-2030 and 10,696 for the period 2045-2050, including both direct and indirect employment.

Overall, if we interpret these data using an annual equivalent employment approach, and taking into account direct and indirect jobs, as well as jobs created within investment related and non-investment related activities, we obtain scenarios of between 7,523 and 17,438 jobs. These jobs would be in addition to those that the wind sector itself is already consolidating year by year in activities other than offshore wind power.

In short, **offshore wind energy, both bottom-fixed and floating, is an electricity generation technology with a high potential to contribute to the main energy and environmental policy objectives of the European Union:** to ensure a secure and reliable energy supply, reduce energy dependence, decarbonise the economy and boost competitiveness.

Spain cannot miss this opportunity to harness its exceptional advantages, derived from its geographical position and its business structure, to develop a floating offshore wind sector that leads the world. Our country has all the main features required to develop a powerful floating offshore wind industry:

- Extensive coastline and wind resources;
- Leading global players in shipbuilding, project development, equipment and component manufacture and provision of services;
- World-class port and shipyard infrastructures;
- Leadership in the development of floating offshore wind prototypes worldwide;
- Professionals with a recognised international track record in the naval and wind industries, and in the development of activities in marine environments;
- World-leading developers and financial institutions in the sector of renewable energy facilities.

On the other hand, **in order for Spain to take advantage of its position and the technological**, economic, social and environmental opportunity that the deployment

of offshore wind power represents, **it must make progress in a series of essential areas**, at a competitive pace with neighbouring countries. These areas include: **the organisation of marine space, project permitting, the design of auctions and a timetable that provides visibility, as well as coordination in the deployment of the necessary grid.**

Similarly, work must be done to improve social acceptance, both by business sectors and by administrations and institutions, in order to overcome the social rejection that exists in some geographical areas. Based on the experience accumulated in other countries, offshore wind energy is compatible with other economic activities related to the sea:

- It allows certain areas to be consolidated as reserves for marine biodiversity, generating benefits for the environment, fishing and other marine activities;
- Floating offshore wind power facilities will be installed at a long distance from the coast, avoiding the visual impact of wind turbines, so it should not have an effect on other economic activities such as tourism.







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