

Press Release

October 28, 20261 | 4

Federal Government Funds New Wind Energy Testing Infrastructure

Fraunhofer IFAM Establishes Germany's First Integrated Validation Chain for Autonomous Offshore Systems in FOKUS-Wind

With 8.85 million euros in funding from the Federal Ministry for Economic Affairs and Energy (BMWE), Fraunhofer IFAM is establishing a new research infrastructure for wind energy. The FOKUS-Wind project will create Germany's first end-to-end testing and validation chain for autonomous systems in offshore wind farms across the institute's sites in Bremen, Cuxhaven, and Heligoland. The infrastructure will enable companies and research organizations to develop, test, and qualify drones, robotic systems, and sensors under realistic operating conditions. The aim is to support their reliable and cost-effective use for the inspection, maintenance, and condition monitoring of offshore wind farms.

As offshore wind energy continues to expand, wind farms are being built farther from the coast. This trend increases the complexity, costs, and risks of operation, inspection, and maintenance – activities that already account for a significant share of overall electricity generation costs. Drones, robotic systems, and intelligent sensors can automate workflows, ease the workload of skilled personnel, and make offshore wind farm operations safer and more efficient. However, their widespread deployment depends on suitable facilities for testing and validation under realistic conditions.

Suitable infrastructure for comprehensively testing these technologies under realistic operating conditions is currently lacking. FOKUS-Wind addresses this gap by establishing a large-scale, multi-stage research infrastructure that will enable autonomous systems to be systematically evaluated and qualified for use in typical wind farm scenarios.

End-to-end validation from the laboratory to the North Sea

The heart of FOKUS-Wind is a cross-site validation chain covering the full range of development and testing stages – from laboratory studies to demonstrations under real-world offshore conditions.

At Fraunhofer IFAM in Bremen, a highly controlled laboratory environment will be established for investigating early-stage developments and interactions between robotic systems and different surfaces under reproducible conditions. This facility will serve as the starting point of the multi-stage testing and validation chain.

The next stage of development and testing will take place at the Offshore Drone Campus Cuxhaven (ODCC). Opened in September 2024, the ODCC provides Fraunhofer IFAM with a testing and development environment for offshore drones that is unique in Europe. A coastal flight zone and dedicated flight corridors over the North Sea enable testing under real-world conditions. As part of FOKUS-Wind, the existing research facility will be expanded to include large-scale test structures. Plans include a nacelle simulator with a movable platform, a transition-piece mock-up, rotor blade segments with defined damage patterns, and a large-volume drone cage.

October 28, 20262 | 4

The Heligoland site forms the final stage of the validation chain. The offshore island offers ideal conditions for demonstrations and long-term testing in real-world offshore conditions. Through its Test Center for Maritime Technologies, Fraunhofer IFAM has established research and testing capabilities that serve as a living laboratory for maritime technologies.

“By combining a laboratory environment, a nearshore test site in Cuxhaven, and testing under real-world offshore conditions near Heligoland, we are creating a multi-stage validation chain for autonomous systems. This will enable technologies and operational processes to be progressively qualified – from the laboratory through to practical application in an offshore wind farm – and their operational readiness to be demonstrated reliably,” explains Dr. René Neuholz, project manager for FOKUS-Wind at Fraunhofer IFAM.

Qualification, standardization, and certification – the path to industrial application

In addition to supporting research and technology development, the new infrastructure will be available for education, training, and qualification programs. It will provide opportunities to test new workflows, train users to apply emerging technologies, and strengthen knowledge and technology transfer between academia and industry.

The FOKUS-Wind team is also helping to establish the organizational framework required for deploying autonomous systems. This includes developing new operating concepts, integrating digital solutions into existing organizational and operational structures, and advancing coordination and approval processes among operators, service providers, and regulatory authorities. In this way, technical innovations can be developed and evaluated alongside the associated working and collaborative processes under real-world operating conditions.

The test environment will also lay the groundwork for standardized testing procedures and future certification. Manufacturer-neutral interfaces, defined test procedures, and reproducible test conditions are intended to improve the comparability of results and accelerate the development of new systems.

The project has already attracted significant industry interest and is supported by wind farm operators, industrial companies, certification bodies, and industry associations. FOKUS-Wind will initially run for four years. Thereafter, the infrastructure will remain available on a permanent basis to companies and research institutions as an open platform for testing and evaluating autonomous technologies for offshore wind energy and supporting their industrial deployment.

Funding note:

October 28, 2026

3 | 4

Under the 8th Energy Research Program, Fraunhofer IFAM is receiving approximately 8.85 million euros in funding from the Federal Ministry for Economic Affairs and Energy's (BMWE) "Infrastructure and Climate Neutrality" special fund.

Grant number: 03TE2003

Project duration: August 1, 2026 – July 30, 2030

Images:

Free to publish in connection with reporting on this press release.

Download at: <http://www.ifam.fraunhofer.de/de/Presse/Downloads.html>



Fig. 1 From the laboratory environment in Bremen to the Offshore Drone Campus Cuxhaven and testing under real-world offshore conditions on Heligoland: FOKUS-Wind is creating a comprehensive infrastructure for validating autonomous systems for offshore wind energy. © Fraunhofer IFAM



October 28, 2026

4 | 4

Fig. 2 The Offshore Drone Campus Cuxhaven (ODCC) is being expanded into a central FOKUS-Wind test environment. Initial test structures are already laying the groundwork for testing autonomous technologies under realistic conditions. © Fraunhofer IFAM

The Fraunhofer Society, headquartered in Germany, is one of the leading organizations for applied research. It plays a central role in the innovation process—with a research focus on key technologies relevant to the future and the transfer of research results to industry to strengthen Germany's position as a business hub and for the benefit of society. Founded in 1949, the organization currently operates 75 institutes and research facilities in Germany. Its nearly 32,000 employees, most of whom have backgrounds in natural sciences or engineering, generate an annual budget of € 3.6 billion. Of this amount, € 3.1 billion is allocated to contract research.

Contact

Martina Ohle

Press and Public Relations

Fraunhofer Institute for Manufacturing
Technology and Advanced Materials
IFAM
Wiener Straße 12 | 28359 Bremen

Tel. +49 160 4874340
martina.ohle@ifam.fraunhofer.de

www.ifam.fraunhofer.de

