

## Floating Wind

Since 2007, our experts have offered independent floating wind consultancy services for floating wind projects across all project phases.

Floating Wind is a growing market entering the commercial phase, featuring a large variety of floater designs from spars, semisubmersibles, and barges to tension leg systems. The technology requires a multidisciplinary engineering approach and specific expertise in floating wind project development and project execution.

Ramboll has a well-established track record in industrial and R&D projects as a leading independent engineering consultancy in the field of floating offshore wind. Our clients value our independent detailed offshore engineering knowledge of floating substructures (both steel and concrete), mooring and tendon systems, dynamic cables and wind turbines, combined with our in-depth understanding of fabrication, logistics, T&I and O&M related requirements specific to floating wind projects. Furthermore, Ramboll offers floating wind project development and advisory services such as cost and risk assessments, floater selection and screening studies and other techno-economic, socio-economic and environmental services.

We build on our competences as world leading in detailed design of fixed offshore wind foundations and our long-term experience with wind turbines, special purpose ships, floating offshore structures, mooring systems, marine operations and asset management. Our mission is to provide our clients with customised, tailored, cost-efficient, effective and industrialised solutions and services during the entire lifecycle of a floating offshore wind turbine project.

### **Our experience and competences**

Ramboll is a truly independent one-stop engineering consultancy. We do not develop our own floating substructure design and are therefore not focused on a specific floater concept. Our floating wind engineering teams consist of experienced experts in naval architecture, floater and mooring design, wind turbine technology and control, coupled load analysis and T&I. In addition, we bring in expertise in project development, monitoring, O&M, and digital twin technology, as well as know-how in logistics, port assessments and

fabrication. We follow a holistic approach in our consulting considering all relevant project aspects.

Since 2007, Ramboll has been active in commercial floating wind projects. We participate in high-profile R&D programmes and JIPs which aim at advancing floating wind technology and contributing to its commercialisation and industrialisation. With our multi-disciplinary team, Ramboll supports its clients most efficiently in solving their project challenges.

For further information, please visit [www.ramboll.com/wind-energy](http://www.ramboll.com/wind-energy) or contact us directly:

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### Owner's engineer

As owner's engineer we support our clients as an independent engineering consultant with:

- Independent concept evaluation and selection
- Preparation of tender documents and tender evaluation
- Strategic consultancy
- Critical design reviews
- Wind farm engineering (WRA, EYA, layout, etc.)
- Fabrication, assembly, logistics and T&I studies
- "Virtual WTG Manufacturer"
- Ports and infrastructure
- Asset management
- O&M service strategy
- Risk assessments
- FMECA
- HAZID / HAZOP

As an independent third party, we support project viability, to avoid design errors, and fill client gaps in resources and in expertise to help reduce project cost and risk.

### Design

Ramboll has expert knowledge in the design of floating wind turbines during all phases from concept development to workshop drawings.

We offer:

- Feasibility studies
- Conceptual design
- FEED
- Floater detailed design (including integrated load analyses)
- Mooring and tendon design
- Tower design
- Generic WTG models and controller
- Component design (secondary structures, moorings, dynamic cables)
- Integrated coupled load analysis
- Electrical, mechanical and other equipment
- Geotechnical and anchor design
- Dynamic Cable Design
- Floating OSS

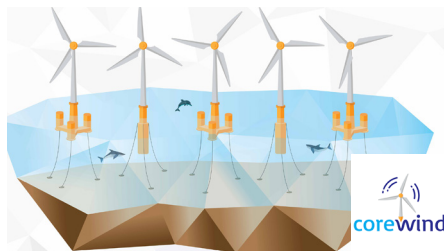
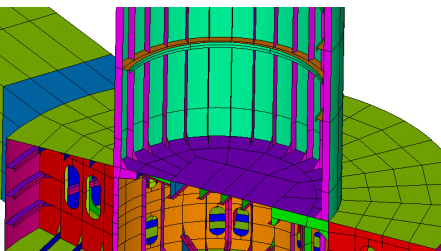
We are well-prepared to support our clients in any design challenge. We draw on our proven customisable in-house and commercial software process chain, and our long-term experience with detailed design of offshore wind foundations.

### Project Development and Advisory

We provide consultancy services including:

- Due diligence (technical and commercial)
- Certification support
- Reference designs
- Structural health monitoring
- Market and concept assessments and strategic advice
- Market and concept assessments
- Strategic Advisory
- Auction Bidding Support
- Supply Chain Studies
- Probabilistic cost assessments
- Market-entry studies
- Project and interface management
- Project development services

As a dedicated and trusted advisor to our clients, we deliver tailored services to derisk floating wind projects, and to ensure their technical / commercial viability along with the best project results.



#### Comm. Projects in design of floating substructures for offshore wind turbines

##### Client

Project Developers, Concept Designers

##### Location

Atlantic, Mediterranean Sea, North Sea, Pacific

##### Period

2009-now

##### Service Provided

Design of substructures and mooring systems; feasibility studies, design reviews.

#### European H2020 research project: Corewind

##### Client

European Union

##### Location

Worldwide

##### Period

2019-2023

##### Service Provided

Ramboll leads work package on optimizing O&M and T&I.

#### Early phase studies for upcoming commercial floating wind projects

##### Client

Project Developers

##### Location

Worldwide

##### Period

2018-now

##### Service Provided

Floater Screening, Cost models, logistics, T&I, supply chain and port studies.