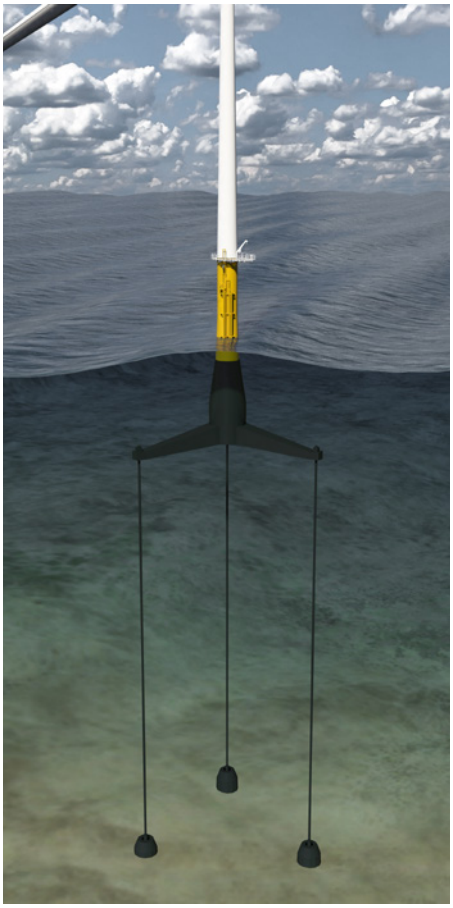
FLOATING STRUCTURES

- Floating bridges
- Marine structures
- Marine operations
- Floating offshore wind structures



COWI

Bjørnafjorden floating cable stayed bridges

Photo: Iberdrola Wikinger Project

Wikinger OWF – transport of foundations

FLOATING BRIDGES FOR STRAIT CROSSINGS

COWI has assisted the Norwegian Public Road Administration with the design of different types of floating bridges including both, floating suspension bridges and cable stayed bridges. Currently, COWI is developing a suspension bridge supported by tension leg platforms. In particular, the following items have been within COWI's scope:

- Hydrodynamic hull design of the tension leg platform hulls
- Design of tension-leg system layout
- Concept development of the suspension bridge system
- Preliminary design of cable constructions
- Risk screening and safety aspects of the entire project
- Assessment of overall structural stability
- Construction methods for bridges built on floating foundations
- Global dynamic analyses of the floating bridge under combined wind and wave excitation.

VARIOUS APPLICATIONS OF FLOATING MARINE STRUCTURES

Based on COWI's broad expertise in marine engineering in general, COWI can offer a wide range of services for floating marine structures, such as:

- Design of floating breakwaters
- Design of floating marinas, quays and piers
- Design of semi-submersibles, TLP-platforms, buoys and hulls in general
- Analysis of all types of inshore and offshore moorings
- Virtual reality navigation simulation to assess shipping routes, port layouts, etc.

MARINE OPERATIONS

Being involved in planning and construction of large infrastructure projects as well as offshore wind farms and other offshore developments, COWI naturally deals with offshore transportation tasks for large and heavy structures. In particular, COWI's field of activity comprises the analysis of typical marine operations with barges, ships and jack-up vessels, i.e. for:

- Offshore structures: foundations, subsea structures and topsides
- Tunnel and bridge segments
- Decommissioning of offshore structures

COWI's services focus on:

- Motion analysis and calculation of design values of accelerations
- Load-out, transport, lift and installation
- Deck layout and seafastenings design
- Determination of limiting weather criteria for missions
- Site-specific leg penetration and site assessments for jack-ups.

FLOATING OFFSHORE WIND STRUCTURES

COWI combines an extensive track record from the design of bottom-fixed foundations for offshore wind with a long history of design of floating foundations for offshore applications in general, a unique starting point for designing the next generation of floating foundations for offshore wind farms.

COWI's multidisciplinary design team has the right experience to design floating substructures of all types, be they spar-buoys, tension-leg platforms or semi-submersibles. COWI's services span from concept evaluations to detailed design and support the entire lifecycle from engineering and installation to decommissioning, using state-of-the-art analytical tools. COWI has established interfaces with all major wind turbine manufacturers and is very experienced in integrated load analysis.

COWI's experience from the design of floating installations for the offshore industry has positioned COWI as an experienced designer, especially skilled in the use of simulation-driven design for complex environmental loading.

ENGAGE OUR EXPERTISE

COWI is a leading provider of engineering services for marine and port structures and for offshore renewable energy, engaged by our customers worldwide.

Our multi-disciplinary team and consultancy approach efficiently handle the challenge of designing floating structures and add value to our customer's projects.

Together with our customers, we create coherence in tomorrow's sustainable societies through our unique 360º approach.

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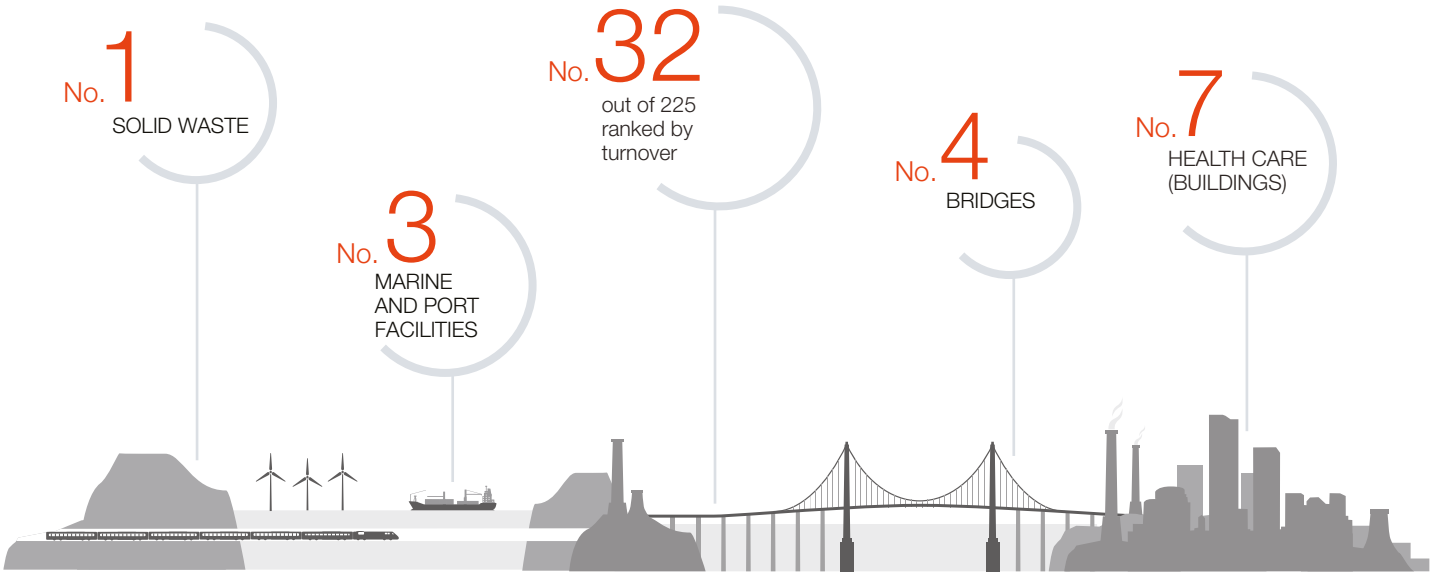
TOP RANKINGS IN ENGINEERING SOLUTIONS

The 2016 Engineering News Records (ENR) Annual Survey ranked COWI as the number three international consultant in marine and port facilities.



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www.cowi.com

POWERING YOUR 360° SOLUTIONS
COWI is a leading consulting group that creates value for customers, people and society through our 360° approach. We tackle challenges from many vantage points to create coherent solutions for our customers.