CONSULTANCY SERVICES WITHIN ONSHORE WIND

With a growing demand for energy and a pressure on global resources there is a need for innovative, sustainable, cost-effective and flexible solutions within wind energy.

Ramboll is one of the top-ranking engineering consultancies in Europe. We provide individualised services, supporting our clients in onshore wind energy project development and implementation processes. This capability statement introduces our onshore wind services. Ramboll has a strong focus on understanding our clients’ needs, and we strive to provide sustainable and long-term technical and commercial solutions to our clients.

In-depth knowledge and experience
With more than 30 years of consultancy experience from wind projects, Ramboll has built up comprehensive knowledge and competencies within wind energy, and we have provided expert services to wind farms with a nominal output of more than 60 GW in more than 60 countries.

Access to global knowledge
With 300 offices in 35 countries, we are aiming at a global working platform where we strive to combine our local presence with our global resources and expertise. This means that our clients worldwide can get globally leading consultancy with an in-depth knowledge of local conditions with short, fast and cost-reduced ways to the client and mother-tongue communication.

Multi-disciplinary assistance throughout the project lifecycle
Investing in a windfarm requires both technical and commercial knowledge to make sure all risks are evaluated and mitigated to ensure project profitability short and long term. Ramboll has the expertise to support our clients from wind measurement campaigns, bankable wind energy yield assessments, due diligence and environmental studies over planning and construction to commissioning and operation or performance check of the wind farm. Ramboll can provide assistance at every stage along the project lifecycle. In Ramboll, our multidisciplinary team are working together and complementing each other to address our clients’ complex technical and strategic topics across engineering and management disciplines. Our focus is to make solutions taking into consideration the entire project lifecycle.

Cost-effective solutions
Within wind energy there is a constant demand for optimisation and innovation as cost reduction is a driving factor in the industry. In Ramboll, we follow market trends to be able to support our clients in developing new innovative solutions. Throughout the years we have been

SELECTED PROJECT REFERENCES

- Wettendorf-Bottendorf I/II, Germany - Owner’s engineering/project development
- Tafila onshore wind farm, Jordan - Owner’s engineering/project development
- Wind farm, Germany - Data base containing key data of >30,000 WTG installed or decommissioned in Germany
- Sidensjö wind farm, Sweden - Technical Due Diligence and construction supervision (OE)
- Bad Hersfeld wind farm, Germany - Performance analysis and optimisation
- LafageHolcim, Germany - Development of prefabricated WTG foundation
**SUPPORT AND CONSULTANCY SERVICES**

Ramboll provides support and consultancy services to our clients within all phases of a wind farm project. Our clients include utility companies, project developers and investors. We have expert competencies within infrastructure and transport, urban development, wind energy, power generation and power distribution and transmission.

**PROJECT DEVELOPMENT**
- Layout & micrositing
- Feasibility studies
- Project engineering
- Cost optimisation
- Procurement & contracting
- Permit management
- Owner’s & Lender’s Engineer
- Repowering

**WIND & SITE**
- Wind measurements (LiDAR/SoDAR/masts)
- Energy yield assessments (WAsP/CFD)
- Wind farm calculation/optimisation
- Turbulence studies
- Loss calculation

**DUE DILIGENCE**
- Technical
- Environmental
- Contract review

**ASSET MANAGEMENT**
- Technical operation management
- Performance optimisation
- Lifetime extension
- Nacelle based LiDAR
- Inspections
- Condition monitoring
- Power curve measurements

**CIVIL & STRUCTURAL DESIGN**
- WTG foundation design
- Geotechnical investigations
- Tower design
- Road & hardstands

**ELECTRICAL DESIGN**
- System studies
- Grid connection concept
- LV, MV and HV grid design
- Substation design
- Smart grid solutions

**ENVIRONMENTAL SERVICES**
- Environmental and Social Impact Assessments
- Landscape impact
- Noise & shadow flicker impact
- Visualisation
- Icefall modelling
- Cultural heritage studies
- Visual oppressive effect
- Visibility analyses

Project management of complex projects

Ramboll is dedicated to delivering the best results by providing our clients with world-class project management competencies. Such competencies are essential to deliver a successful project for all stakeholders, and to reach satisfactory financial results. With our clear and structured approach to project management, Ramboll has a safe path to success.

**RAMBOll ONSHORE WIND IN NUMBERS**
- 30+ years of experience in wind
- Has provided expert services to wind farms with a nominal output of more than 60 GW in more than 60 countries
- Technical assessments (TDD) on wind energy projects of more than 35 GW nominal power
- 350 people working with consultancy services within wind
- 2,000 environmental experts worldwide with EIA expertise
- Has performed >3,000 wind assessments and 1,000 environmental assessment over the last 20 years
- Has performed 76 measurement campaigns with own LiDAR/SODAR equipment
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