Offshore Renewables

natural power
# contents

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>introduction</td>
</tr>
<tr>
<td>02</td>
<td>overview</td>
</tr>
<tr>
<td>03</td>
<td>experience</td>
</tr>
<tr>
<td>04</td>
<td>case studies</td>
</tr>
<tr>
<td>05</td>
<td>worldwide offices</td>
</tr>
<tr>
<td>06</td>
<td>supporting information</td>
</tr>
</tbody>
</table>
Natural Power is an independent renewable energy consultancy and services provider with over twenty years of in-house project experience. We provide expertise at every stage of the project lifecycle: from feasibility, development, pre-construction, construction, operations to re-powering, and through all elements of due diligence.

Natural Power’s 360° lifecycle experience spans more than 800 projects, with a team of over 340 experts. Our approach to consultancy services allows us to focus on reducing interface risk and working smarter from day one of your power project, through:

- The application of pioneering new technologies, methodologies and best practices to tackle the most complex and challenging issues
- The provision of project management experience delivering both practical and innovative consulting
- Building wide and lasting relationships with our clients, who then benefit from our full lifecycle experience at every stage of their project
- Providing trusted, impartial due diligence services to financial investors that equal the breadth of services offered to development clients

"our mission and vision:

to create a better environment by providing market leading advice and services to our clients

Stephen Trotter, Managing Director"
Natural Power provides expertise in every stage of the project lifecycle; from site prospecting, constraints mapping and resource assessment, through consent, design and construction to operational asset management.

We are leaders in bringing new technologies, methodologies and best practice methods to the forefront of the offshore renewable energy industry in order to tackle our clients’ most complex and challenging issues. Our project management experience allows us to offer truly innovative yet practical consultancy.
Feasibility

Natural Power has a proven reputation and track record of working with our clients to undertake site finding, screening and feasibility studies for offshore wind. Our in-house experts on wind resource, grid, offshore ecology, human use considerations and planning legislation, work seamlessly to identify sites with the lowest associated risk in terms of consent and build conditions.

Our onshore team provides a similar role for onshore grid infrastructure feasibility studies, with our technical experience and capacity being supplemented by wayleaving experience.

We also have a highly trained global team of experienced wind analysts and environmental project engineering personnel who offer a comprehensive range of technical services to wind farm developers and investors alike. This allows us to provide our clients with optimised project designs, finance-grade Energy Yield Analysis (EYA) and site classification studies.

Our full technical services applicable in feasibility studies include:

- Anemometry campaign design
- Layout design
- Wind resource assessment
- Turbine sizing and selection
- Site screening
- Environmental constraint mapping
- Grid infrastructure feasibility
- Construction surveys

“we take a considered approach from the outset, therefore we can advise our clients on the best way to achieve their project goals while flagging any potential risks

Lauren Wheatley, Director of Technical
Natural Power supports our clients through the project design and consenting process by bringing together cutting edge project knowledge and experience with a realistic approach to development and risk mitigation. We are particularly experienced at working with our clients’ engineers in the development of robust, consentable, buildable and CAPEX sensitive Design Envelopes for deeper water sites.

We have supported a range of projects from full Environmental Impact Assessment (EIA) production and consent management to specialist expert advisory roles, baseline data gathering, analysis and modelling, and individual Environmental Statement (ES) chapter production to include assessment of potential impacts from offshore wind farm, transmission and cabling infrastructure.

We also work closely with our colleagues who specialise in onshore impact assessment to provide coordinated EIAs of the onshore grid and infrastructure requirements for offshore projects.

Our approach is to work with our clients to define and address every aspect of a potential project throughout the development phase; identifying risks and opportunities at the earliest possible stage. Our aim, like our client’s, is to efficiently manage costs and risks to help deliver your consented project ready for financing and construction, including, but not limited to:

- Scoping, EIA co-ordination, consent strategy and management
- Design Envelope development with client’s engineers
- Total in-house services including: baseline ecological survey design, management and data analysis, and ES chapter production, including shadow Habitats Regulations Assessments of:
  - Benthic ecology
  - Fish
  - Birds
  - Marine mammals
  - European protected species
- Industry, government, stakeholder and developer group representation
- Offshore policy, statutory regulation, offshore politics – strategy, advice and application
- Wind resource mapping / yield and assessment
  - Design of met mast / lidar anemometry campaign
  - Wind data management, analysis and reporting
  - Feed into Design Envelope for optimised turbine selection and layout
- Turbine advisory, supply package management and options appraisal
- Operations and maintenance strategy development
Environmental Liaison Officer

Our team of ELOs act as the point of contact for all licence condition discharge, construction & installation teams and statutory and non-statutory stakeholder liaison. This is a key knowledge transfer aspect from pre-construction to construction and post-construction and is a core area of Natural Power’s expertise.
Pre-Construction & Construction

Natural Power provides a wide range of services during the pre-construction and construction of offshore wind projects. We support clients in both the onshore and offshore elements including onsite client representative, health & safety co-ordination, turbine commissioning services and consent condition discharge.

In terms of offshore, along with our sister company SeaRoc, our focused experience in the commissioning, health and safety, planning and environmental area required for discharge of requirements. Dedicated in-house teams include:

- Benthic, bird and marine mammal ecologists
- Offshore ecological surveyors
- Planning and EIA project managers
- Design, geotechnical and geophysical engineers
- Turbine commissioning engineers
- QHSE coordinators

For onshore infrastructure elements, our in-house team has managed the development and build out of a number of wind farm support infrastructure projects, this includes the development, consultation and approval of a range of management and mitigation plans in order to meet suspensive conditions, including:

- Health and safety management
- Habitat management
- Protected species
- Peat management
- Geotechnical site investigation including drilling
- Water quality, drainage management and flood protection
- Traffic and transport planning
- Contaminated land surveys analysis and mitigation

Additionally, we have a very experienced team of environmental, planning and construction professionals who have supported clients in meeting ongoing planning conditions throughout pre-construction, construction and operations, this includes:

- Environmental liaison and Environmental Clerk of Works
- Health and safety co-ordination
- Stakeholder liaison
- Negotiation with determining authorities
we take a pragmatic approach to engineering timescales while remaining sensitive to the environment

Chris Pendlebury, Director of Planning and Environment
we aim to get maximum revenue for our clients by optimising performance and reliability during the operational stage

Euan Fenelon, Director of Operations and Asset Management
03.4 / Operations

Natural Power is one of the world’s leading independent providers of operational phase services for major utilities and independent power producers.

We provide award-winning excellence in health & safety management combined with unique software tools and procedures to ensure maximum efficiency in wind farm operations for our clients. Our aim is to manage, co-ordinate and efficiently control your operating assets safely and efficiently while maximising production.

Offering a full range of services designed to meet the needs of offshore projects, we ensure a consistency of approach without compromising on health and safety, including:

Site Services
- Local site management
- 24/7/365 ControlCentre services
- High-Voltage (HV) management
- Grid code compliance and trading
- Wind turbine resets
- Commercial and financial services
- Ecology and hydrology monitoring services

Advanced Performance Engineering
- Real time independent SCADA monitoring
- Operational downtime analysis and reporting
- Wind turbine, End of Warranty (EoW) and Balance of Plant (BoP) inspections/audits
- Performance and reliability optimisation
- Post-Construction Yield Analysis (PCYA)
- Power output forecasting
- Engineering solutions and implementation

Post construction ecological monitoring services including: survey design, management, stakeholder negotiation and data analysis for:
- Benthic ecology
- Fish
- Birds
- Marine mammals
- European protected species

Industry, government, stakeholder and developer group representation
Due Diligence

Natural Power provides technical due diligence services throughout all stages of the transaction cycle, from initial risk assessment and reporting in early transaction stages through to comprehensive reporting for credit-committee at final bid stage or financial close. Our due diligence clients include major international banks, developers, IPPs, utilities, investment funds and other financial institutions.

Global Experience

Natural Power works across all stages of the transaction cycle, onshore wind, offshore wind, solar pv, renewable heat and hydro-power sectors.

Our client offering includes:

- Full technical due diligence scope of works
- Advice based on real-life experience
- Long established credibility and trust
- Flexibility and broad resources
- Clear and concise reporting
- Clearly managed project risk
- Depth of skills and resources

Natural Power routinely performs detailed technical due diligence on behalf of clients in a number of different transaction scenarios:

- Project finance debt transactions, where Natural Power fulfills the duties of lender’s or owner’s independent engineers / technical advisors, from pre-finance technical due diligence to project commissioning and handover;
- Mergers and acquisitions transactions, often containing a mixture of operating, pipeline and pre-construction assets, where Natural Power performs technical due diligence duties on behalf of the acquirer or on behalf of the vendor.

“our team of 50 due diligence specialists has worked across over 200 projects worldwide, giving us unparalleled experience of a range of transaction scenarios”

Giles Dearden, Director of Due Diligence
## Project: Offshore Wind Farm, France

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<thead>
<tr>
<th>Client:</th>
<th>Confidential</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Description:</td>
<td>French round 2 offshore wind development</td>
</tr>
</tbody>
</table>

### Services Provided:
- Provided design for turbine layout, inter-array cables and substation, considering wind, geotechnical, geophysical and met ocean conditions, environmental topics, and existing activities onsite
- Key consultant providing Wind Resource Assessment and Energy Yield Analysis for the turbine, supplying integration and validation of meso-scale data, wake modelling and yield analysis based on time dependent calculations
- Co-managed preparation of pre-Environmental Impact Assessment (pre-EIA) and led preparation redaction of baseline regarding existing activities, such as fishing and vessel traffic
- Managed third parties and collected data and outputs from geophysical surveys and geotechnical investigations, pre-FEED designs, desktop studies related to the installation of foundations and cables, environmental studies (birds, hydro acoustic, marine mammals, benthos, landscape and seascape, tourism, etc.), navigation and UXO risk assessments, fishing activities studies, etc
- Prepared documents and advice for negotiation process with local authorities and fishermen groups, proposed mitigation measures and prepared contract signed by local stakeholders, approving layout designed by our team
- Reviewed draft and prepared final version of report presenting project and justifying technical and strategic choices made by client in order to propose to French Government most competitive and environment friendly project

### Added Value:
- Technical, economical and environmental interface
- Design of the most efficient, cost-effective and environment friendly turbine and cables layouts
- Successful delivery in short time lines (call for tender)
- Strategic advice for negotiation with stakeholders
- In this project, meso-scale data were adjusted with onshore measurements from LiDAR and met-masts
- Utilised Natural Power’s robust GIS system, with data combined with our wind and wake effects modelling. Respecting site conditions, this allowed for optimum design of most efficient and cost-effective layout for turbines, inter-array cables and offshore substation
Project: Offshore Wind Farm, Outer Moray Firth, Scotland

Client: Moray Offshore Renewables

Project Description: Moray Offshore Renewables Ltd. is a consented development for 1.116MW of offshore wind generation in the Outer Moray Firth. The project consists of the Telford, Stevenson and MacColl offshore windfarms, which are planned for construction 14 miles (22km) from the Caithness coastline. 180MW

Services Provided:
- Lead ornithology and marine mammal advisors during scoping, Environmental Impact Assessment and consent management pre- and post- Marine Licence application
- Natural Power provided frequent advice to the developer’s consenting and engineering teams on ornithological and marine mammal issues while developing the project Design Envelope. The team also input into scoping, production of the ornithology and marine mammal ES chapters and stakeholder liaison including discussions with SNCBs and as part of the Moray Firth Developers Group on cumulative impacts within the Moray Firth

Added Value:
- Results were used in combination with data collated from primary literature to carry out collision risk modelling and displacement analysis, feeding into stochastic Population Viability Analysis (PVA) for key species
- Ecology data team developed range of methods for presenting PVA outputs, facilitating easy interpretation of results and transparency of approach
- Allowed more detailed assessment of animal distribution across surveyed area than Conventional Distance Sampling
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<thead>
<tr>
<th><strong>Project:</strong></th>
<th>Robin Rigg Offshore Wind Farm, Solway Firth, Scotland</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Client:</strong></td>
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<td><strong>Project Description:</strong></td>
<td>Robin Rigg East and Robin Rigg West are the first commercial offshore wind farms in Scottish waters (together known as Robin Rigg). These wind farms began full generation in April 2010 with a capacity of 180MW</td>
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</tbody>
</table>
| **Services Provided:** | ➔ Designed Marine Environment Monitoring Plan (MEMP) in collaboration with the Robin Rigg Working Group  
➔ Managed surveys during the construction period (2008-2009) and subsequent operational years  
➔ MEMP surveys covering birds, marine mammals, fish, and benthic habitats  
➔ Managed large dataset, developing data processing and archiving procedures resulting in robust, secure data storage  
➔ Data team responsible for on-going analysis of data for comparison between pre- and post-construction with reports submitted to Working Group and Marine Scotland  
➔ Worked in consultation with leaders in field of ecological modelling |
| **Added Value:** | ➔ Analyses methods ensured conclusions drawn from complex dataset were robust, maximising client confidence in results  
➔ Model outputs presented through density surface maps allowing at-a-glance assessment of changes in abundance and distribution of animals |
teesside wind farm
Natural Power delivers services and operates assets globally for our clients, with eleven offices across Europe and North America and agencies active in South America and Asia Pacific.
Health & Safety

Natural Power operates a Safe System of Work procedure, this procedure outlines the requirements and guidelines required for safety in the workplace and mitigation of risk.

Health & safety is the number one priority for Natural Power both from an operational and management point of view. The safety of our staff, contractors, and the public must come before any technical or commercial considerations.

In accordance with statutory requirements, for all routine and non-routine activities undertaken by employees and others working on behalf of Natural Power, a risk assessment must be undertaken and sufficient controls introduced to manage the risk. Method statements are activity specific and are prepared where their absence would adversely affect the ability to exercise the controls identified by risk assessment.

The ControlCentre is an industry leading innovation providing 24/7 monitoring and communication services through trained operatives in our control room, ensuring our field staff have round the clock access to log on and off of the remote/lone working system. This combined with our hand-held SPOT devices ensures staff members working in the field have a safe environment to operate in.

Quality

Natural Power has established rigorous procedures and work instructions for all aspects of our business. All staff currently work to a list of core procedures for quality control and business management as part of our on-going commitment to our Quality Management System (QMS).

A totally integrated project management system is used throughout all departments, that includes file tracking and back-up along with resource management, document checking and authorisation, providing a full audit trail for all documents and project activities.

All data and reports are subject to a minimum two stage quality assurance process in line with ISO 9001:2008 procedures where documents are produced by a technical specialist then checked by another specialist before being checked and approved by a senior manager, ensuring a consistently high quality output to clients at all times.

Our asset management, construction and ecology management group, technical services and development consultancy services have all achieved the ISO 9001:2008 certification and Achilles Verify Category B2. Full details of our QMS are available on request.
Environment
Natural Power has internal goals with regards to environmental practice relating to energy use, carbon footprint reduction and recycling. We have had an Environmental Management System (EMS) in place since 2001 and have progressed our EMS to an integrated Quality and Environmental Management System and now hold ISO 14001:2004 certification.

All policies and arrangements are reviewed on an annual basis by our Quality and Environmental Manager and the management team.

The processes required for the Quality and Environmental Management System, their sequence and interaction have been identified along with the criteria and methods required to ensure their effective operation and control. All subcontractors would be expected to work to the Natural Power Environmental Policy Statement; evidence of this is required on appointment. Before each project commences an environmental risk assessment is carried out covering all aspects required for the scope of work.

Disaster recovery
Natural Power recognises the need for our clients’ projects to have robust systems and processes in place to ensure that data, documents and key staff continuity are retained in the event of a major incident.

Natural Power’s electronic Document Management System ensures that project documents are stored in a secure and ordered location on a central server which is backed up regularly to off-site storage.

All emails are archived in a cloud based system which allows recovery of deleted mail and also provides email continuity in the event of a failure of Natural Power’s servers or internet connection.

Hard copies of key documents are stored in a fireproof safe.

Multiple office locations assist in provision of continuity in the event of a major incident, such as fire, affecting any particular location.
what we do

→ Leading independent renewable energy consultancy
→ Analysis, engineering, planning & permitting, environmental, project management and due diligence services
→ Onshore wind, offshore renewables, solar, hydro, renewable heat and grid & infrastructure
→ Established in 1995, 11 offices globally, 340+ staff

For full details on our ISO and other certifications, please visit: naturalpower.com/company