

## FRONT END AND DETAILED DESIGN SERVICES FROM THE EXPERTS IN RENEWABLE ENERGY PROJECTS.



Our experienced civil, structural, mechanical and electrical engineers bring practical experience to projects across the renewable energy sector from on and offshore wind, hydro, marine, renewable heat and solar

Our clients include major power producers, independent developers and contractors.

### EARLY STAGE INVOLVEMENT

- Site planning and infrastructure layout
- Traffic impact assessment
- Hydro yield studies
- Geohazards review
- Outline structural design
- HV/MV cable selection and layout
- Process and biomass studies
- Flood risk assessment
- CAPEX and whole life costing

### DETAILED DESIGN STAGE

- Highways design
- Track and earthworks including 3D analysis
- Structural analysis and detailed drafting
- Large gravity and piled turbine foundations
- Bridges
- Buildings / substations
- Drainage systems / SUDS
- Grid compliance studies
- Biomass plant procurement and integration

### TENDER/PRE-CONSTRUCTION STAGE

- Pre-tender design and costings
- Grid connection review, and managing the DNO interfaces

### CONSTRUCTION STAGE

- Design for contractors/review of contractor's design
- Banks' technical advisor

**25+**  
YEARS  
EXPERIENCE

**15**  
EXPERT  
DESIGNERS

**10**  
NUMBER OF  
COUNTRIES



// our commitment is to optimise initial and whole life costs and release locked in value in any project site //

RALPH SPORNAGEL DIRECTOR OF CONSTRUCTION

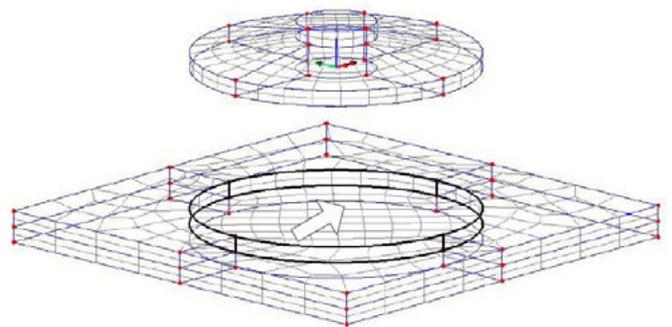


**GLENFALLOCH HYDRO SCHEMES**

**01** Natural Power was engaged to develop two high head run-of-river MW-scale projects near Loch Lomond in Scotland. The schemes feature multiple intakes and some 7km of total penstock length, two power houses integrated into the National Park terrain, a railway bridge crossing, and three river crossings. Both schemes are connected to the 11kV local distribution grid.

The hydro systems and all elements were fully designed by Natural Power using in-house hydropower, civil, structural, electrical and geotechnical engineers. The services included intrusive geotechnical investigations, topographic survey, permitting, detailed design and specification of all intakes, pipelines, bridges and power houses, contract administration, and ecological monitoring services.

With comprehensive services provided in house, Natural Power was able to meet and address unforeseen ground conditions and other challenges in a pro-active manner to enable the scheme to be successfully commissioned prior to the 2015 FIT depression, following an intensive 1 year construction.



**PEARIE LAW WIND FARM**

**01** Natural Power was commissioned by EDF Energy Renewables to carry out the site investigations, concrete foundation design and site inspections for six GE 3.2MW turbines with 125m tip height. The site investigations comprised desktop study, cored boreholes at each turbine location and trial pitting. Following the production of a Geotechnical Design Report, Natural Power carried out geotechnical analysis and initial sizing of the chosen gravity foundations to confirm budgets. This was followed by structural analysis, detailed design to Eurocode 2 standards, and production of construction-ready drawings and specifications. During construction, Natural Power provided regular site inspections, to verify subsoil conditions and construction quality of the foundations.

The site presented challenging geotechnical conditions, with artesian water present in some locations. Design solutions adopted by Natural Power included grouting of the artesian water source, over-dig and controlled upfill, and use of an intercepting drainage layer under the foundation.



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 ACCOUNT MANAGER

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