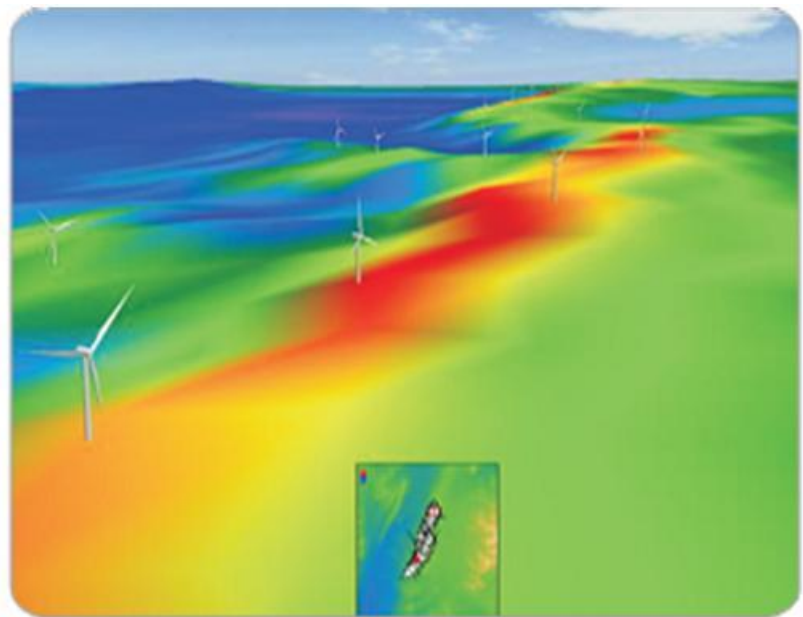

Wind Resource Services

Capability Statement



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Why Wind Prospect?



Wind Prospect is an independent, global wind energy business which is wholly owned by its directors and staff. The company was founded in England in the early 90s and built the UK's second commercial wind farm in 1992. The company now employs a team of over 200 wind energy professionals in some 24 offices across 10 countries in Europe, Africa, North America and the Asia Pacific region.

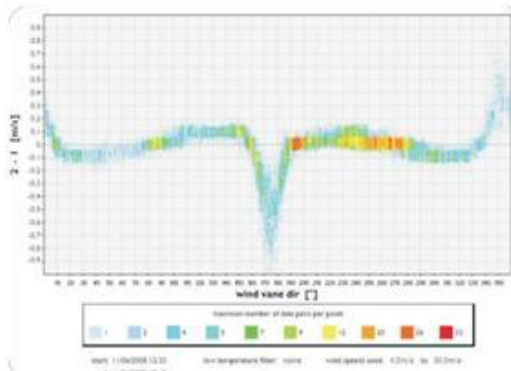
Our strength lies in the fact that whilst we continue to develop our own sites, we also use our extensive 'hands-on' experience to offer a wide range of wind resource services. We provide developers and investors with independent assessments of the energy resource for specific project sites to facilitate investment decisions.

Services through the wind farm lifecycle

Wind Prospect's depth and breadth of experience enables the company to offer the most comprehensive service possible to our clients. On numerous occasions Wind Prospect has acted on behalf of a client for all stages of the acquisition or development, procurement, financing, construction and operation of a wind farm. This involvement in all stages of the life cycle of the project enables Wind Prospect to minimise the risks to the client, enabling them to achieve the highest return on their investment. Wind Prospect offers the following services:

- Feasibility studies for green and brownfield sites
- Wind measurement campaigns
- Wind data management
- Wind resource analysis and energy yield assessment
- Technical due diligence
- Development services
- Pre-construction & construction project management / owner's engineer
- RFP preparation & reviews
- Contract negotiation – WTG & balance of plant
- Construction monitoring / Bank's engineer
- 24/7 WTG monitoring and operations
- Operational audits including performance analysis

Wind resource services



Wind Prospect undertakes a range of wind services for clients around the world. Our multi-disciplinary team combine technical and project experience to offer a coordinated approach to wind farm development. Wind Prospect ensures that a project is developed and operated in an optimised, cost-effective and timely manner.

The way we work

Wind Prospect has a large international team with local presence and unrivalled practical experience. We are renowned for delivering the vital detail that helps clients to understand the viability of a proposed project, and also to understand whether it has scope to operate more efficiently once it is operational.

Why us?

Having developed, constructed and operated our own wind farms we are experts in wind projects. As a result we are in the unique position to be able to deliver the following to our clients:

- Quick response times to queries
- Shorter project timescales
- Friendly, approachable staff always available
- Advice based on significant hands on development experience
- Flexible work scopes adapted to meet exact needs

What we deliver

We can help to bring your projects to successful financial close by acting in partnership with you and your investors by providing a comprehensive services package tailored to meet the specific requirements of your project:

Feasibility studies

Wind Prospect support developers with multi-criteria studies of the suitability of a proposed site for wind turbine development by assessing technical, environmental, planning and economic issues that could influence project viability including:

- Initial mapping of site constraints e.g. natural features, special uses, regulatory requirements; pre-screening for interference with military operations or other radio-communication issues
- Development of a preliminary layout and therefore capacity of the site
- An initial wind resource (likely to rely on meso-scale wind mapping), energy production and high level financial analysis
- Identification of a range of turbine models, suggested for further consideration at the site
- A grid connection study

Developers are provided with options and recommendations for the development and preliminary plans for further investigation. We have also successfully worked with a number of industrial businesses to help realise the renewables potential of their brownfield sites.

Monitoring campaigns

Wind Prospect understands all available options of tubular and lattice tower equipment used for resource assessment.

We save our clients time and effort by managing:

- Location selection and permitting
- Met mast installation and equipment configuration
- Inspections throughout wind measurement campaigns
- Thorough documentation and error logging
- Adherence to strict health and safety procedures



Wind data management

Wind Prospect works with a dedicated, specially trained team that utilizes custom tools designed for wind data management and analysis. We provide continuous quality data monitoring via daily downloads, screening and quality checks. This keeps our clients in control as we notify them of anomalies, errors or missing data. Throughout the campaign, we recommend required actions to maximise data availability and to maintain quality and consistency.

By optimising data recovery we ultimately provide data that are sufficient to support project financing and accurately represent the long-term potential of a project.

We monitor over 100 masts for a variety of clients across the world, with data availability averaging 98.9%, ensuring the highest quality service available.

We keep our clients informed via comprehensive monthly reports that include:

- Monthly wind speed distributions
- Wind shear and turbulence
- Data logger condition
- Summary of recommended actions

Remote sensing

Wind Prospect provides guidance in planning cost-effective remote sensing measurement campaigns, either as stand-alone units or in conjunction with met masts. We can facilitate purchasing or leasing a remote sensing unit or work with the client's units to conduct measurement campaigns customized to fit their wind resource requirements. We offer numerous on-site services including micrositing; consulting; calibration to nearby wind assessment tower(s); set-up and deployment of equipment; and expertise in maintenance including power upgrades, equipment troubleshooting or replacement, decommissioning, and re-commissioning.

Wind Prospect understands the challenges unique to remote sensing equipment, having been involved in testing remote sensing equipment, and regularly partners with other vendors in the industry to provide packaged service offerings to our clients.

Layout design

In the early stages of development Wind Prospect provides initial estimates of potential capacity of the site and identifies any 'show stoppers'. As the development progress we carry out detailed design to optimise the wind resource whilst taking account of all relevant technical and environmental constraints.

Wind Prospect has extensive specialist technical expertise in relevant fields, such as:

- Site constraints analysis
- Geotechnical evaluation
- Micro-siting
- Site access
- Infrastructure layout and site access
- Noise
- Visual influence assessment
- Electromagnetic interference evaluation
- Shadow flicker assessment

Wind resource analysis and energy yield assessment

We convert our clients' data into useful information by combining it with data from a carefully selected reference station to provide bankable reports covering:

- Analysis of site measured data
- Selection and review of reference data
- Correlations based on measured mast data and long term data sets
- Long-term wind regimes for the site
- Wind shear and turbulence analysis at the mast location
- Wind flow calculations (using WAsP / CFD)
- Micrositing and energy predictions for turbines and their wakes
- Optimization and comprehensive assessment of losses and uncertainties
- Calculation of overall energy yield values

Site conditions assessment

Often required as part of a turbine supply agreement, and relates to suitable turbine selection and ensuring compatibility. The studies determine:

- Mean wind speeds
- Turbulence intensity
- Extreme wind conditions
- Site wind shear

And can relate to any revision of IEC 61400-1 as required by the turbine manufacturer.

Validation of wind resource assessments and energy yield estimates

Wind Prospect will assess the adequacy and quality of the wind monitoring campaign that has been carried out. We review the mast and equipment setup as well as the installation report. We check that appropriate energy prediction methods have been used, that the types and sizes of losses that were assumed conform to industry best practice, together with the error analysis of the long-term energy yield prediction, turbulence and extreme wind speeds.

Operational energy assessment

Pre-construction energy estimates are based on a number of assumptions and require flow models to determine the hub height wind speed distribution. Once an asset has been operating for a reasonable period of time, it is advisable to have pre-construction estimates of a wind farm's long-term energy production checked against real operational data. For operators and investors alike an operational energy assessment is invaluable in generating accurate projections of future energy production levels, reconciling pre- and post-construction energy assessments and validating loss factors.

Our clients

Our client base is extensive and varied and we pride ourselves in delivering excellence for a variety of client interests and needs around the world.

Global track record for all wind services



Developers & utilities

Many of our developer and utility clients rely upon our technical capability for designing sites, facilitating measurement campaigns, analysing the wind resource, carrying out energy yield assessments and preparing for project finance. Clients include:

NRG Energy

E.On Climate & Renewables

Oklahoma Gas & Electric

International Power PLC

EdF Energies Nouvelles

ESB

EDP Renovaveis

AGL

Gaz de France-SUEZ

Viridian

Banks

We are often requested to carry out wind resource reviews or to recalculate energy yields for financial institutions as part of our technical due diligence service. Clients include:

Alliance and Leicester

IIB Bank

HSBC

Allied Irish Bank

Société General

HSH Nordbank

Bank of Ireland

Ulster Bank

Barclays Bank

Cooperative Bank

Standard Bank

LBBW

Private equity & infrastructure funds

The investments made in the wind energy sector by private equity investors and other financial institutions is increasing each year, and Wind Prospect is frequently engaged by investors to perform due diligence assessment of wind resource forecasts or to undertake wind resource assessments for our client's existing projects. Clients include:

- *Babcock & Brown*
- *Latium*
- *HSBC Infrastructure*
- *Climate Change Capital*
- *HgCapital*
- *Allianz Specialized Investments*
- *Pattern Energy Group*
- *AXA Private Equity*
- *Samfi Invest*
- *Fortis Investments*
- *Continental Wind Partners*
- *Ethemba Capital*
- *Turk Ventures*
- *Armaec*

Case study examples

Wind Prospect has conducted a wide range of wind resource services for a variety of clients all over the world. Our involvement can range from met mast siting right through to undertaking final wind resource assessments, and our strength is based on this wide range of experience across all stages of development, construction and operation.

Feasibility study at industrial site (Wales)

Onsite generation can be a key goal for industrial clients in order to harness the natural resources of their site, reduce their reliance on grid suppliers and reduce their electricity costs.

Wind Prospect undertook the feasibility and development of a 4MW project at Solutia in South Wales. The study presented the range of options, including technical descriptions and the potential advantages



and disadvantages associated with them enabling the client to identify the scope of future assessment requirements and provide a solid foundation upon which financial and development decisions can be made with confidence.

Wind resource assessments for Pattern Energy Group portfolio (Canada)



As part of a partnership arrangement with Pattern Energy Group, Wind Prospect has undertaken a series of wind resource assessments across Ontario, totalling 50 MW across 5 sites. Working closely with each site's development manager and the development director of the portfolio, Wind Prospect worked to optimise the site design and maximise the potential yield for the chosen wind turbines. The final energy assessments have since been used for financing purposes.

In addition to the above activities, Wind Prospect has also carried out a number of due diligence studies in Canada and the US for developers and independent investors looking to establish themselves in the market. Our global experience in all stages of wind energy projects proves invaluable in advising on these key decisions.

Technical support to Green Bear Wind 300MW development portfolio (Poland)

Wind Prospect has a framework agreement with Green Bear Wind to provide the technical support to their development portfolio. Working with their engineers, development managers and directors, we have designed and optimized complex layouts, determined appropriate mast specifications and locations to minimise uncertainty, and provided energy predictions to aid site development. This wide range of wind services has accelerated the progress of the client's sites, allowing them to tweak each stage as required to ensure the best results.



Technical support to An Avel Braz 170MW development portfolio (France)



Wind Prospect has a framework agreement with French developer An Avel Braz to provide the technical support to their development portfolio. Working across their entire portfolio of sites, we have designed and implemented measurement campaigns including determining appropriate mast specifications and locations to minimize uncertainty, managed the recorded data, designed and optimized layouts, provided wind speed and energy predictions at all stages of the development process to aid in layout submissions for planning, and assisted in choosing the appropriate wind turbines for the sites. We continue to work on an ongoing basis across their growing portfolio of sites providing summary reports for each iteration of a site's configuration, and final wind assessment reports which are being used to obtain project finance.

This method of continual engagement brings the benefits of having an in-house wind resource team combined with third party independence.

Reviewing Oklahoma Gas & Electric (OG&E) 2.8 GW portfolio (USA)

OG&E undertook a search for 300MW of wind energy projects and looked to Wind Prospect to undertake the technical assessment of the massive 2.8 GW of projects submitted as part of the RFP.



We carried out an in-depth review of all submissions, assessing the methodologies undertaken, data recorded and reported on the likelihood of the predicted yields for each site.

Submissions were then ranked based on potential yield and quality of the assessments undertaken in order to show the Manager of Power Operations at OG&E which projects they could have confidence in. We provided continued support throughout their acquisition process.

As an independent third party assessor we were able to provide OG&E with the information to support their decisions regarding which sites to progress to the next stage of their selection process.

Operational assessment of 36MW site in Ireland



After 2 years of operation, Wind Prospect undertook an operational assessment of a 36MW wind farm, analysing production data from each turbines' SCADA system along with the data from the export meter.

Analysis of the power curve performance and real wind turbine availability showed some interesting operational characteristics which affected the asset's overall performance. Taking this into account, and assessing the long term impact of any operating issues, we then proceeded to undertake a long term energy prediction for the site.

The advantage of this assessment is that all flow modelling and shear uncertainties that are present in the pre-construction assessment are removed from the process and all wind farm losses are inherent in the operational data which is available. Thus the future performance of the asset can be better understood through operational assessment.

The wind services team

Our experienced wind resource engineering team provide global service to a range of clients such as wind farm developers and financial organization that are in need of high quality understanding of the wind resource across their sites.

The team is lead by **Dr Paul Stangroom (Wind Services Team Manager)** who is an experienced engineer with a strong background in numerical methods, stemming from a PhD in CFD modelling of wind flow. He manages a growing wind resource group, providing a wide range of wind resource services to clients across the world.



Key members of the team include:



Adrian Oakey – Technical Director – Adrian focuses on developing the analytical processes used as part of the wind services offered by Wind Prospect. He has over 20 years experience in the industry and is committed to high quality standards in all of Wind Prospect’s wind resource and due diligence efforts.

Christian Darr – Technical Manager – Christian is responsible for technical input into all projects, ensuring the latest best practice methods and procedures form part of Wind Prospect’s wind resource services methodology.



Oliver Davies – Project Manager – Oliver manages a range of wind services projects and has experience across the sector from shadow flicker and noise through to extreme winds and wake modelling.

Paty Perez – Project Manager – Paty comes from a development background and has a clear understanding of constraints and environmental issues which can affect wind measurement methods, results and the analysis stages.



Contact us

To discuss project opportunities, or for further information regarding our team and capability, please contact:

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