

Renewable energy consultants

GL Garrad Hassan



WIND FARM DESIGN SOFTWARE



Maximum yield with minimum impact

WindFarmer

WindFarmer has been developed by GL Garrad Hassan to facilitate the design of wind farms, maximising the power produced by the wind farm whilst minimising environmental impact. Users of **WindFarmer** gain the competitive advantage and accuracy that comes from over 25 years of expert wind energy know-how.

Predict accurate energy yields

WindFarmer offers advanced, validated wake models suitable for all types of wind farms. This allows for the most accurate energy predictions available on the market. With **WindFarmer**, you can handle meteorological data, create frequency distributions and wind roses, and conduct long term correlations.

Optimise your wind farm

Optimise the turbine layout for maximum return on investment whilst meeting environmental, technical and construction constraints. Automatically consider constraints such as minimum turbine separation, noise limits, visibility, proximity to dwellings, boundaries and setbacks.

Know how the results are calculated

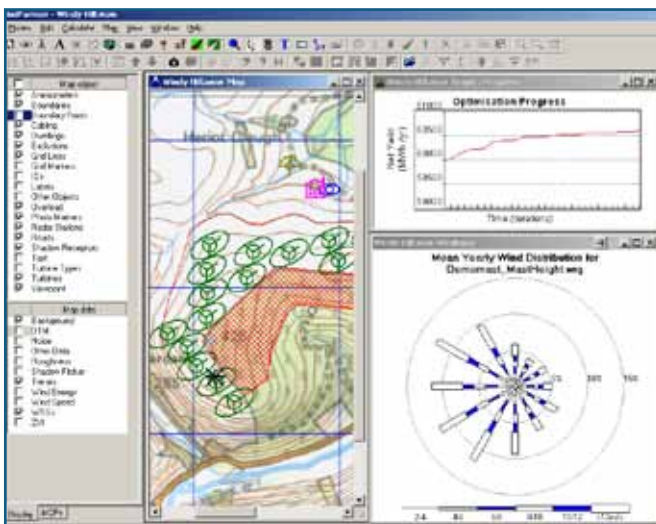
WindFarmer provides unrivalled model transparency. See how the inputs are used to calculate the results. Use data from your preferred flow model, input any type of wind turbine and exchange data with other software programs including GIS data formats.

Get the results you need

WindFarmer delivers extensive, detailed, useable reports. Define the data reported, the structure of the report and choose your preferred file type format. Easily export your turbine layout to a KML file and animate the turbines in Google Earth.

WindFarmer - a powerful engineering tool

WindFarmer is offered in 12 languages and comes with first class global user support. Training courses and self-learning tutorials are available.

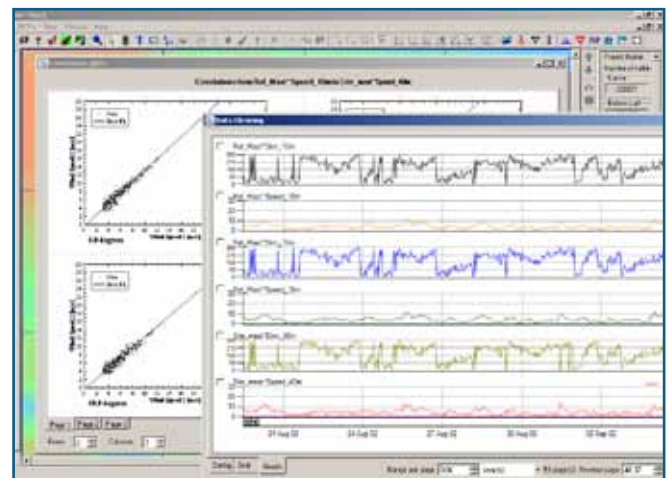


Meteorological data handling

- Load multiple data channels, any signal type
- Apply or modify signal calibrations
- Clean plotted data interactively and exclude erroneous data
- Create seasonally adjusted frequency distributions and wind roses in up to 36 direction sectors
- Calculate turbulence intensity matrices

MCP (Measure-Correlate-Predict)

- Correlate overlapping time series data
- Choose the correlation method
- Display directional correlation plots and statistics
- Apply direction shifts
- Create long-term frequency distributions and wind roses



Layout optimisation

- Optimise for energy yield or financial return
- Consider minimum turbine separation, noise at each dwelling, ground slope, visibility, radar line-of-sight, boundaries and setbacks
- Optimise random or grid structured layouts

Output options

- Generate customised reports and figures; report data can be edited
- Import/export data files of workbook components
- Export detailed matrices of flow and performance analysis
- Save videos in common formats for independent playback
- KML layout export and animation

Map handling

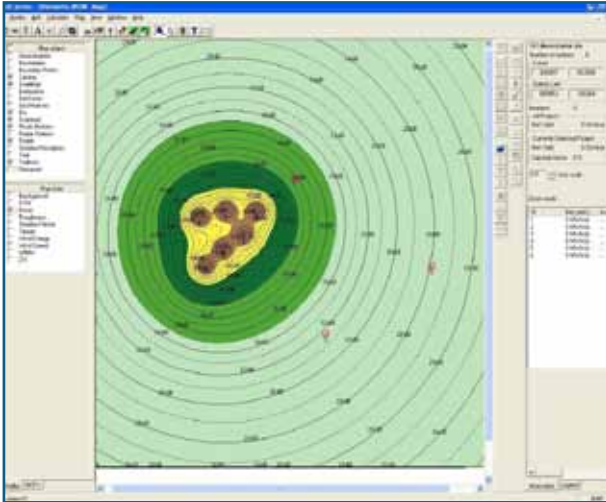
- Import major map formats, including shape files
- Projection recognition and conversion
- Edit and digitise maps
- Geo-reference background images
- Display ground heights, terrain contours, slopes and background images

Radar stations

- Conduct line-of-sight calculation between radar stations and turbines
- Adjust minimum angle of radar beam elevation
- Map, report and interrogate results
- Superimpose radar sweeps on visualisations

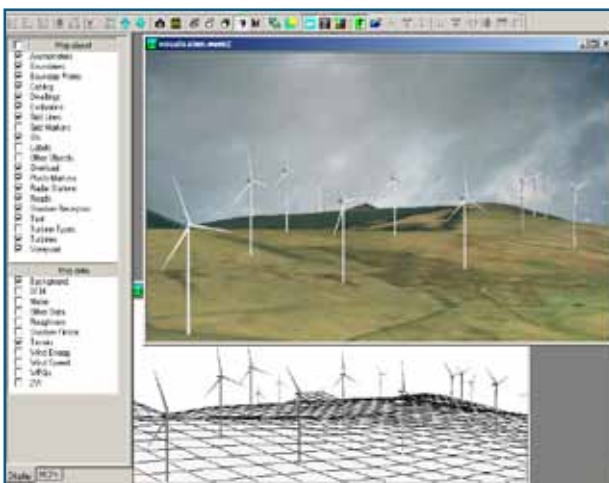
Noise modelling

- Apply simple, complex and custom models (ISO 9613)
- Use single value or octave band calculations
- Apply ground attenuation characteristics
- Consider different wind speeds in background measurements and wind turbine sites
- Map and interrogate detailed results at any location



Energy production

- Air density is corrected at every turbine
- Consider the effect of turbulence, terrain and turbine spacing
- Work at high directional resolution (up to 1 degree)
- Conduct uncertainty analysis (P90, P75, etc.)
- Employ advanced large wind farm, close-spaced, Eddy Viscosity and modified PARK wake models
- Account for non-Weibull frequency distributions
- Consider multiple turbine types and hub heights
- Adjust wind flow at individual turbine locations
- Define wind sector management

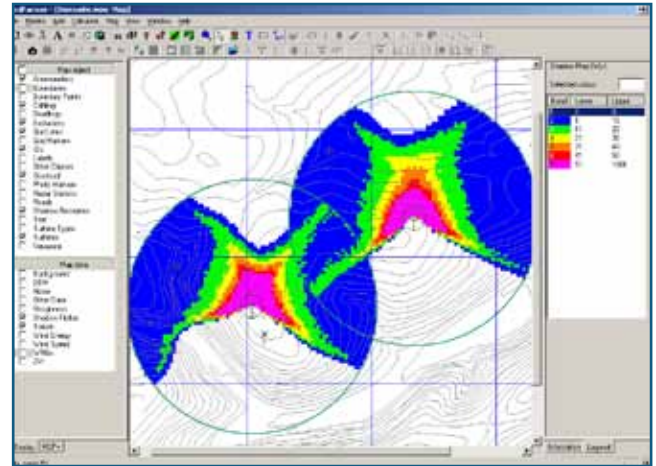


Visualisation

- Map zones of visual influence (ZVI)
- Consider curvature of the earth
- Visualise wire frame, rendered or draped landscapes
- Turbine animation, fly-through and 360° pan
- Lighting and shading options
- Photomontages
- KML export and animation

Shadow flicker

- Map, report and interrogate detailed results at any location
- Define height, tilt and orientation of receptors
- Determine exact times of occurrence caused by each turbine
- Calculate impact for a specific year
- Automatically correct grid/true north deviation



Multiple projects capability

- Option to include other wind farms in energy calculations
- Study the environmental impact of several projects, individually or combined

Financial

- Integrate your own spreadsheet or work with the sample spreadsheet
- Dynamically link spreadsheet with wind farm layout and energy production
- Optimise your wind farm layout to maximise a target cell in the financial spreadsheet
- Account for different turbine types, road types and road lengths

Electrical

- Model the electrical network from the turbine to the grid connection point
- Dimension your electrical components
- Assess the power factor and include compensation devices
- Calculate losses and reactive power and check for overload

Site condition assessment

- Rank site conditions at each turbine
- Calculate the load equivalent design turbulence (IEC61400-1 Ed2, Ed3, Ed3 Amendment, DIBT)
- Facilitate load calculations with **WindFarmer Bladed Link**

Parallel processing

WindFarmer exploits the power of dual and quad core processors to give enhanced performance and fast calculations.

Try a DEMO

For further information about WindFarmer and its individual modules or to request a demonstration version, please visit www.gl-garradhassan.com. Alternatively, please contact our WindFarmer team by emailing:

windfarmer@gl-garradhassan.com

This brochure was produced with consideration for the environment. It is printed on paper that is 100% recycled and has an FSC accreditation.

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