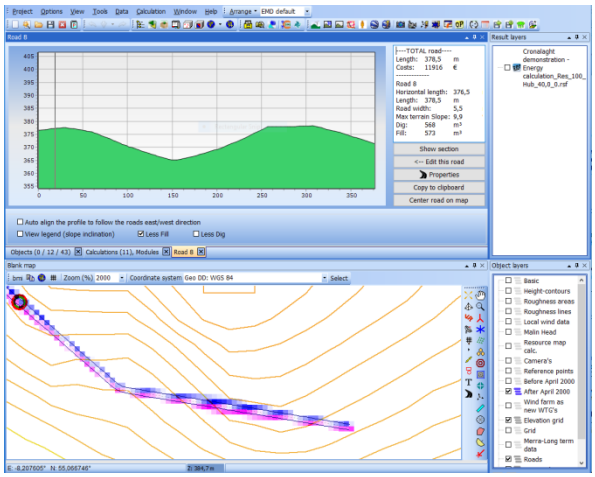
windPRO

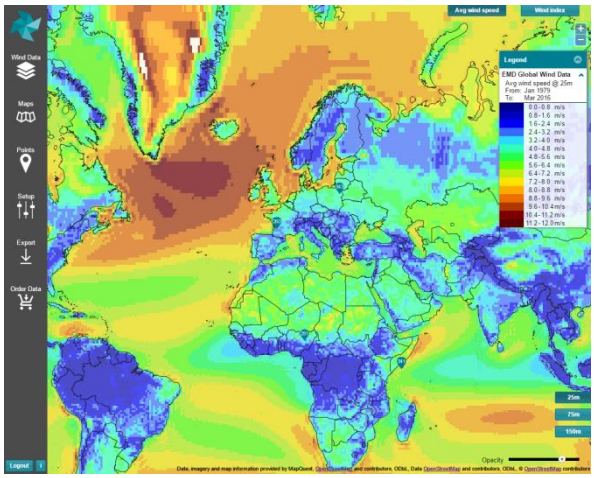
Feature list

New in windPRO 3.1

EMD International A/S
www.emd.dk

Contents





Road Construction tool and windPROSPECTING

1 Road Construction tool (NEW)

- Design a wind farm road layout which ensures curvature demands are fulfilled and horizontal and vertical gradient limits are met.
- Dig and fill volumes are continuously calculated.
- Costs of the road are calculated based on user-defined values.
- Auto-optimize a selected sub-section of the road to minimise dig and fill, providing graphical support for the road designer.
- This new tool is FREE for all windPRO users.
- See also: Short Video about Road Construction Tool

2 windPROSPECTING (NEW)

- Spatial visualization of EMD mesoscale and global data in a web browser.
- Click on point on map to see statistics and e.g. development in wind speed by year.
- Easy prospecting and prioritization between different areas of potential development.
- Wind energy index based on global data sets, like MERRA and EMD-Meso data based on different heights (hub heights).
- Released with v3.0 service pack to users with EMD Mesoscale data subscriptions. Now available to all windPRO users with METEO licence.

3 PARK calculations

- Calculate AEP for different Day-Evening-Night noise settings in ONE calculation within the time-step based calculation (using the same setup as for DECIBEL).
- New report pages from time-step calculations (e.g. graphical representation of the wind distribution, etc.).
- Improved, more accurate sensitivity calculations in time step calculations (not just based on mean wind speed as previously, but a wind speed perturbation for each time step).
- Support for selection of a more accurate Wake Decay Constant (WDC) based on hub height, turbulence and more.
- Park power curves now support "storm control" where turbines run above 25 m/s.
- Print of reference turbine results now includes summary with AEP sum, wake efficiency, wind speed and Goodness factor.
- Season correction fine-tuned, now including a check for minimum data amount in each season.
- **Park model revisions;** see technical note**.** Most important here is when using NO2005 Wake model in time step based calculation for large wind farms (>25 WTGs), a linear weight of 35% should be used in wake combination model in the "Deep array settings".

4 SCALER (Time domain calculations)

- The new energy calculation concept has been finalized, including sector-wise displacement height when using SCALER with Meteo objects. This will work in METEO object, STATGEN (also from MCP), Meteoanalyser and PARK calculations.
- More measurement heights can be used in SCALER, thereby interpolation possible when more measurement heights below and above hub height.
- Scaling of turbulence is now also part of SCALER, as well as a new improved method for scaling measured wind data that handles turning in wind flow more accurately and it uses the WAsP or CFD calculated native speed up factors as alternative to calculated A-parameter ratio's. The disadvantage by the method is that no stability correction is included, therefore measurement height must be close to hub height, and max 20 m deviation is allowed when calculating with this method.
- It is now possible to calculate wind RESOURCE maps based on the SCALER, including for example, downscaling of mesoscale data and the use of advanced distance weighting on the geostrophic wind; it is also possible to use these features with met mast data.
- SCALER based calculations support the new Flowres file format, thereby calculations can be performed based on external CFD tools that support this open format (see later).

5 METEO object

- Disable/enable data faster by mouse drag.
- Stability signal now supported with detailed viewer by hour, month and wind speed.
- Name of Meteo object and displacement height included in profile export.
- Measure heights can be entered with 2 decimals.

6 SITE COMPLIANCE and LOAD RESPONSE

- Support for IEC 61400-1 ed. 2 assessments.
- Use of flow results from any CFD model which supports the generalized Flowres file format (see New Flowreq and Flowres file formats).
- A 3rd party mode to allow users to load pre-calculated IEC main checks to be used in LOAD RESPONSE.
- Advanced sector curtailment defined on individual WTG objects included in the Effective Turbulence and LOAD RESPONSE calculation.

7 DECIBEL and SHADOW

- DECIBEL: flexible colouring of noise sensitive areas, updated country specific models (Finnish, Norwegian, DK and UK); valley and topographic screening effects now calculated if required.
- SHADOW: Incorporation of flicker stop /curtailment in the calculation of shadow flicker with a "decision table" for easy design of flicker stop strategy.

8 PHOTOMONTAGE

- Trace lines for calibration of a camera object supported by the information from other cameras (mark e.g. a tree top in one picture and see where this is in another picture by a line of possible positions. With more cameras showing the same tree top crossing lines will tell exactly where the tree top should be located with a correct camera calibration).
- New elegant camera browser showing all cameras by miniature pictures and photo file names.

9 Miscellaneous

9.1 Calculation speed improvements

- 5x faster calculation time of some calculations, for example time-step PARK calculations (depending on hardware) using multiple cores.
- Multi-core support for ZVI and SHADOW.

9.2 New Flowreq and Flowres file formats

- Flowres is a generalized flow result format to integrate flow results from any external CFD model (or other flow model).
- Flowreq is a generalized flow request file format to facilitate output of terrain and simulation setup.
- Includes a general graphical viewer of calculation results with, for example, a shear viewer.
- OF-Wind CFD model planned release autumn 2016 is developed in co-operation with EMD and fully supports Flowreq and Flowres file formats. If you are interested in BETA testing this model, please contact sales@emd.dk.
- Currently, also Meteodyn and MeteoPole have announced they will support the Flowres/Flowreq format.
- Ask your CFD supplier to support export of flow results in the Flowres format.
- Details of the Flowres and Flowreq formats: link

9.3 Improved Google Earth export

- Include WTG-area objects with buffer zones.
- Include NSA areas.
- Include Area object areas
- Rotating turbines are also now supported (use the Google Earth animation pane).

9.4 Auto test tool

- Makes it possible for users to set up a number of test projects and let the software run through these automatically and check if results are consistent with calculations performed using previous versions. See documentation at this link: Performing Regression Test of windPRO