

Function

The MODEL module provides the interface between the wind model calculation and the production result in typically the PARK calculation. With the MODEL module it is possible to interface with WAsP for wind farm production calculation and wind resource maps. It is also possible interface with external models like CFD model by providing raw data for the calculation and loading the resulting wind resource map. Finally EMD's own ATLAS model can be used with this module.

Calculation Method

The MODEL module is not a calculation in itself, but gives access to a number of calculations with WAsP, CFD and ATLAS.

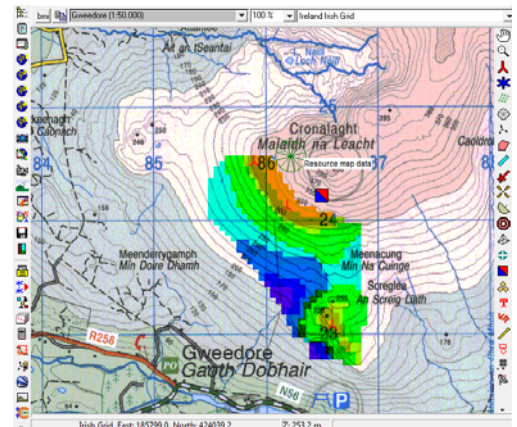
Necessary Input Data (Objects)

Please note that the objects (WTGs, SITE DATA, LINE, AREA, WTG AREA, OBSTACLE and METEO objects) are entered on the map. Please read the BASIS description for further details.

Depending on the model used different objects and information are required.

Creation of wind statistic (WAsP):

This will require a terrain description of roughness and elevation prepared in area, line and obstacle objects. These are assembled in a site data object and sent to WAsP together with wind measurement data from a meteo object or an MCP calculation.



Calculation of production output (WAsP):

For this the same terrain input is used as above with the addition of a wind statistic. The calculation can be made for a single point using a range of wind turbine types or for a wind farm in a PARK calculation defined by a layout created using WTG objects.

Calculation of wind resource map (WAsP):

The same terrain description and (multiple) wind statistics can be used to calculate a wind resource map. An irregular shaped area for the map can be defined with a WTG area object. The resulting resource map can be presented on the working map and used as wind model for a PARK calculation.

CFD PRE/POST:

While WindPRO does not directly operate CFD models, it does prepare data for them. To pre-process data for CFD calculation basically the same data and objects are needed as for a WAsP wind statistic calculation. The post processing requires the resource map created by the CFD model and any other resource map calculated for the site for comparison.

ATLAS:

To run an ATLAS calculation a roughness and an elevation model are needed. These can either be defined directly in a site data object or created based on line object data (roughness lines and height contours). The ATLAS model is unable to create wind statistics so pre-made wind statistics are needed. The ATLAS model is integrated in WindPRO so no additional software is needed. ATLAS can either be calculated for a single turbine or used as input for a wind farm in a PARK calculation.

Description

The interface allows calls to the respective models. If WAsP is registered on the same computer WAsP can be used as wind model in the PARK calculation, wind statistics can be calculated based on measurements and as a result of long term correction and WAsP can be called to calculate a wind resource map. If the user has access to a CFD model, WindPRO can process the data of the project in a format that can be read by most available CFD models, which can use them to calculate a resource map. This map can in turn be read by the MODEL module where the map can be compared to other resource maps and be used as basis for a PARK calculation. Finally the MODEL module gives access to the ATLAS calculation model. The ATLAS model (not to be confused with the WAsP wind atlas model) is a simple wind model calculator made by EMD for calculating production in simple terrain using one calculation point and a pre-made wind statistics. The modules allows a number of calculation calls directly and facilitate expanded use of other modules (PARK, MCP, OPTIMIZE).

Calculation reports

Special reports are produced for the ATLAS, WAsP interface and RESOURCE calculation.