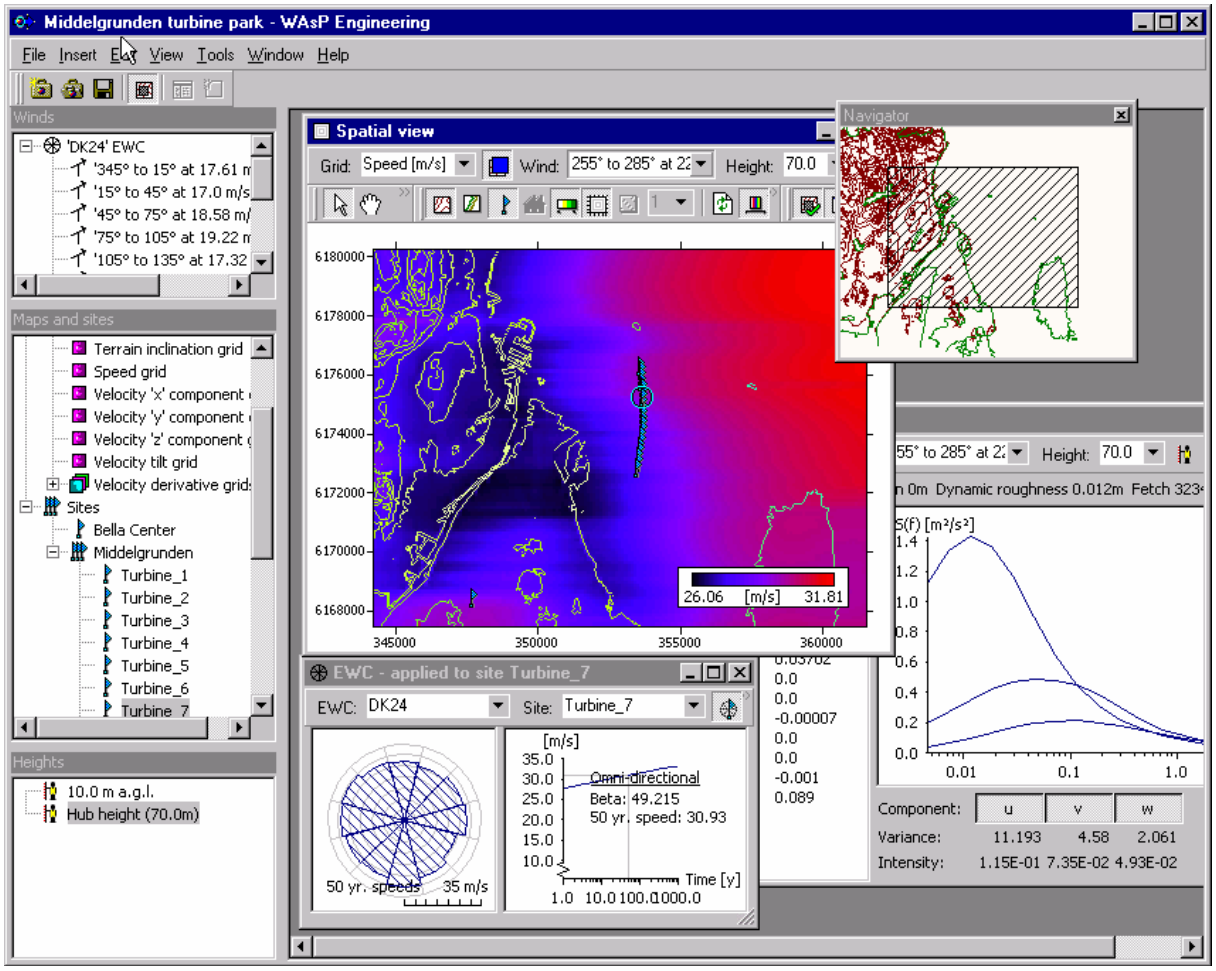
WAsP Engineering 2.0



The graphical user interface of WAsP Engineering showing a calculation of the 50-year wind at the Middelgrunden wind farm, off the shore of Copenhagen.

The WAsP Engineering project
WAsP Engineering is an umbrella of activities including measurements, analysis and modelling of those properties of the wind, which are relevant for the estimation of loads on wind turbines and other civil engineering structures situated in all types of terrain. Most of the results of these activities are unified in the computer program called WAsP Engineering. The wind properties treated in version 2.0 of this computer program are described briefly below.

Extreme wind speeds – such as the 50-year wind. If a wind turbine is well exposed on a hill, the mean wind speed and thereby the energy production can be increased significantly compared to that over flat terrain. Unfortunately, the 50-year wind will increase correspondingly, maybe calling for increased strength of the rotor blades or other parts of the turbine. A utility program to calculate the observed extreme wind climate based on measured data is provided with version 2.0.

Wind shears and wind profiles – Strong mean wind shears (large differences of the mean wind speed over the rotor) give large fluctuating loads and consequently fatigue on wind turbine blades because the blades move through areas of varying wind speed.

Turbulence – i.e. gusts of all sizes and shapes which cause dynamic loads on various civil engineering structures, including wind turbines. The strength of the turbulence varies from place to place. Over land, turbulence is more intense than over the sea. Also hills affect the structure of turbulence. We model the various terrain-dependent properties of turbulence. A new standalone program for time series of turbulence according to IEC61400-1 ed.3 is included in 2.0.

For more information, please visit our Web-page www.waspengineering.dk or mail to Hans E. Jørgensen at waspengineering@risoe.dk. You may order by mail or fax – including information on contact person, shipping address and invoicing address.

Wind Energy Department
Risø National Laboratory
Technical University of Denmark (DTU)
P.O. Box 49, VEA-118
4000 Roskilde
Denmark

Phone +45 4677 5097
Fax +45 4677 5970
wasp@risoe.dk
www.wasp.dk
www.windatlas.dk

Visiting address
Frederiksborgvej 399
Roskilde • Denmark

2007-06-10