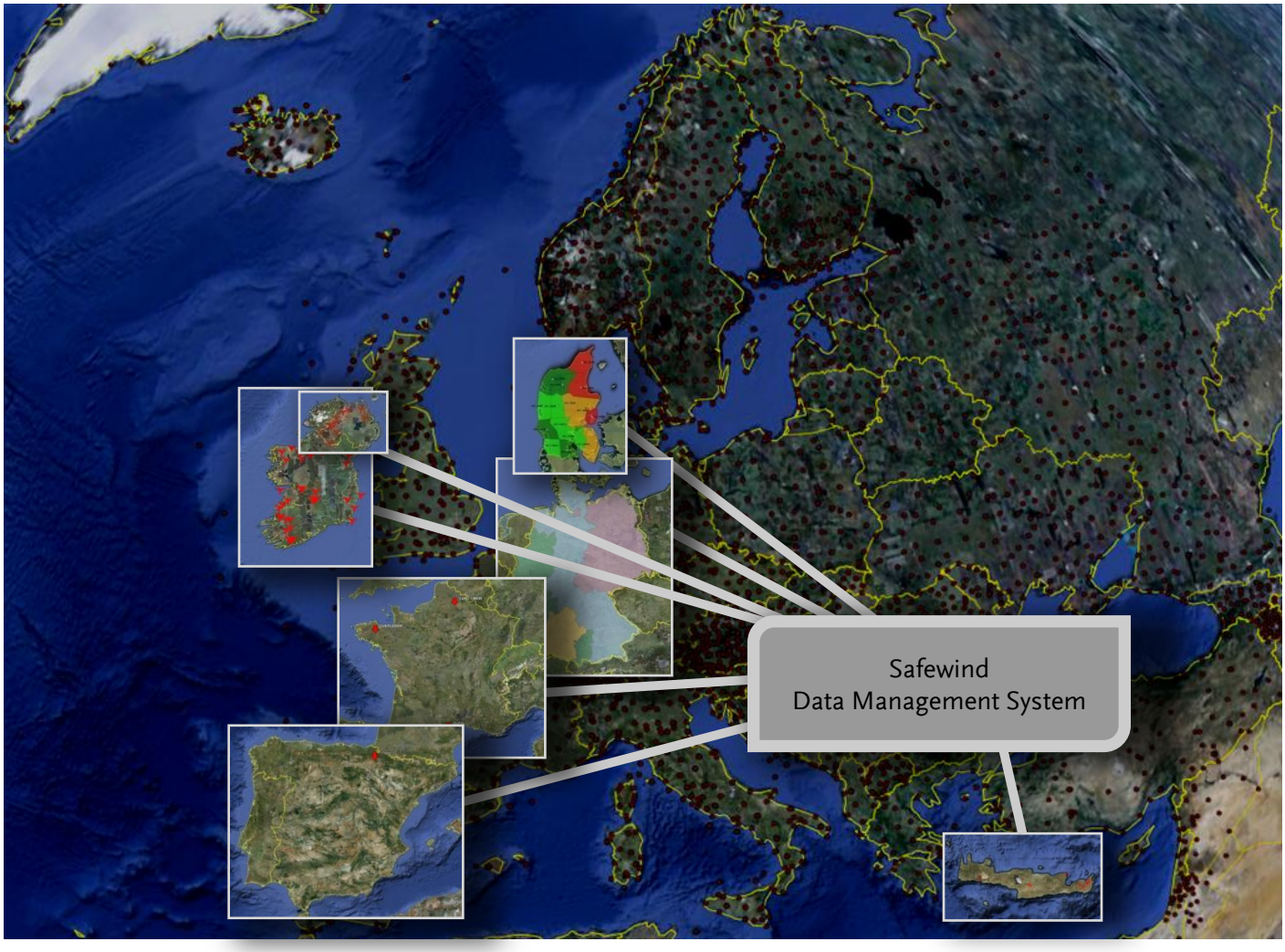
SafeWind

WP 3 Highlight: Data Management System

Infrastructure to monitor the wind energy weather over Europe in real-time with observation data from many different sources

- **More than 2.000 weather stations**
- **120 single wind farms**
- **19 regions**

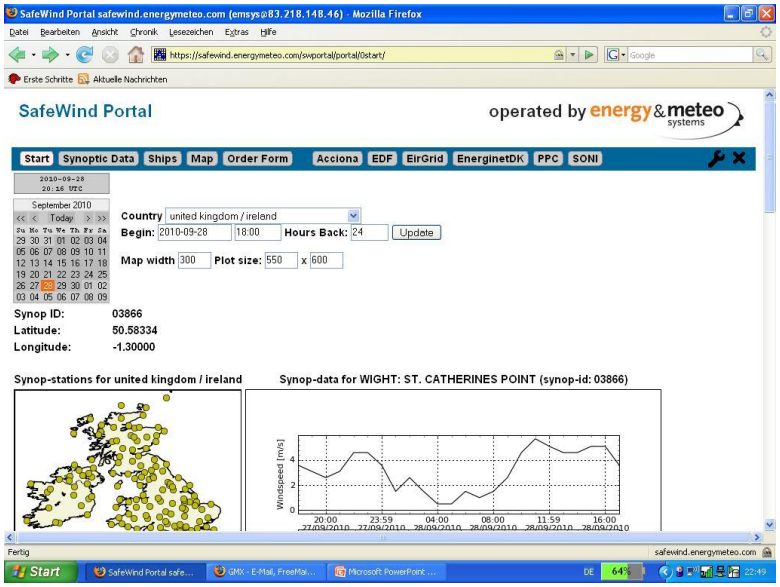


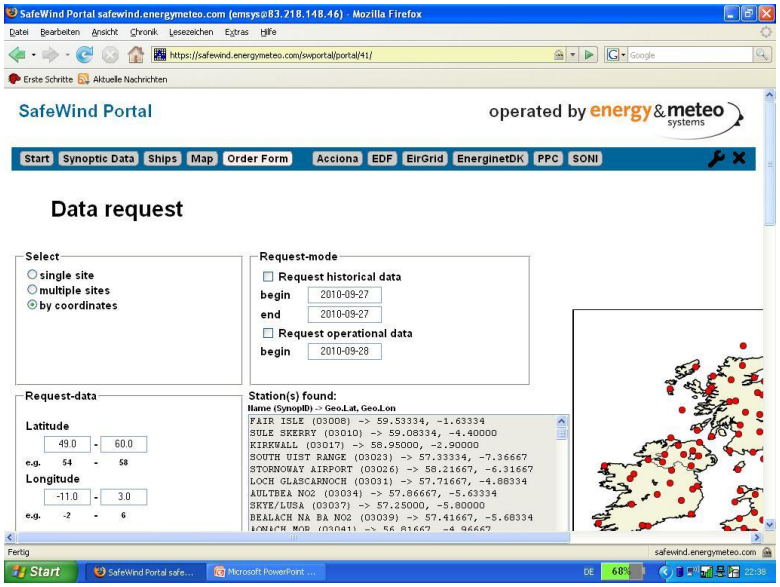
Data is:

- Continously updated with online data from different sources
- Available for a time period of several years back
- Quality checked in regard to non-availitbility, curtailment, data error
- In a common standardized format

WP 3 Highlight: Data Management System

... data can be visualized and retrieved through a web tool





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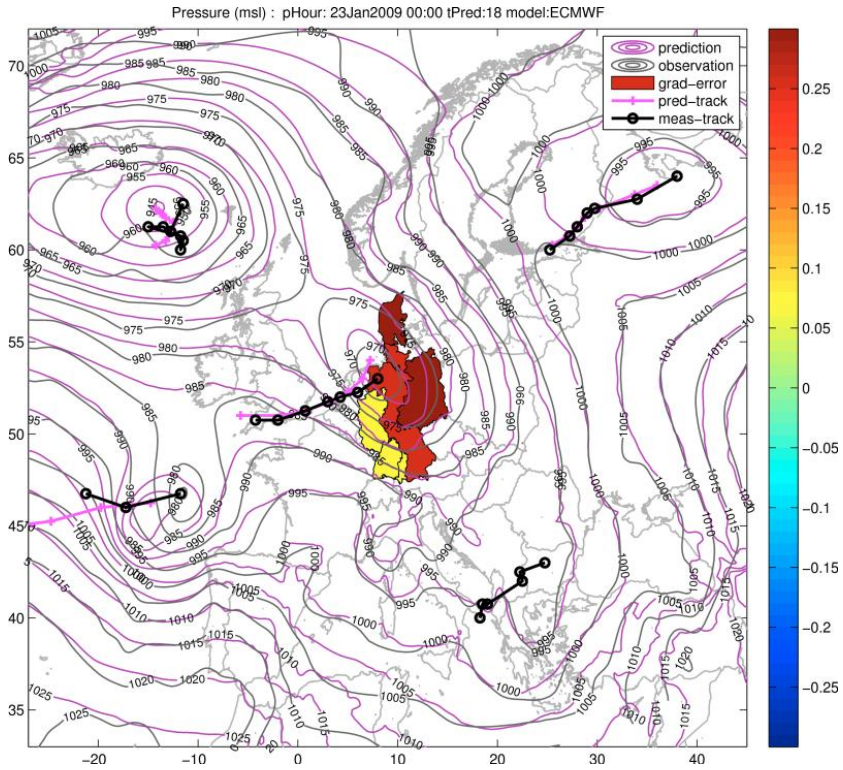
WP 3 Highlight: Alarming Module

- **Continuous monitoring of current large-scale weather situation over Europe**
- **Newly developed Alarming Module for forecasting users**
- **Issue of warnings if large deviation is detected between current weather and latest numeric weather prediction (NWP)**



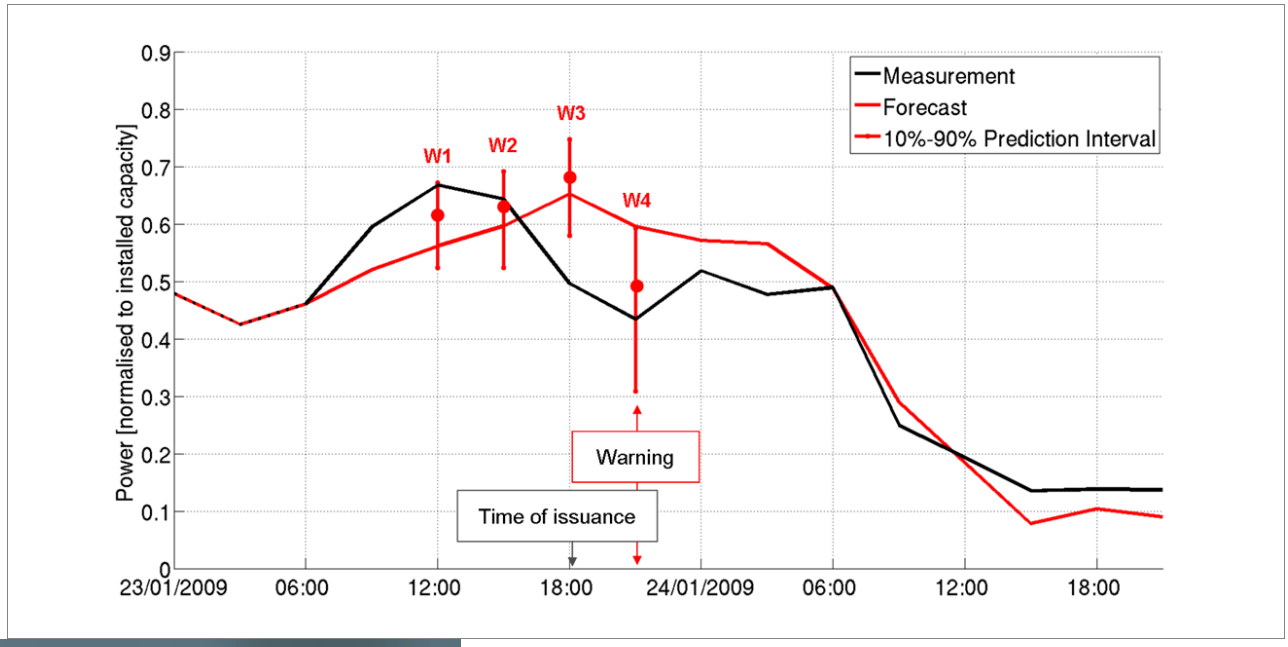
Forecast errors occur often due to failures in numerical weather models. Therefore, an alarming module has been developed to warn in the very short term (0h-6h) where no forecasting updates or analyses are available from weather services. Here the predicted large scale weather situation is compared to the observed weather in real-time.

It uses numerical weather prediction data and measurements from synoptic stations as well as the current wind power prediction error.

The pressure fields of prediction (magenta lines) and observation (black lines) as well as the trajectories of the low pressure are compared to detect severe deviations, e.g. in the pressure gradient over different areas (colored as coded in the colorbar). This information is retrieved from online data.

WP 3 Highlight: Alarming Module

If a significant deviation is detected the user obtains a warning as shown in the following example.



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Time series example of the warning module:

Original Standard
- forecast (red line)
- measurement (black line)

Warning Module
- prediction interval (vertical red lines)
- the median of the prediction intervals (red dots) can be used as forecast update.

Each warning was issued 3 hours before the event, e.g. warning 4 (W4) is valid for 21 UTC and was issued at 18UTC.

→ **The forecasting user has pre-warning time of about 3 hours to react to an upcoming forecasting error**

→ **The user can purchase the surplus or deficit on the energy market and avoid expensive balancing power**

The alarming module is still under development. Our aim is to make it available to customers in 2013 after thorough practical testing.