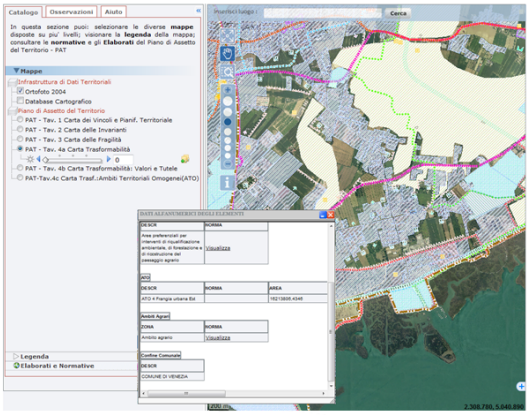
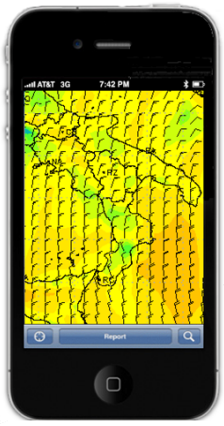
How Geospatial technologies can support the planning and operation of power farms

Success Story on the use of EO to support the planning and operation of power farms

Summary

- Energy has become a top priority for EU policy makers.
- A large contribution to power generation is theoretically available from wind energy.
- A wind farm design requires the identification of the optimal site, in terms of availability of the wind resource, through the preliminary analysis of local wind regimes.
- Preciso wind is the solution designed for the detection and characterization of suitable sites for wind turbine plant.





Project Background

The growing demand for energy by the developed countries and, at the same time, the reduced availability and the high price of conventional resources are pushing the operators towards renewable energy and, among these, wind energy.

Wind is an abundant resource almost everywhere present and one of its advantages is the fact that the cost of electricity from the wind is fixed once the wind farm has been built. It is one of the fastest growing energy sources. The right return of investment in strongly influenced by the amount of wind available in the specific site. Knowledge of wind regimes in the sites is a must for the investors.

Issues & Needs

The lack of wind data on sites of interest is certainly the main problem. Wind measurements are available only in few places. Solutions that require the ad hoc installation of wind measurement instruments, in order to determine the producibility of the site, require long period analysis and are usually very expensive.

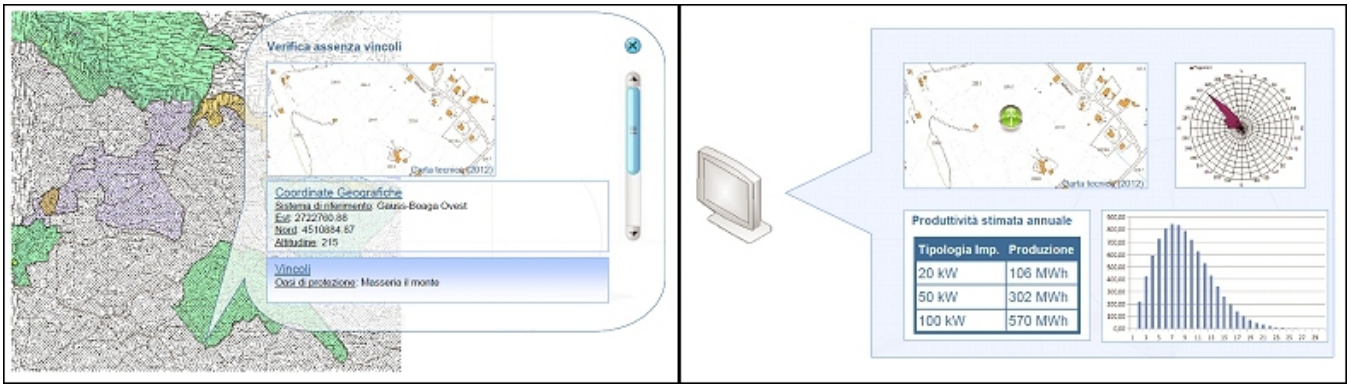
A viable solution can be achieved using mathematical models to calculate the wind in the target location. Fluidodinamic modelling requires data on near sites, and also these data are not always available. Complete meteorological model running for a single site as alternative is not economically sustainable.

The great opportunities of the market, and the wide potential users base made feasible for Planetek Italia to make the conspicuous investments in terms of research and development to define a high resolution model, run it on large areas and offer to the market the resulted information as a service to several users on a request base.

Solution

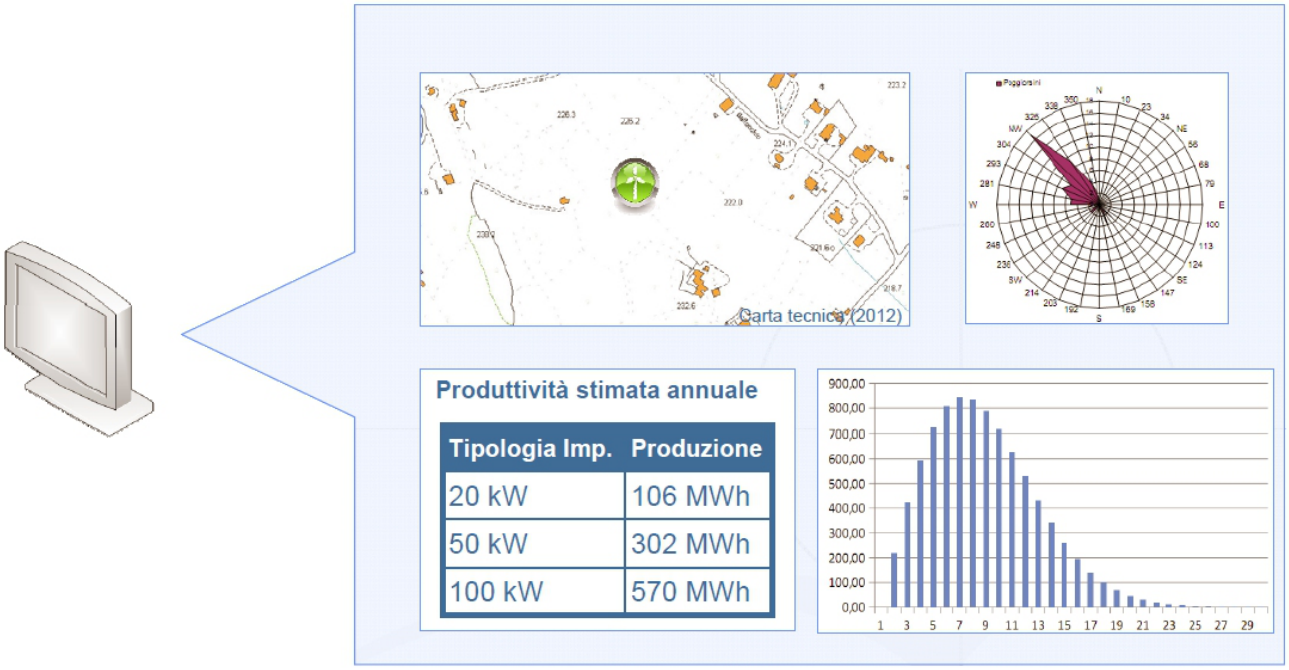
The big investments made in order to define a producing model over large areas allows the offering of a fast service to several users.

Thank to this service several users are able to receive in short time the information about the candidate wind farm site instead to wait the long time needed for an anemometric campaign that usually is also more expensive.



Results & Perspectives

Using Preciso Wind, users are able to quickly evaluate their return of the investment.



Related Info

- **SERVICE PROVIDER**: Product developed by Planetek Italy.
- **USER/CUSTOMER**: The service is offered on the market to several private company, as well as investors and financial institution for due diligence purposes.

- **EO SERVICE**: The service stats using in input the ECMWF (European Centre for Medium-Range Weather Forecasts) reanalysis of the wind, temperature, humidity, ozone and surface pressure of the atmosphere, that are produced by a four-dimensional variational assimilation system, where a significant and increasing contribution is represented by EO data provided by polar-orbiting and geostationary satellites, like ESA Meteorological Missions, driven mainly by Weather forecasting and Climate monitoring needs. These missions developed in partnership with EUMETSAT include the Meteorological Operational satellite programme (MetOp) and the new generation of Geostationary Meteosat satellites (MSG & MTG satellites).
- **KEY WORDS**: Wind energy; Meteorological Model