

# Improved Siting of Wind Turbines means Reducing Investor's Risks

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## **Siting means assessment of risks**

Wind farms are complex technical systems, which include a cascade of risks. In the event of loss, unforeseen costs arise. Therefore all efforts are concentrated on risk reduction.

In planning wind parks, siting is one of the first steps to be carefully considered, because siting is inevitably connected with the production of energy on the long term. Since less windy sites are becoming viable, the analysis of the wind turns into the limiting factor in risk assessment.

In other words, siting is one of the most essential assessments to ensure the return of investment.

## **On reduction of risk**

The assessment of risks follows simple statistical arguments, although they are sophisticated in detail. Statistics tells us risk (or uncertainty) is evaluated from given sets of data – in our case from analysis of the wind.

The risk of insufficient wind can be overproportionately reduced when the analysis of the wind can be done a second time. For that, an independent set of wind data is necessary.

That means, with doubled input one gets more than twice of risk reduction.

## **Risk reduction with measurements?**

The main question is: how can we obtain independent wind data?

The answer is, for practical purposes measurements cannot provide independent data sets. The reason is that wind data sets measured at hub height over a period of several years are not available. In practical applications wind is measured

for a short period of one year - or less - on the site of the wind turbines. The long term wind is then evaluated from matching with national weather stations. This procedure cannot result in a second, independent set of wind data.

Therefore the goal to obtain a second, independent set of long term wind data is not possible. Improving risk assessment neither.

## **The way out**

The way out of this dilemma is the usage of an independent method: no measurements! Such an independent method can be provided by means of computational meteorology. With the aid of large computer systems wind data can be provided with similar accuracy as achieved by measurements and with comparable costs.

Computational meteorology is well established in every days weather forecast or climate re-cast. And it can be used for local wind analysis, urgently needed for risk assessment of wind farms.

## **Computational wind analysis**

From computational meteorology one obtains: time series over more than 10 years on a net, several times denser than realised by any measurement network.

Wind analysis based on computational meteorology provides independent wind data. This method – added to wind measurements – tremendously reduces the risks and insures the return of investment.

Although costs must be shifted from dis-investment to pre-investment the total price of the wind farm will reduce due to an overly proportional reduction of risk.