

10th WindSim User Meeting

24-25 June 2015, Tønsberg



PRESENTED BY: ARNE R. GRAVDAHL

windsim

WindSim User Meetings; 2005 – 2014

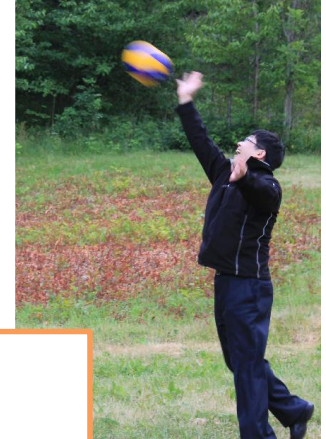


Knowledge sharing

WindSim User Meetings; 2005 – 2014



Sailing



Great fun



Shrimps



22:15

Agenda – Day 1 – Wednesday

08:30—09:00	<i>Registration</i>	
09:00—09:10	<i>Welcome and Objectives</i> John Olaf Rømme, WindSim	} WindSim
09:10—10:30	<i>Recent Developments</i> Arne R. Gravdahl, Catherine Meissner, Rui Santos, Matteo Mana and Jan-Olav Øderud WindSim	
10:30—11:00	Coffee	
11:00—11:30	<i>WindSim CFD validation in densely forested terrain</i> Cecilie Langhans and Torkel Løland, COWI	} Forest
11:30—12:00	<i>Forest model</i> Karsten Busch, WKN AG	
12:00—12:30	<i>Forest validation</i> Jan Borràs Morales, Uppsala University/WindSim	
12:30—12:45	Photo shoot	
12:45—14:00	Lunch	

Agenda – Day 1 – Wednesday

14:00—14:30	<i>A comparison between the WindSim results and the real parks production</i> Georg Droukas, 2EN	} Park production } Park performance } Grid setting
14:30—15:00	<i>Validation of Park Performance</i> Jose Prati, RENOVBLES	
15:00—15:15	<i>Improving vertical gridding by using multiple intervals on k-logical in refinement files</i> Juan Pablo Hernández, Climatik	
15:15—15:45	Coffee	
15:45—16:15	<i>Wind and solar hybrid farms – a wind flow analysis using WindSim</i> Flavia Goncalves, RePowertech	} Wind and solar } Uncertainty WRA } Background noise
16:15—16:45	<i>Uncertainty in Wind Resource Assessment</i> Akgün Kalkan, INORES	
16:45—17:00	<i>Background noise map usage and creation through WindSim</i> Andrea Bartolazzi, Studio Rinnovabili srl	
17:30—23:00	Social event: Sailboat trip in the archipelago	

Agenda – Day 2 – Thursday

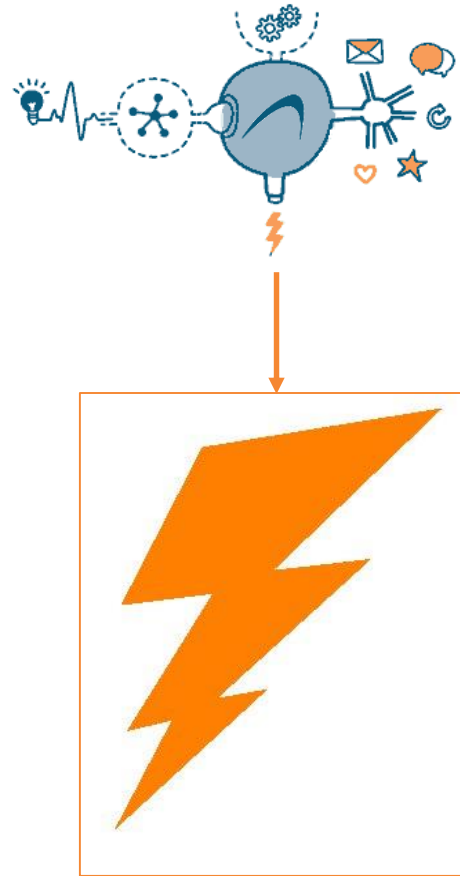
09:00—09:05	<i>Good morning</i>	}	Wind Atlas
09:05—09:30	<i>Wind Atlas</i> Sara Koller, METEOTEST		
09:30—10:00	<i>Test of CFD with Hyper threading</i> Eva-Maria Nikolaj, WKN AG	}	Hyper threading
10:00—10:15	<i>Examples of findings when using data management software to increase profitability in wind farm operations</i> Sigurd Joakim Juvik, Baze Technology		
10:15—10:30	<i>Breeze Traders Dashboard - Power, Forecast, Price</i> Jonas Corné , Breeze	}	Wind Farm Management System
10:30—11:00	Coffee		
11:00—11:20	<i>Park Optimizer 2.0</i> Klaus Vogstad, Markedslabben	}	Park Optimizer

Agenda – Day 2 – Thursday

11:20—11:30	Workshop introduction; <i>Best practice</i> , Li Di, WindSim
11:30—11:40	Workshop introduction; <i>Wake modeling</i> , Nikolaos Simisiroglou, WindSim
11:40—11:50	Workshop introduction; <i>Power Forecasting</i> , Matteo Mana, WindSim
11:50—12:00	Workshop introduction; <i>Forest modeling</i> , Catherine Meissner, WindSim
12:00—12:45	<i>Join one of the parallel workshops: Best practice; Wake modeling; Power Forecasting or Forest modeling</i>
12:45—13:00	<i>Summary of the workshops</i>
13:00—14:00	Lunch
14:00	End – have a safe trip back home

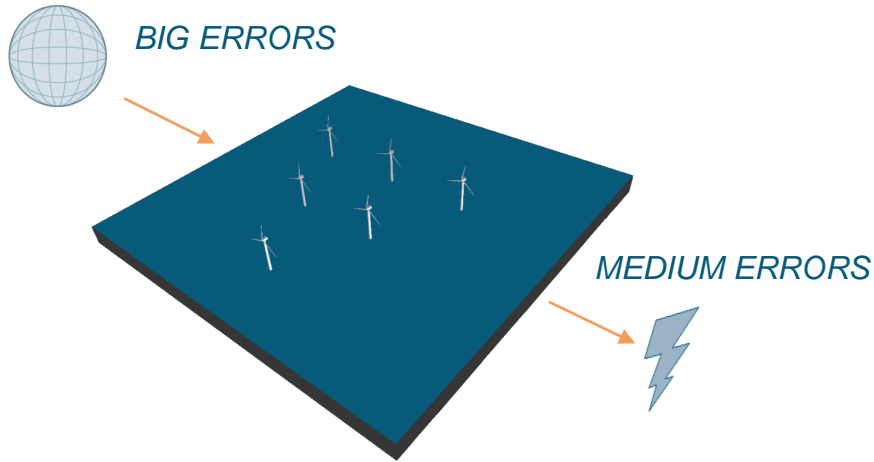
WORKSHOPS

Back to my presentation

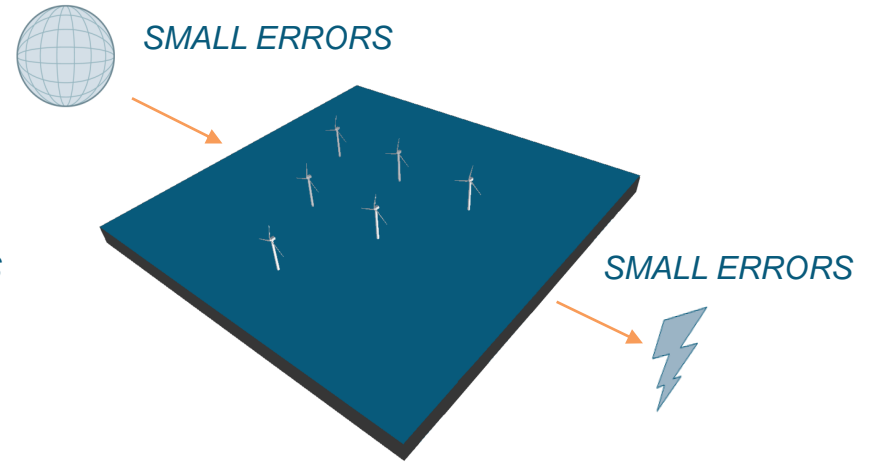


Power Forecasting – Evolution of errors

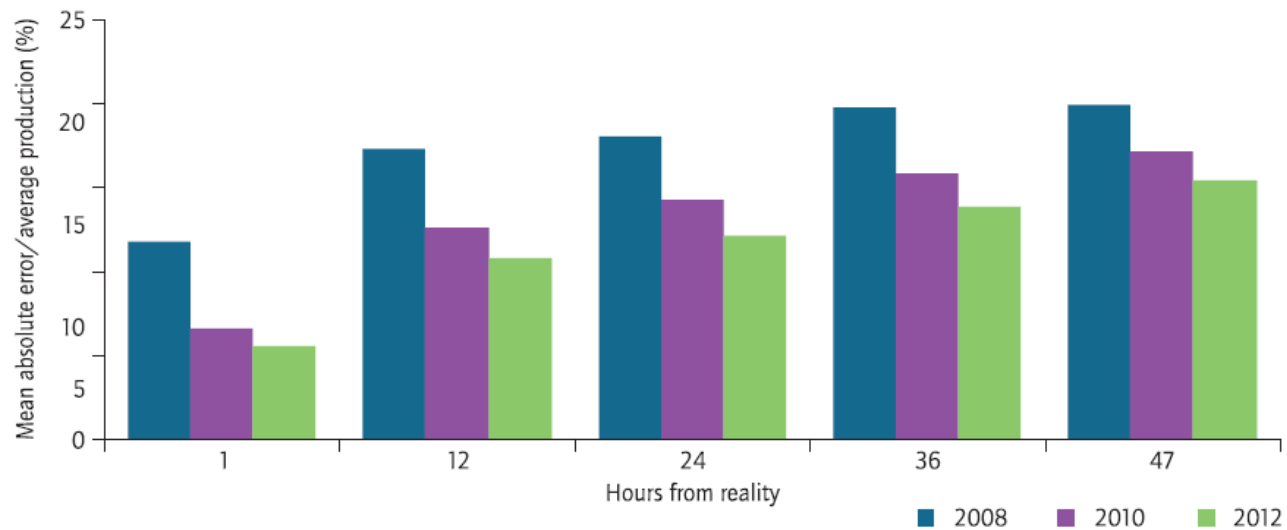
2005



2015



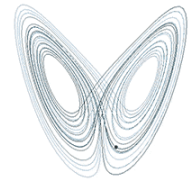
Power Forecasting – Evolution of errors in the period 2008 until 2012



Source: Red Electrica, 2013.

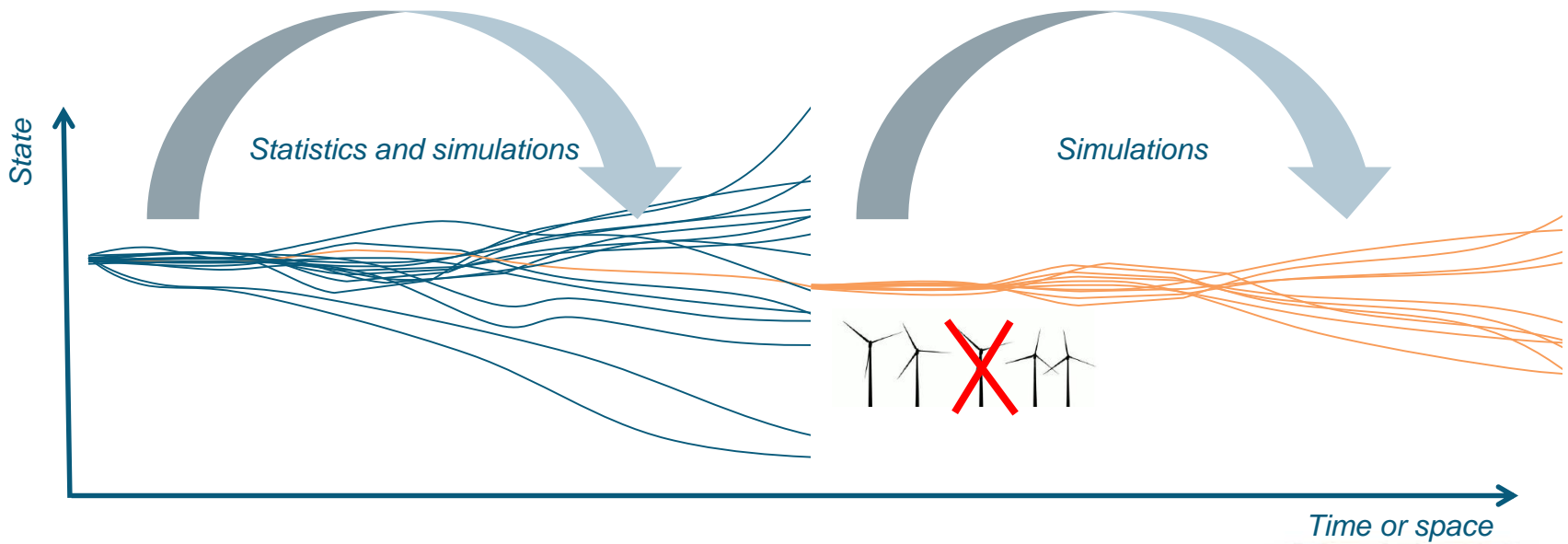
KEY POINT: day-ahead errors in Spain have been reduced by one-third since 2008, a result of dramatically improved forecasting technologies.

Source: http://www.iea.org/publications/freepublications/publication/Wind_2013_Roadmap.pdf



Short-term – Short-range

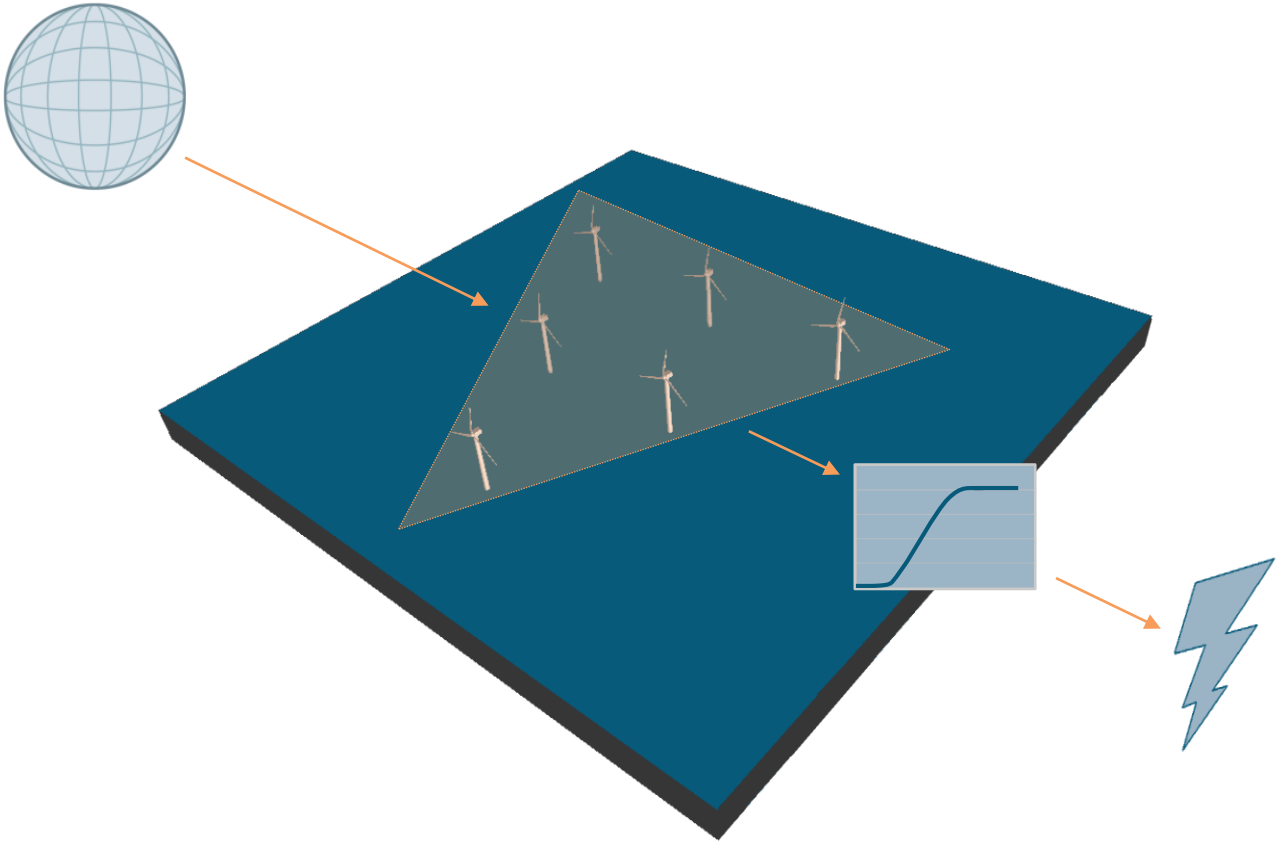
As short-term and/or short-range is reached the “State” includes the operational state of the turbines, favoring deterministic simulations



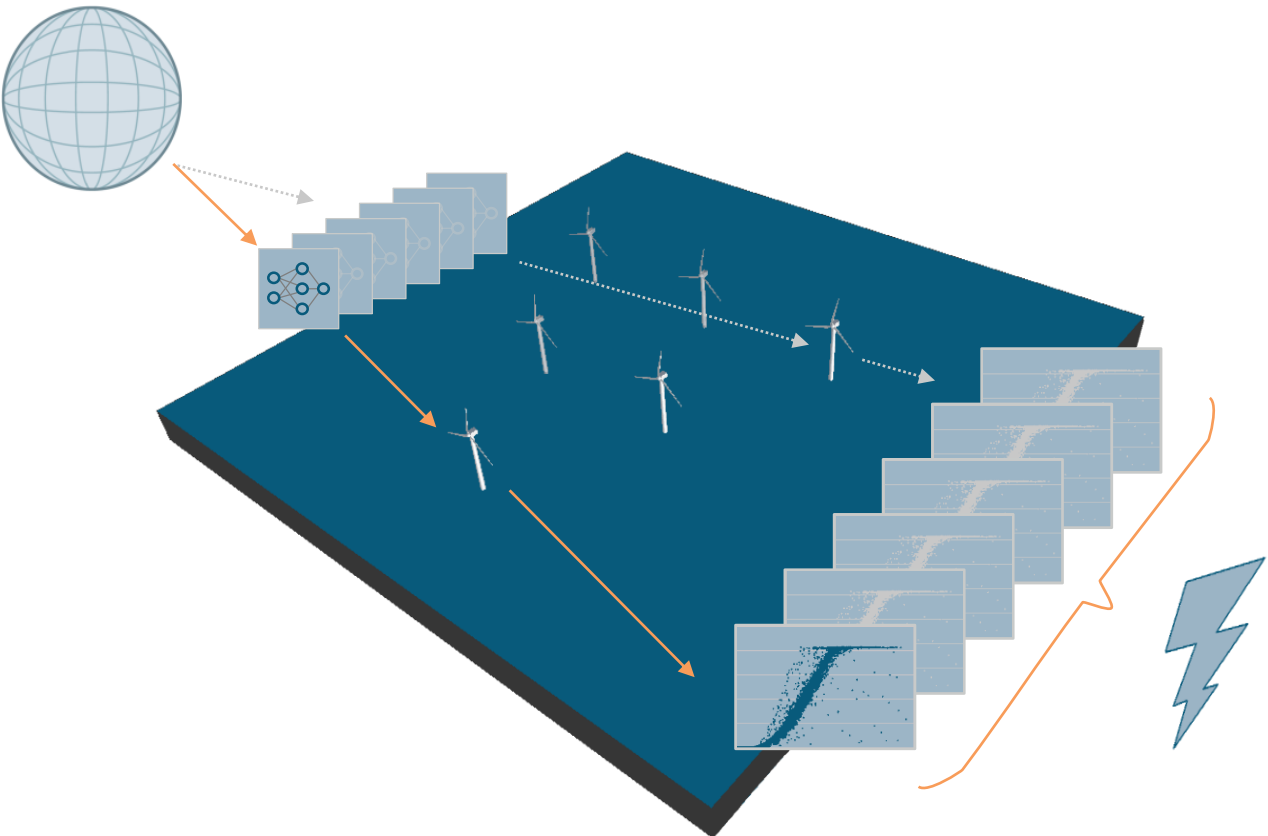
Development of WindSim Power Forecasting

- Power Forecasting has been developed through R&D and Joint Industry Projects (JIP)
- It started with extensions in WindSim, developed into a separate software, further into services and now all our forecasting technology is easy accessible in the WindSim portal
 - 2008 First adaptations towards Power Forecasting; Power time series
 - 2008 - 2015 JIPs; validation, development of software and services
 - 2012 Launch of Power Forecasting software
 - 2013 NFR Energix; Artificial Neural Networks, Meso-micro coupling
 - 2014 Launch of Power Forecasting service with UK Met Office
 - 2015 NFR Energix; Nowcasting
 - 2015 Launch of WindSim Portal
 - 2015 Power Forecasting of more than 1500 MW (Ongoing or under preparation in third quarter)

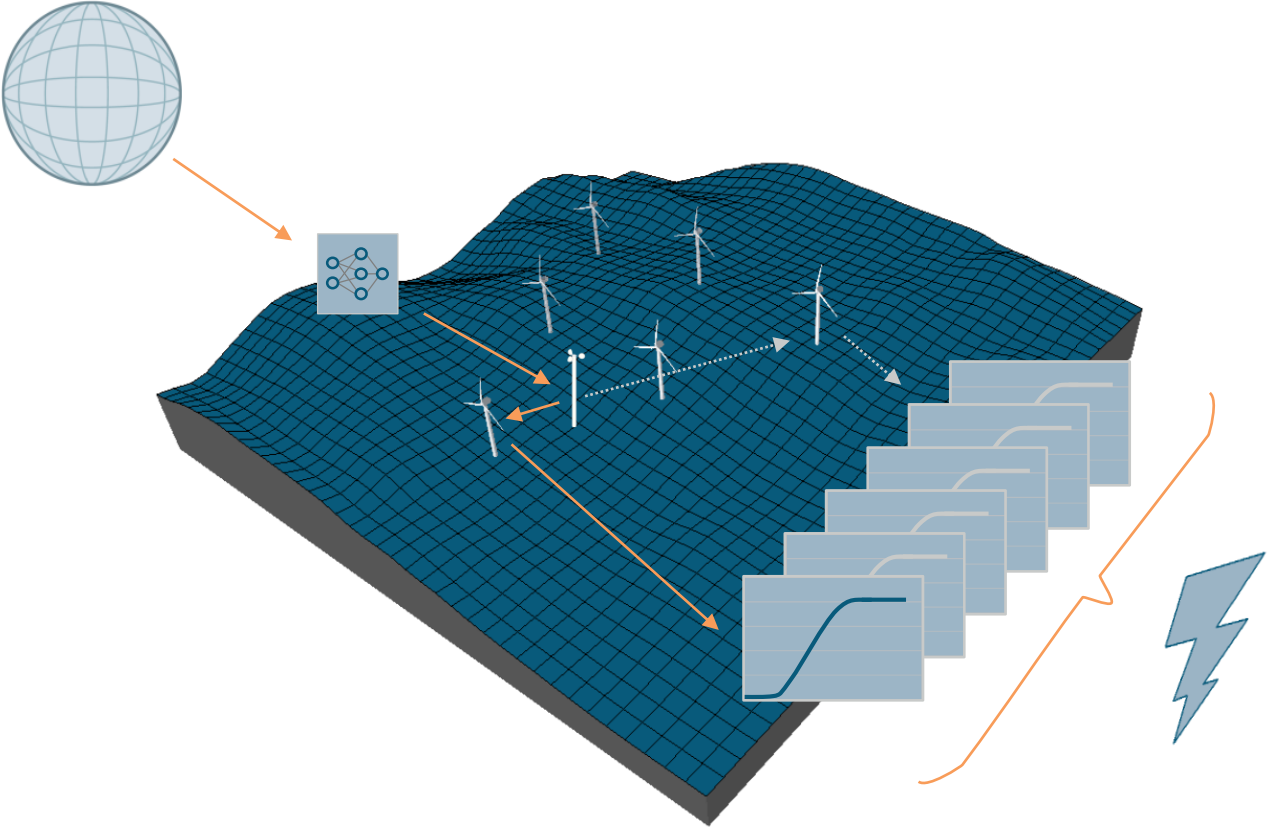
Strategy: Simplified



Strategy: Artificial Neural Network (Wind to Power)



Strategy: Artificial Neural Network & CFD (Wind to Wind to Power)



Setup your power forecasting in the WindSim Portal

windsim [Menu] [Clock] [Lock] [Share]

Main Navigation

- Home
- Documentation

Components

- Forecasting

WindSim Portal

Welcome

WIND KNOWLEDGE | IS WIND POWER

For more than a decade we have developed software for the wind energy sector
Our software suite help you understand the local wind conditions
Wind knowledge is the basis for the design and operation of efficient wind farms
WindSim portal gives easy access to our technology - Welcome

First service out is Power Forecasting
But, there is more to come - stay tuned

Power Forecasting

Not knowing has a cost

The power forecasting system couples Numerical Weather Prediction data, Artificial Neural Network and Computational Fluid Dynamic
The system gives precise predictions of the day ahead and intraday power forecasts
It is configurable with respect to weather input data
Several forecasting strategies are available - use the strategy that reduces your imbalance costs

Forecasting strategies based on statistical methods and Computational Fluid Dynamics in various combinations