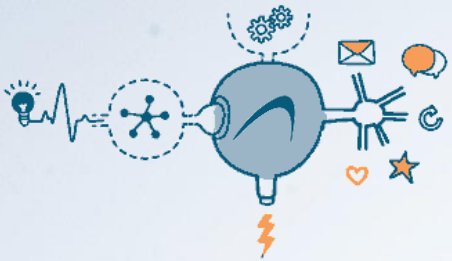
10th WindSim User Meeting

24-25 June 2015, Tønsberg



PRESENTED BY: ARNE R. GRAVDAHL

windsim

WindSim User Meetings; 2005 – 2014

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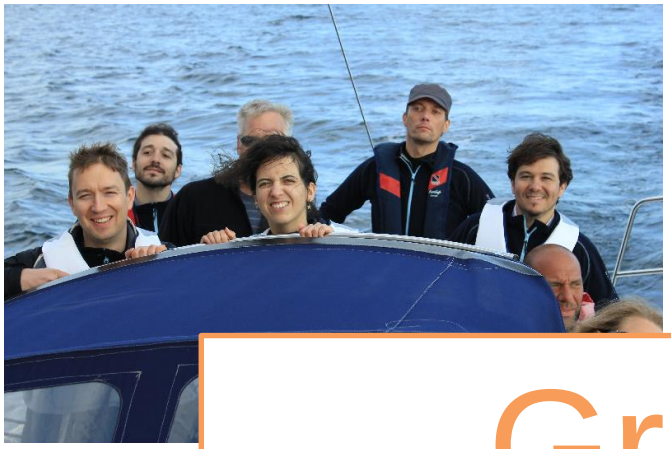


Sailing

Great fun

Shrimps

22:15

Agenda – Day 1 – Wednesday

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

Agenda – Day 1 – Wednesday

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

Agenda – Day 2 – Thursday

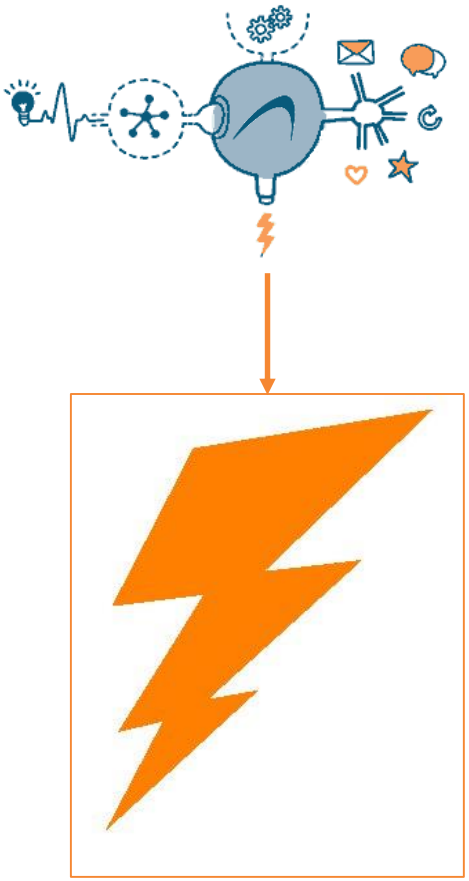
09:00—09:05	*Good morning*	
09:05—09:30	*Wind Atlas* Sara Koller, METEOTEST	Wind Atlas
09:30—10:00	*Test of CFD with Hyper threading* *Eva-Maria Nikolai*, WKN AG	Hyper threading
10:00—10:15	*Examples of findings when using data management software to increase profitability in wind farm operations* Sigurd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

Agenda – Day 2 – Thursday

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

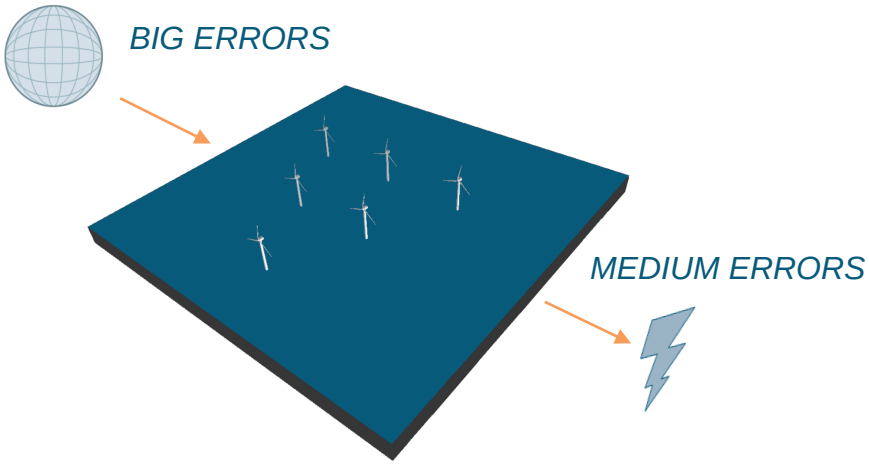
WORKSHOPS

Back to my presentation …..

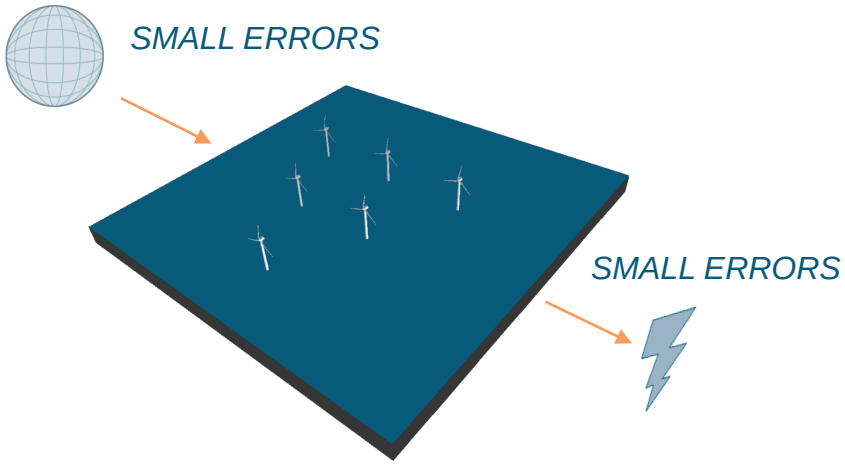


Power Forecasting – Evolution of errors

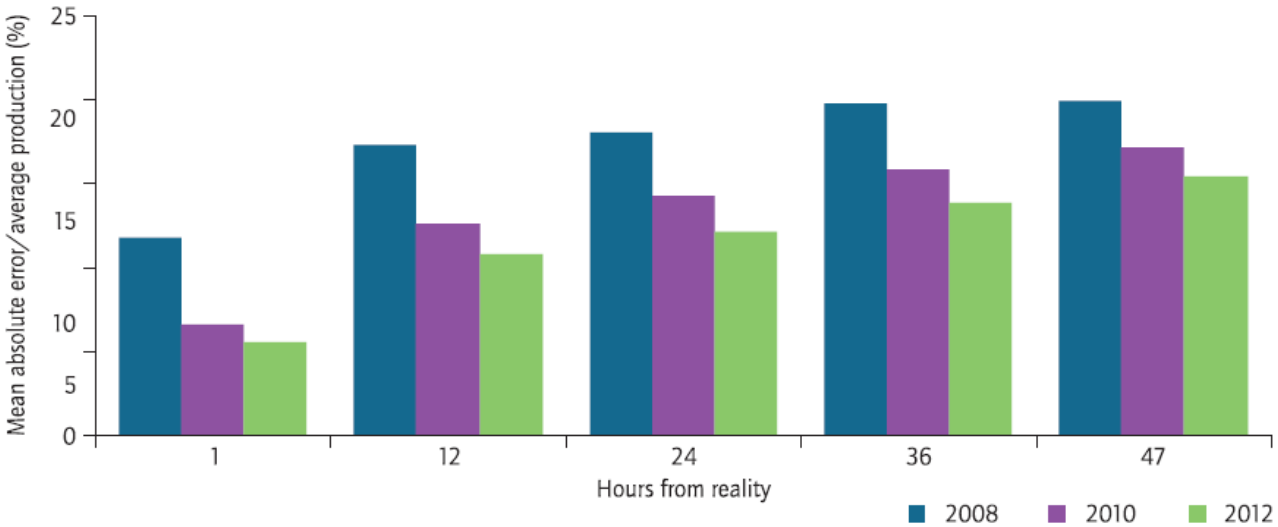
2005



2015



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



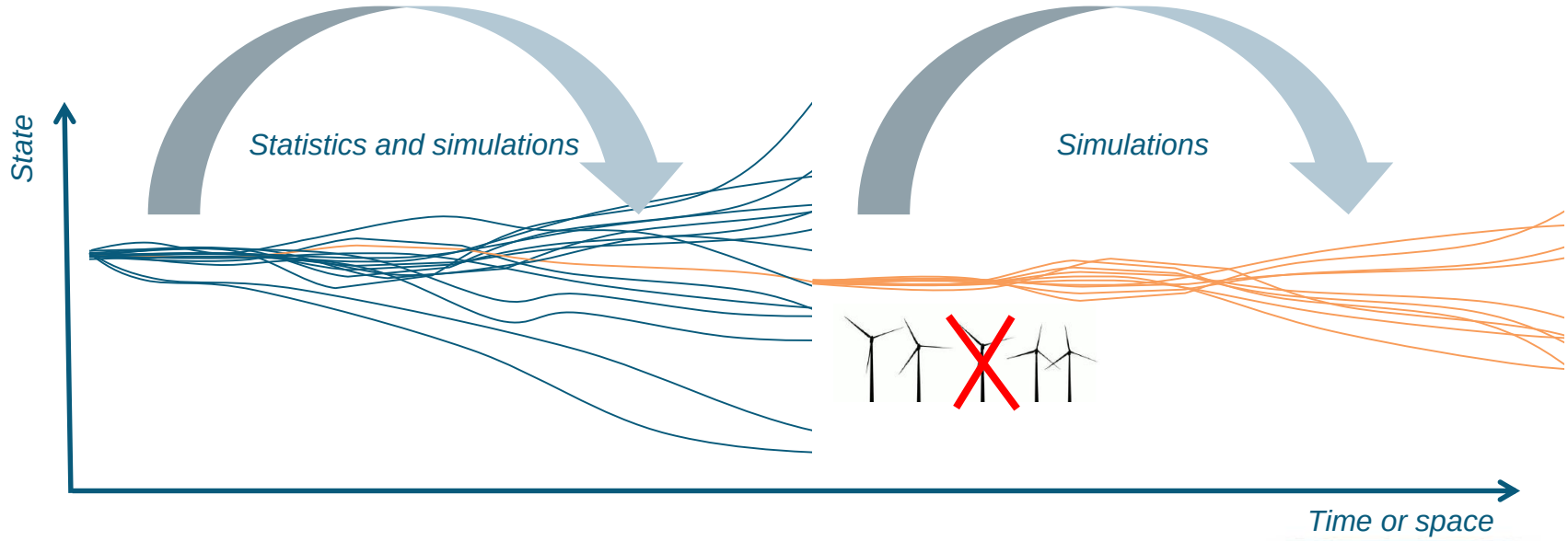
Source: Red Electrica, 2013.

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



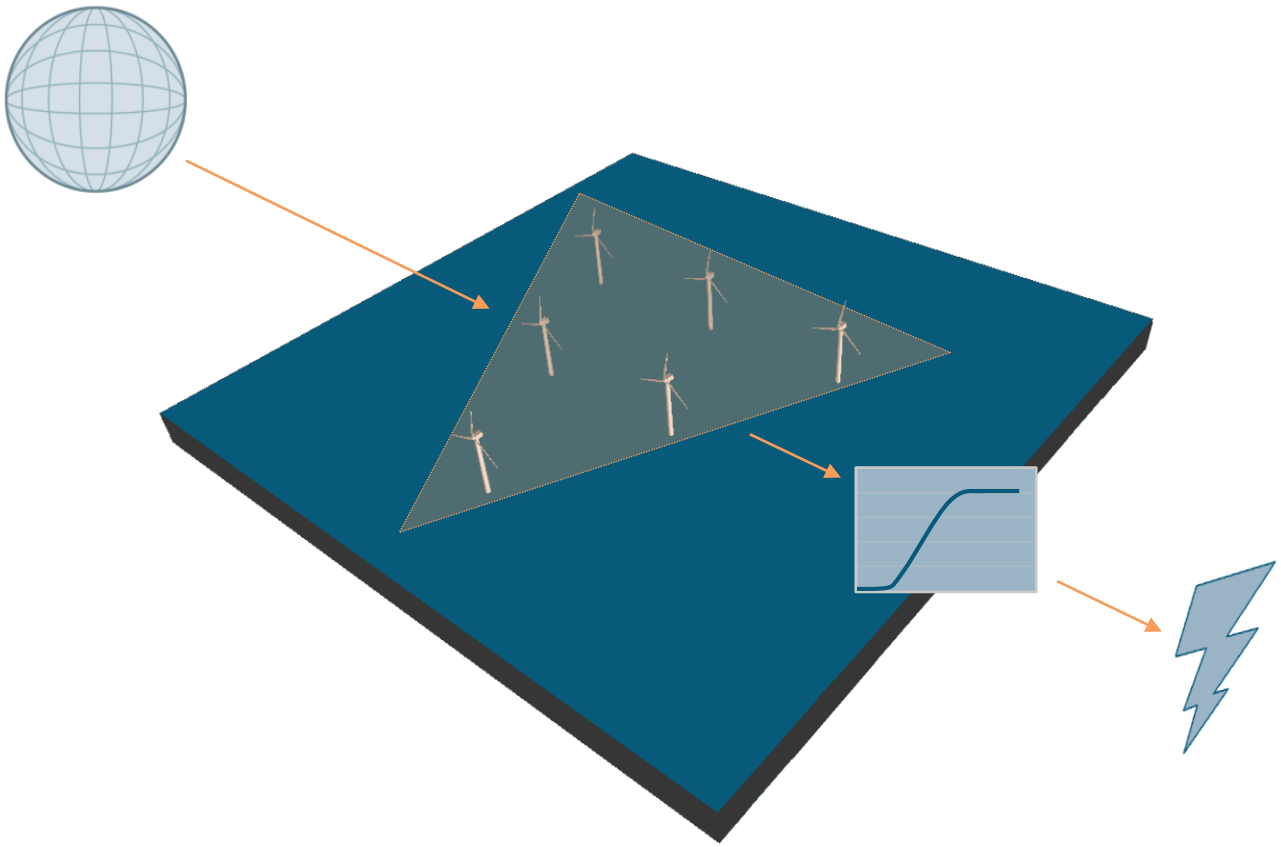
Development of WindSim Power Forecasting

- Power Forecasting has been developed through R&D and Joint Industry Projects (JIP)

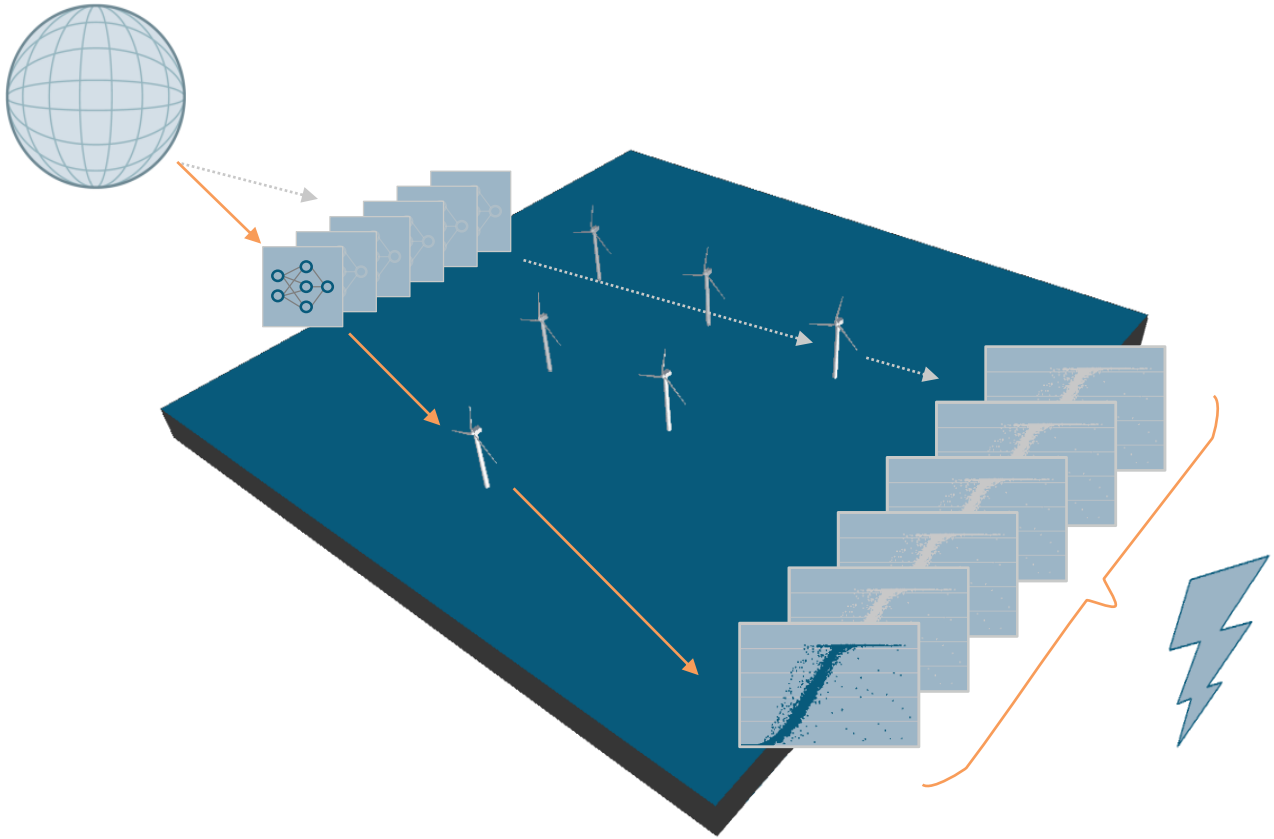
- It started with extensions in WindSim, developed into a separate software, further into services and now all our forecasting technology is easy accessible in the WindSim portal

• 2008	First adaptions 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)

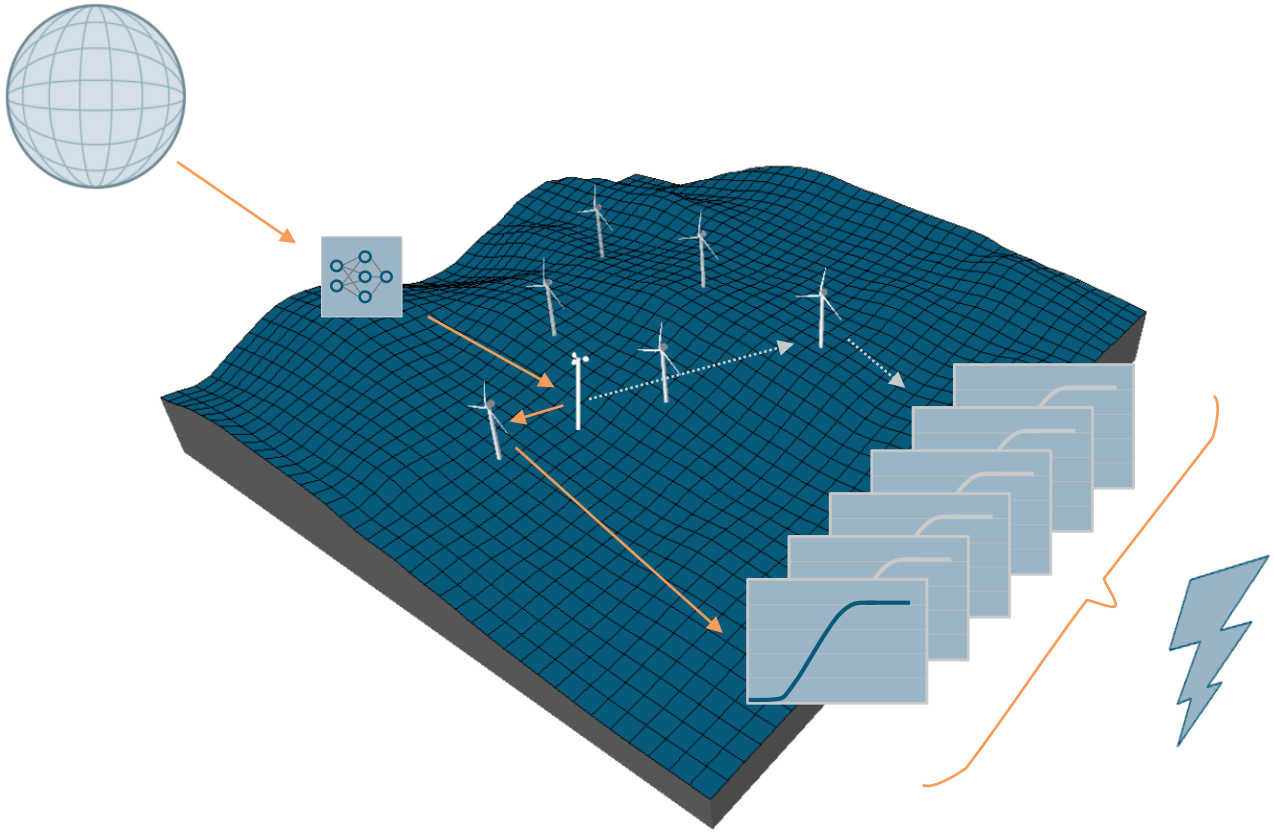
Strategy: Simplified



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