



Prediction solutions made to measure based on the flexible Anemos forecasting platform

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www.windpowerpredictions.com



What is Anemos?

- Leading edge research and development
- Prediction models and modules
- High-availability IT platform
- Prediction system
- Partnership (over 70 GW worldwide)
- Commercial activities world-wide





What is Anemos?

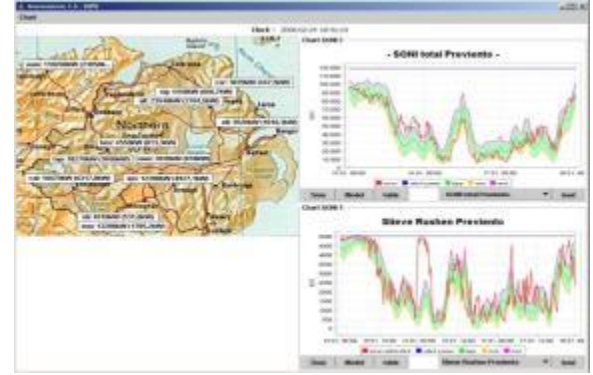
The Anemos prediction system

AWEFS/Australia 5 min predictions

Extreme events and ramps

Summary





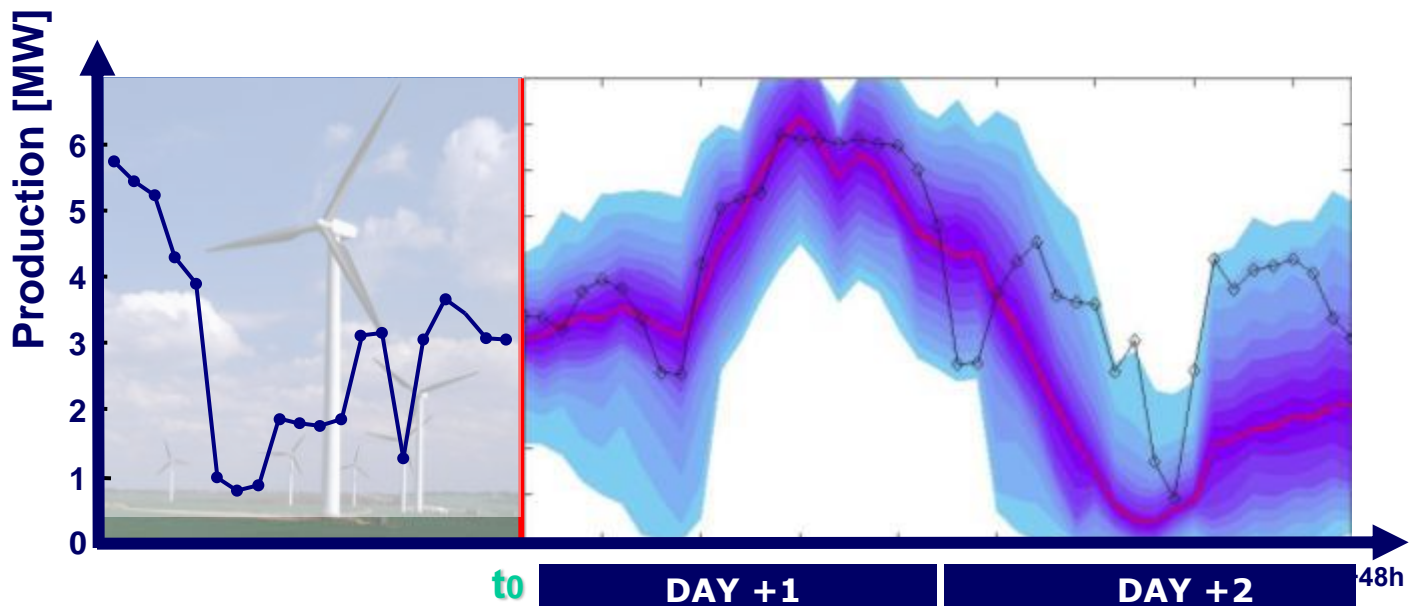
Anemos prediction system





Prediction models ...

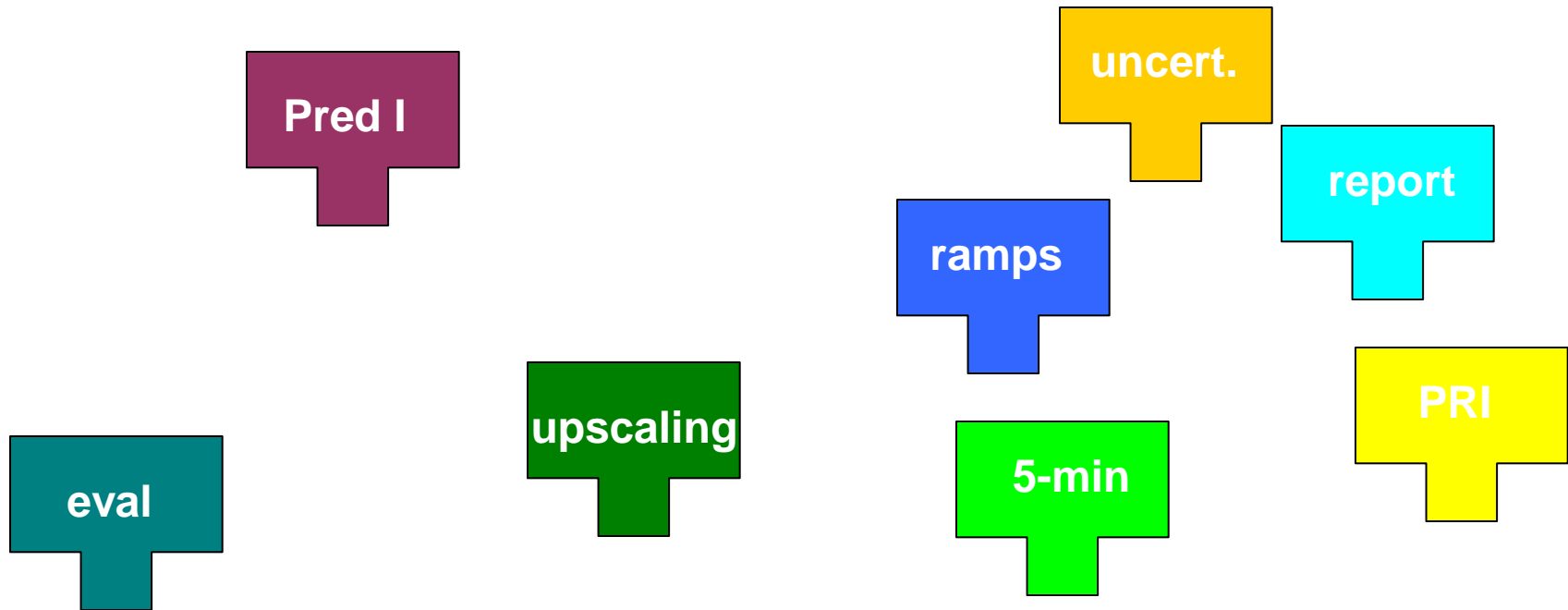
Models from current research





... and modules

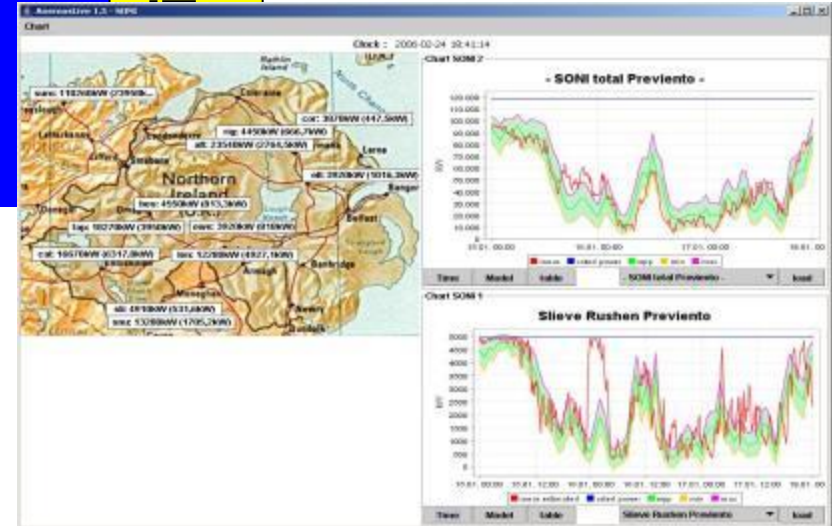
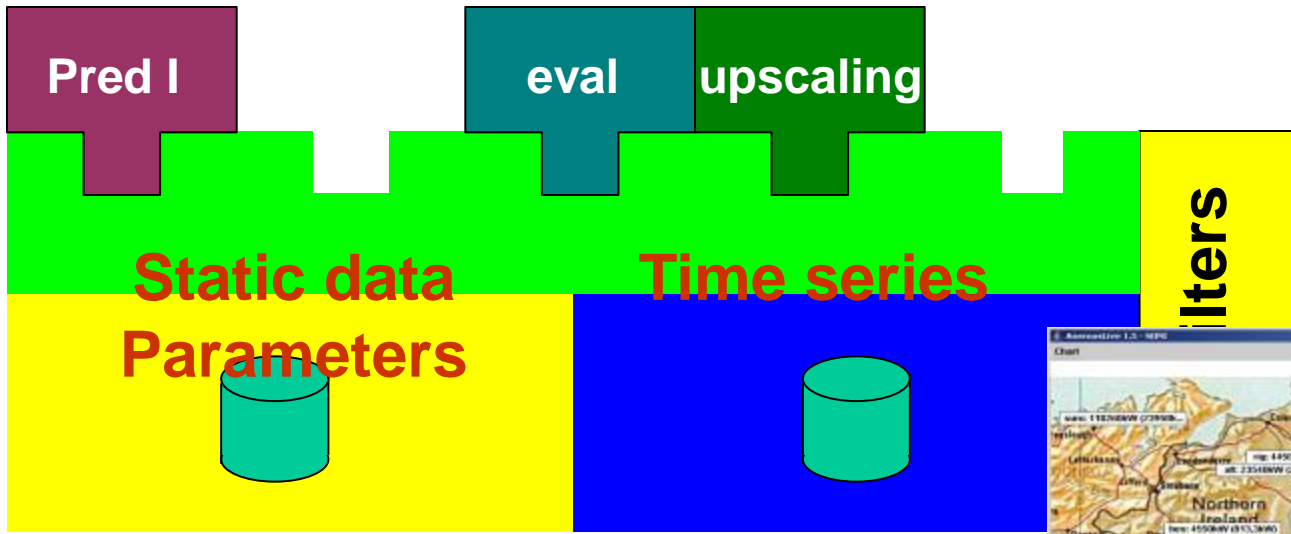
... implemented as software modules for the Anemos prediction system





... running on a prediction platform

Standardized solution of data handling, logging, user interfaces,...





AWEFS/Australia



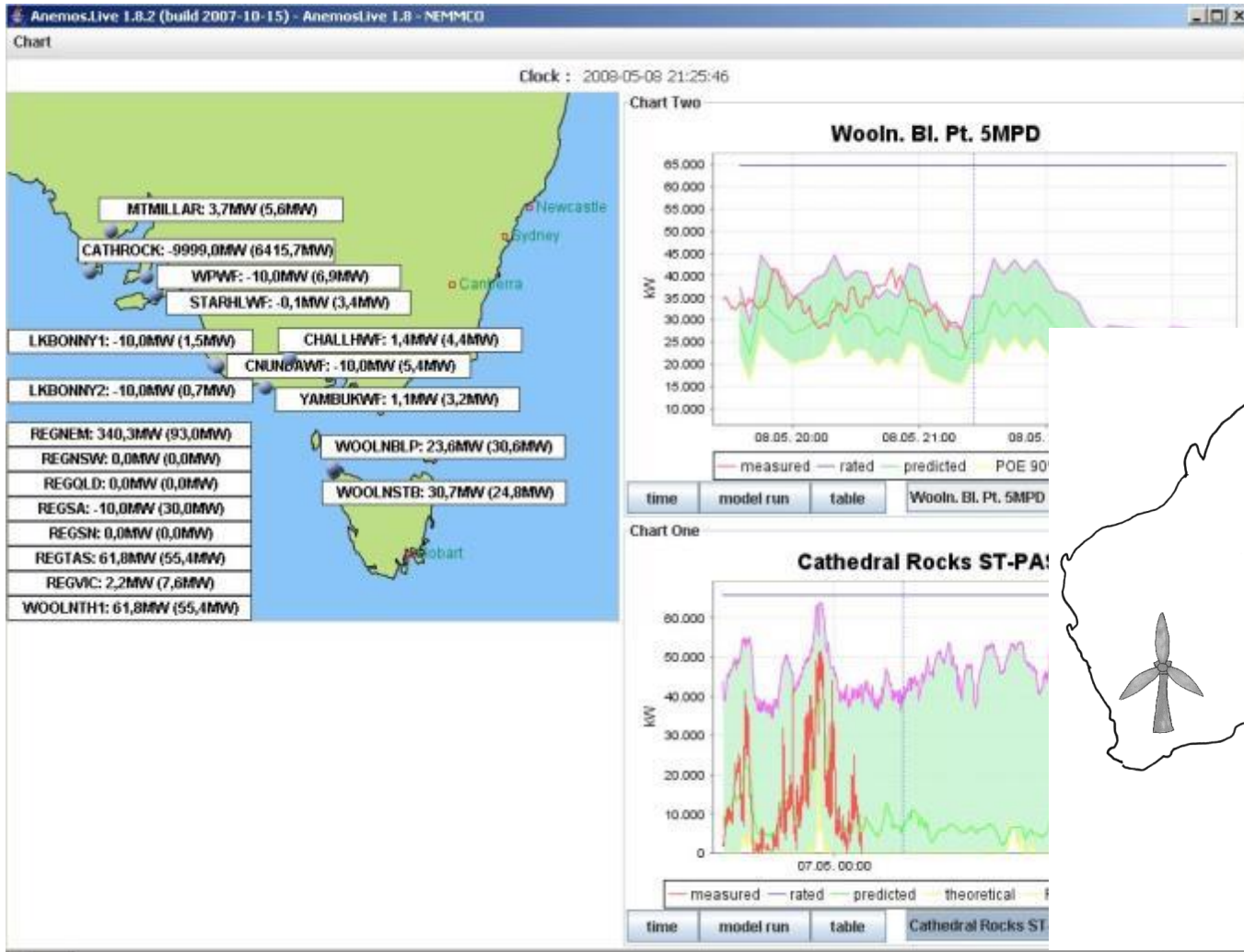


AWEFS/Australia

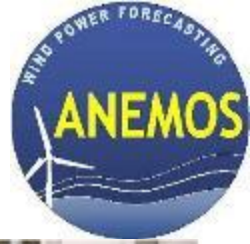
- Very short-term predictions: 5 minutes
- Fully integrated into Australian market system
- Ramp predictions and warnings
- 100 % availability



Australian Wind Energy Forecasting system



Australian Wind Energy Forecasting System



- Fully integrated in market system
- Fully automated market, 5-min bids
- „Market-system-proof“
- High-availability design

- 24/7 operation
- 100% availability (5 years)

- Support Australian researchers → Standardisation



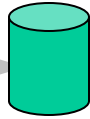


Prediction horizons and data sources

5 min to 2 h

5 min model *OSFive*
5 min fallback *OSFive*

aggregation module
uncertainty module
EMS/MMS exporter

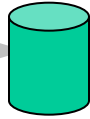


2 h to 10 days

WPP models
Combination

continuity module
post-proc module
aggregation module
uncertainty module

EMS/MMS exporter

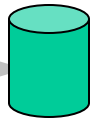


> 1 year

long term model

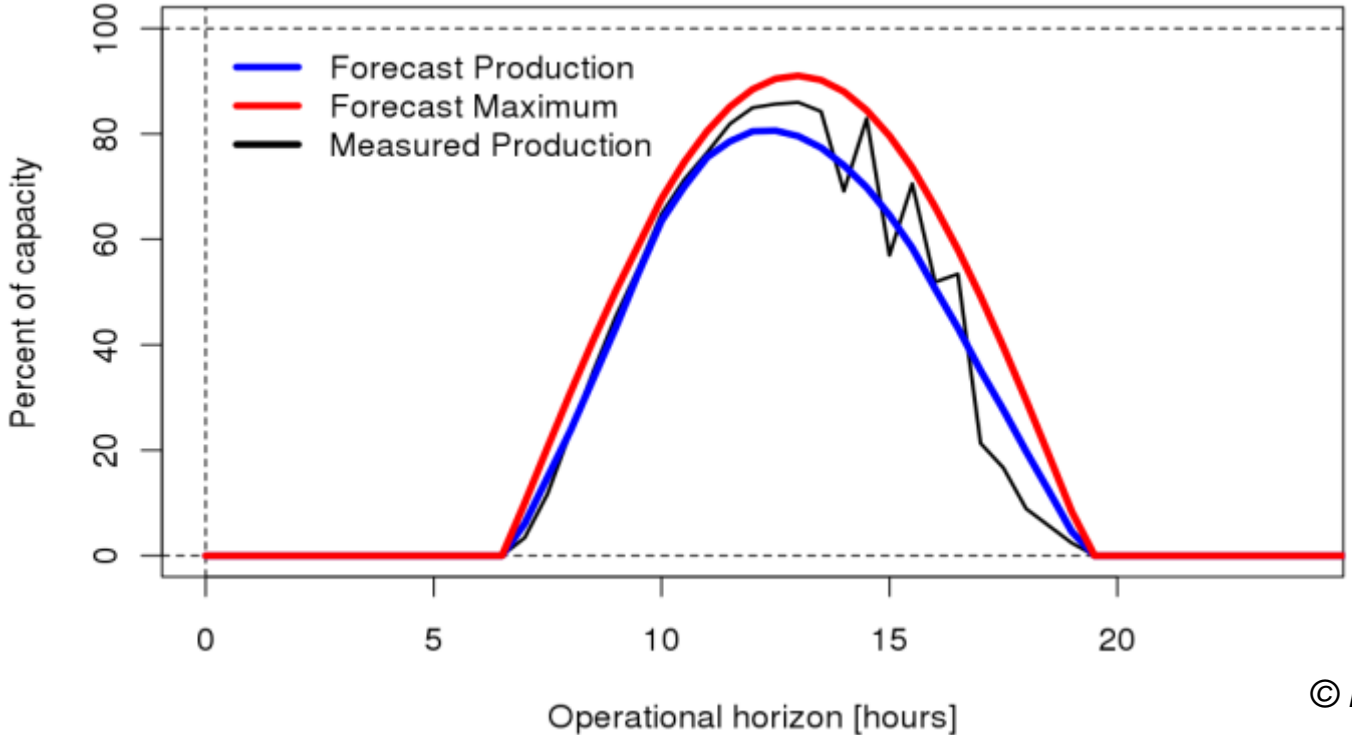
continuity module
aggregation module
post-proc module

EMS/MMS exporter



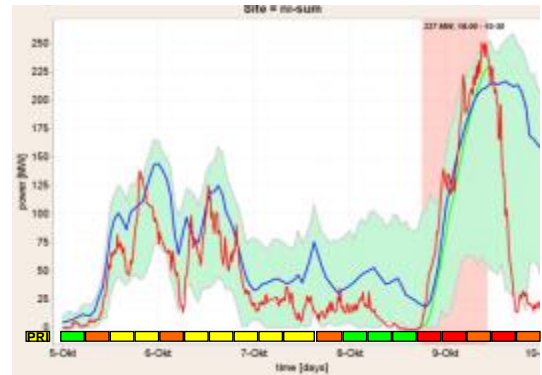


Now: ASEFS: Solar predictions at Australia



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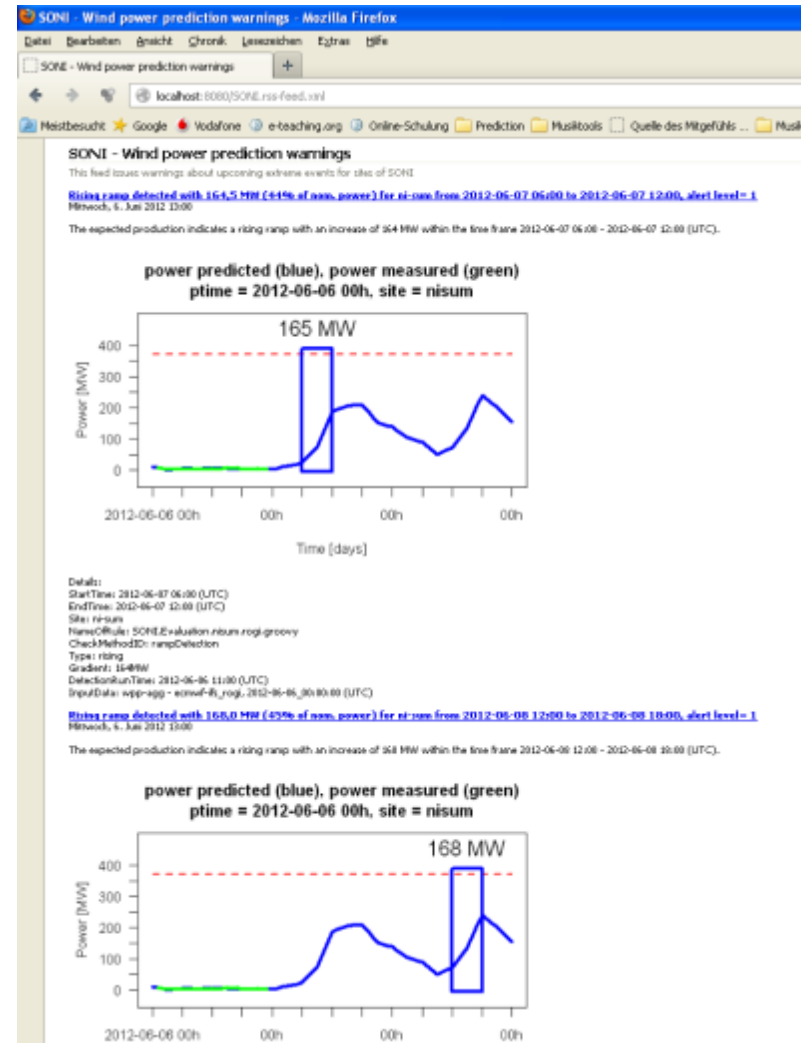


Extreme event predictions

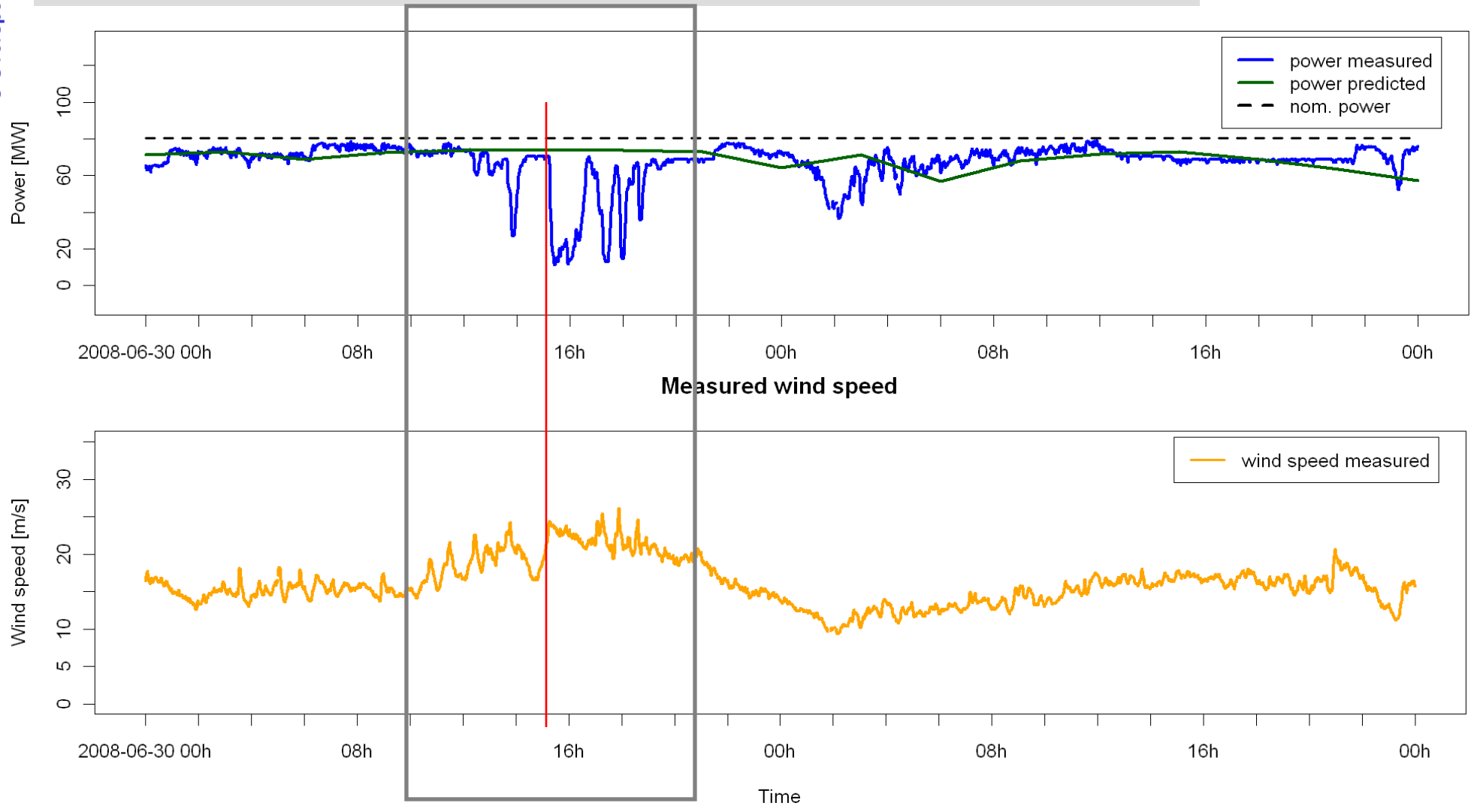


Ramp predictions: Anemos.rulez

- Specialised prediction model
- Highly configurable
- Detection method and parameter
- Warnings as RSS feed



Shut-down events and wind speed

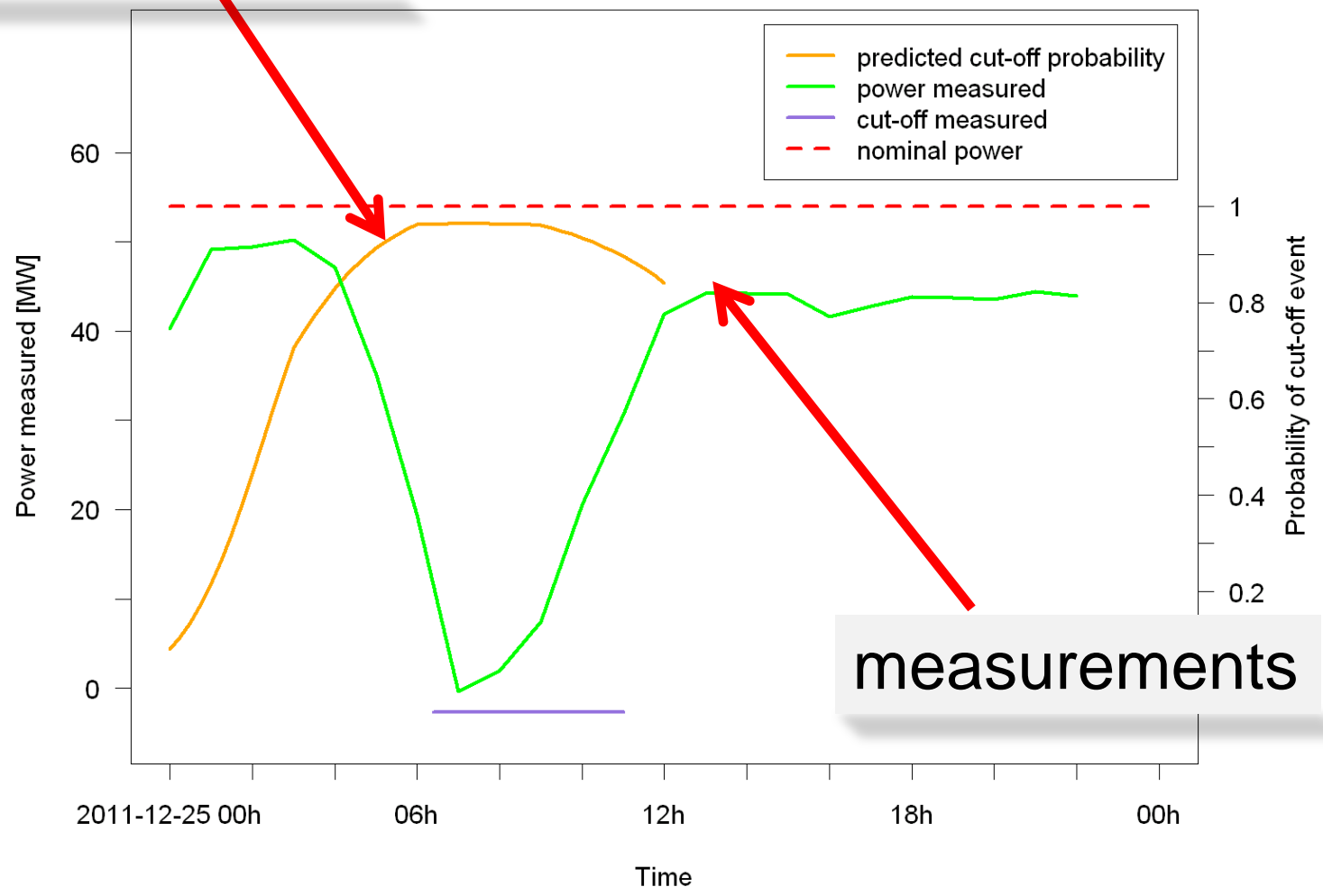




SONI WPPT cut-off example, EnFor

Cut-off probability

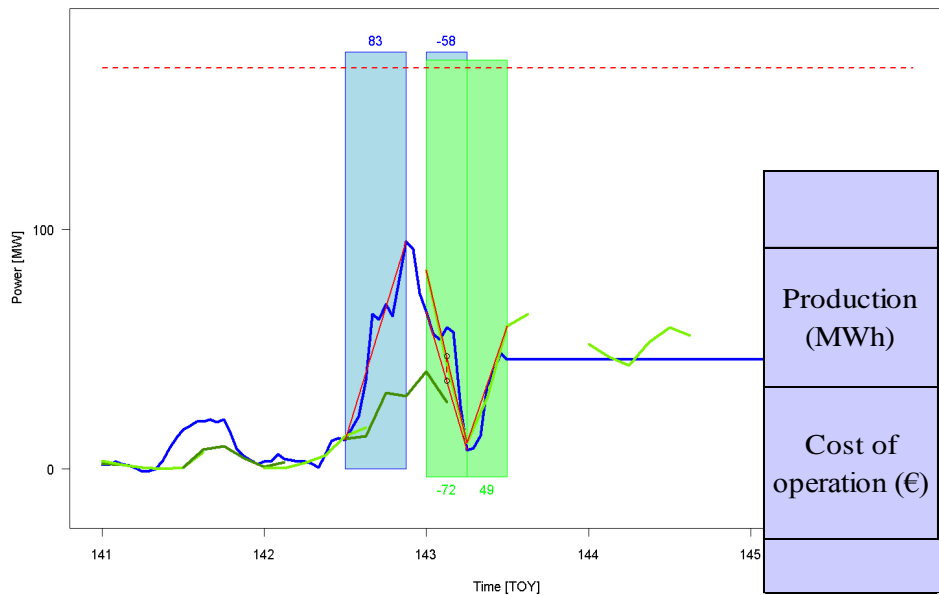
Wppt-cut-off predictions for sl2



Case PPC: Economic benefit

The CC started after a necessary repair, at 17:11. At that time the Gas turbine 11 was in operation and the load demand has started to increase. For this reason, and in absence of the information that wind generation was going to increase substantially, the Gas turbine 11 remained in operation. If this information was available, **Gas turbine 11 could stop, economic benefit: 12'210 EUR only for this event. (Source: Prin. Nikos Chatziargiriou)**

Power Predicted (green), Power Measured (blue)



		Gas Turbine 11	Combine Cycle	Total	Min spinning reserve
Production (MWh)	as system operated	143.71	109.42	253.13	9.38%
	with the information of the wind increase	0	253.13	253.13	16.36%
Cost of operation (€)	as system operated	42,972	44,418	87,390	
	with the information of the wind increase		75,180	75,180	
Economic benefit (€)				12,210	





Anemos: from research to operations





Anemos system: From research to operations

- Standardized platform
- High IT level
- Ideal for on-site integration and on-site operation

- Short time to market for new developments and R&D by standardization

