



Using ECMWF's Forecast  
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Duferco GROUP

Lorenzo Ramella Pralungo & Kieran Lynch  
lorenzo.ramella@dufenergy.com

## About us

### Who we are

DufEnergy is an international, multi-commodity Swiss-based trading company;

### Our mission

To build an integrated portfolio at a global level, bringing our expertise and added value on our core markets:

### What we do

#### Trading



Energy purchase and supply in different countries. Energy flow management across the European borders.

We use our know-how to identify potential opportunities in the market.

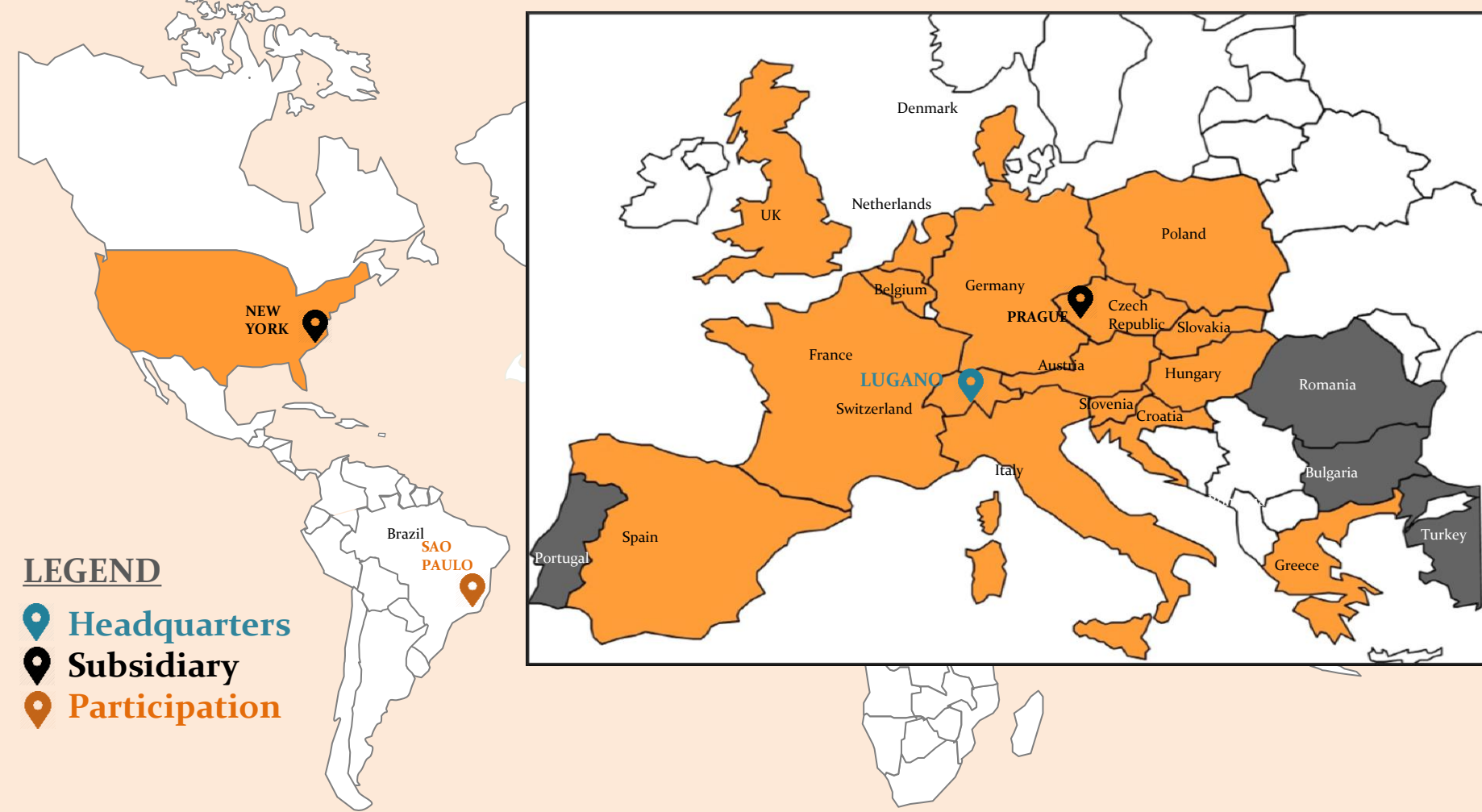
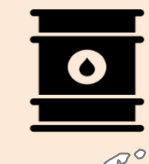
#### Asset Optimization



Production management of conventional and renewable power plants.

We currently manage different types of plants:

Electricity Natural Gas Oil LNG



### Where we are

Active in more than 20 Markets



Wind



Solar



Hydro



Biomass



Cogeneration

## Meteorology for Trading

Weather prediction (ECMWF, other NWP models)

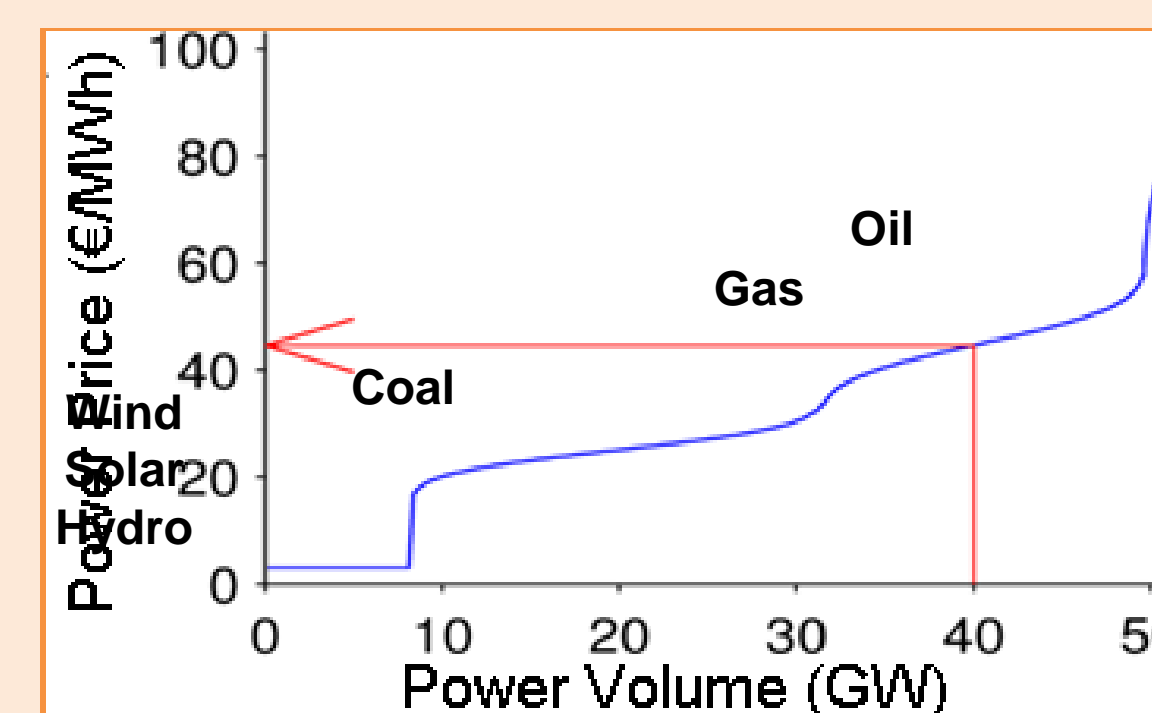
Wind  
Radiation  
Precip  
Temps  
SnowDepth

DufEnergy models for Supply & Demand

Supply forecast for Wind, PV and Hydro Power (Renewables)

Demand forecast

Price Forecast  
DufEnergy price model



Brainstorming Decision making



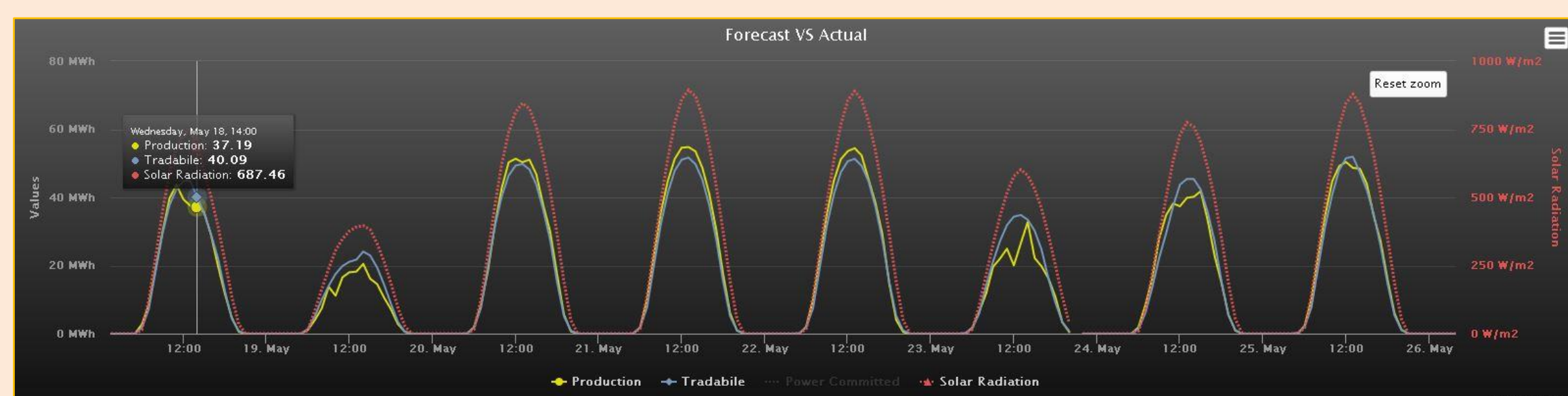
## DufEnergy Meteorology Activity: case study

### PV Power Forecast

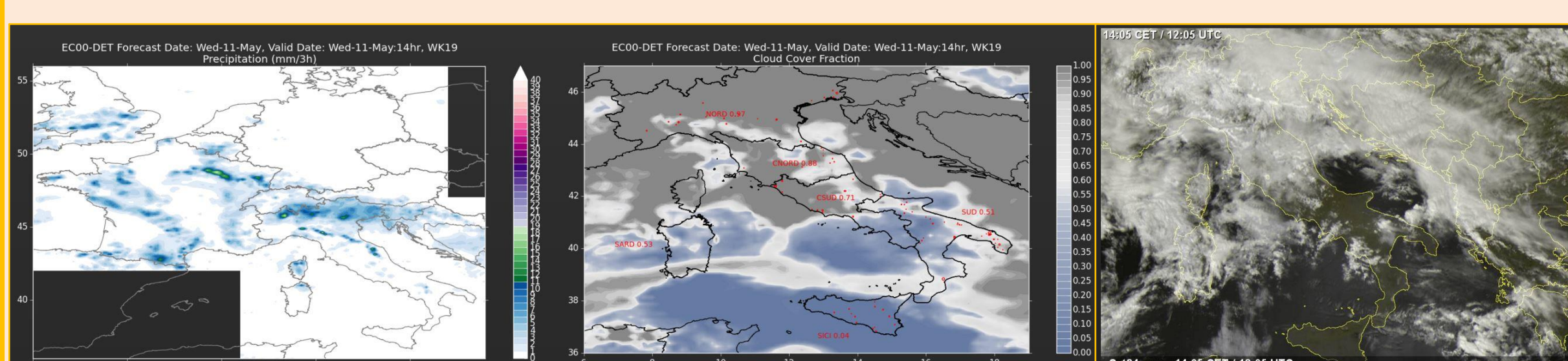
#### INPUT

Meteo (Radiation, Temp, Wind) + Farm: position, panel type  
Calibrated output over the farm historical production

#### OUTPUT



- Yearly satisfactory performance ( RMSE ~10%);
- Poor forecast with fog, cloudy and heavy rain  
May, 11<sup>th</sup> 2016 in the peak hours RMSE ~67%
- Similar behaviour on National scale over Europe

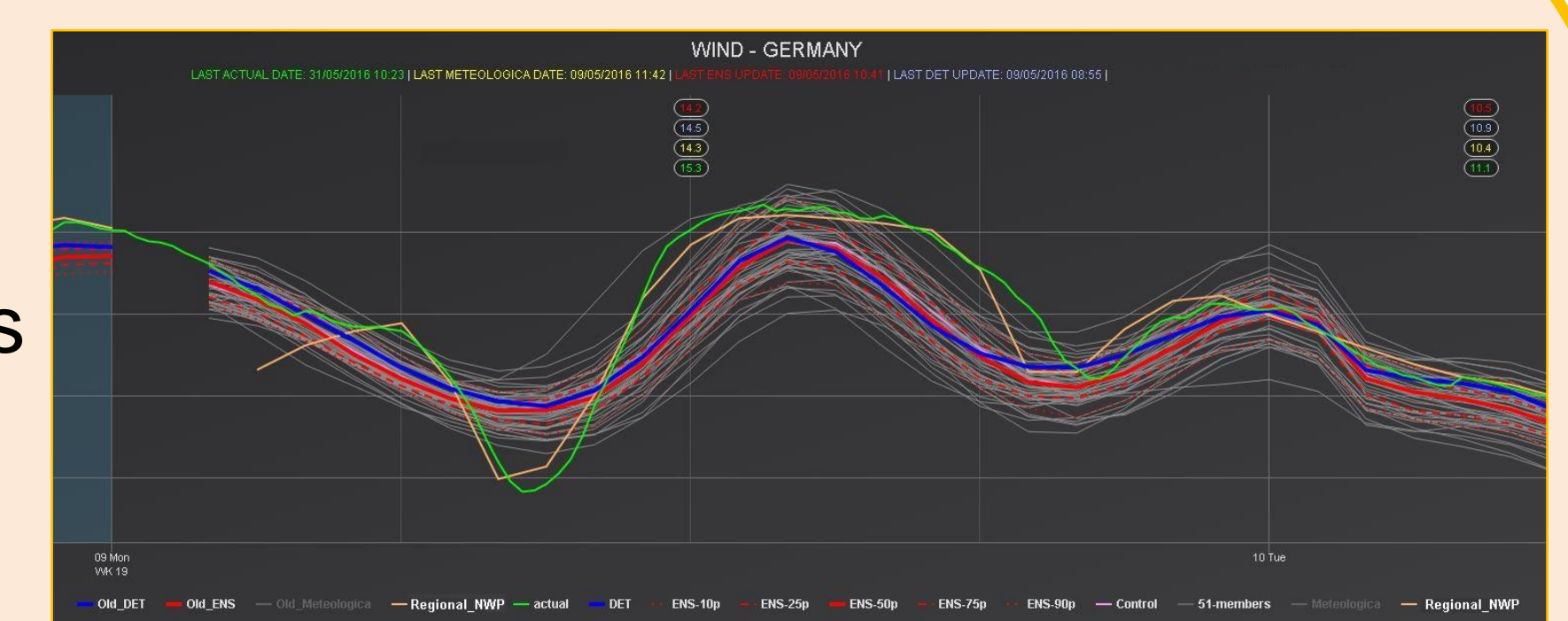


- Did you experience radiation overestimation with strong cloud cover/fog and rain?
- Which weather conditions lead to large radiation biases/errors?
- Do you think to offer in the near future instantaneous radiation values instead of cumulated radiation?

### Wind PowerForecast

#### CASE 1 National Forecast GER

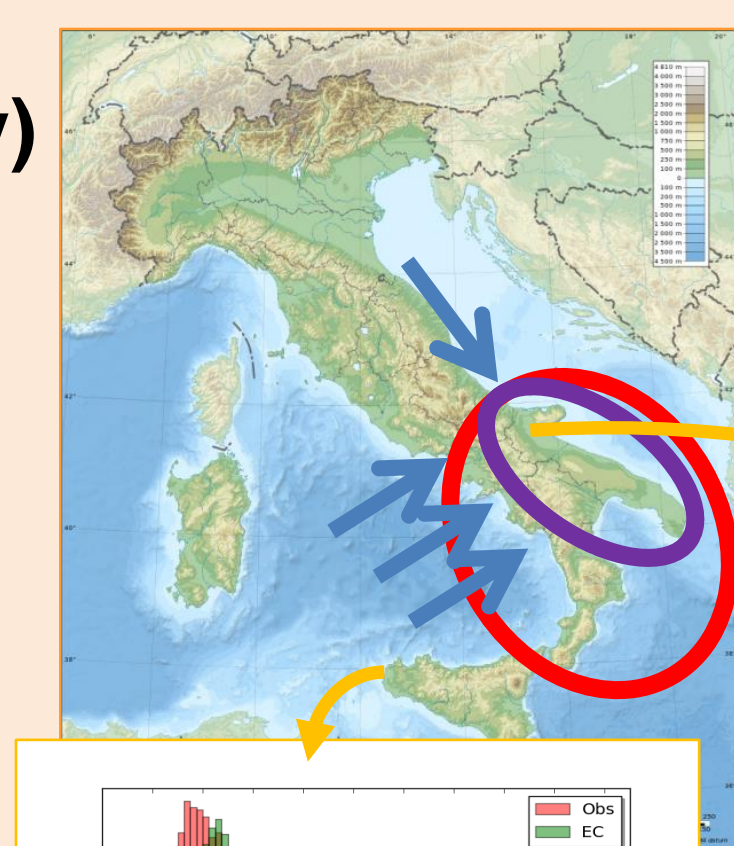
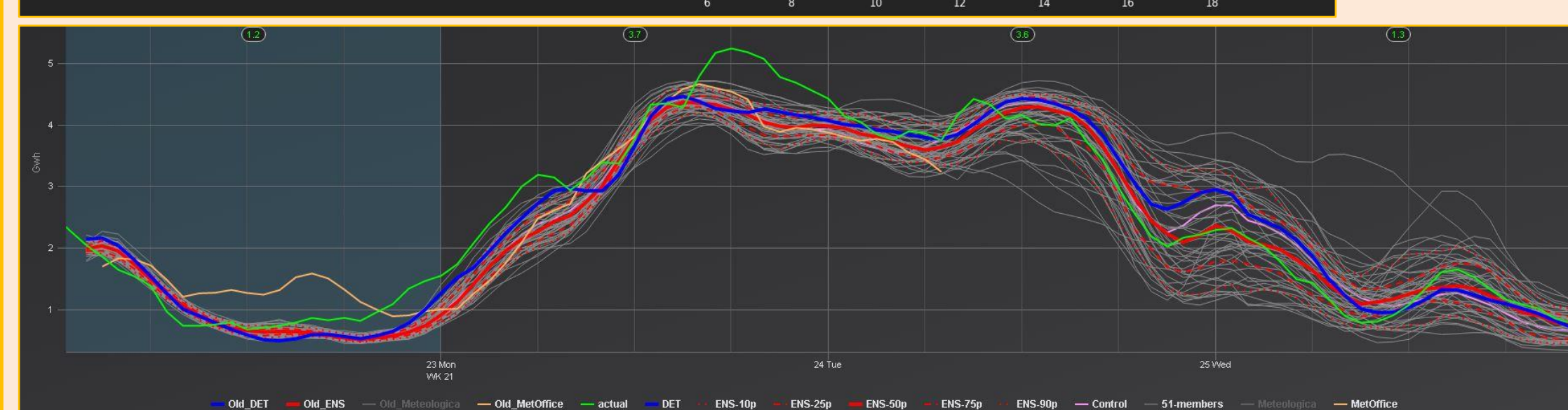
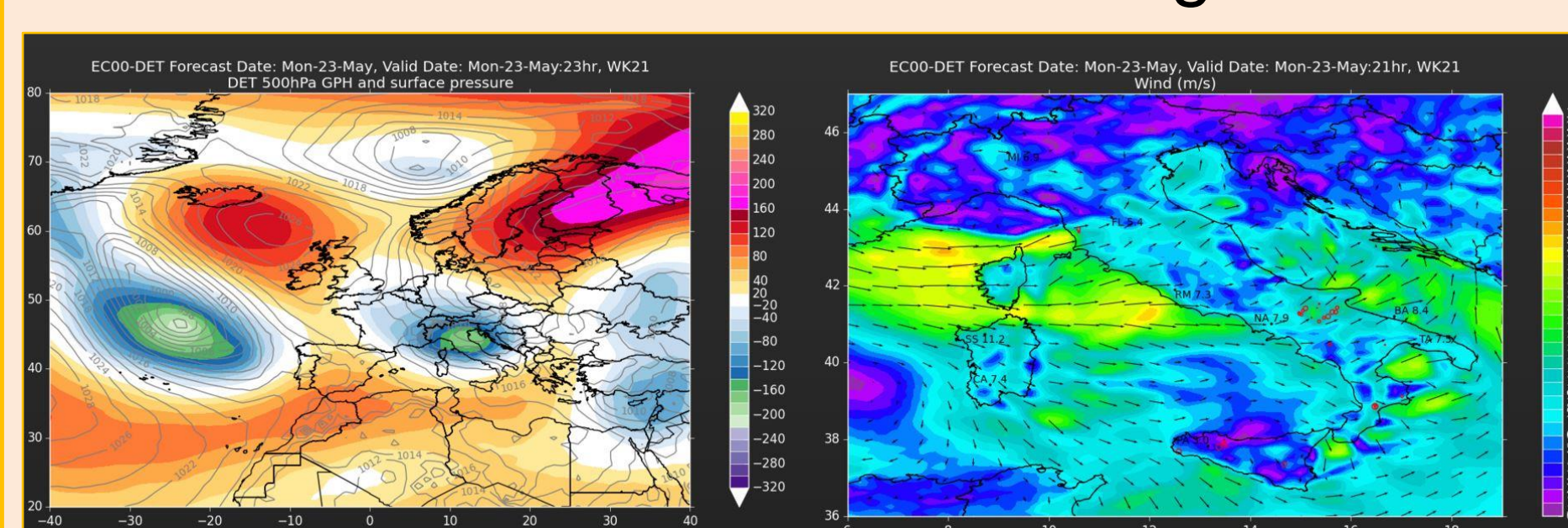
- On yearly basis ECMWF shows better performance than regional NWP.
  - On short and sharp events regional NWP is more accurate than ECMWF model.
- Could the ECMWF improve the forecast skill increasing temporal and spatial resolution?



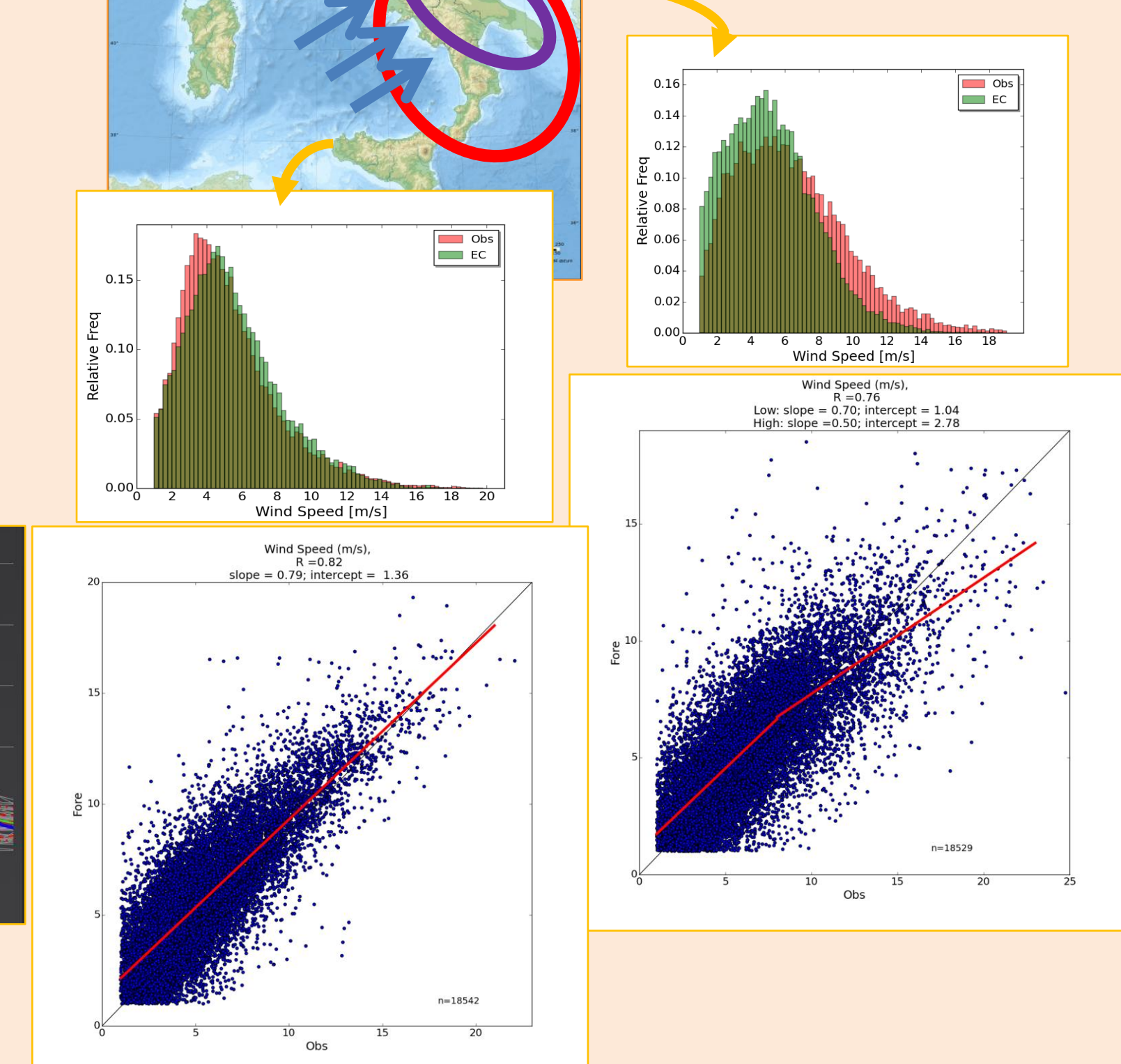
#### CASE 2

#### Wind Power Forecast over complex terrain (South Italy)

- Transition from subcritical to supercritical flow crossing Apennines (Durrán, 1986)
- Venturi effect in the North of Puglia



Installed Capacity  
~4 GW South ITA  
~2 GW Puglia



#### Questions:

- How to improve wind forecast?
- Is it possible to include more observations coming from challenging regions?
- Since the events are usually short (< 3h), could the dissemination at higher temporal resolution help? And higher horizontal resolution?