CLIM-RUN Product Information Sheet: May 2013

ADVANCED WIND RESOURCE RISK MANAGEMENT: Regional long-term wind speed scenarios

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Keywords: Wind, Renewable Energy, Investments

Target groups

- **Energy**
- **Professional organisations and federations**
- **Regional authorities**

Relevance to the case-study requirements

Most of the interest concerning wind modelling focuses on the very short-range (nowcasting) and on seasonal forecasts, because the largest part of the manageable risk is concentrated on these time-scales. However, the interaction with stakeholders, especially in the energy sector, has highlighted the need for more in-depth understanding of wind modelling capacities at a longer time scale, which may contribute to both site evaluation in the absence of very accurate wind atlases and to the assessment of risks that may affect the return on investments on longer time scales.

The approach

Regional Climate Models (RCMs) produce high-resolution (about 20 km) climate scenarios over selected areas by taking the input at the lateral boundaries from coarser resolution (about 100 km) Global Climate Models (GCMs). RCMs enhance the quality of climate projections with respect to GCMs, especially in the presence of complex orography (Artale et al., 2010) and in the proximity of coastal areas (Feser et al., 2011). In CLIMRUN, we have evaluated wind modelling over the Euro-Mediterranean area using what is currently the largest and most consolidated ensemble of RCM simulations - produced during the EU-FP6 project ENSEMBLES (van der Linden and Mitchell, 2009).

The table shows (in blue) the GCMs-RCMs combinations that have been extracted from the ENSEMBLES archive to develop the CLIMRUN products on wind scenarios.

		Global Model					
		HadCM3Q16	ARPEGE	BCM	ECHAM5-MPIOM r3	MIROC3.2 hires	HadCM3Q0
Regional Model	C4IRCA3	■					
	CNRM-RM4.5		■				
	DMI-HIRAM5		■	■	■		
	ETHZ-CLM						■
	ICTP-RegCM3				■		
	KNMI-RACMO2				■	■	
	METNO-HIRAM			■			■
	METO-HC HadRM3Q0						■
	MPI-M-REMO				■		
	SMHIRCA			■	■		
	UCLM-PROMES						■

References:
Artale et al., 2010. An atmosphere-ocean regional climate model for the Mediterranean area: assessment of a present climate simulation Clim. Dyn. doi:10.1007/s00382-009-0691-8
Feser et al., 2011. Regional climate models add value to global model data". Bull. Of the American Meteorological Society 92. 1181-1192.
van der Linden P., and J.F.B. Mitchell , 2009. ENSEMBLES: Climate Change and its Impacts: Summary of research and results from the ENSEMBLES project. Met Office Hadley Centre, FitzRoy Road, Exeter EX1 3PB, UK. 160pp

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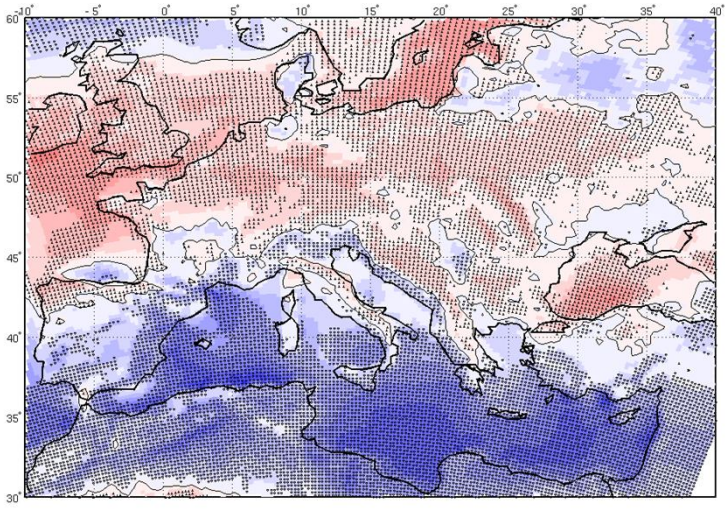
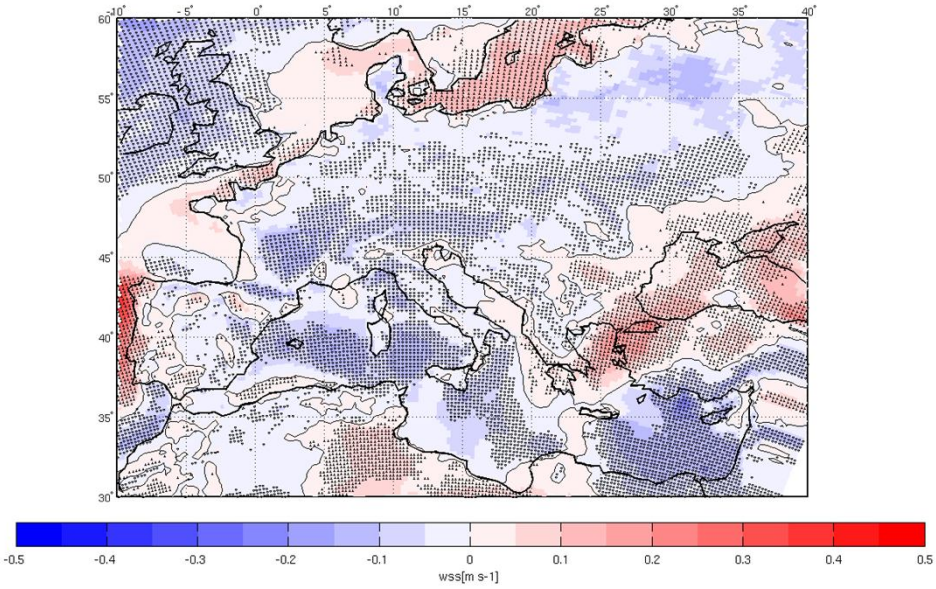
The product

A1B RCMs wind speed changes 2021-2050 vs 1961-1990; DJF



A1B RCMs wind speed changes 2021-2050 vs 1961-1990; JJA



Mean change in surface wind speed projected by A1B greenhouse gas emissions scenario for winter (top) and summer (below).

Colours represent the average long-term change in wind speed projected for 2021-2050 with respect to 1961-1990.

Model data are produced at an horizontal resolution of about 25Km.

Stippled areas represent areas where more than 66% of the models agree in the sign of the long-term change. Red indicates an increase, blue a decrease.

Making the product usable

The CLIMRUN team is seeking collaborations with stakeholders in the energy sector to make this climate product usable. Areas for potential cooperation include:

- Derivation tailored indices based on wind speed products
- Statistics of extremes
- Critical thresholds
- Calibration climate models to specific wind energy sites.

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Further information: www.climrun.eu