



Wind Has No Borders

Energy Talks Ossiach 2011

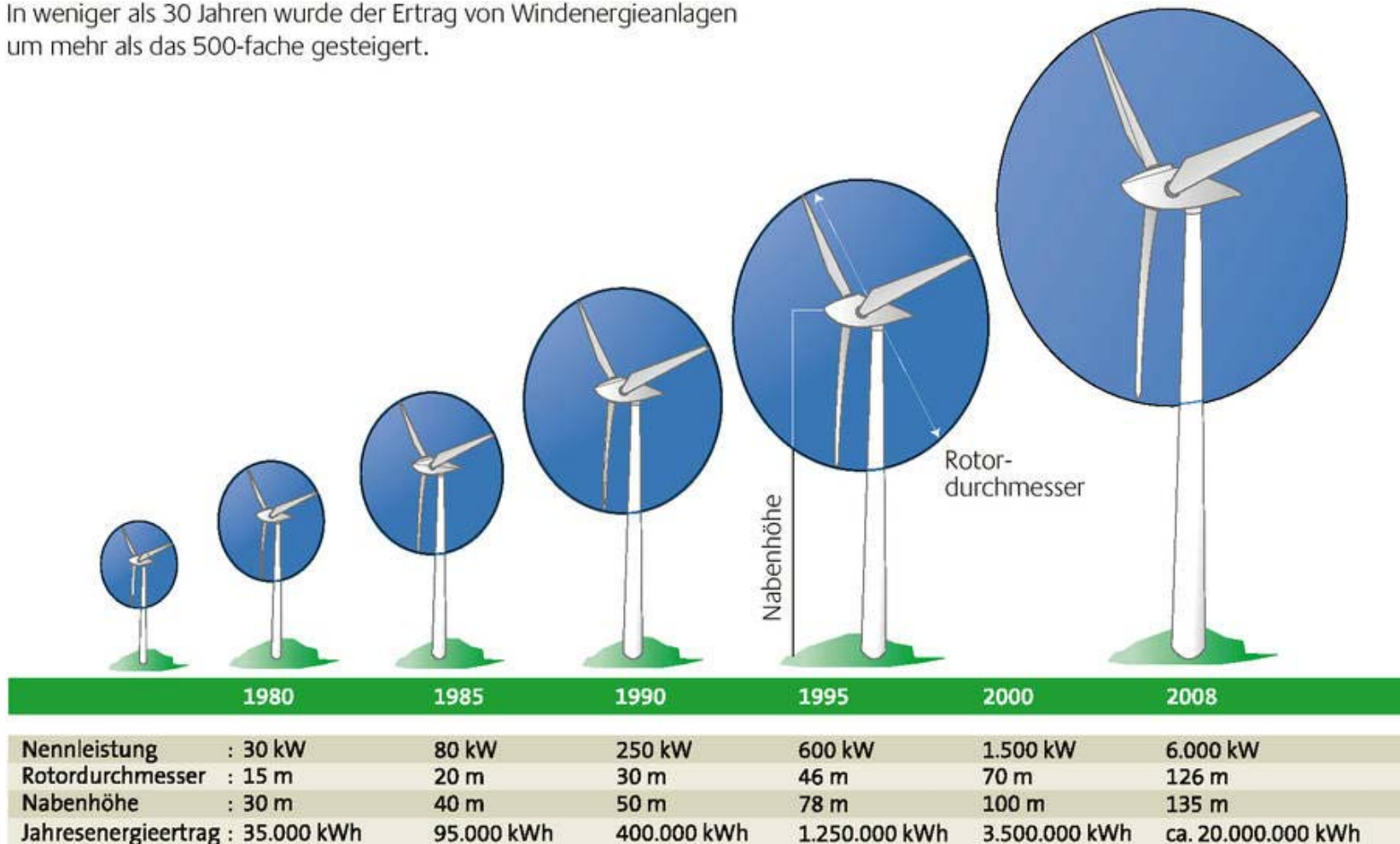
Rüdiger Kipke
Ossiach, 06.05.2011

Some facts on 8.2:

- Founded 1995
- currently > 100 people
- consulting engineers for wind, solar PV and biogas
- over 15,000 inspections of turbines
- construction supervision, due diligence, negotiation assistance etc.

Wind has No Borders: No Borders in Size?!

In weniger als 30 Jahren wurde der Ertrag von Windenergieanlagen um mehr als das 500-fache gesteigert.



Source: BWE

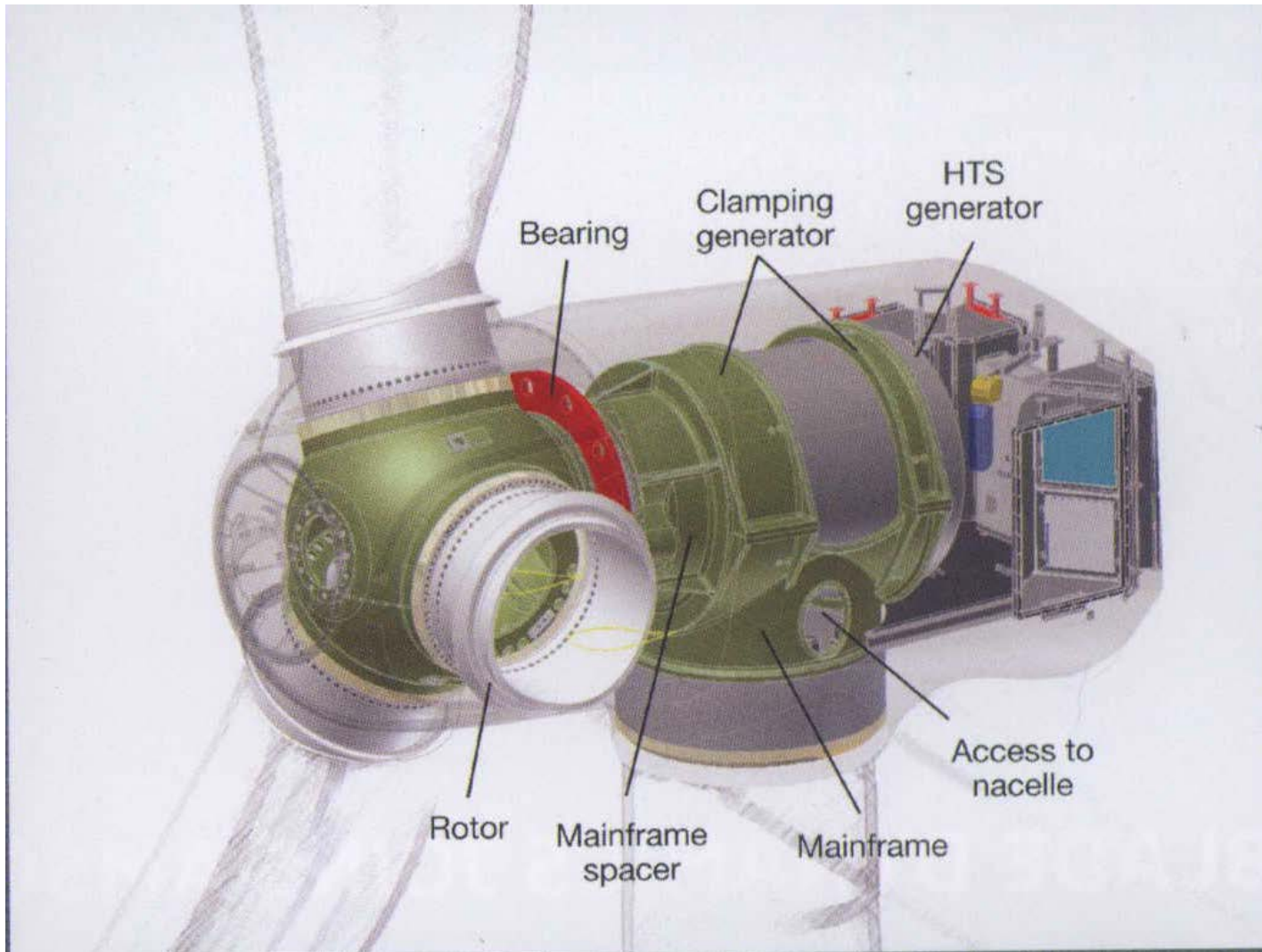
Typ	Rated power (kW)	Rotor diameter (m)	Hub height (m)
Enercon E 126	6000	126	135
REpower 6M	6000	126	100
Siemens SWT-3.6-120 3.0 - 101	3600	120 / 101	80 / ?
GE 2.5	2500	103	100
Fuhrländer FL 2500	2500	100	160
REpower 3.4	3200	114	123

» Enercon E-126, 7.5 MW

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für Erneuerbare Energien
*The Experts in
Renewable Energies*





Source: AMSC



Wind has No Borders: No Borders!

Land	Installierte Leistung in MW 2008 / 2009	Installierte Leistung in MW 31.12.2010 (gerundet)
Deutschland	24.694	27.000
Spanien	16.453	20.700
Dänemark	3.159	3.700
USA	25.237	40.000
Japan	2.033	2.300
China	12.121	42.000
Indien	9.655	13.000
Australien	1587	1.900
Ägypten	384	550



- 240 x GE 2.5 MW WTG
- First phase: 139 WTG already commissioned



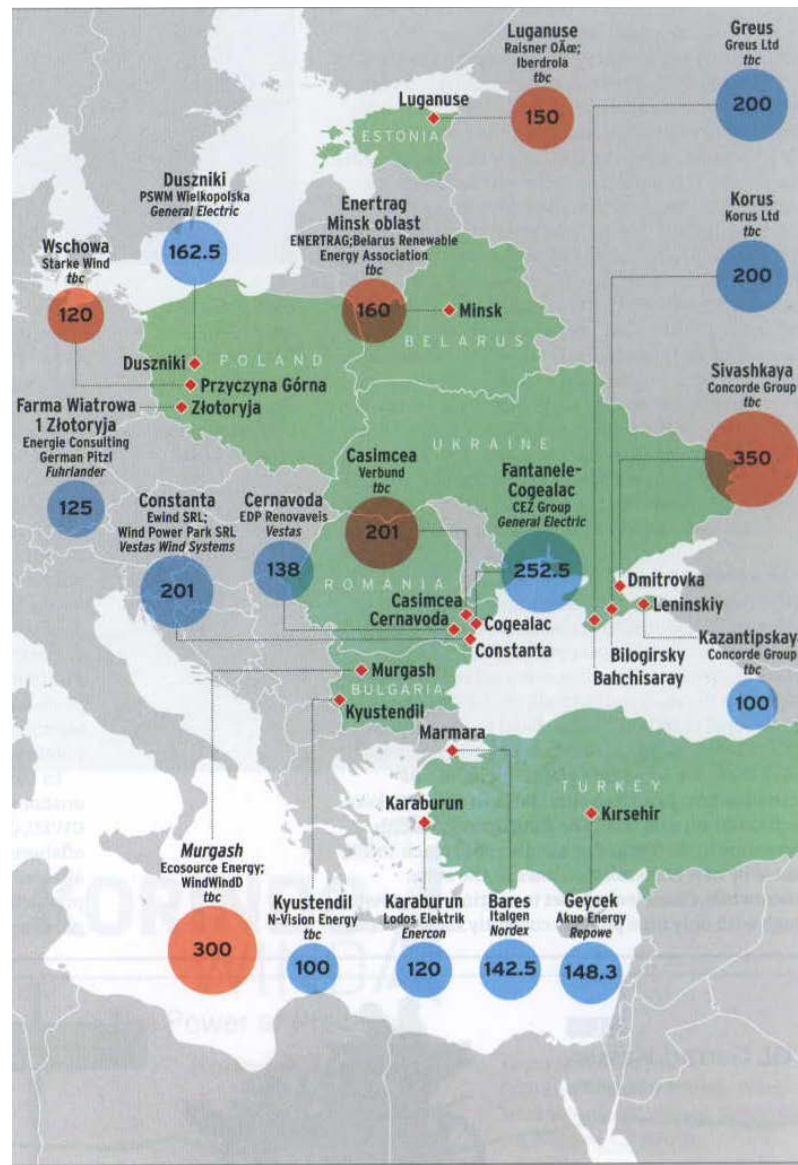


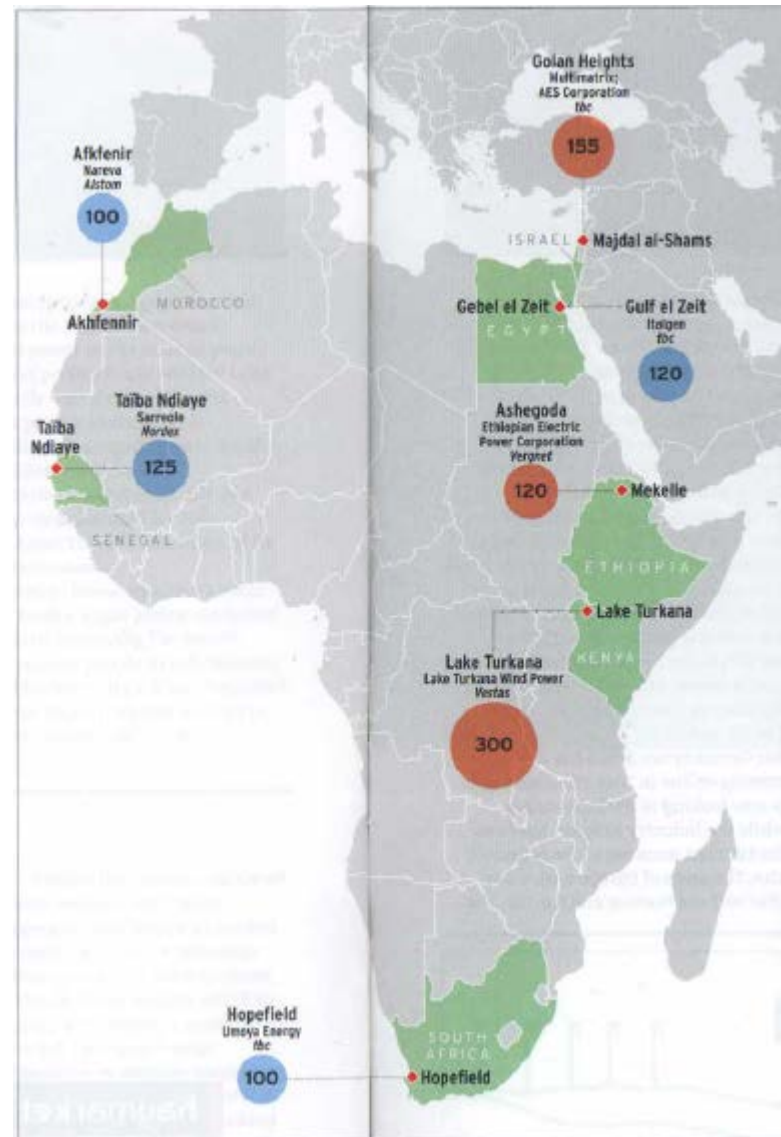
On 4200 m

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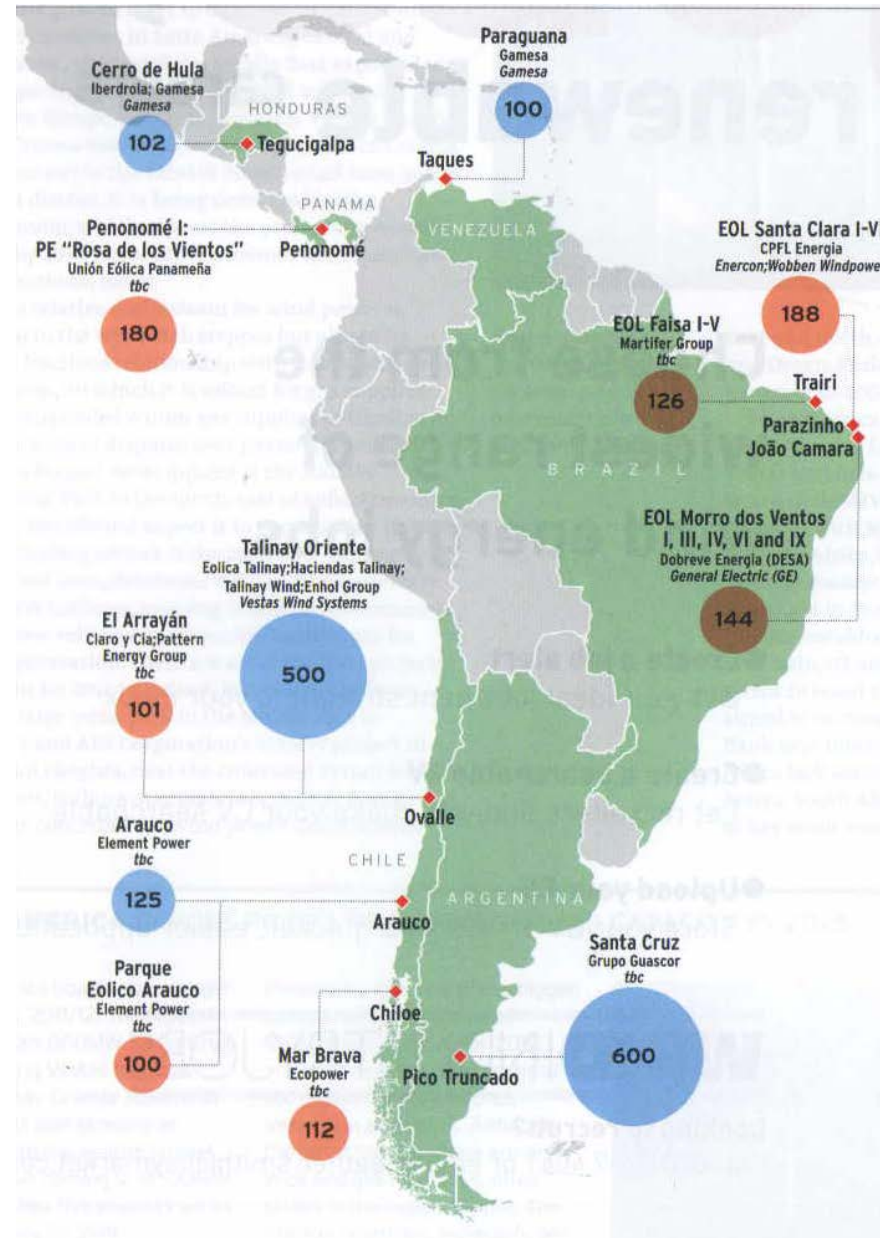
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Source: Windpower Monthly 01/2011





Wind has No Borders: No Borders for Manufacturing!







Producing 6 MW generators

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Wind has No Borders: Wind Power on Sea and Land

	Installed MW 2009	Accu. MW 2009	Installed MW 2010	Accu. MW 2010
Country				
Belgium	0	30	165	195
P.R. China	63	63	39	102
Denmark	228	625.9	207	832.9
Germany	60	60	108	168
Ireland (Rep.)	0	25	0	25
Netherlands	0	246.8	0	246.8
Norway	2.3	2.3	0	2.3
Sweden	30	163.3	0	163.3
UK	306	894	925	1819
Total capacity - World	689	2,110	1,444	3,554

Source: BTM Consult - A Part of Navigant Consulting - March 2011



First foundation
London Array-
March 2011
Phase One: 630 MW
Largest Offshore
Wind Park



Offshore wind park Horns Rev/DK 8.2^{AG}

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» Hywind - the world's first large-scale floating wind turbine

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Source: www.siemens.com

- Hywind project was developed by StatoilHydro
- SWT-2.3 MW with a rotor diameter of 82 meters
- located approx. 12 km south east of Karmøy/Norway at a water depth of about 220 meters.



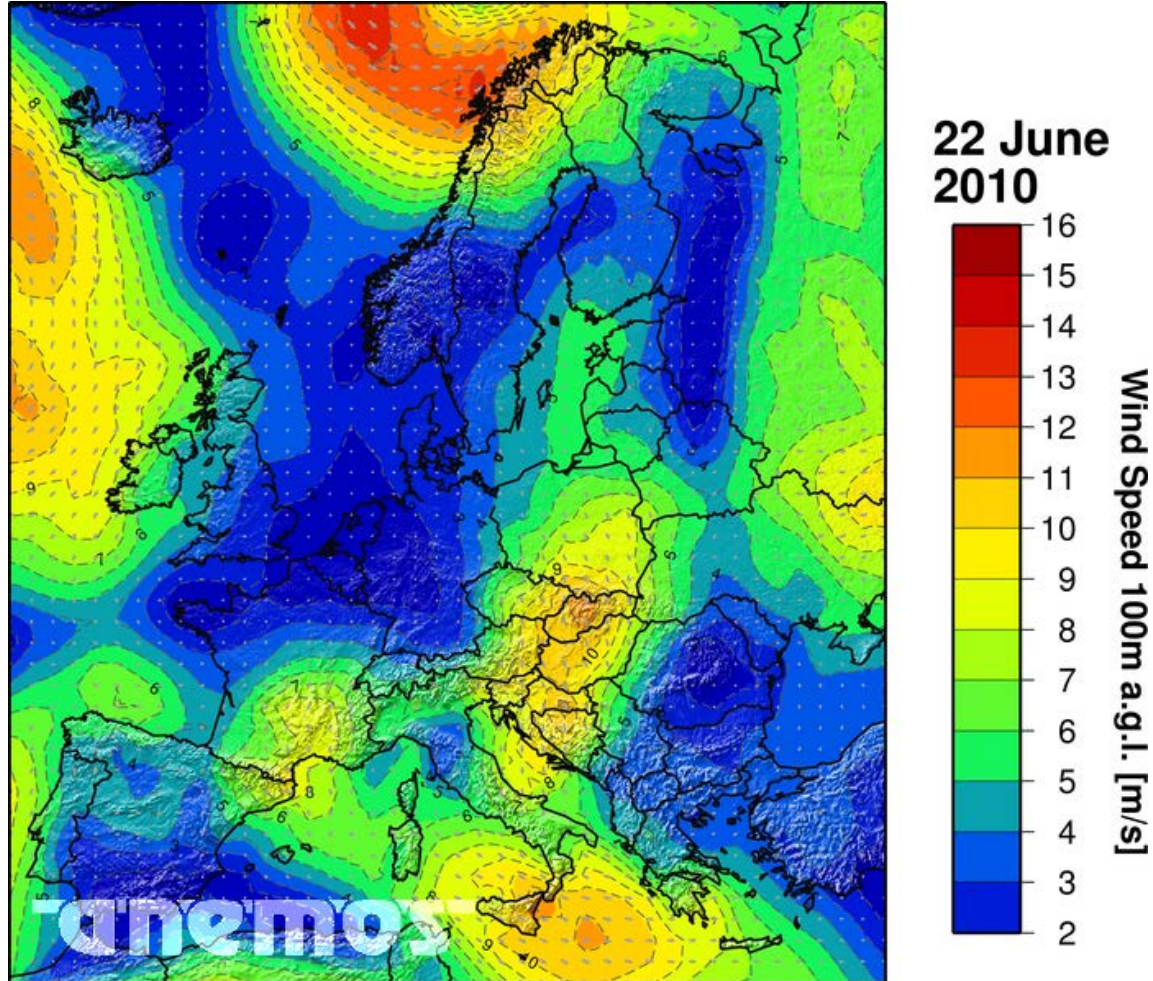
Wind has No Borders!



No borders for no wind

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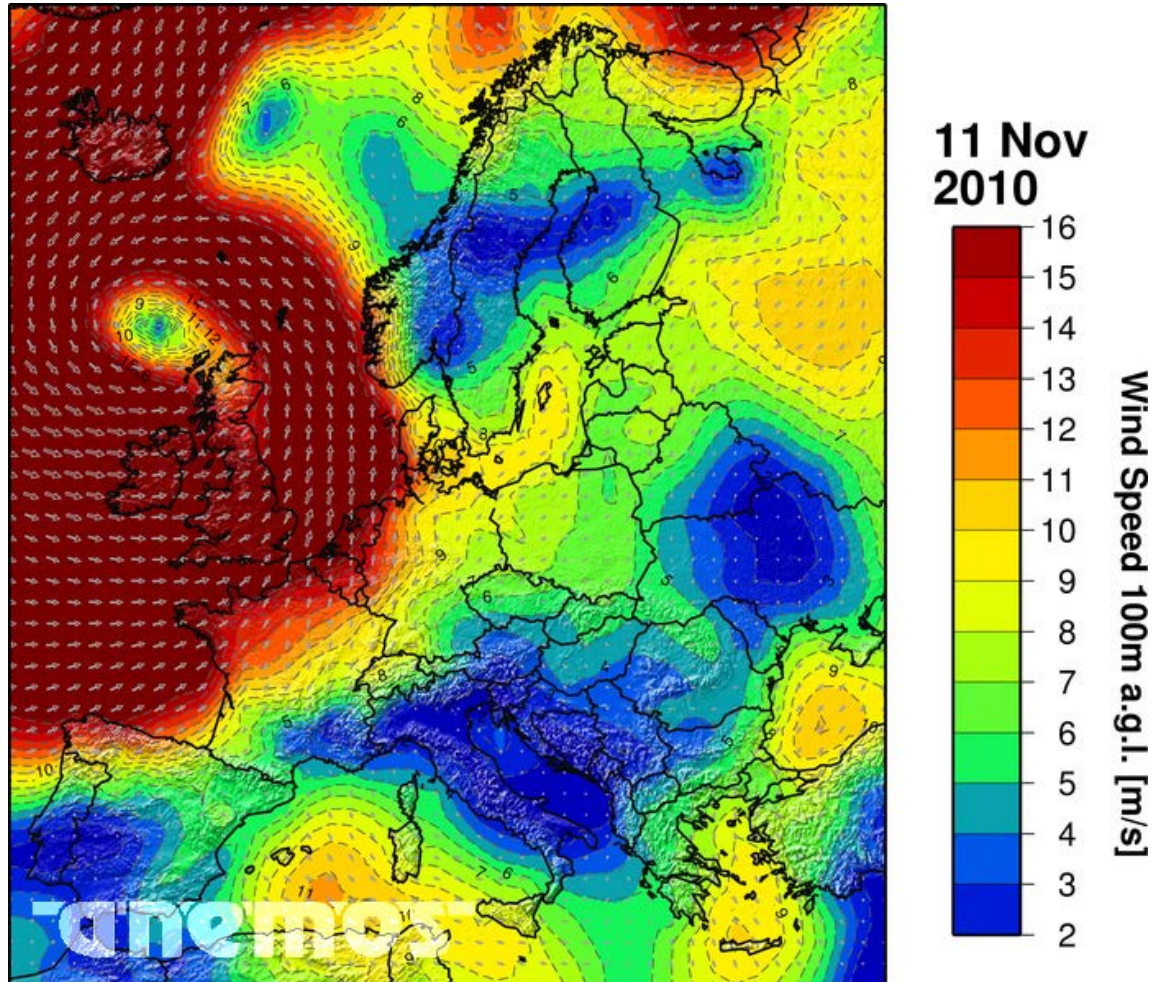


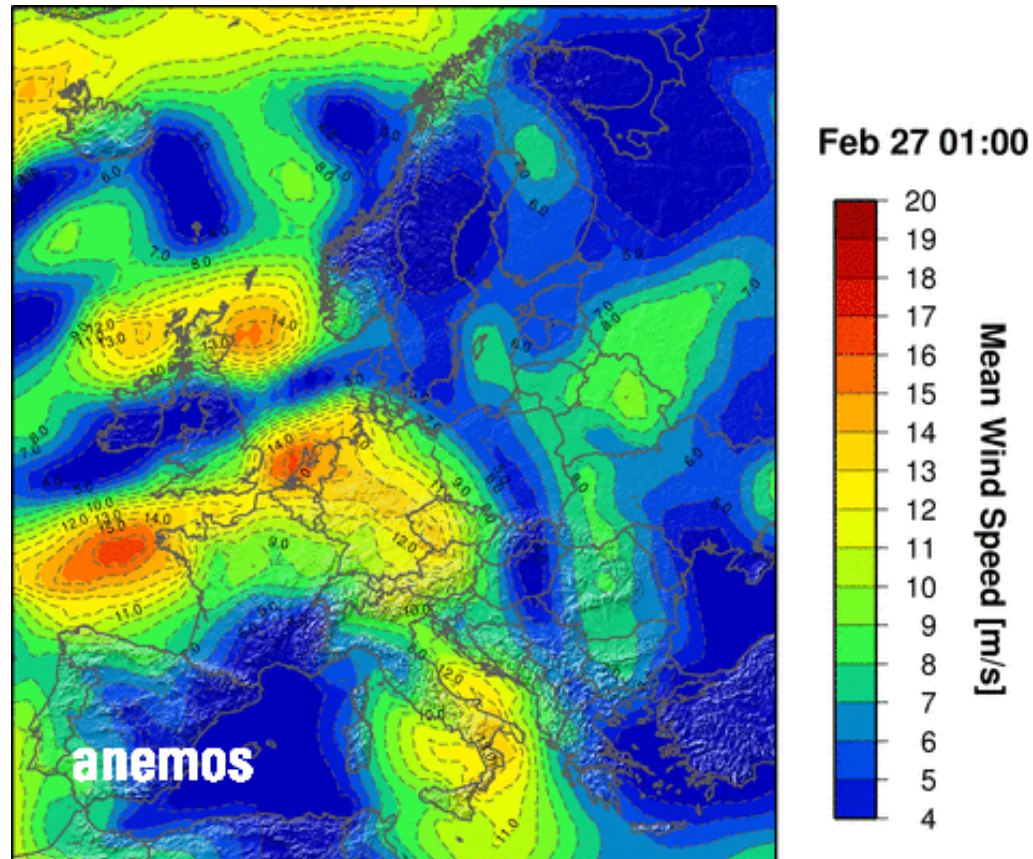


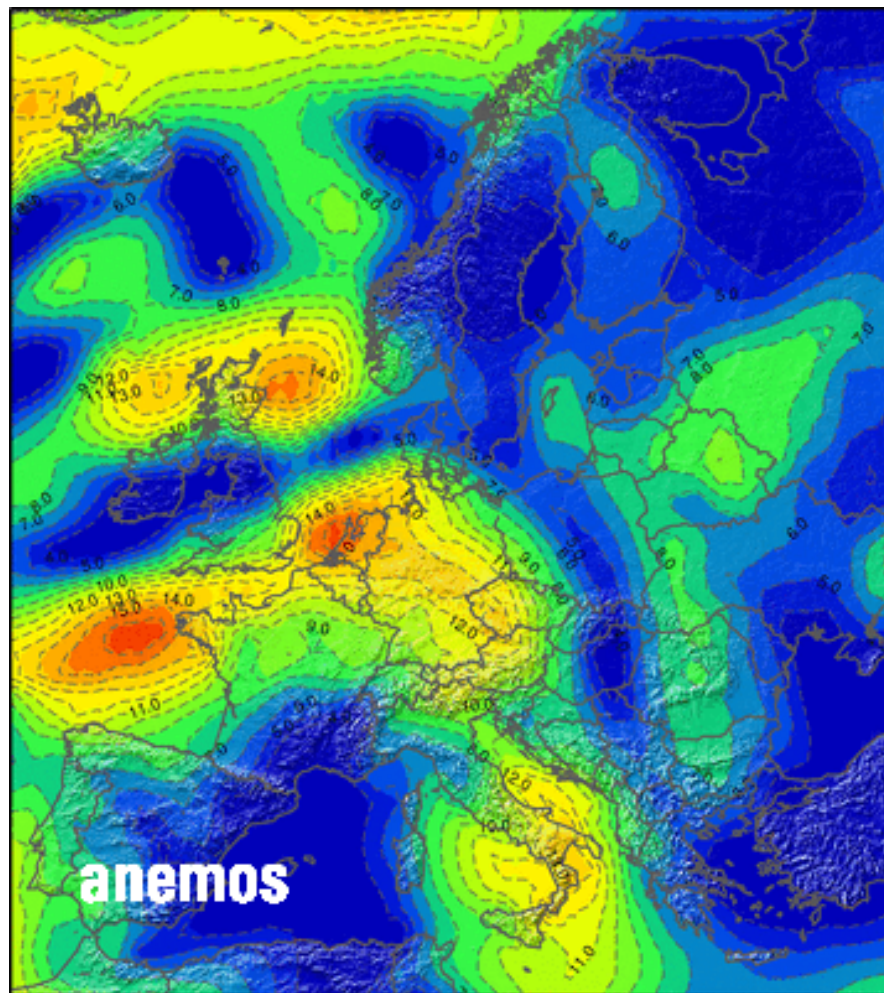
No borders for a storm

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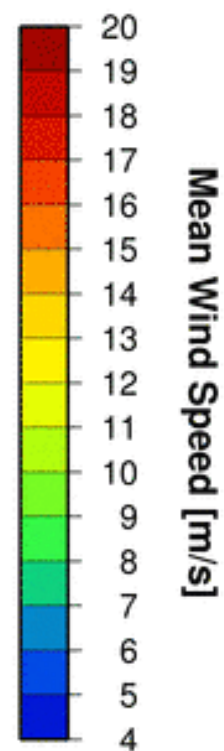
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Feb 27 01:00



Wind has No Borders: No Borders for the Grid!

From \ To	IE/NI	GB	MA	PT	ES	FR	BE	NL	LU	DE (DE)	DKw (DK)	DKe (DK)	NO	SE	FI
IE/NI		450													
GB	80					2000 _{FR}									
MA					900 _{MA}										
PT					1700										
ES			600 _{MA}	1500		1300									
FR		2000 _{FR}			500		2300			3200					
BE						3400		2400							
NL							2400			3850					
LU										980					
DE (DE)						2700		3000	NRL		1500 _(DK)	585 _{800 DE}		610	
DKw (DK)										950 _(DK)			950 _{NO}	680	
DKe (DK)										600				1300	
NO											950 _{NO}			3895	
SE										600	740	1700	3595		1650
FI														2050	
CH						3200				1500					
IT (IT)						2575									
AT										2200					



Commissioned, under
construction, awarded

Tendered

Potentially to be tendered

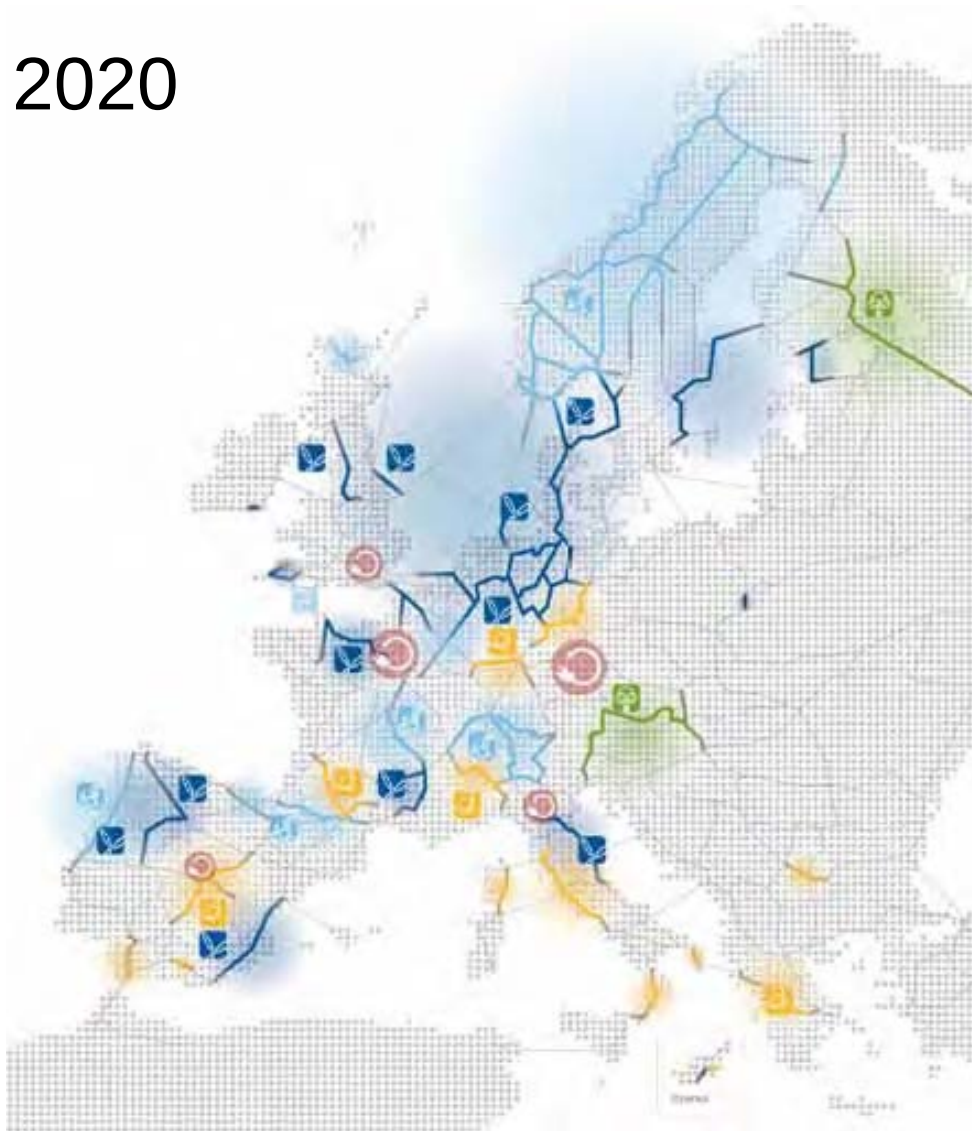
Source: Tennet



Source: <http://www.friendsofthesupergrid.eu/>

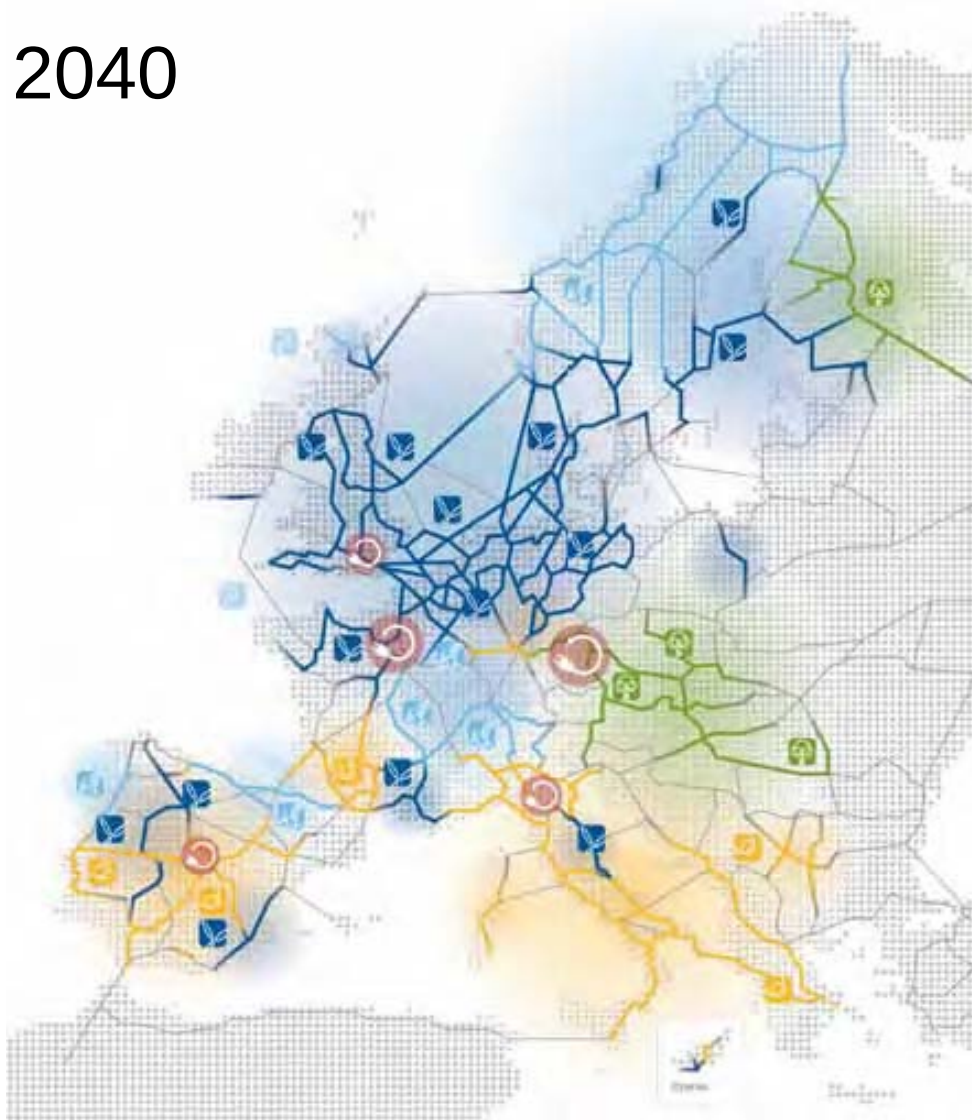
Supergrid is defined as "An electricity transmission system, mainly based on direct current, designed to facilitate large-scale sustainable power generation in remote areas for transmission to centres of consumption, one of whose fundamental attributes will be the enhancement of the market in electricity".

2020



Source: Powering Europe: wind energy and the electricity grid

2040



Source: Powering Europe: wind energy and the electricity grid

Europas Batterien

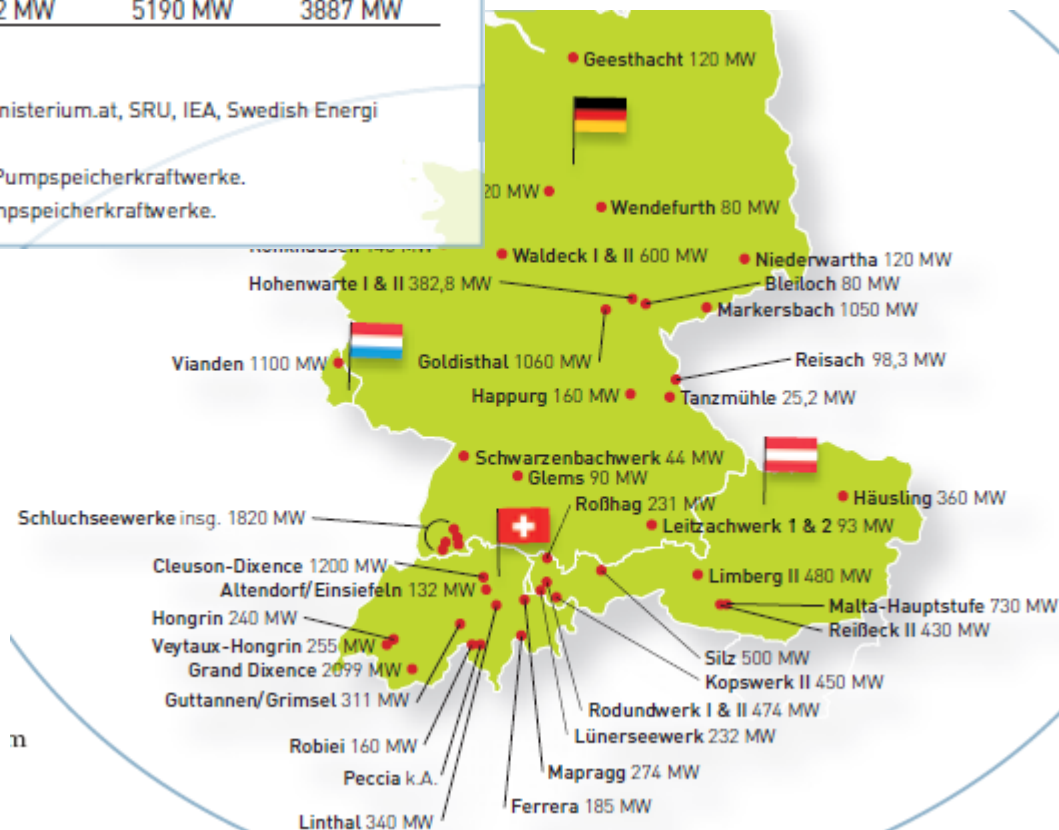
	Norwegen*	Schweden*	Deutschland	Schweiz	Österreich
					
Kapazität der Speicher	84 TWh	34 TWh	0,04 TWh	zus. 30 TWh	
Stromproduktion aus Wasserkraft (2008)	122,7 TWh	61,6 TWh	20,7 TWh	35,6 TWh	38 TWh
Installierte Leistung Wasserkraft **	29 482 MW	16 209 MW	6 732 MW	5 190 MW	3 887 MW

Quellen:

BMU, Norwegian Water Resources and Energy Directorate, Lebensministerium.at, SRU, IEA, Swedish Energi

* für Norwegen und Schweden: Angaben der größten Wasser- bzw. Pumpspeicherkraftwerke.

** für Deutschland, Schweiz und Österreich: installierte Leistung Pumpspeicherkraftwerke.





Source: neue energie 7/2010

Vielen Dank für Ihre Aufmerksamkeit!

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