EWEA
THE EUROPEAN WIND ENERGY ASSOCIATION

Wind in power

2011 European statistics

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Data sources

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EWEA, wind energy and ocean energy data
EPIA, solar PV data
ESTELA, CSP data
EU-OEA, Ocean energy data
EGEC and Eurostat, Geothermal data

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Photo cover: Enel Green Power

Executive summary

2011 annual installations

- 9,616 MW of wind power capacity (worth some €12.6 billion) was installed in the EU during 2011, a similar figure to the previous year (9,648 in 2010);
- Wind power accounted for 21.4% of total 2011 power capacity installations;
- Renewable power installations accounted for 71.3% of new installations during 2011: 32,043 MW of a total of 44,939 MW of new power capacity;
- More renewable power capacity was installed during 2011 than any other year, an increase of 37.7% compared to 2010;
- More power capacity was installed in 2011 than ever before - an increase of 3.9%, due entirely to increasing renewable power installations.

Trends & cumulative installations

- The EU's total installed power capacity increased by 35,468 MW net to 895,878 MW, with wind power increasing its share of installed capacity to 10.5% (93,957 MW), and renewable capacity increasing its share to 31.1%;
- Since 2000, 28.2% of new capacity installed has been wind power, 47.8% renewables, and 90.8% renewables and gas combined;
- For only the third time since 1998 the EU power sector installed more coal than it decommissioned, highlighting the urgent need for the EU to move to a 30% greenhouse gas reduction target for 2020, to introduce an Emissions Performance Standard, and to end decades of subsidies for new coal build and its fuel;
- The EU power sector continues its move away from fuel oil and nuclear, with each technology continuing to decommission more than it installs;

Wind power installations

- Annual installations of wind power have increased steadily over the last 17 years from 814 MW in 1995 to 9,616 MW in 2011, an annual average market growth of 15.6%;
- A total of 93,957 MW is now installed in the European Union, an increase in installed cumulative capacity of 11% compared to the previous year;
- Germany remains the EU country with the largest installed capacity, followed by Spain, France, Italy and the UK;
- Growth in onshore installations in Germany and Sweden, and offshore in the UK - together with continuing strong performance from some emerging onshore markets in Eastern Europe – have more than offset the fall in installations in mature markets such as France and Spain;
- The wind capacity installed by the end of 2011 would, in a normal year, produce 204 TWh of electricity, representing 6.3% of electricity consumption – up from 5.3% the year before.

Wind power installed in Europe by end of 2011 (cumulative)

	Installed 2010	End 2010	Installed 2011	End 2011
EU Capacity (MW)				
Austria	19	1,014	73	1,084
Belgium	325	886	192	1,078
Bulgaria	322	500	112*	612*
Cyprus	82	82	52	134
Czech Republic	23	215	2	217
Denmark	315	3,749	178	3,871
Estonia	7	149	35	184
Finland	52	197	0	197
France	1,396	5,970	830*	6,800*
Germany	1,493	27,191	2,086	29,060
Greece	238	1,323	311	1,629
Hungary	94	295	34	329
Ireland	82	1,392	239	1,631
Italy	948	5,797	950*	6,747*
Latvia	2	30	1	31
Lithuania	72	163	16	179
Luxembourg	1	44	0	44
Malta	0	0	0	0
Netherlands	56	2,269	68	2,328
Poland	456	1,180	436	1,616
Portugal	171	3,706	377	4,083
Romania	448	462	520	982
Slovakia	0	3	0	3
Slovenia	0	0	0	0
Spain	1,463	20,623	1,050	21,674
Sweden	604	2,163	763	2,907
United Kingdom	1,005	5,204	1,293	6,540
Total EU-27	**9,648**	**84,650**	**9,616**	**93,957**
Total EU-15	**8,144**	**81,571**	**8,409**	**89,670**
Total EU-12	**1,504**	**3,079**	**1,208**	**4,287**
Of which offshore and near shore	883	2,944	866	3,810

European Union: 93,957 MW
Candidate Countries: 1,930 MW
EFTA: 565 MW
Total Europe: 96,607 MW

	Installed 2010	End 2010	Installed 2011	End 2011
Candidate Countries (MW)				
Croatia	61	89	42	131
FYROM**	0	0	0	0
Serbia	0	0	0	0
Turkey	528	1,329	470	1,799
Total	**589**	**1,418**	**512**	**1,930**
EFTA (MW)				
Iceland	0	0	0	0
Liechtenstein	0	0	0	0
Norway	18	436	84	520
Switzerland	25	42	3	46
Total	**43**	**478**	**87**	**565**
Of which offshore and near shore	0	2	0	2
Other (MW)				
Faroe Islands	0	4	0	4
Ukraine	1	87	66	151
Russia	0	9	n/a***	n/a***
Total	**1**	**101**	**66**	**164**
Total Europe	**10,280**	**86,647**	**10,281**	**96,607**

* Provisional
** Former Yugoslav Republic of Macedonia
*** Figure not communicated
Note: Due to previous year adjustments, 216.03 MW of project de-commissioning, re-powering and rounding of figures, the total 2011 end-of-year cumulative capacity is not exactly equivalent to the sum of the 2010 end-of-year total plus the 2011 additions.

2011 annual installations

Wind power capacity installations

During 2011, 10,281[1] MW of wind power was installed across Europe, of which 9,616 MW was in the European Union, similar to the previous year.

Of the 9,616 MW installed in the EU, 8,750 MW was onshore and 866 MW offshore. In 2011, the annual onshore market remained stable compared to the previous year, whilst the offshore market decreased slightly (-1.9%).

Investment in EU wind farms in 2011 was €12.6 billion, a similar figure to 2010. The onshore wind power sector attracted €10.2 billion, while the offshore wind power sector accounted for around €2.4 bn (19%).

In terms of annual installations, Germany was by far the largest market in 2011, installing almost 2,100 MW of new capacity. The UK came in second with just under 1,300 MW, 752 MW of which (58%) offshore, followed by Spain with 1,050 MW. Italy (950 MW), France (830 MW) and Sweden (763 MW) are followed by Romania (520 MW).

Among the emerging markets, after Romania, Poland installed the second most capacity in 2011 (436 MW). Both remain among the 10 biggest EU markets for the second year running.

Offshore accounted for 8.9% of total EU wind power installations in 2011.

EU MEMBER STATE MARKET SHARES FOR NEW CAPACITY INSTALLED DURING 2011 IN MW. TOTAL 9,616 MW FIGURE 1.1

Photo: RES

[1] Figures for Russia were not available at time of publishing

Power capacity installations

Wind power accounted for 21.4% of new installations in 2011, the third biggest share after solar PV (46.7%) and gas (21.6%).

Solar PV installed 21,000 MW (46.7% of total capacity), followed by gas with 9,718 MW (21.6%), and wind with 9,616 MW (21.4%).

No other technologies compare to wind, PV and gas in terms of new installations. Coal installed 2.2 GW (4.8% of total installations), fuel oil 700 MW (1.6%), large hydro 607 MW (1.3%) and CSP 472 MW (1.1%). Nuclear (331 MW), biomass (234 MW), waste (69 MW), geothermal (32 MW) and ocean technologies (4.5 MW), each represented less than 1% of new capacity installations.

Overall, 2011 was a record year in the EU, with 45 GW of new electricity generating capacity installed, a 3.9% increase compared to 2010.

2011 SHARE OF NEW POWER INSTALLATIONS IN EU FIGURE 1.2

NEW INSTALLED CAPACITY AND DECOMMISSIONED CAPACITY IN MW. TOTAL 35,468 MW FIGURE 1.3

During 2011, 6.3 GW of nuclear capacity was decommissioned, and over 1 GW of fuel oil capacity was taken offline. Gas decommissioned 934 MW, coal 840 MW and wind 216 MW.

For the second year running, coal installed more capacity (2,147 MW) than it decommissioned (840 MW). This hike in new coal power capacity highlights the urgent need for the EU to move to a 30% greenhouse gas reduction target for 2020, to introduce an Emissions Performance Standard, and to end decades of subsidies for new coal build and its fuel.

Renewable power capacity installations

More renewable generating capacity was installed in the EU in 2011 than ever before - 32 GW, representing 71.3% of all new installations. Since 2008 renewable capacity installations have represented more than half of all new installed capacity.

2011 SHARE OF NEW RENEWABLE CAPACITY INSTALLATIONS (TOTAL 32,043 MW) FIGURE 1.4

Trends & cumulative installations

Renewable power installations

In 2000, new renewable power installations totalled 3.5 GW. Renewable capacity installations have been growing almost tenfold over the past 11 years, to reach 32 GW in 2011.

The share of renewables in total capacity additions has also grown. In 2000, the 3.5 GW represented 20.7% of new power installations, increasing to 23.3 GW (53.8%) in 2010, and 32 GW (71.3%) in 2011.

302.6 GW of new power capacity has been installed since 2000. Of this, 28.2% has been wind power, 47.8% renewables, and 90.8% renewables and gas combined.

EU INSTALLED POWER GENERATING CAPACITY PER YEAR IN MW AND RES SHARE (%) FIGURE 2.1

Net changes in EU installed capacity 2000-2011

The net growth since 2000 of gas power (116 GW), wind power (84.2 GW) and solar PV (47.4 MW) was at the expense of fuel oil (down 14.2 GW), nuclear (down 13.5 GW) and coal (down 10.3 GW). 2011 saw a sharp decrease in nuclear capacity due to the early decommissioning of a number of reactors in Germany. The other renewable technologies (hydro, biomass, waste, CSP, geothermal and ocean energies) have also been increasing installed capacity over the past decade, albeit more slowly than wind and solar PV.

The 21st century sees the EU power sector moving away from fuel oil, coal and nuclear while continuing to increase its total installed capacity with gas, wind and solar PV to meet increasing demand.

NET ELECTRICITY GENERATING INSTALLATIONS IN EU 2000-2011 IN GW — FIGURE 2.2

Total installed power capacity

Wind power's share of total installed power capacity over the last decade has increased more than four-fold from 2.2% in 2000 to 10.5% in 2011. Over the same period, renewable capacity increased by a third from 22.5% in 2000 to 31.1% in 2011.

EU POWER CAPACITY MIX 2000 — FIGURE 2.3

EU POWER CAPACITY MIX 2011 — FIGURE 2.4

A closer look at wind power installations

Annual wind power installations

Annual wind power installations in the EU have increased steadily over the past 17 years from 814 MW in 1996 to 9,616 MW in 2011, an average annual growth rate of 15.6%.

ANNUAL WIND POWER INSTALLATIONS IN EU IN GW FIGURE 3.1

National breakdown of wind power installations

In 2000, the annual wind power installations of the three pioneering countries – Denmark, Germany and Spain – represented 85% of all EU wind capacity additions. In 2011, this share has decreased to 34%. Wind power is increasingly being installed across Europe.

DENMARK, GERMANY AND SPAIN'S SHARE OF EU WIND POWER MARKET (GW) FIGURE 3.2

Onshore and offshore annual markets

In 2011, offshore wind's share of total installations was 9%, compared to 9.2% in 2010.

ANNUAL ONSHORE AND OFFSHORE INSTALLATIONS IN MW

FIGURE 3.3

Cumulative wind power installations

A total of 93,957 MW is now installed in the European Union, a growth of 11% on the previous year. Germany remains the EU country with the largest installed capacity, followed by Spain, Italy, France and the UK.

Nine other countries have over 1 GW of installed capacity: Portugal, Denmark, the Netherlands, Sweden, Ireland, Greece, Poland, Austria and Belgium.

CUMULATIVE WIND POWER INSTALLATIONS IN THE EU (GW)

FIGURE 3.4

EU MEMBER STATE MARKET SHARES FOR TOTAL INSTALLED CAPACITY AT END 2011 (TOTAL 93.7 GW)

FIGURE 3.5

Estimated wind energy production

The wind capacity installed at end 2011 will, in a normal wind year, produce 204 TWh of electricity, representing 6.3% of the EU's gross final consumption[2].

Denmark remains the country with the highest penetration of wind power in electricity consumption (almost 26%), followed by Spain (15.9%), Portugal (15.6%), Ireland (12%) and Germany (10.6%). Overall, in a normal wind year, installed wind capacity at end 2011 will meet 6.3% of the EU's electricity needs.

WIND SHARE OF TOTAL ELECTRICITY CONSUMPTION FIGURE 3.6

[2] According to the latest figures from Eurostat, gross electricity consumption in the EU was 3,225.2 TWh in 2009