



**EWEA**

THE EUROPEAN WIND ENERGY ASSOCIATION



# Wind in power

2014 European statistics

February 2015

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### Data collection and analysis

Giorgio Corbetta, European Wind Energy Association (EWEA)

### Contributing authors

Iván Pineda (EWEA)

Justin Wilkes (EWEA)

### Data sources

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EWEA, wind energy data

EU-OEA, ocean energy data

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## Executive summary

### 2014 annual installations

- 11,791.4 MW of wind power capacity (worth between €13.1bn and €18.7bn) was installed in the EU during 2014, an increase of 3.8% compared to 2013 annual installations.
- Wind power is the generating technology with the highest rate for new installations in 2014, accounting for 43.7% of total 2014 power capacity installations, 12 percentage points higher than during the previous year.
- Renewable power installations accounted for 79.1% of new installations during 2014: 21.3 GW of a total 26.9 GW of new power capacity, up from 72% the previous year.

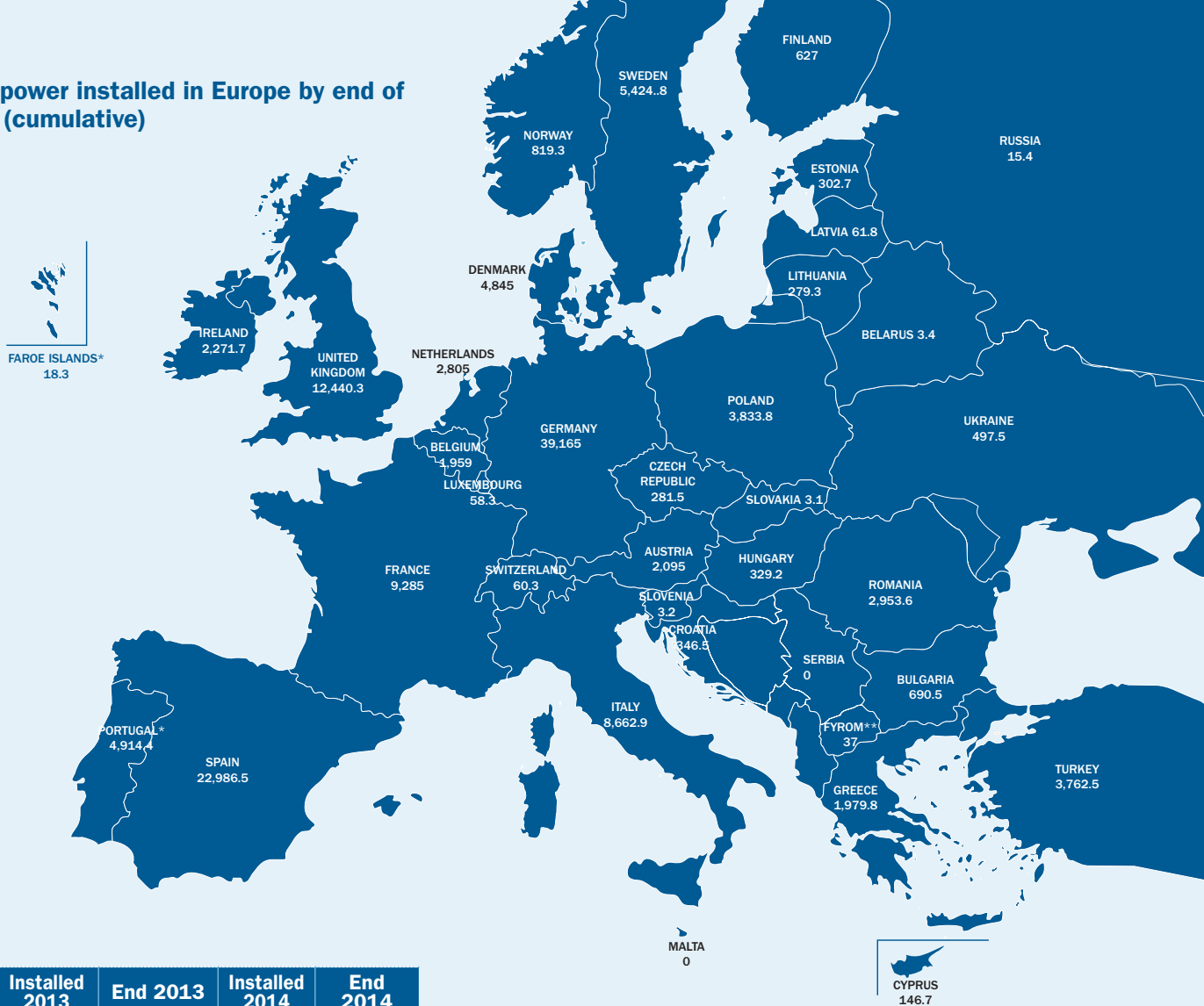
### Trends and cumulative installations

- There is now 128.8 GW of installed wind power capacity in the EU: approximately 120.6 GW onshore and just over 8 GW offshore.
- The EU total installed power capacity increased by 14.8 GW net in 2014 to 910.1 GW, with wind power increasing by 11.4 GW net and reaching a share of total installed generation capacity of 14.1%.
- Since 2000, 29.4% of new capacity installed has been wind power, 56.2% renewables and 91.1% renewables and gas combined.
- The EU power sector continues its move away from fuel oil and coal with both technologies continuing to decommission more than they install.

### Wind power installations

- Annual installations of wind power have increased over the last 14 years, from 3.2 GW in 2000, to 11.8 GW in 2014 at a compound annual growth rate (CAGR) of 9.8%.
- A total of 128.8 GW is now installed in the European Union, an increase in installed cumulative capacity of 9.7% compared to the previous year.
- Germany remains the EU country with the largest installed capacity followed by Spain, the UK and France. There are 15 EU countries with gigawatt-level wind power capacities installed, including two relatively new EU countries (Poland and Romania), and eight EU countries each have more than 4 GW of installed capacity.
- 59.5% of all new installations in 2014 were in just two countries (Germany and the UK), an increased concentration compared to 2013 (46% of total installations). 77.2% of all new installations were concentrated in the top four countries (Germany, the UK, Sweden and France).
- 2014 shows the negative impact of market, regulatory and political uncertainty sweeping across Europe. Destabilised legislative frameworks for wind energy are undermining investments.
- A number of previously large markets such as Denmark, Spain and Italy saw their rates of wind energy installations decrease significantly in 2014, by 90.4%, 84.3% and 75.4% respectively.
- Offshore wind saw almost 1.5 GW installed in 2014, 5.3% less than 2013.
- The wind power capacity installed by the end of 2014 would, in a normal wind year, produce 284 TWh of electricity, enough to cover 10.2% (of which 1% from offshore wind) of the EU's electricity consumption – up from 8% the year before.

## Wind power installed in Europe by end of 2014 (cumulative)



	Installed 2013	End 2013	Installed 2014	End 2014
<b>EU Capacity (MW)</b>				
Austria	308.4	1,683.8	411.2	2,095
Belgium	275.6	1,665.5	293.5	1,959
Bulgaria	7.1	681.1	9.4	690.5
Croatia	81.2	260.8	85.7	346.5
Cyprus	-	146.7	-	146.7
Czech Republic	8	268.1	14	281.5
Denmark	694.5	4,807	67	4,845
Estonia	10.5	279.9	22.8	302.7
Finland	163.3	449	184	627
France	630	8,243	1,042	9,285
Germany	3,238.4	34,250.2	5,279.2	39,165
Greece	116.2	1,865.9	113.9	1,979.8
Hungary	-	329.2	-	329.2
Ireland	343.6	2,049.3	222.4	2,271.7
Italy	437.7	8,557.9	107.5	8,662.9
Latvia	2.2	61.8	-	61.8
Lithuania	16.2	278.8	0.5	279.3
Luxembourg	-	58.3	-	58.3
Malta	-	-	-	-
Netherlands	295	2,671	141	2,805
Poland	893.5	3,389.5	444.3	3,833.8
Portugal*	200	4,730.4	184	4,914.4
Romania	694.6	2,599.6	354	2,953.6
Slovakia	-	3.1	-	3.1
Slovenia	2.3	2.3	0.9	3.2
Spain	175.1	22,959.1	27.5	22,986.5
Sweden	689	4,381.6	1,050.2	5,424.8
UK	2,075	10,710.9	1,736.4	12,440.3
<b>Total EU-28</b>	<b>11,357.3</b>	<b>117,383.6</b>	<b>11,791.4</b>	<b>128,751.4</b>

European Union: 128,751.4 MW  
Candidate Countries: 3,799.5 MW  
EFTA: 882.6 MW  
Total Europe: 133,968.2 MW

	Installed 2013	End 2013	Installed 2014	End 2014
<b>Candidate Countries (MW)</b>				
FYROM	-	-	37	37
Serbia	-	-	-	-
Turkey	646.3	2,958.5	804	3,762.5
<b>Total</b>	<b>646.3</b>	<b>2,958.5</b>	<b>841</b>	<b>3,799.5</b>
<b>EFTA (MW)</b>				
Iceland	1.8	1.8	1.2	3
Liechtenstein	-	-	-	-
Norway	110	771.3	48	819.3
Switzerland	13.3	60.3	-	60.3
<b>Total</b>	<b>125.1</b>	<b>833.4</b>	<b>49.2</b>	<b>882.6</b>
<b>Other (MW)</b>				
Belarus	-	3.4	-	3.4
Faroe Islands	4.5	6.6	11.7	18.3
Russia	-	15.4	-	15.4
Ukraine	95.3	371.2	126.3	497.5
<b>Total</b>	<b>99.8</b>	<b>396.7</b>	<b>138.0</b>	<b>534.7</b>
<b>Total Europe</b>	<b>12,228.5</b>	<b>121,572.2</b>	<b>12,819.6</b>	<b>133,968.2</b>

\* Provisional data

\*\* Former Yugoslav Republic of Macedonia

Note: due to previous year adjustments, 423.5 MW of project decommissioning, repowering and rounding of figures, the total 2014 end-of-year cumulative capacity is not exactly equivalent to the sum of the 2013 end-of-year total plus the 2014 additions.

# 2014 annual installations

## Wind power capacity installations

During 2014, 12,819.6 MW of wind power was installed across Europe, of which 11,791.4 MW was in the European Union.

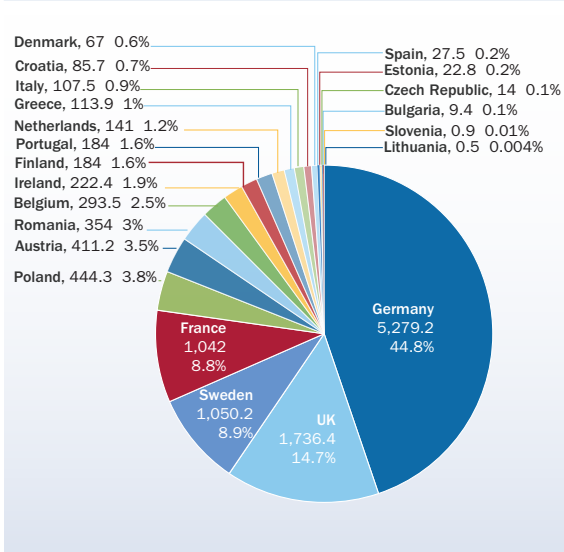
Of the capacity installed in the EU, 10,308.1 MW was onshore and 1,483.3 MW offshore. In 2014, the annual onshore market increased in the EU by 5.3%, and offshore installations decreased by 5.3% compared to 2013. Overall, EU wind energy annual installations increased by 3.8% compared to 2013 installations.

Investment in EU wind farms was between €13.1bn and €18.7bn. Onshore wind farms attracted around €8.9bn to €12.8bn, while offshore wind farms accounted for €4.2bn to €5.9bn.

In terms of annual installations, Germany was the largest market in 2014, installing 5,279.2 MW of new capacity, 528.9 MW of which (10% of total capacity installed in Germany) offshore. The UK came in second with 1,736.4 MW, 813.4 MW of which (46.8%) offshore, followed by Sweden with 1,050.2 MW and France with 1,042 MW. The next countries are significantly behind: Poland with 444.3 MW and Austria with 411.2 MW.

The emerging markets of Central and Eastern EU installed 838 MW, 7.1% of total installations. In 2014, these countries represented a smaller share of the total EU market than in 2013 (16%). That is due to retroactive legislative changes in Romania and uncertainty on the impact of the Renewable Energy Sources Act on the support system and renewable energy market in Poland.

**FIGURE 1: EU MEMBER STATE MARKET SHARES FOR NEW WIND ENERGY CAPACITY INSTALLED DURING 2014 (MW). TOTAL 11,791.4 MW**



Moreover, 59.5% of all new EU installations in 2014 were in just two countries, Germany and the United Kingdom, a similar trend to the one seen in 2013.

A number of previously large markets such as Denmark, Spain and Italy have seen their rate of wind energy installations decrease significantly in 2014, by 90.4%, 84.3% and 75.4% respectively.

Offshore accounted for 12.6% of total EU wind power installations in 2014, confirming the high level of concentration in annual installations during 2014.

### Power capacity installations

Overall, during 2014, 26.9 GW of new power generating capacity was installed in the EU, 9.4 GW less than in 2013.

Wind power was the energy technology with the highest installation rate in 2014: 11.8 GW, accounting for 43.7% of all new installations. Solar PV came second with 8 GW (29.7% of 2014 installations) and coal third with 3.3 GW (12.3%).

No other technologies compare to wind and solar PV in terms of new installations. Gas installed 2.3 GW (8.7% of total installations), biomass 990 MW (3.7%), hydro 436 MW (1.6%), waste 68 MW (0.3%), geothermal 45 MW and ocean 1.3 MW. CSP, fuel oil, nuclear and peat did not install any generating capacity in 2014.

During 2014, 7.2 GW of coal capacity was decommissioned, as was 2.9 GW of gas, 1.1 GW of fuel oil, 423.5 MW of wind energy, 370 MW of biomass and 14.9 MW of hydro capacity<sup>1</sup>.

FIGURE 2: SHARE OF NEW POWER CAPACITY INSTALLATIONS IN EU (MW). TOTAL 26,975.5 MW

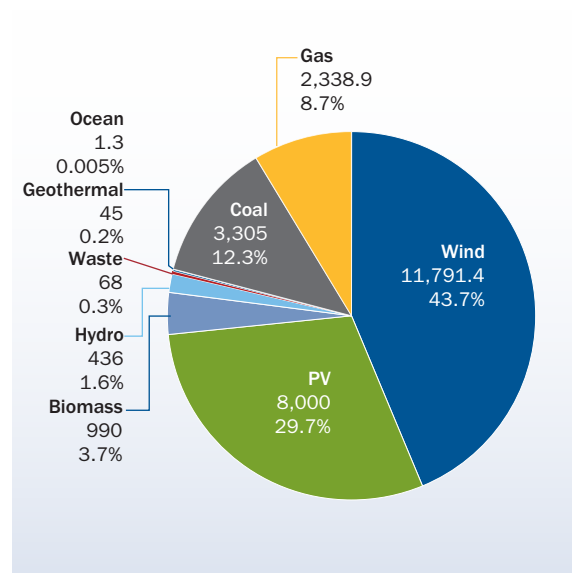
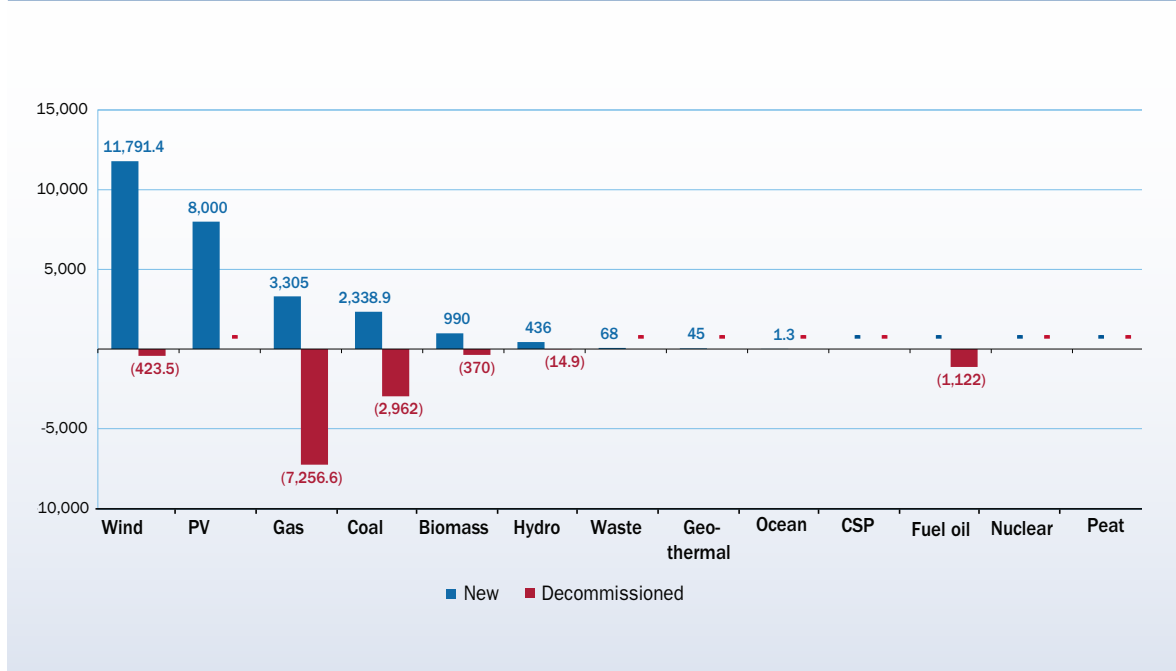


FIGURE 3: NEW INSTALLED CAPACITY AND DECOMMISSIONED CAPACITY (MW)

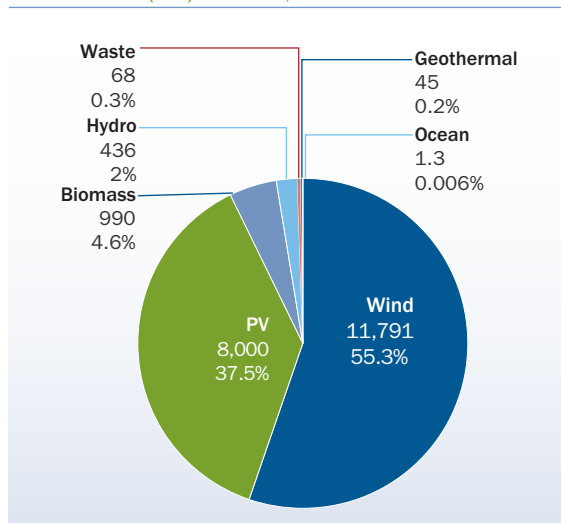


<sup>1</sup> Figures for PV decommissioning are not available

## Renewable power capacity installations

In 2014, a total of 21.3 GW of renewable power capacity was installed. 79.1% of all new installed capacity in the EU was renewable. It was, furthermore, the seventh year running, that over 55% of all additional power capacity in the EU was renewable.

FIGURE 4: 2014 SHARE OF NEW RENEWABLE POWER CAPACITY INSTALLATIONS (MW). TOTAL 21,331.6 MW



## Trends & cumulative installations

### Renewable power capacity installations

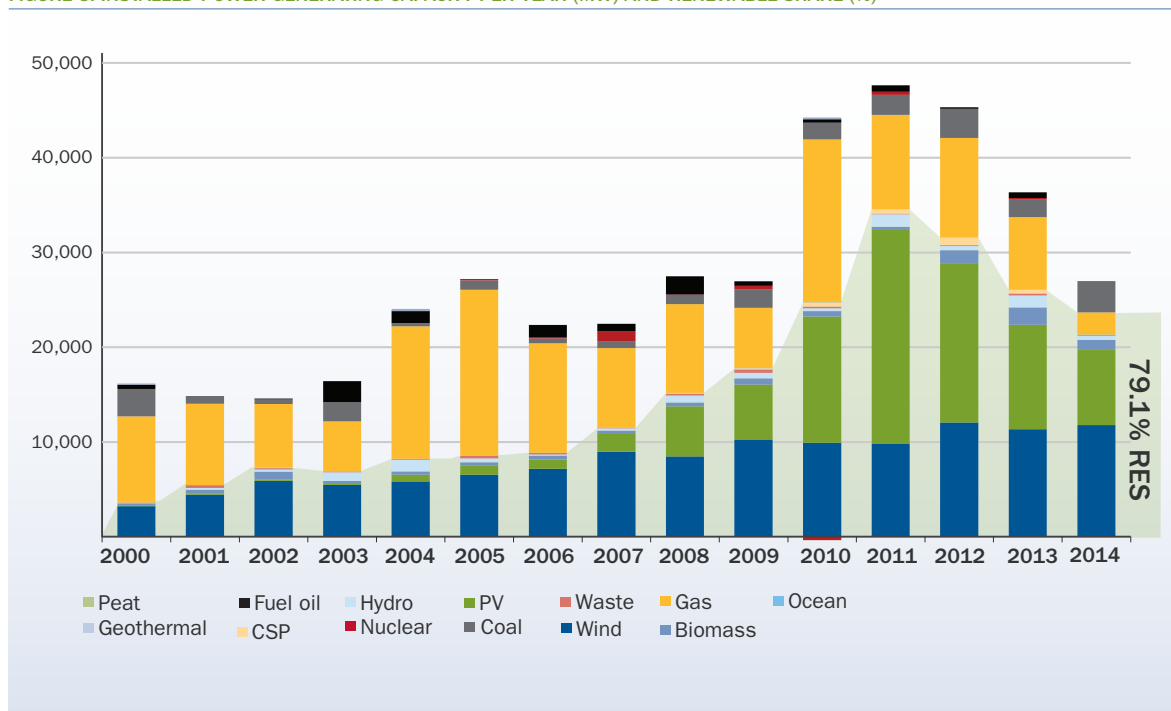
In 2000, new renewable power capacity installations totalled a mere 3.6 GW. Since 2010, annual renewable capacity additions have been between 24.7 GW and 34.6 GW, eight to ten times higher than in 2000.

The share of renewables in total new power capacity additions has also grown. In 2000, the 3.6 GW

represented 22.4% of new power capacity installations, increasing to 21.3 GW representing 79.1% in 2014.

412.7 GW of new power capacity has been installed in the EU since 2000. Of this, 29.4% has been wind power, 56.2% renewables and 91.1% renewables and gas combined.

FIGURE 5: INSTALLED POWER GENERATING CAPACITY PER YEAR (MW) AND RENEWABLE SHARE (%)

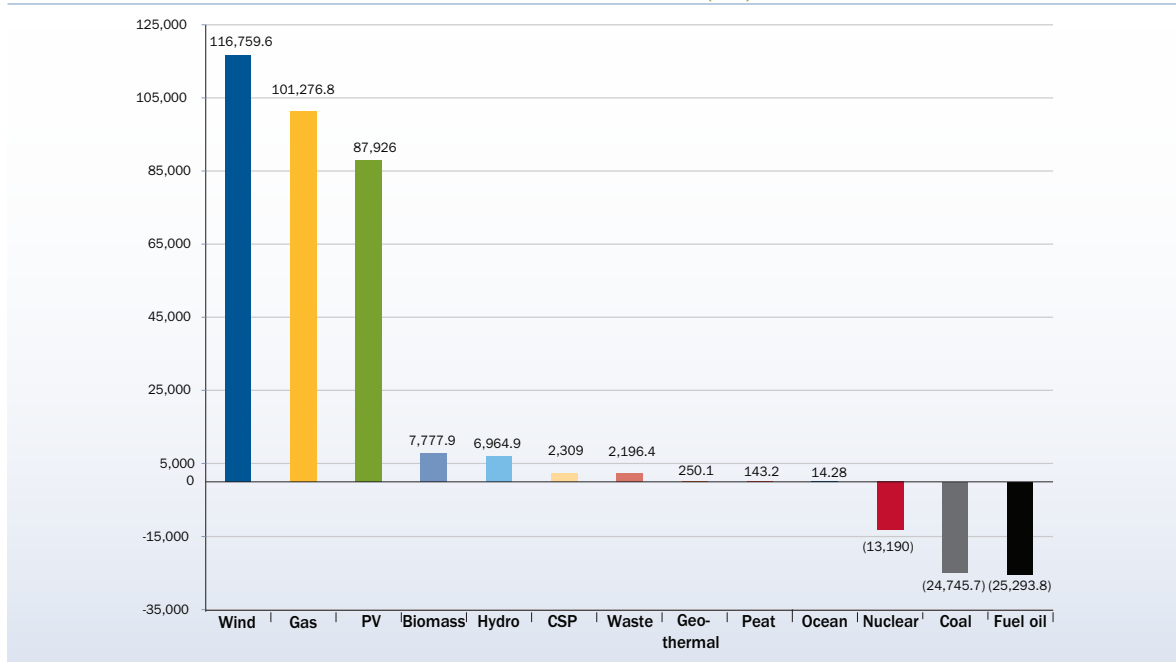


### Net changes in EU installed power capacity 2000-2014

The net growth since 2000 of wind power (116.8 GW), gas (101.3 GW) and solar PV (87.9 GW) was at the expense of fuel oil (down 25.3 GW), coal (down 24.7 GW) and nuclear (down 13.2 GW). The other renewable technologies (biomass, hydro, waste, CSP, geothermal and ocean energies) have also been increasing their installed capacity over the past decade, albeit more slowly than wind and solar PV.

The EU's power sector continues to move away from fuel oil, coal, nuclear and gas while increasing its total installed generating capacity with wind and solar PV. In 2014 gas decommissioned more MW than what it installed but still has the most overall built capacity.

FIGURE 6: NET ELECTRICITY GENERATING INSTALLATIONS IN THE EU 2000-2014 (MW)



### Total installed power capacity

Wind power's share of total installed power capacity has increased five-fold since 2000; from 2.4% in 2000 to 14.1% in 2014. Over the same period, renewable

capacity increased from 24.4% of total power capacity in 2000 to 41.5% in 2014.

FIGURE 7: EU POWER MIX 2000 (MW)

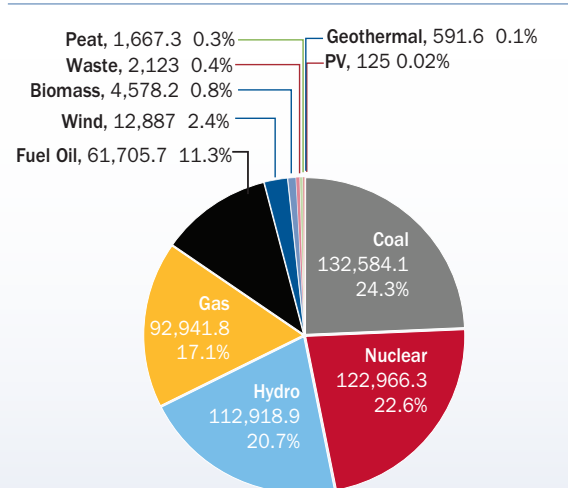
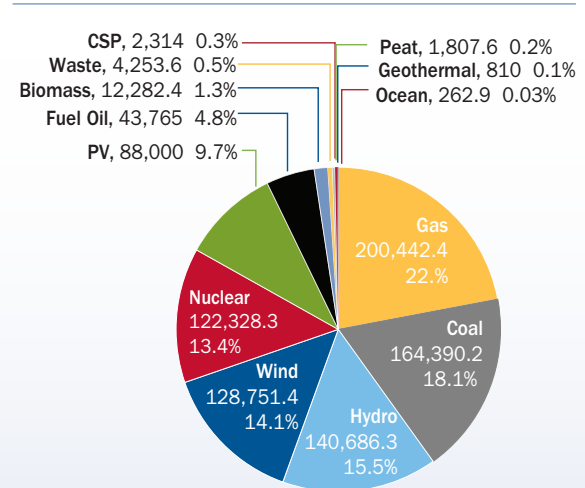


FIGURE 8: EU POWER MIX 2014 (MW)



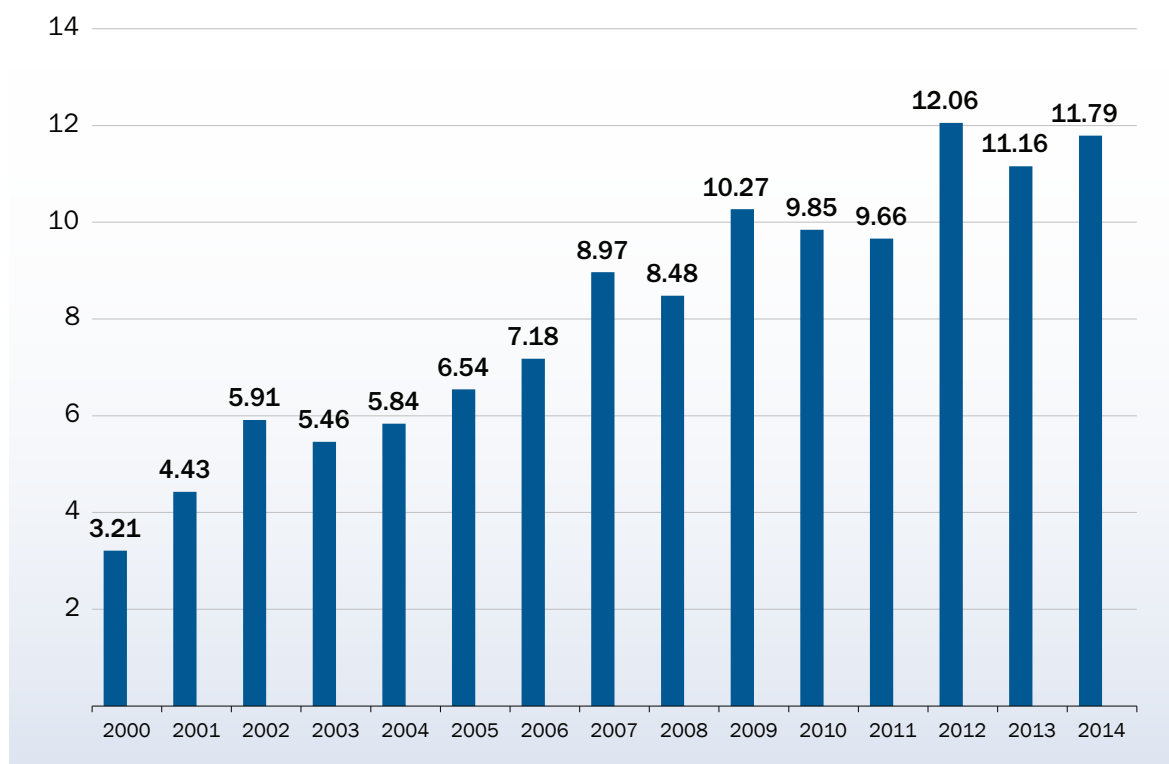


## A closer look at wind power installations

### Total installed power capacity

Annual wind power installations in the EU have increased steadily over the past 14 years from 3.2 GW in 2000 to 11.8 GW in 2014, a CAGR of 9.8%.

FIGURE 9: ANNUAL WIND POWER INSTALLATIONS IN EU (GW)



### National breakdown of wind power installations

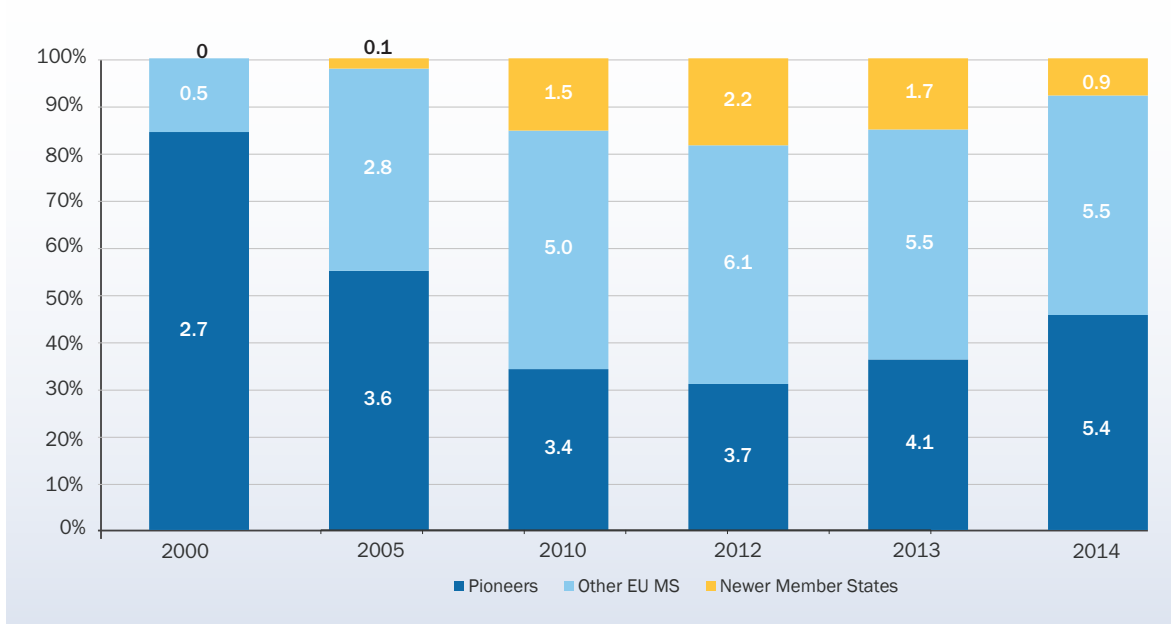
In 2000, the annual wind power installations of the three pioneering countries – Denmark, Germany and Spain – represented 85% of all EU wind capacity. By 2013, they represented only 36.2% of total installations. In 2014 installations in the three pioneering countries together represented 45.6% of the EU market and were mainly driven by the 63% German market growth.

Moreover, in 2000, the countries that make up the 13<sup>2</sup> newer EU Member States had no wind energy, while

in 2014 they reached 7.9% of the EU’s total market. However, 85.7% of those installations were in just two countries: Poland and Romania.

This indicates that the policy instability facing renewables in numerous countries in the EU is leading to an increased concentration of wind energy installation in a handful of countries with stable frameworks.

FIGURE 10: SHARE OF EU WIND POWER MARKET, PIONEERING COUNTRIES, NEWER MEMBER STATES, AND THE REST OF EU (GW)

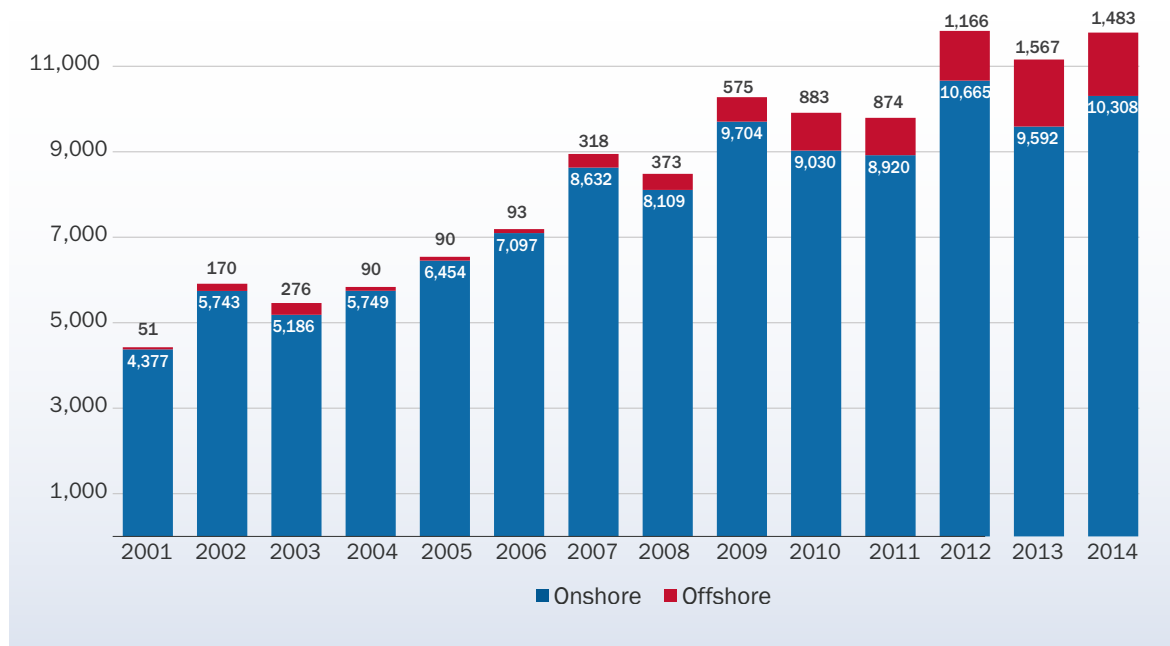


<sup>2</sup> Bulgaria, Croatia, Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Romania, Slovakia, Slovenia.

## Onshore and offshore annual markets

Offshore wind installations in 2014 were 5.3% less than in 2013, with 1,483.3 MW of new capacity grid connected. Offshore wind power installations represent 12.6% of the annual EU wind energy market, down from 14% in 2013.

FIGURE 11: ANNUAL ONSHORE AND OFFSHORE INSTALLATIONS (MW)



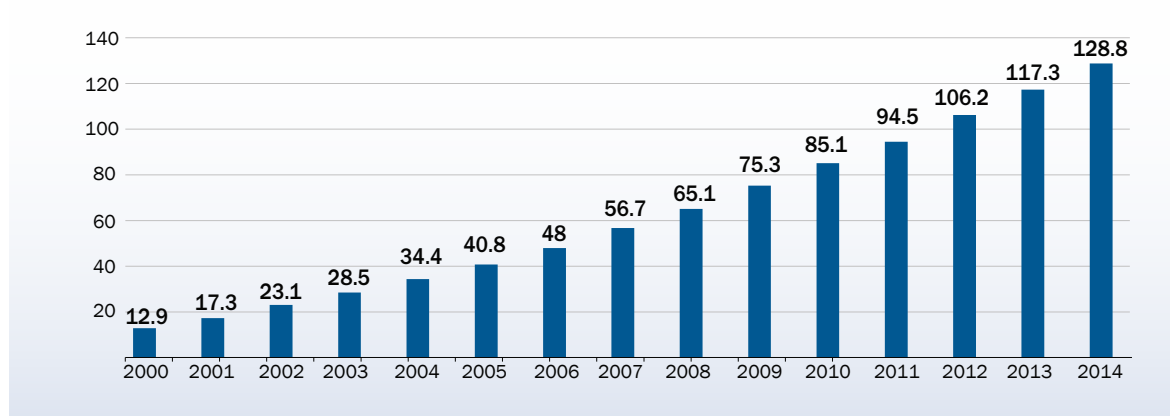
## Cumulative wind power installations

A total of 128.8 GW is now installed in the European Union, a growth of 9.8% on the previous year and lower than the record growth registered in 2012 (+12% compared to 2011). Germany remains the EU country with the largest installed capacity, followed by Spain, the UK, France and Italy. Ten other EU countries have

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

Three of the latter (Denmark, Portugal and Sweden), have more than 4 GW of installed wind energy capacity.

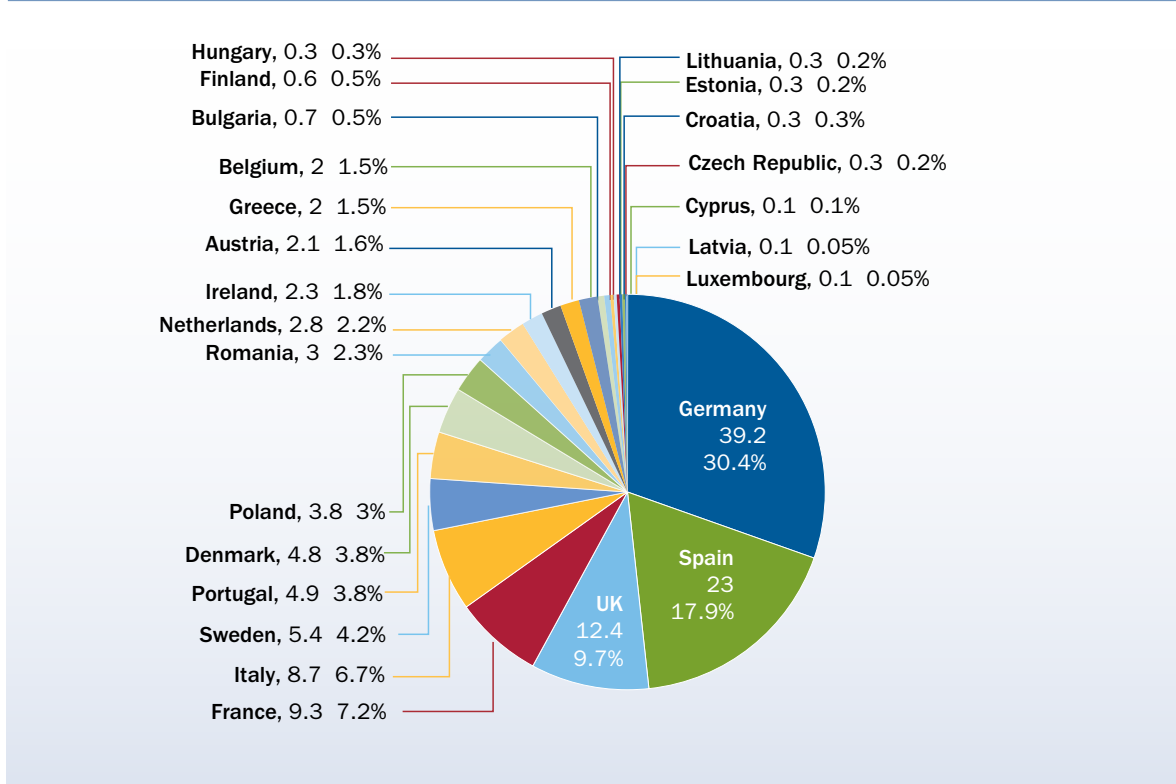
FIGURE 12: CUMULATIVE WIND POWER INSTALLATIONS IN THE EU (GW)



Germany (39.2 GW) and Spain (23 GW) have the largest cumulative installed wind energy capacity in Europe. Together they represent 48.3% of total EU capacity. The UK, France and Italy follow with, respectively, 12.4 GW (9.7% of total EU capacity), 9.3 GW (7.2%) and 8.7 GW

(6.7%). Amongst the newer Member States, Poland, with 3.8 GW (3% of cumulative capacity), is now in the top 10, in front of Romania (3 GW, 2.3%), and the Netherlands is eleventh with 2.8 GW (2.2%).

FIGURE 13: EU MEMBER STATE MARKET SHARES FOR TOTAL INSTALLED CAPACITY (GW). TOTAL 128.8 GW



## Wind power penetration

The wind energy capacity currently installed in the EU would produce in an average wind year 284 TWh of

electricity, enough to cover 10.2% of the EU's total electricity consumption<sup>3</sup>.

Total EU electricity consumption (TWh)	Onshore wind energy production (TWh)	Offshore wind energy production (TWh)	Share of EU consumption met by onshore wind (TWh)	Share of EU consumption met by offshore wind	Share of EU consumption met by wind
2,798	254.43	29.59	9.1%	1.1%	10.2%

<sup>3</sup> Wind energy penetration levels are calculated using average capacity factors onshore and offshore and Eurostat electricity consumption figures (2012). Consequently, table 1 indicates the approximate share of consumption met by the installed wind energy capacity at the end of 2014. The figure does not represent real wind energy production over a calendar year. The most recent data (2012) for EU 28 final energy consumption of electricity from Eurostat, is 2,798 TWh. Eurostat, online table code [nrg\_105a], extracted on 21 January 2015.