The World Wind Energy Association

2011 | Report

WWEA
World Wind Energy Association

www.wwindea.org

Join the World of Wind Energy at

12th World Wind Energy Conference & WWEC2013 Trade Fair

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The World Wind Energy Association WWEA
Uniting the World of Wind Energy

The World Wind Energy Association (WWEA) is a non-profit organisation which works for a world energy system fully based on the various renewable energy technologies, with wind energy as one cornerstone.

WWEA acts as a communication platform for all wind energy actors worldwide, WWEA advises national governments and international organisations on favourable policies for wind energy implementation and WWEA enhances international technology transfer, a key in the accelerated dissemination of this clean technology.

Currently, WWEA has 500 members and represents the wind sector from 100 countries on all continents. Amongst the WWEA members, there are the national wind energy associations of the major wind countries – which themselves represent more than 50'000 members – as well as companies, scientific institutions and public bodies.

WWEA is governed by a Board which comprises WWEA President Prof He Dexin (China), ten Vice Presidents from the five continents and the Treasurer. The Secretary General Stefan Gsänger manages the daily administration of the association at the WWEA Head Office in Bonn/Germany.

In 2007, WWEA was granted Special Consultative Status at the United Nations. WWEA has observer status e.g. at the UNFCCC Climate Conferences and cooperates with further international organisations. WWEA is represented at the International Steering Committee of REN21 and is one of the first and major proponents of the creation of the International Renewable Energy Agency IRENA.

WWEA organises annually World Wind Energy Conferences like the WWEC2012 in Bonn/Germany in July 2012 and in the previous years in:

- *Cairo/Egypt (2011)*
- *Istanbul/Turkey (2010)*
- *Jeju/South Korea (2009),*
- *Kingston/Canada (2008),*
- *Mar del Plata/Argentina (2007),*
- *New Delhi/India (2006),*
- *Melbourne/Australia (2005),*
- *Beijing/China (2004),*
- *Cape Town/South Africa (2003),*
- *Berlin/Germany (2002).*

In cooperation with Husum fair, WWEA has invited for the World Summit for Small Wind Turbines, taking place in Husum/Germany in conjunction with New Energy fair.

WWEA cooperates with and supports numerous wind and renewable energy events all over the world.

WWEA publishes on a regular basis information about wind energy and provides up-to-date information about wind energy technology, like

- *the annual World Wind Energy Report*
- *the WWEA Quarterly Bulletin*
- *the technology website www.world-wind-energy.info*
- *the biannual yearbook Wind Energy International which comprises updated country reports about 100 countries and numerous special reports.*
- *the Small Wind World Report*

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Executive Summary

- **The worldwide wind capacity reached 237 016 Megawatt, out of which 40 053 Megawatt were added in 2011, more than ever before.**
- **Altogether, 96 countries and regions have been identified worldwide to use wind power for electricity generation.**
- **Wind power showed a growth rate of 20,3 %, the lowest rate in more than a decade.**
- **All wind turbines installed by the end of 2011 worldwide can provide 500 Terawatthours per annum, around 3 % of the global electricity consumption.**
- **The wind sector in 2011 had a turnover of 50 billion Euro/65 billion USD.**
- **Continents:**
  - **Asia accounted for the largest share of new installations (53,7 %), followed by Europe (21,9 %) and North America (20,5 %). Latin America stood for 2,9 % and Australia/Oceania for 0,9 %. Africa (0,2 %) represented only for a negligible share.**
- **Asia:**
  - **China continued to be by far the largest market and added 17,6 Gigawatt, however, for the first time showed an unexpected decrease in new installations.**
  - **India re-gained old strength and became the third largest market for new wind turbines, adding 2,8 Gigawatt. Recent studies suggest that the country has a much bigger wind potential than assessed earlier.**
- **Europe:**
  - **Germany kept its number one position in Europe with 29 075 Megawatt, followed by Spain with 21 673 Megawatt.**
  - **Italy, France and the UK continued to be the medium-sized markets, between 6 and 6,7 Gigawatt.**
- **North America:**
  - **The US market recovered from a very weak 2010 but stayed behind expectations, adding 5,6 GW.**
  - **Canada made a big step ahead and became the fifth largest market for new wind turbines.**
- **Latin America became the most dynamic world region with high growth, especially due to Brazil and Mexico.**
- **Africa showed stagnation, only Cap Verde and, as a newcomer, Ethiopia, installing new wind farms.**
- **The share of offshore wind in the overall capacity fell to 1,5 %, after 1,6 % in 2010.**
- **Many major markets are facing negative outlook due to lack of political support.**
- **WWEA sees a global capacity of 500 000 Megawatt as possible by the year 2015 and more than 1 000 000 Megawatt by the year 2020.**

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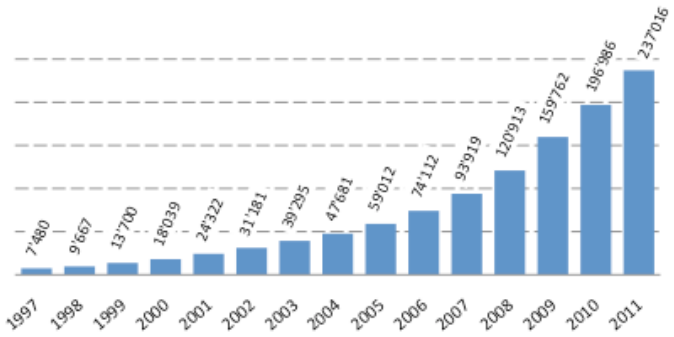
General Situation: New Record in New Installations

World Total Installed Capacity [MW]



Without doubt wind power has become a pillar of the energy systems in many countries and is recognised as a reliable and affordable source of electricity.

In the year 2011, the worldwide wind capacity reached 237 016 Megawatt, after 196 630 Megawatt in 2010 and 159 050 MW in 2009.

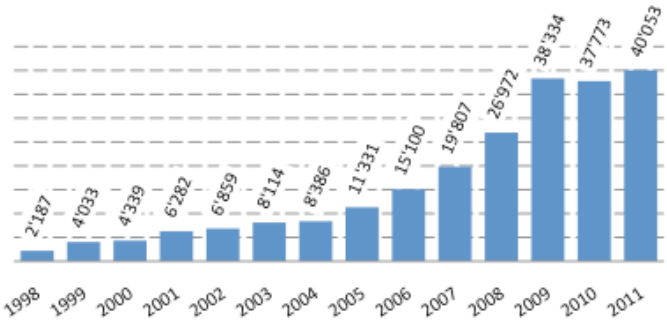
The market for new wind turbines reached a new record: 40 053 Megawatt were installed in 2011, 6 % more than in the year 2010 with 37 642 MW.

The contribution of wind power to the energy supply has reached a substantial share even on the global level: All wind turbines installed around the globe by the end of 2011 contribute potentially 500 Terawatthours to the worldwide electricity supply equalling around 3 % of the global electricity demand.

In the year 2011, 96 countries were identified where wind energy was used for electricity generation. 50 countries installed new wind turbines, two less than in the previous year.

The turnover of the wind sector worldwide reached 50 billion € (65 billion US$) in 2010, after 40 billion € (55 billion US$) in the year 2010. With this, the total turnover reached the same level like in the year 2009.

New Installed Capacity [MW]

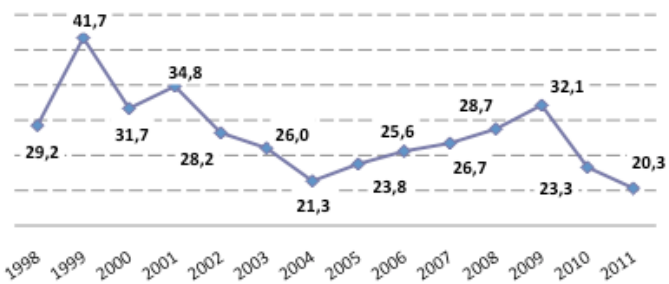


Lowest Worldwide Growth Rate in More Than a Decade

Although the year 2011 brought a new record in new as well as in total installations, the markets have cooled down in relative terms.

A very good indicator for the vitality of the market development is the average growth rate. The growth rate is the relation between the new installed wind power capacity and the installed capacity of the previous year.

World Market Growth Rates [%]



After an average growth of 30 % in the past decade, the growth has decreased substantially: In 2011, the global growth went down to 20,3 %, the lowest rate in two decades. Already the year 2010 had brought a very low rate, with 23,3 %.
Before 2010, the annual growth rate even had continued to increase since the year 2004, peaking in 2009 at 32,1 %.

In spite of the lower annual growth rate, the longer-term trend continued that the installed wind capacity doubles every third year. In 2008, there was a global wind capacity of 121 GW, compared with 237 GW in 2011.

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Strongest Growth in Two Latin American Markets

In terms of national and regional distribution of the growth, the world map changed fundamentally:

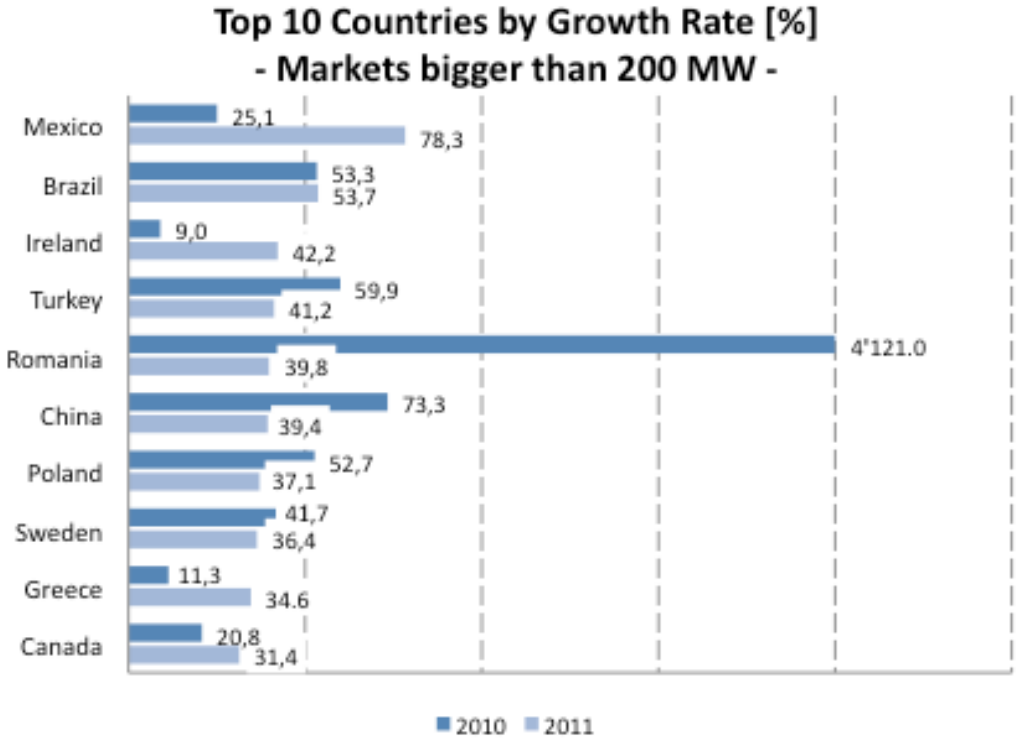
In 2011, two Latin American countries showed highest growth rates: Mexico as the world's most dynamic wind market grew by 78,3 %, followed by Brazil with 53,7 %.

Such rates are low compared with the past, when e.g. in 2009 four countries more than doubled their wind capacity.

It also represents a remarkable geographical shift, as in the recent years, strong growth occurred mainly in Eastern European and Asian markets.

Next to Latin America, growth above the average could still be found in China and Canada as well as in several peripheral and Eastern European countries: Ireland, Turkey, Romania, Poland, Sweden and Greece.

Africa continues to be a major matter of concern, as it not only represents the continent with the smallest capacity but also had the lowest growth rate of all regions.



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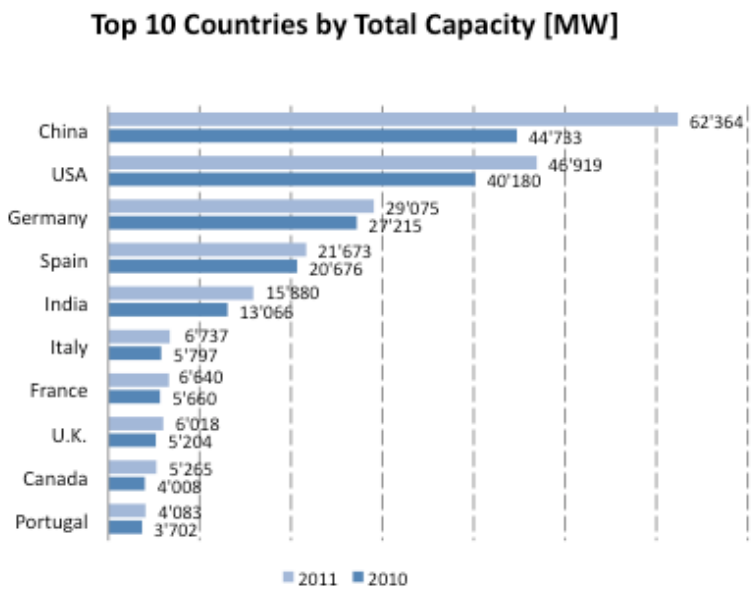
Top Wind Markets 2011: Stagnation in Big Five Markets

Since many years the wind industry has been driven by the Big Five markets: China, USA, Germany, Spain, and India. They have represented the largest share of the increase in wind power during the last two decades. In 2011, they represented 74 % of the worldwide wind capacity, same like in the previous year. However, their markets slowed down and they added 29 GW, slightly less than in the year 2010 (30 GW).

At the same time, the top 10 markets increased their capacity additions from 33 GW to 35 GW and their overall wind capacity share grew from 86 % in 2010 to 87 % in 2011.



Amongst the top markets, again China was a class on its own. The country accounted for 44 % of the world wind market 2011, however, a significant decrease compared to the 50 % market share of 2010. China increased its share in the global wind capacity from 23 % in 2010 to 26 % in 2011.

The US market kept its number two position and recovered partially from the dramatic decrease in 2010, when only have of the capacity of the previous year was added.

Ten countries can be seen as major markets, with turbine sales in a range between 0,5 GW and 3 GW: India, Germany, Canada, Spain, France, Italy, Sweden, the United Kingdom and the newcomers Turkey and Brazil. Romania dropped out of this list.

Another ten markets for new turbines had a medium size between 100 and 500 MW: Mexico, Poland, Portugal, Greece, Romania, Australia, Belgium, Denmark, Japan, and New Zealand.

Bulgaria, Egypt and Ireland, all of them medium markets in the year 2010, showed stagnation in 2011.

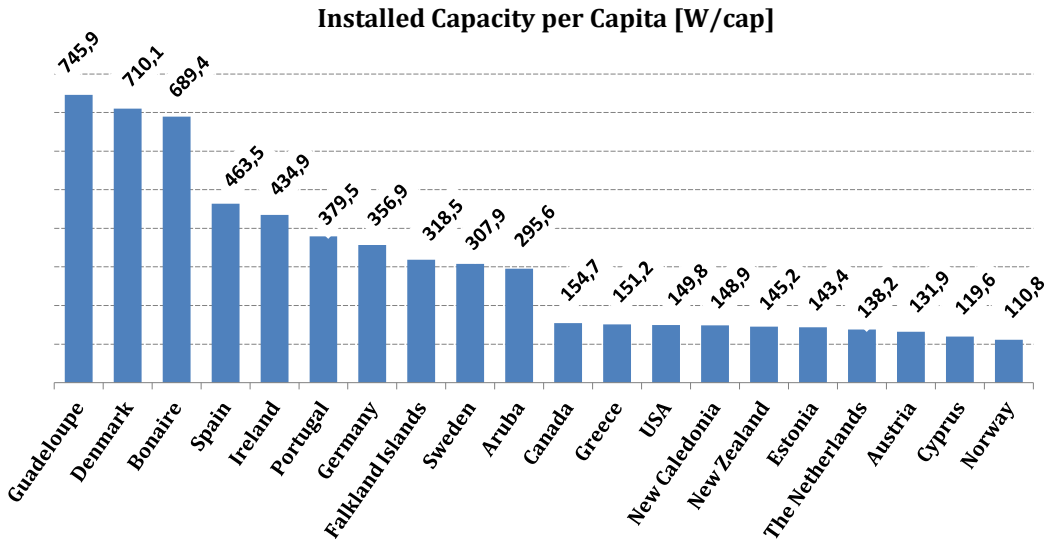
By the end of 2011, 22 countries had installations of more than 1 GW, two more than in 2010. Brazil and Belgium are the new entrants of the Gigawatt club. In the year 2005, this club had only 11 members.

43 countries have today wind farms with an overall capacity of 100 Megawatt or more, compared with 39 countries one year ago, and only 24 countries six years ago.

Due to the strong performance of the Chinese market, a certain concentration process of the world market on China can be observed, with China alone representing more than half of the market for new wind turbines.

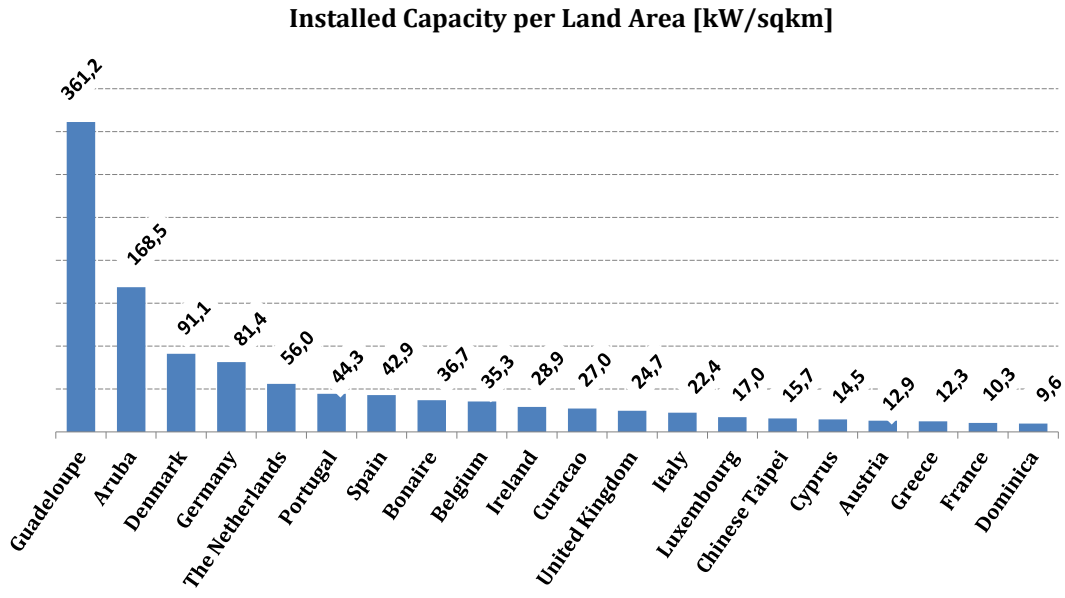
In 2011, two countries installed for the first time major wind farms: the Latin American country Honduras (70 MW) and Ethiopia in East Africa (now 30 MW).

Installed Capacity by Country Size



In order to understand the actual commitment of a country to wind power and its progress in wind power utilisation, it is worthwhile not only to look at the total figures, but also to put the installed capacity in relation to the size of a country. It becomes better visible that some of the smaller and poorer countries have made remarkable progress in wind power utilisation as well.

The global average is 34 Watt of wind capacity per person. The small state of Guadeloupe and Denmark have both more than 700 Watt and thus the by far highest amount of installed wind capacity per person, followed by Bonaire, Spain, Ireland, Portugal and Germany. China ranks 34th, with 46 Watt per person, India is on position 51 with 13 Watt per person, below the global average.



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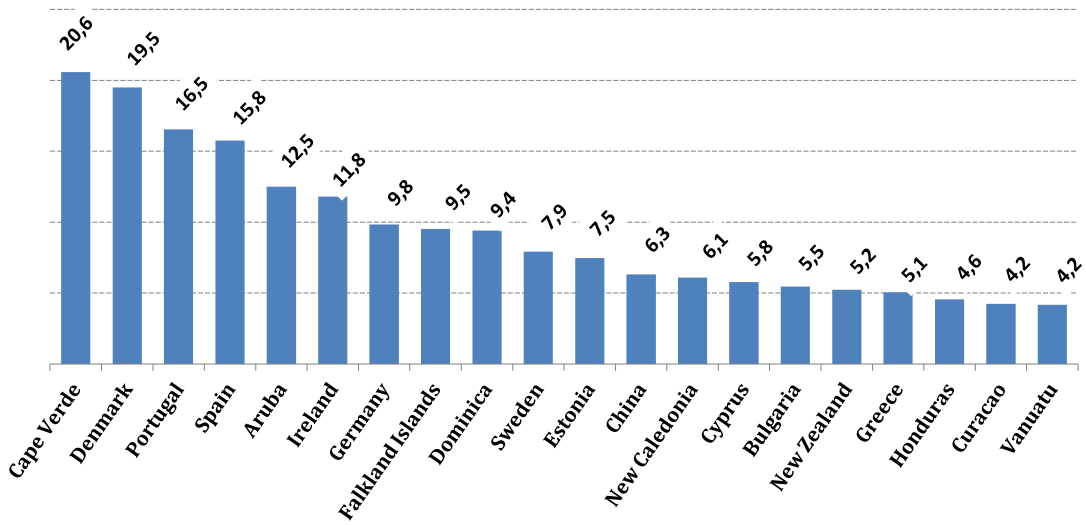
By land area, again two small countries, Guadeloupe and Aruba, have the highest wind turbine density, followed by several European countries: Denmark, Germany, Netherlands, Portugal, and Spain. Three of the top five wind countries are not yet amongst the top 20: China holds position 25 (6,5 Watt per square kilometre), India ranks 28th (4,8 Watt/sqkm), and the USA are number 29 (4,8 Watt/sqkm).

This geographical distribution reveals that especially the countries with large land masses have still a huge potential which they could harvest. Although e.g. all European countries can without doubt still expand their wind power utilisation as well, their land related wind utilisation factor, applied in other countries, would lead to a huge increase of the installed wind capacity: Denmark's, Germany's or Spain's wind turbine density is 10 to 20 times higher than China, India or USA.

Although investment in wind turbines cannot be seen as a burden, but can help countries to strengthen their economic position, it still requires major initial investment. Hence it is also important to look at the installed capacity per unit of its gross domestic product (GDP):

The leaders in terms of wind investment per GDP are Cape Verde, followed by Denmark, Portugal and Spain. Also Aruba, Ireland and Germany have invested for more 10 or more kW per million USD of their GDP. While China ranks 17th, India is only on position 28 with 3,9 kW per million USD GDP. The USA can be found on position 35 with 3,2 kW/million USD.

Installed Capacity per GDP [kW/million USD]



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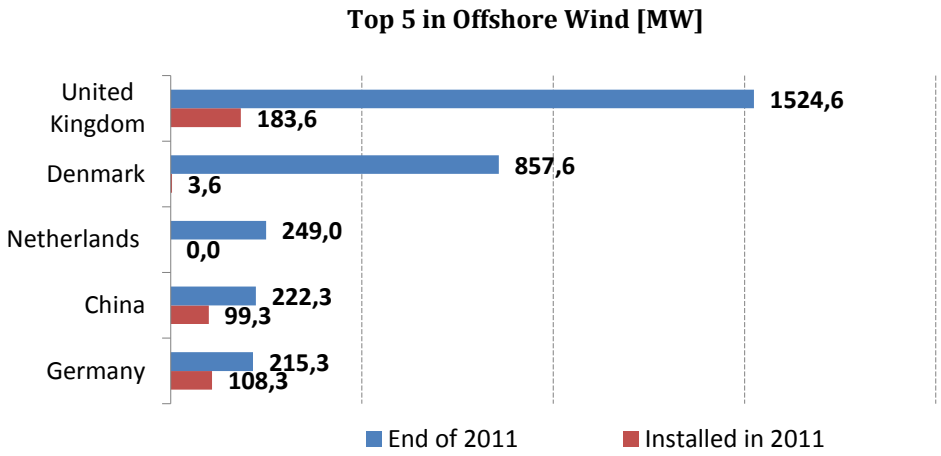
Offshore Wind

The growth of the offshore wind sector slowed down in the year 2011. By the end of 2011, the cumulative offshore wind capacity reached 3522 MW, out of which 397 MW were added during that year, compared with 1162 MW in 2010.

This represents an annual growth rate of 13 %, well below the average growth rate of the wind sector. The share of offshore wind in the total wind capacity worldwide fell from 1,6 % in 2010 to 1,5 % in 2011. The share of offshore wind in new installations fell from 3,1 % in 2010 to 1,0 % in 2011.



13 countries had offshore wind farms, eleven of them in Europe, as well as in China and Japan. Only three countries out of them added major offshore wind farms in 2011: The United Kingdom, Germany and China.

Position 2011	Country	Total Offshore Capacity 2011 [MW]	Added Offshore Capacity 2011 [MW]	Total Offshore Capacity 2010 [MW]	Added Offshore Capacity 2010 [MW]	Total Offshore Capacity 2009 [MW]
1	United Kingdom	1524,6	183,6	1341,0	653,0	688,0
2	Denmark	857,6	3,6	854,0	190,4	663,6
3	Netherlands	249,0	0,0	249,0	2,0	247,0
4	China	222,3	99,3	123,0	100,0	23,0
5	Germany	215,3	108,3	107,0	35,0	72,0
6	Belgium	195,0	0,0	195,0	165,0	30,0
7	Sweden	164,0	0,0	164,0	0,0	164,0
8	Finland	30,0	0,0	30,0	0,0	30,0
9	Japan	25,3	0,0	25,3	14,0	11,3
10	Ireland	25,0	0,0	25,0	0,0	25,0
11	Spain	10,0	0,0	10,0	0,0	10,0
12	Norway	2,3	0,0	2,3	0,0	2,3
13	Portugal	2,0	2,0	0,0	0,0	0,0
Total		3522,4	396,8	3125,6	1159,4	1966,2

The UK represented 46 % of the offshore market in 2011 and added 184 MW of offshore wind turbines. The country has an exceptional role in offshore wind power utilisation, and every fourth wind turbine installed in the UK was in the sea.

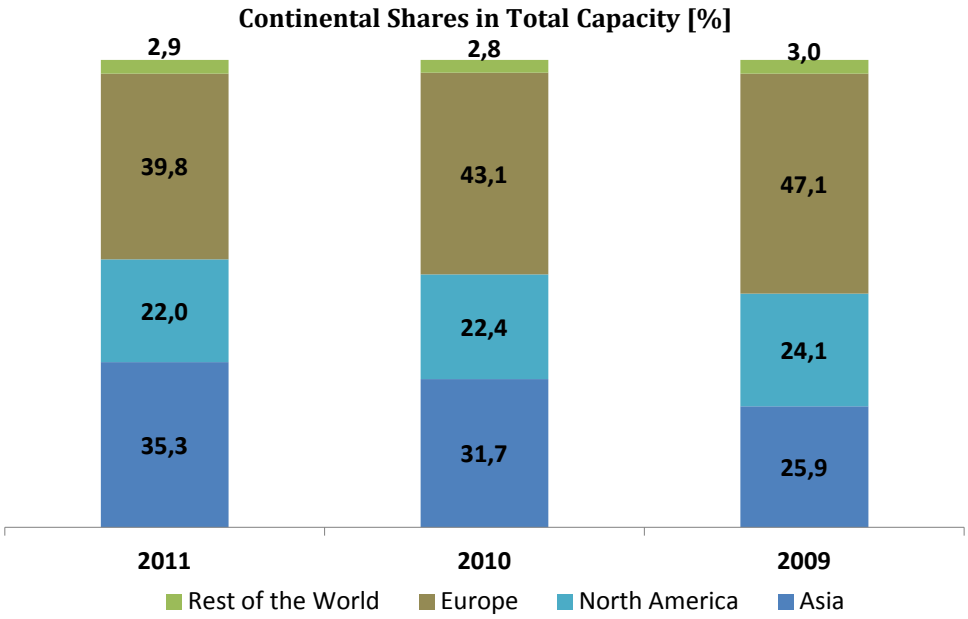
Denmark kept its second position in offshore wind, however, no major wind farm started operation in 2011.

Germany became the second largest offshore market in 2011, doubling its installed capacity from 108 MW to 215 MW, 0,7 % of the total installations. Grid connection is a major challenge for the prospects of offshore wind in Germany.

China made a major step ahead and established itself as the fourth largest offshore country, almost doubling its offshore capacity. Still offshore wind has only a minor share in China: 0,4 %. China plans to install 5 GW of offshore wind farms by 2015.

Japan's 14 MW Kamisu nearshore windfarm proofed that wind power can even survive natural disasters as it survived the earthquake and tsunami on 11 March 2011 without being damaged.

Continental Distribution: Europe and Asia competing for Leading Position



Europe is still the number one continent, accounting for almost 40 % of the total wind capacity. However, due to modest growth rates in the past years, Europe lost its dominant position - still in 2006, Europe represented 66 % of the global wind capacity. Also in terms of new capacity, Europe accounted in 2011 only for 22 %,

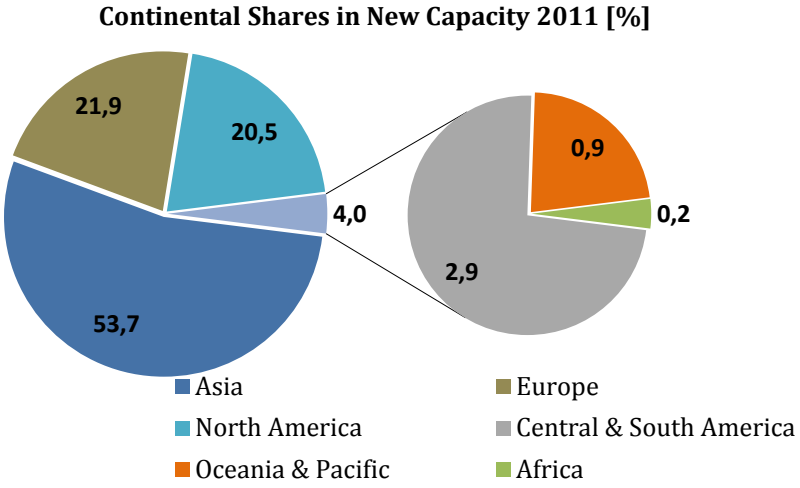
Asia has steadily increased its share in the global wind industry and has now come very close to Europe. Asia, like in 2010, accounted for more than half of the market for new wind turbines (after 40 % in 2009, 32 % in 2008).

It can be expected that in the year 2012, Europe and Asia will have almost equal installed capacities.

The share of North America in total capacity decreased further, in spite of the strong performance of the Canadian market. The North American market for new wind turbines recovered from the very low 17 % in the year 2010 and reached 21 % in 2011.

Latin America saw major progress and increased its share in new capacity from 1,2 % in 2010 to 2,9 % in 2011. In total capacity, Latin America improved from 1 % (2010) to 1,4 % in 2011.

Africa's share in the total capacity dropped in 2011 to 0,4 %, only 0,2 % of the new wind turbines was added on this continent.



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Africa

All wind turbines installed in Africa in 2010 had a capacity of 1003 MW (0,4 % of the global capacity), out of which only 73 MW were added (compared with 155 MW in the year 2010).

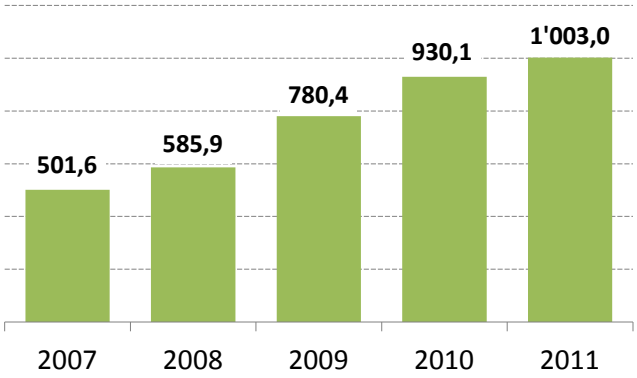
New capacity included new wind farms in Ethiopia, Cap Verde and two smaller projects in Morocco and Madagascar.

Although Africa was already on a comparatively low level, the 2011 growth rate of 8 % was again far below the global average of 20,3 %.

The two leading wind countries can be found in Northern Africa: Egypt (550 MW installed capacity) and Morocco (286 MW), as well as Tunisia (54 MW). Almost 90 % of the African wind capacity are installed in these three countries, however, only 5 MW were added during 2011.
Obviously the Arab Spring has an impact in the short term of the situation of wind power investment in this region.

Egypt, host of the WWEC2011 in October/November 2011, aims at the installation of more than 7 GW of wind power by the year 2020.

Total Installations in Africa [MW]



support the financing of wind farms in Africa, especially in Sub-Sahara Africa. A special consideration should be given to small scaled and hybrid systems for rural electrification so that hundreds of millions Africans in unserved areas can eventually benefit from modern electricity services.

For this purpose, the establishment of a Global Fund for Renewable Energy Investment would offer huge opportunities for many African countries to bypass one of the major barriers for wind energy investments: the lack of financial resources. Such a fund could be established within the frame of the Green Climate Fund.

Asia

Asia continued to be the continent showing the strongest increase in 2011, adding 21,2 GW.

The total installed wind capacity in Asia reached 83,7 GW, 35,3 % of the global capacity. The continent had the second highest growth rate of all world regions, with 34 %, however, the growth was small than in 2010 (51 %), and 2009 (67 %).

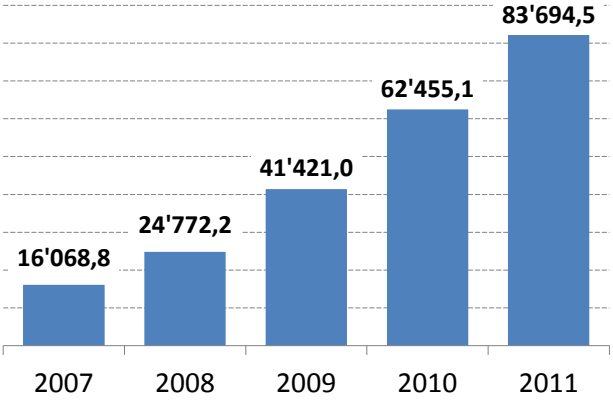
In total, only six Asian countries and regions installed new wind turbines during the year 2011: China, India, Japan, South Korea, the island Taiwan and Turkey (most wind farms are on the Asian part of this country). China accounted for 75 % of the Asian wind capacity, followed by India with 19 %.

The prospects for the Chinese market are still bright: China aims at a total wind capacity of 100 GW in 2015, amongst them decentralised wind projects with a capacity of 30 GW.
Before the background of such a strong home market, the Chinese wind industry has been able to establish itself as a strong player in terms of global market shares and has just started to export to other markets. It can be expected that this will have a major impact on the market situation of many wind markets around the world.

India as the oldest major and now second largest Asian wind market showed an impressive increase of 2827 MW in 2011, reaching a total capacity of 15,9 GW.
A study published recently revealed that the wind potential of India lies between 2000 and 3000 GW, opening bright prospects for wind power in the country – much hgher than previous official assessments. However, the recent decision by the Indian government to abolish the accelerated depreciation scheme for wind farms has been criticised as detrimental for future investment in wind power.

Japan (total capacity 2,5 GW, 167 MW added) continued to be number three wind power market in Asia. The nuclear accident in Fukushima will have major impact on the energy market in the country. Today, all

Total Installations in Asia [MW]



nuclear power stations have been switched off and many of them are expected not to start operation again.
At the same time the new feed-in tariff has been announced and is expected to be implemented in July 2012, creating favourable market frameworks for wind power. The tariffs as published recently have the potential of creating a very attractive market for large wind but also small wind and may convert Japan into a world leader of wind technology in the foreseeable future. However, long permission processes remain to be a major hurdle against a rapid take-off of wind power in the country.

Turkey, geographically predominantly in Asia, showed strongest growth in the region, adding 525 MW and reaching 1,8 GW of wind capacity. The private sector in the country shows strong interest in wind power investment, while the government still shows some reluctance, although wind power is one of the cheapest electricity sources in Turkey.

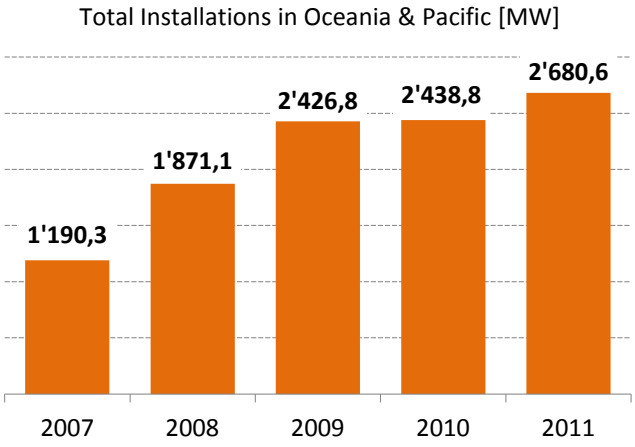
The two smaller Asian wind markets showed only modest growth: the island of Taiwan (total installations reached 564 MW, after 519 MW in 2010) and South Korea (total capacity of 406 MW, after 379 MW).
Especially the South Korean government still has not yet given sufficient priority to wind power but still expands nuclear power domestically, quite unique amongst OECD countries and in sharp contrast to its neighbour Japan. Renewable energies are rather seen as technologies to be exported to other countries. This situation may change after the presidential elections in 2012.

Oceania and Pacific

The region of Australia and Oceania increased its installed capacity by 351 MW which equals a growth of 14 %, after a very weak year 2010 with stagnation.

Australia as well as New Zealand added new capacity in 2011: Australia added 234 MW, reaching 2005 MW. Two Community wind farms started operation in 2011: the Mount Barker wind farm and the Hepburn wind farm, which together represent the first community owned wind farms in Australia. Similar projects are under development in various states, including Tasmania.

New Zealand had a robust growth in 2011, from 506 MW to 633 MW.



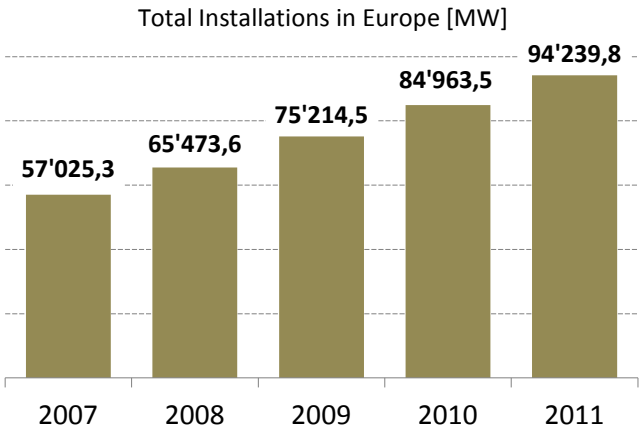
Europe

The wind capacity in Europe grew from 86 GW in 2010 to 94 GW in 2011. This equals a growth rate of 11 % and helped Europe to maintain its number one position in terms of total capacity. Europe added 8,6 GW in 2011, much less than the 21,2 GW market size of Asia. The overall European market size shrank from 10,5 GW in 2009 and 10 GW in 2010.

Germany continued to be biggest wind market on the continent, adding 2007 MW and reaching a total capacity of 29 GW, Within the country, there is broad consensus and support for the “Energiewende”, the transformation of the energy supply which includes the phase-out of nuclear power and a shift towards renewable energy. Hence it can be expected that the German wind power market will continue to be the lead market in Europe.

Three countries, Spain, France and Italy, have reached similar market sizes of around 1 GW: Spain had by end of 2011 a total wind capacity of 21,7 GW, Italy reached 6,7 GW and France 6,6 GW.

After the new Spanish government came into power, it suspended all support schemes for new renewable energy projects, thus endangering the prospects of the Spanish wind industry. This will have a negative impact on the short-term development in Spain, however, European legislation will force Spain to re-introduce supportive policies in the foreseeable future.



The new Italian government will have to deal with the strong dependence of the country on import of fossil resources. After the very clear result of the referendum on nuclear power in June 2011 with 94 % of the population voting against nuclear power, Italy will have to intensify its efforts to foster investment in renewable energy, and wind power will represent a large share of this.

The outcomes of the presidential elections in France are expected to create a positive momentum for renewable energy in the country. Although most likely no dramatic change will happen, renewable energy will be given more consideration.

European medium-sized markets with robust growth of around 20 % were Italy (5 797 MW, new: 950 MW), France (5 660 MW, additional: 1 086 MW), and the United Kingdom (5 204 MW, added: 1 112 MW).

Some of the most dynamic, however still small wind markets can be found in Eastern Europe: Romania (more than 4 000 % growth, 591 MW total capacity), Croatia (161 %, 70 MW), Bulgaria (112 %, 375 MW), Lithuania (69 %, 154 MW), Poland (53 %, 1'107 MW) and Hungary (47%, 295 MW).
Also Switzerland (139 %, 42 MW), Belgium (62 %, 886 MW), Turkey (60 %, 1'274 MW) and Cyprus (82 MW, up from 0) showed impressive growth.

The Danish, German and Spanish wind turbine manufacturing industries were still playing a leading role in many wind markets around the world. However, competitors especially from Asia (China, India, Korea as well as Japan) have been able to increase their market shares in their home markets as well as on international markets.

In spite of the stagnation in 2010, the general prospects in Europe are good, considering the ambitious targets of many countries:

In Germany, a wind share in electricity supply of 20-25 % is expected by the year 2020, equalling 150 TWh, or 45 GW onshore installations plus 10 GW offshore.

Spain expects 38 GW of installed capacity by the year 2020, including 370 MW of small wind and 3 GW of offshore wind.

The United Kingdom, world leader in offshore wind, has set a target for 2020 of 15 GW onshore and 13 GW offshore.

Italy set and official target of 12 680 MW in 2020, which would more than double its installed capacity.

Poland expects 8,6 GW to be installed by 2020.

Europe continues to be the leading continent in offshore installations where 96 % of the offshore wind turbines can be found.

Another important trend has started in Germany: Repowering of older turbines plays and increasing role: In 2010, 183 MW were replaced by bigger machines. This market is expected to grow substantially in the future.

Another important trend can be found in Denmark, the birthplace of community based wind farms. The country re-introduced special incentives for community ownership of wind turbines.
Considering the importance of a high social acceptance, policymakers in other parts of the world should feel encouraged to take up the Danish model.

Central and South America

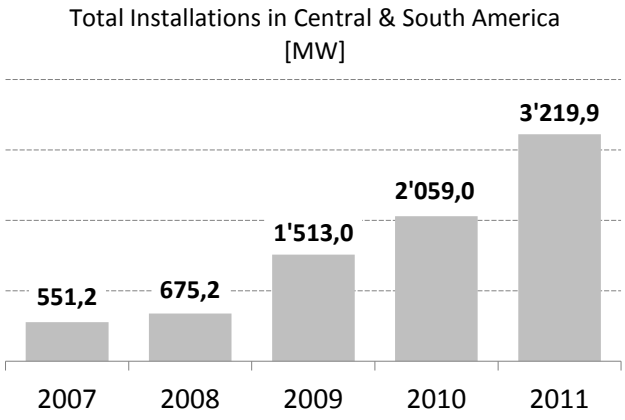
Latin America added for the first time more than 1 GW of new wind capacity in a year, reaching 3 219 MW. This represented a growth of 56,4 % respect 2010. Brazil (498 MW) and Mexico (408 MW) lead the region followed by Argentina (75,2 MW) and Honduras with his first major wind farm (70,0 MW).

The growth rate of the region was again well above the worldwide average, however the continent accounted for only 1,2 % of the globally added wind turbines.

Eight Latin American countries installed new wind turbines in the year 2011: Brazil, Mexico, Argentina, Honduras, Costa Rica, Jamaica, Dominican Republic and Chile.

Two more countries joined the list of countries with major wind farms, Honduras with a 70,0 MW wind farm and the Dominican Republic with a 33,2 MW wind farm.

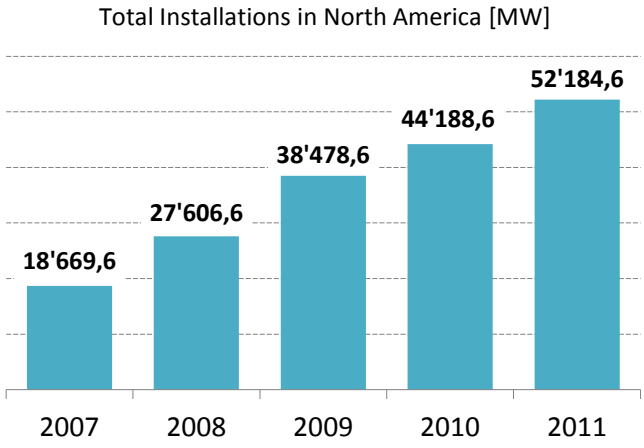
Two more countries are expected to join the list in the near future: Venezuela with a 72 MW wind farm and Panama with the biggest wind farm in Central America.



North America

The US market presented itself stronger than in 2010, however, the mid-term prospects are not very bright, due to a lack of clarity regarding the political support schemes. In Canada, especially Ontario with its Green Energy Act, adopted as a consequence of the WWEC2008, made sure that the country now finds itself as number five in terms of new capacity.

The USA saw an increase of new installations in 2011, adding 1,2 GW more than in 2010. The leading state was California with a new installed capacity of 921 MW. The State of Texas with a total installed capacity of 10,3 MW which would be number 6 in global terms.
By the end of 2011, 8,3 GW of wind farms were under construction.

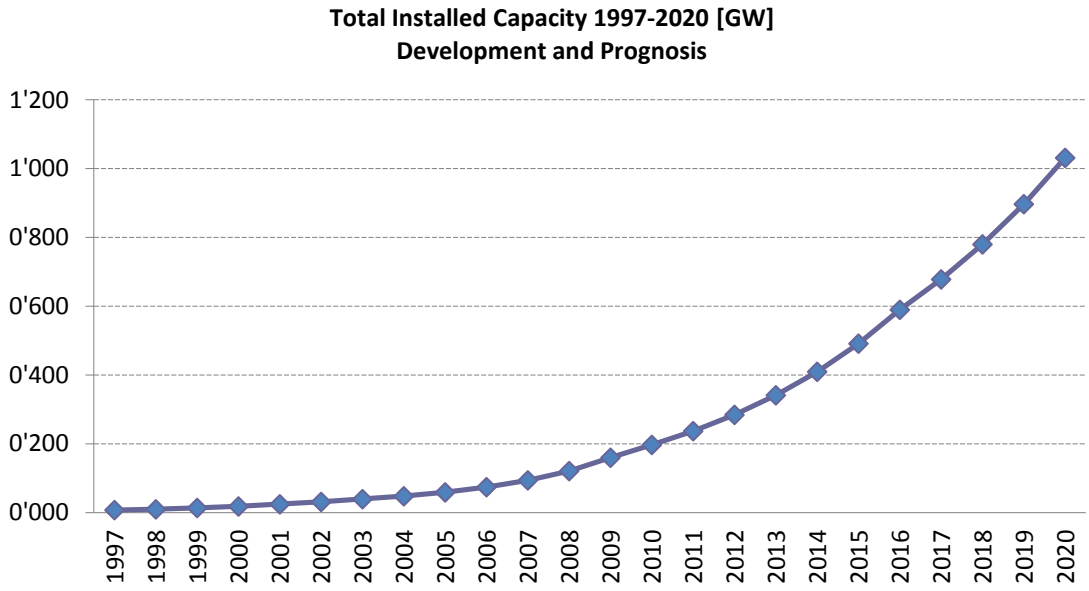


Canada increased its capacity by 31 %, adding 1 267 MW (close to 700 MW in 2010), to a total of 5 265 MW.

Forecast for 2015 and 2020

Based on the current growth rates, WWEA revises its expectations for the future growth of the global wind capacity:

In 2015, a global capacity of 500 000 MW is possible. By the end of year 2020, at least 1 000 000 MW can be expected to be installed globally.



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Position 2011	Country/Region	Total capacity installed end 2011 [MW]	Added capacity 2011 [MW]	Growth rate 2011 [%]	Position 2010	Total capacity installed end 2010 [MW]	Total capacity installed end 2009 [MW]	Total Capacity installed end 2008 [MW]	Total Capacity installed end 2007 [MW]
1	China	62'364,0	17'600,0	39,4	1	44'733,0	25'810,0	12'210,0	5'912,0
2	USA	46'919,0	6'810,0	16,8	2	40'180,0	35'159,0	25'237,0	16'823,0
3	Germany	29'075,0	2'007,0	6,8	3	27'215,0	25'777,0	23'897,0	22'247,4
4	Spain	21'673,0	1'050,0	4,8	4	20'676,0	19'149,0	16'689,0	15'145,1
5	India	15'880,0	2'827,0	21,5	5	13'065,8	11'807,0	9'587,0	7'850,0
6	Italy	6'737,0	950,0	16,2	6	5'797,0	4'850,0	3'736,0	2'726,1
7	France	6'640,0	980,0	17,3	7	5'660,0	4'574,0	3'404,0	2'455,0
8	United Kingdom	6'018,0	730,0	15,6	8	5'203,8	4'092,0	3'195,0	2'389,0
9	Canada	5'265,0	1'267,0	31,4	9	4'008,0	3'319,0	2'369,0	1'846,0
10	Portugal	4'083,0	375,0	10,3	11	3'702,0	3'357,0	2'862,0	2'130,0
11	Denmark	3'927,0	180,0	5,2	10	3'734,0	3'465,0	3'163,0	3'125,0
12	Sweden	2'798,0	746,0	36,4	14	2'052,0	1'448,2	1'066,9	0'831,0
13	Japan	2'501,0	167,0	8,6	12	2'304,0	2'083,0	1'880,0	1'528,0
14	The Netherlands	2'328,0	068,0	2,6	13	2'269,0	2'223,0	2'235,0	1'747,0
15	Ireland	2'031,3	603,3	42,2	16	1'428,0	1'310,0	1'027,0	805,0
16	Australia	2'005,0	234,0	6,6	15	1'880,0	1'877,0	1'494,0	0'817,3
17	Turkey	1'799,0	525,0	41,2	17	1'274,0	796,5	333,4	206,8
18	Greece	1'626,5	311,2	34,6	18	1'208,0	1'086,0	989,7	873,3
19	Poland	1'616,4	377,0	37,1	19	1'179,0	725,0	472,0	276,0
20	Brazil	1'429,0	498,0	53,7	21	930,0	600,0	338,5	247,1
21	Austria	1'084,0	073,0	7,3	20	1'010,6	995,0	994,9	981,5
22	Belgium	1'078,0	192,0	21,7	22	886,0	548,0	383,6	286,9
23	Mexico	929,0	408,0	78,3	25	521,0	416,8	85,0	85,0
24	Romania	826,0	235,0	39,8	23	591,0	14,0	7,0	7,8
25	New Zealand	622,8	116,8	23,1	27	506,0	497,0	325,3	321,8
26	Chinese Taipeh	563,8	45,1	8,7	26	518,7	436,0	358,2	279,9
27	Egypt	550,0	0,0	0,0	24	550,0	435,0	390,0	310,0
28	Norway	520,0	83,0	19,7	29	434,6	431,0	429,0	333,0
29	Bulgaria	503,0	3,5	0,8	28	499,0	176,5	157,5	56,9
30	Korea (South)	406,3	27,0	7,1	30	379,3	348,4	278,0	192,1
31	Hungary	329,4	70,0	11,7	31	295,0	201,0	127,0	65,0
32	Morocco	291,0	5,0	1,7	32	286,0	253,0	124,0	125,2
33	Czech Republic	217,0	2,0	0,9	33	215,0	191,0	150,0	116,0
34	Finland	197,0	0,0	0,0	34	197,0	147,0	143,0	110,0
35	Chile	190,0	20,0	11,8	35	170,0	167,6	20,1	20,1
36	Estonia	184,0	35,0	23,5	37	149,0	142,3	78,3	58,6
37	Lithuania	179,0	16,0	9,8	36	163,0	91,0	54,4	52,3
38	Ukraine	151,1	66,1	73,0	41	87,4	90,0	90,0	89,0
39	Costa Rica	148,2	25,2	20,5	38	123,0	123,0	74,0	74,0

40	Cyprus	134,0	52,0	63,4	42	82,0	0,0	0,0	0,0
41	Croatia	131,0	42,0	47,2	40	89,0	26,7	18,2	17,2
42	Argentina	129,2	75,2	139,3	44	54,0	28,7	29,8	29,8
43	Iran	100,0	0,0	0,0	39	100,0	82,0	82,0	66,5
44	Honduras	70,0	70,0	New	New	0,0	0,0	0,0	0,0
45	Nicaragua	63,0	0,0	0,0	43	63,0	40,0	0,0	0,0
46	Tunisia	54,0	0,0	0,0	45	54,0	54,0	20,0	20,0
47	Jamaica	47,7	18,0	60,6	54	29,7	29,7	20,7	20,7
48	Switzerland	45,5	3,3	7,6	47	42,3	17,6	13,8	11,6
49	Luxembourg	44,0	0,0	0,0	46	44,0	35,3	35,3	35,3
50	Uruguay	40,5	0,0	32,8	51	30,5	20,5	20,5	0,6
51	Cape Verde	38,3	25,5	1267,9	71	2,8	2,8	2,8	2,8
52	New Caledonia	38,2	0,0	0,0	48	38,2	38,2	38,2	38,2
53	Dominican Republic	33,6	33,4	13900,0	87	0,2	0,2	0,2	0,0
54	Philippines	33,0	0,0	0,0	49	33,0	33,0	25,2	25,2
55	Vietnam	31,0	0,0	0,0	50	31,0	8,8	1,3	0,0
56	Latvia	31,0	1,0	3,3	52	30,0	28,5	26,9	27,4
57	Aruba	30,0	0,0	0,0	53	30,0	0,0	0,0	0,0
58	Ethiopia	30,0	30,0	New	New	0,0	0,0	0,0	0,0
59	Guadeloupe	26,8	0,0	0,0	55	26,8	26,8	26,8	20,5
60	Reunion Island	23,4	0,0	0,0	56	23,4	23,4	23,4	23,4
61	Colombia	19,5	0,0	0,0	57	19,5	20,0	19,5	19,5
62	Russia	15,4	1,4	9,1	58	15,4	14,0	16,5	16,5
63	Guyana	13,5	0,0	0,0	59	13,5	13,5	13,5	13,5
64	Curacao	12,0	0,0	0,0	60	12,0	12,0	12,0	12,0
65	Cuba	11,7	0,0	0,0	61	11,7	7,2	7,2	2,1
66	Bonaire	10,8	0,0	0,0	62	10,8	0,0	0,0	0,3
67	South Africa	10,1	0,0	1,0	63	10,0	8,0	21,8	16,6
68	Fiji	10,0	0,0	0,0	64	10,0	10,0	10,0	10,0
69	Dominica	7,2	0,0	0,0	65	7,2	0,2	0,2	0,0
70	Israel	6,0	0,0	0,0	66	6,0	6,0	6,0	6,0
71	Pakistan	6,0	0,0	0,0	67	6,0	6,0	6,0	0,0
72	Faroe Islands	4,0	0,0	0,0	68	4,0	4,0	4,1	4,1
73	Belarus	3,5	1,6	0,0	74	1,9	1,9	1,1	1,1
74	Slovakia	3,0	0,0	0,0	69	3,0	3,0	6,0	5,0
75	Vanuatu	3,0	0,0	0,0	70	3,0	3,0	3,0	3,0
76	Armenia	2,6	0,0	0,0	-	2,6	2,6	0,0	0,0
77	Ecuador	2,5	0,0	0,0	72	2,5	2,5	4,0	3,1
78	Nigeria	2,2	0,0	0,0	73	2,2	2,2	2,2	2,2
79	St. Kitts and Nevis	2,2	0,0	New	New	0,0	0,0	0,0	0,0
80	Kazakhstan	2,2	1,5	300,0	86	0,7	0,5	0,5	0,5
81	Azerbaijan	2,2	0,0	0,0	-	2,2	2,2	2,2	2,2
82	Antarctica	1,6	0,0	0,0	75	1,6	1,6	0,6	0,0
83	Jordan	1,5	0,0	3,4	76	1,5	1,5	1,5	1,5
84	Indonesia	1,4	0,0	0,0	77	1,4	1,4	1,2	1,0

85	Mongolia	1,3	0,0	0,0	78	1,3	1,3	2,4	0,0
86	Madagascar	1,2	1,2	New	New	0,0	0,0	0,0	0,0
87	Martinique	1,1	0,0	0,0	79	1,1	1,1	1,1	1,1
88	Mauritus	1,1	0,0	New	New	0,0	0,0	0,0	0,0
89	Falkland Islands	1,0	0,0	0,0	80	1,0	1,0	1,0	1,0
90	Eritrea	0,8	0,0	0,0	81	0,8	0,8	0,8	0,8
91	Grenade	0,7	0,0	0,0	82	0,7	0,2	0,2	0,2
92	Peru	0,7	0,0	0,0	83	0,7	0,7	0,7	0,7
93	St. Pierre-et-Miquelon	0,6	0,0	0,0	84	0,6	0,6	0,6	0,6
94	Syria	0,6	0,0	0,0	85	0,6	0,6	0,4	0,3
95	Namibia	0,2	0,0	0,0	88	0,2	0,5	0,5	0,5
96	North Korea	0,2	0,0	0,0	89	0,2	0,2	0,2	0,0
97	Algeria	0,1	0,0	0,0	90	0,1	0,1	0,1	0,0
98	Bolivia	0,0	0,0	0,0	91	0,0	0,0	0,0	0,0
Total	**World**	**237'022,6**	**40'084,2**	**20,3**		**197'040,1**	**159'837,8**	**120'986,6**	**94'009,0**

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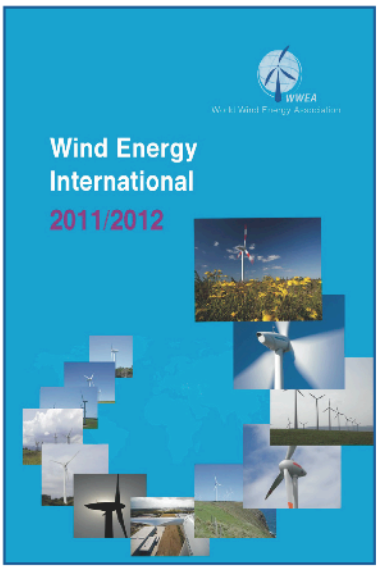

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