

Wind turbines – Sales and market development



“ 2016 order intake reached a new record level driven by improvements in all regions. We are comfortable maintaining our ambition to grow faster than the market and we believe the future is bright for wind energy.”

Juan Araluce
Executive Vice President & CSO

Global trends in the onshore wind energy market 2016

In 2016, global onshore installations is expected to decline to 55 GW compared to 59 GW installed in 2015.¹⁾ The deterioration was mainly caused by a slowdown in the Chinese market, where onshore wind power installations declined to 22 GW in 2016 – a decline of 22 per cent compared to 2015.²⁾

Excluding the Chinese market, global onshore installations is expected to increase by 2 GW in 2016.¹⁾ More importantly, Bloomberg New Energy Finance predicts the wind energy market to continue to expand its position amongst energy sources. While the share of total installed electricity generation capacity only constituted approx 7 percent in 2015, it is estimated that wind energy accounted for approx 18 per cent of the new installed electricity generation capacity in 2016.³⁾

Vestas' market development in 2016

Vestas' installed capacity increased from 74 GW in 2015 to almost 82 GW in 2016 – an increase of 11 percent.

With deliveries across 34 countries in 2016, Vestas' wide geographic diversification remains a key strategic strength, allowing it to balance out the inevitable ups and downs in any given market. Vestas' global presence in 76 countries across six continents underlines its ability to provide wind energy solutions anywhere in the world.

During 2016, Vestas continued its focus on early engagement, thereby offering more attractive cost-effective wind energy solutions to the benefit of both the customers and Vestas. By early engagement with customers, for example on site design, Vestas is able to unlock value and offer a more optimised solution.

Combined with the ongoing efforts to build closer and expand already existing customer relationships and partner with new customers in both mature and new wind power markets, Vestas experienced order

intake growth across all regions and signed orders in a total of 33 countries in 2016. Demand for wind turbines from Vestas' 2 MW and 3 MW platforms remains strong. In 2016, approx two-thirds of the order intake was based on the 3 MW platform, while the remaining one-third related to the 2 MW platform.

2016 order intake and backlog per region

MW

	Europe, Middle East, and Africa	Americas	Asia Pacific	Total
Order intake	5,141	4,318	1,035	10,494
Wind turbine order backlog	4,974	3,448	1,108	9,530

Europe, Middle East, and Africa

Vestas delivered 3,991 MW to the markets in the Europe, Middle East, and Africa region in 2016, up from 3,672 MW in 2015. In 2016, Vestas had an order intake of 5,141 MW in the region, while the order backlog amounted to 4,974 MW as of 31 December 2016.

The European onshore market is expected to be stable in 2016, adding 12 GW of new installations, an increase from 11 GW in 2015.⁴⁾ The stable market development in Europe is founded on long-term targets and policy stability for renewable energy. However, Europe is still characterised by varying growth patterns on a national level due to differences in regulatory, economic, and geopolitical conditions. Europe continues to be driven by the EU member states' approach towards achieving their renewable energy targets for 2020 and 2030. Conventional utility groups across Europe are facing structural

1) Source: Bloomberg New Energy Finance: Q4 2016 Market Outlook, December 2016.

2) Source: Bloomberg New Energy Finance: 2016 China's top 10 wind turbine manufacturers, January 2017.

3) Source: Bloomberg New Energy Finance: Bloomberg New Energy Outlook 2016, June 2016

4) Source: Make Consulting: Global Wind Power Market Update, November 2016.

pressure as the energy markets are being re-regulated by policymakers to enforce de-carbonisation of the energy mix.

By demand of the EU state aid guidelines, European markets are moving towards more market-based support systems, putting greater focus on the development in power prices and cost of energy.

Northern Europe

Northern Europe remains a stable core market for Vestas. The German market continues to display its importance as it once again was Vestas' largest northern European market in terms of deliveries in 2016. Markets like Norway, Finland, and Sweden also supported Vestas' performance in 2016, while activity levels in the UK were more stable.

More specifically in Germany, 2016 marked another year with high installation activity, which reached 4.3 GW in 2016.⁵⁾ Repowering accounted for approx 679 MW of German installations in 2016 and thus, continued representing an interesting segment in Europe's largest onshore market.⁵⁾

In July 2016, the German parliament passed renewable energy legislation covering the shift from the current feed-in premium system to an auctioning system. The auctioning volume (including repowering) is fixed by law at 2.8 GW yearly, split over three to four rounds from 2017 to 2019 and at 2.9 GW yearly from 2020 onwards. The administratively fixed feed-in premium system will, however, remain valid for all projects permitted until end of 2016 and constructed until end of 2018 (transition period), which will drive important market activity in the near-term despite a sharpened support level regression.⁶⁾

The new auction system will influence market size in terms of installations from the second half of 2017 and onwards with the first winning bids of the auction rounds in 2017 starting to be installed. From 2019 onwards, the auctioned volume will entirely drive the market size. Vestas delivered 1,119 MW to the German market in 2016 and expects that Germany will remain one of its key markets in the years to come.

In 2016, Vestas signed the largest single project in the history of the company with the 1 GW Fosen/Hitra project in Norway. The Norwegian market continues to be driven by the joint green certificate system with Sweden, which was implemented in 2012. Further support came from new taxation rules approved in July 2016. Currently, the green certificate system is expected to be phased out by the end of 2021.

1 GW order

In February 2016, Vestas signed a 1 GW order in Norway consisting of

- 248 V117-3.45 MW turbines
- 30 V112-3.45 MW turbines

Finland experienced another strong year for wind energy in 2016 with installations reaching 570 MW – almost a doubling compared to 379 MW in 2015.⁵⁾ The Finnish market continues to be driven by a feed-in tariff mechanism implemented in 2011 and is expected to transition to an auction-based system as of 2018. With deliveries of 340 MW in 2016 – an increase of 54 percent compared to 2015 – Vestas solidified its market leading position in the Finnish market.

As expected, the Swedish market witnessed a weakening in 2016. Market installations reached 493 MW in 2016, down from 615 MW in 2015.⁵⁾ In the near-term, low power and green certificate prices are expected to dampen the activity level in the Swedish market. Despite the weakened Swedish market, Vestas strengthened its leading

position by securing an order intake of 496 MW in 2016 – an increase of 78 percent compared to 2015 – and delivering 343 MW, compared to 194 MW in 2015.

The UK market has been driven by developers seeking to qualify for the existing support scheme that requires projects to be operational by the end of March 2017. The regulatory environment for the development of onshore wind power is increasingly challenging in the UK, as exemplified by the decision to end the existing support scheme one year ahead of schedule. Vestas delivered 310 MW to the UK market in 2016, including 155 MW offshore via the joint venture MHI Vestas Offshore Wind, while order intake amounted to a total of 328 MW (read more about the joint venture on page 037). The wind power industry has so far been unaffected by British vote to withdraw from the EU whereas the long-term market impact from the referendum remains unclear.

Southern Europe

Stagnated demand for electricity and constrained economic conditions in several countries in southern Europe have dampened wind energy installations in the region. Even though demand is still below historical peak levels, a modest market improvement was observed in 2016. During the year, the market in southern Europe saw good support from France, Turkey, and Greece, while activity in Spain remains subdued.

France experienced another good year in terms of installed capacity and order intake in 2016. The approval of a new ambitious energy law during 2015 combined with a focus on simplifying permitting processes has paved the way for a stable market development. Total installations reached 1.6 GW in 2016, which was 45 percent higher compared to 2015.⁷⁾ Vestas delivered 534 MW in France in 2016, an increase of 54 percentage compared to 2015, while Vestas managed to sign orders totalling 642 MW.

Despite political turmoil, Turkey installed 1.4 GW of new wind power capacity in 2016, representing a new record for the Turkish market.⁵⁾ Near-term market activity should remain at a healthy level, supported by a pipeline of projects under construction and increasing electricity demand in the country. Vestas delivered 221 MW to the Turkish market in 2016, a decrease of 35 percent compared to 2015.

Greece commissioned 239 MW of new wind power capacity in 2016.⁵⁾ Representing an increase of 53 percent compared 2015.⁵⁾ Vestas has been successful in the country in 2016 with deliveries of 174 MW and an order intake of 149 MW.

In January 2016, Spain conducted its first renewable power auction in which 500 MW of new wind power capacity obtained approval to be built. However, low bid prices among the approved projects have created uncertainty as to when these projects are expected to be executed as they have until 2019 to be completed. Consequently, the Spanish wind energy market stayed at a very low level in 2016 with only 49 MW of new installations.⁵⁾

Eastern Europe

Despite the long-term growth potential, regulatory uncertainty and geopolitical conflicts are taking their toll on the markets in Eastern Europe. Even though several smaller markets are experiencing steadily increasing support for renewables, it has not been enough to compensate for the shortfall in activity that is affecting large markets such as Poland, Romania, and Ukraine.

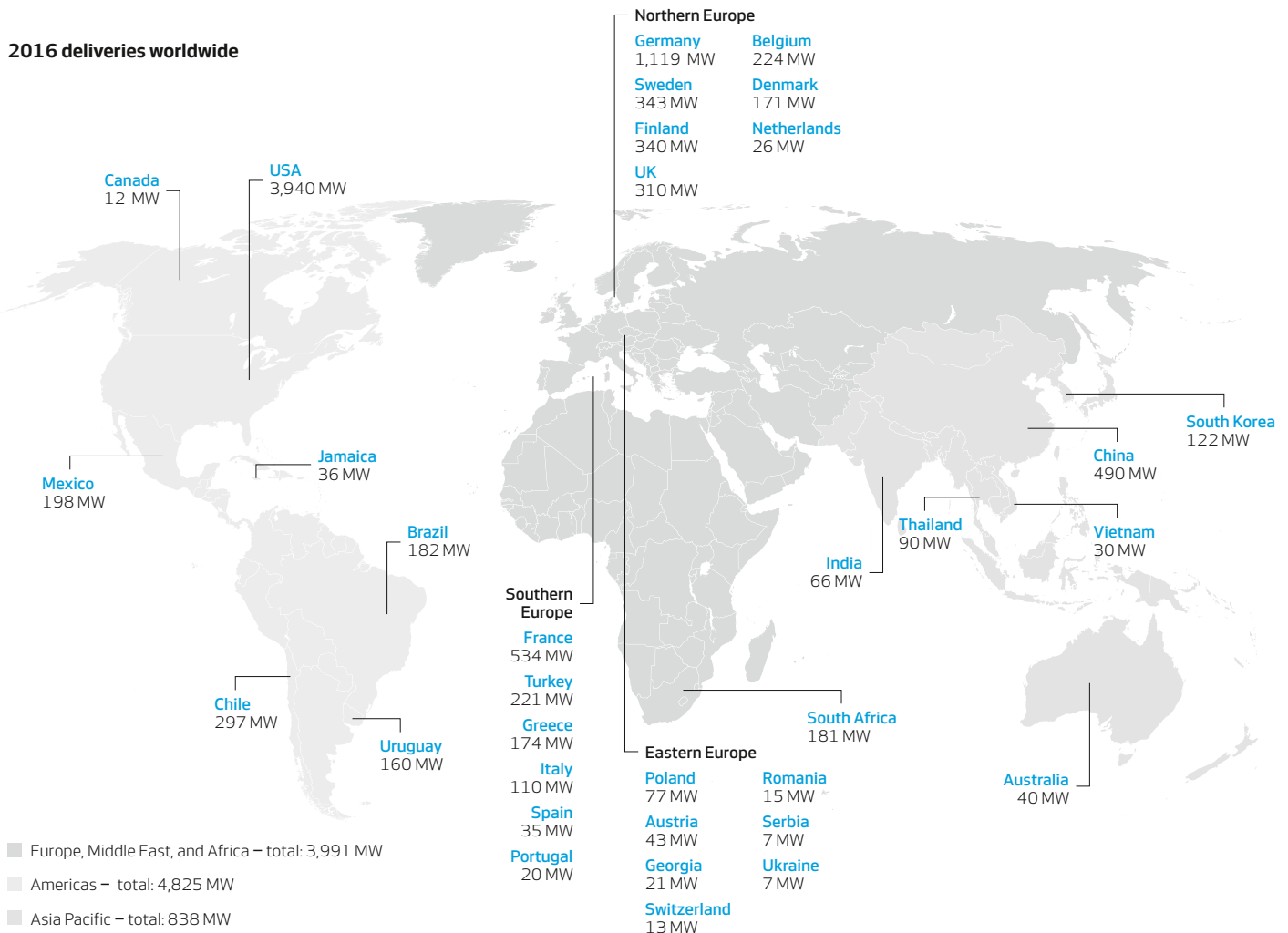
In Poland, notable regulatory changes took place in 2016. The subsidy scheme changed to an auction-based support system that has replaced the former green certificate system. This shift created record-high market activity in 2015 as developers permitted their projects under the previous subsidy scheme. Market installations in 2016 is expected

5) Source: WindEurope. February 2017.

6) Source: Bloomberg New Energy Finance: New Q4 2016 European Policy Outlook. December 2016.

7) Source: France Energie Eolienne: +45 % d'installations éoliennes raccordées en France 2016 : une année record pour l'éolien français. 11 January 2017.

2016 deliveries worldwide



to be markedly below the installation level in 2015 of 1.5 GW.⁸⁾ A new government was elected in 2015 and it has during 2016 for instance adopted stricter requirements for the distance between wind turbines and adjacent buildings, houses, and natural protected sites. Observers of the market are concerned that these stricter requirements will slow the build-out of wind power in Poland. Vestas delivered 77 MW in Poland during the year, down from 774 MW in 2015.

Africa and the Middle East

Africa and the Middle East offer growth potential, although from a low base. The region is characterised by good wind resources and holds an enormous potential due to the historical untapped nature of these markets. Vestas has been active in the region delivering 181 MW in South Africa and securing an order of 120 MW in Morocco.

Vestas continued making solid progress in connection with the Lake Turkana Wind Power project in Kenya – its largest-ever project in terms of the number of wind turbines being installed.

Americas

Vestas delivered 4,825 MW to the markets in the Americas region in 2016, up from 3,357 MW in 2015. In 2016, Vestas had an order intake of 4,318 MW in the region, while the order backlog amounted to 3,448 MW as of 31 December 2016.

North America

In the USA, an extension of the American Production Tax Credit (PTC) was approved in December 2015, the main element of which was a

two-year extension of the 100 percent value followed by a three-year phase-down period. The PTC extension provides the policy certainty necessary for effective business planning and investment. The longer-term expected certainty, alongside wind energy's natural competitiveness against other power generation sources, will ensure an expected solid future for wind energy in the USA.

The US market is currently at very high activity levels and during 2016, Vestas has successfully broadened its customer base. In terms of order intake, the USA was once again Vestas' largest market with 3,465 MW, corresponding to one third of total order intake in 2016. Components orders that enable future project pipeline constituted 1,640 MW.

In 2016, Vestas delivered almost 4 GW in the USA.

Canadian wind power installations reached 702 MW in 2016, representing a decrease of 53 percent compared 2015.⁹⁾ Vestas had deliveries of 12 MW and an order intake of 224 MW.

Latin America

In Latin America, the Brazilian market drove installations, while the introduction of power auctions in Argentina and Mexico opens up for new growth opportunities in the region.

In 2016, total installations in Brazil are expected to be fairly stable compared to the 2.7 GW realised in 2015.⁸⁾ The same goes for Vestas' order intake in the market, which landed at 371 MW in 2016, showcasing its reignited efforts in the market in accordance with its local

8) Source: Bloomberg New Energy Finance: Q4 2016 Market Outlook. December 2016.

9) Source: The Canadian Wind Energy Association: Wind energy continues strong growth in Canada in 2016. January 2017.

strategic plan. However, 2016 also marked a year for Brazil where no energy auction took place and Brazil is therefore expected to be a challenging market near term.

The potential in the remaining Latin American markets is strong, driven by demand for energy security and diversity of supply. During 2016, markets such as Argentina and Mexico have carried out their first power auctions where wind power won a substantial part of the new electricity contracts.

Vestas delivered 873 MW to the markets in the Latin American region in 2016, compared to 336 MW in 2015.

Asia Pacific

Asia Pacific is expected to see an overall decline in market installations in 2016 compared to 2015, driven by a sharp decline in Chinese wind power installations. Installations in China reached almost 30 GW in 2015, but due to changes in the subsidy regime, installations declined to 22 GW in 2016.¹⁰⁾ An expected increased activity in the rest of Asia Pacific will not compensate for the large decline in the Chinese market and hence, installations for Asia Pacific is expected to reach 29 GW representing a decrease of around 9 percent compared to 2015.¹¹⁾

The long-term outlook remains very promising for Asia Pacific. According to the International Energy Agency (IEA), the growth level of electricity demand in Asia Pacific is expected to be higher than in any other region of the world.¹²⁾

The Chinese market remained the largest global wind energy market in 2016. However, a feed-in tariff reduction has taken its toll on installations. According to preliminary data, installations in China declined by 21 percent in 2016 compared to 2015.¹⁰⁾ Part of the strong development in 2015 can be attributed to a rush in the market for securing subsidies under the previous feed-in tariff scheme. It remains to be seen how the change to the feed-in tariffs will impact the level of installations going forward. Grid curtailment remains a challenge though the Chinese authorities are taking responsive actions to solve this.

During 2016, Vestas introduced its largest onshore wind turbine – the V136-3.45 MW turbine – to the Chinese market. Vestas will manufacture and sell the wind turbine and introduce an unprecedented level of service flexibility to the Chinese market. Thus, Vestas continues to show commitment to its strategy in China by focusing entirely on the relatively smaller, but still attractive, addressable segments of the market where Vestas' offerings are relevant. Vestas delivered 490 MW in China in 2016 and signed orders totalling 415 MW.

India's energy sector is currently undergoing a huge transformation towards greater deployment of renewables in the country. The Government has set an ambitious target of 60 GW by 2022.¹³⁾ Despite the high ambitions, the Indian market continues to be challenging and short-term the market performance could potentially be impacted by policy uncertainty.

Vestas took an important step forward in 2015 by announcing its plans to build a new blade facility in India. Once completed in early 2017, this new blade facility is expected to improve Vestas' competitiveness in the Indian market. Vestas made its mark on the market in 2016 by delivering 66 MW in India.

In Australia, the first effects of the new Renewable Energy Target (RET) became visible in 2016. Installations in the market remain at a low level in 2016 but within the year, Vestas secured three orders in the market with a total capacity of 480 MW. The RET will give much needed clarity for the future of the Australian wind energy market. Historically, Australia has been a Vestas stronghold, and with a market share of almost 50 percent based on total expected installed capacity as of 2016,¹⁴⁾ Vestas welcomes the new RET resolution.

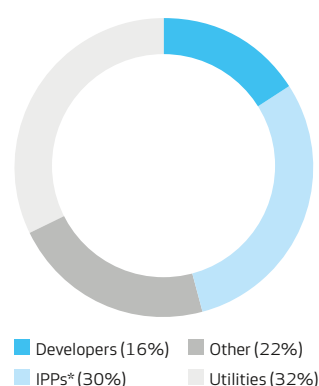
Customer relations

Vestas maintains its focus on its key account management programme, which it expanded in 2016.

With a diverse set of offerings encompassing both products and services, Vestas has broad access to all relevant segments and markets and an undisputed global ability to target value driving growth. Vestas directly or indirectly serves a broad base of customers, including utilities, developers, independent power producers, pension funds, large corporations, and others.

Customer segmentation based on order intake 2016

Percent



10.5 GW in order intake

Vestas experienced order intake growth across all regions and signed orders in a total of 10.5 GW in 33 countries.

* IPP includes community wind power plant customers.

Vestas measures its customer relationships through an annual survey. The most recent survey took place from 2 to 22 November 2016 and included around 300 respondents in more than 40 countries representing around 180 customers.

Overall, customer perception of Vestas improved from 2015 to 2016. The Net Promoter Score increased from 40 to 54 index points with more than two-thirds of Vestas customers being considered as promoters. The results are above industry average for large industrial companies.

10) Source: Bloomberg New Energy Finance: 2016 China's top 10 wind turbine manufacturers. January 2017.

11) Source: Bloomberg New Energy Finance: Q4 2016 Market Outlook. December 2016.

12) Source: International Energy Agency: World Energy Outlook 2016. November 2016.

13) Source: Recharge News: India is on track to installing 175 GW of renewable energy by 2020. 28 September 2016.

14) According to the Global Wind Energy Council, total installed capacity in Australia by end 2015 amounted to 4.2 GW (Source: Global Wind Energy Council: Global Wind Report 2015. April 2016) and with added installations in 2016 (Source: Bloomberg New Energy Finance: Q4 2016 Market Outlook. December 2016), total capacity by end 2016 is around 1.26 GW. At the end of 2016, Vestas had installed 2 GW in Australia.