



A global view of the wind industry

Coming off a record year in 2015, where a ‘perfect storm’ of circumstances pushed the Chinese market to 30 GW and the global market past 60 GW, 2016 was a solid if mostly unspectacular year for the wind power industry. More than 54 GW of clean renewable power was installed across the global market, which now comprises more than 90 countries, including 9 with more than 10,000 MW installed, and 29 which have now passed the 1,000 MW mark.

Cumulative capacity grew by 12.6% to reach a total of 486.8 GW. Wind power penetration levels continue to increase, led by Denmark pushing 40%, followed by Uruguay, Portugal and Ireland with well over 20%, Spain and Cyprus around 20%, Germany at 16%; and the big markets of China, the US and Canada get 4, 5.5, and 6% of their power from wind, respectively.

Much of the reduction from the 2015 market was because China ‘only’ installed 23 GW instead of 2015’s phenomenal 30 GW. The 2015 numbers were driven by an impending cut in the feed-in-tariff which came into effect in January 2016. We face the same situation again in 2017, with an impending tariff reduction on January 2018. While we



don't think the numbers will go back up to 30 GW there will likely be a modest increase in 2017.

India set a new national record with 3,612 MW of new installations, pushing it into fourth place in terms of annual capacity growth, and cementing its fourth place position in cumulative terms, behind China, the US and Germany with total installations of 28,700 MW. We've just received the news that installations in India's 2016/17 fiscal year (April to March) were just over 5.5 GW, pushing the cumulative total well over 30 GW, which bodes well for India's very ambitious 2022 target of 60 GW.

Germany passed the 50 GW mark in 2016 with installations of 5,443 MW, and US

installations of 8,203 MW were about the same as 2015's. Despite the political goings-on, the US seems to be on track for a strong 2017, with 18+ GW either under construction or in advanced stages of development.

Europe's numbers were surprisingly strong, actually surpassing 2015 for Europe as a whole on the strength of Turkey's 1,387 MW, the first time that country has broken the 1 GW barrier in a single year. The EU 28 was down by just a few percent, led by Germany, France (1,561 MW) and the Netherlands (887 MW – most of which was offshore).

Brazil once again led markets in Latin America, installing 2,014 MW, despite the country's political and economic woes.

Chile had a record year with installations of 543 MW, and Uruguay installed 365 MW, pushing both countries over the 1 GW mark in terms of cumulative installations. But the big news in Latin America this year was Argentina, which started the year with a new government and good intentions, but ended the year with a solid 1.4 GW pipeline and more to come.

Africa was quiet last year, even South Africa, due to the ongoing dispute with Eskom which has delayed signing PPAs from the recent tender rounds for nearly two years now. The Pacific was also quiet, with only a subdued Australia putting up any new numbers.

Looking ahead to the 2017 market and our



rolling five year forecast, we're looking for just under 60 GW to be installed globally in 2017, a more or less flat 2018 and then growth again out through the end of the decade to bring total installations up to just over 800 GW by the end of 2021, with the annual market rising to 75 GW in that year.

Global growth will continue to be driven by Asian markets. While falling back from its record breaking 30GW market in 2015, China posted strong installations of 23.4 GW, just ahead of 2014's market. While we expect the market to increase a bit in 2017 due to the imminent feed-in-tariff reduction (and a spurt in offshore), it is unlikely to repeat its 2015 achievement in the medium term.

India set a new record in 2016, and 2017 is likely to be another strong year, but after that things will probably slow a bit as the industry and markets adapt to the new tendering system, and then pick up again. Elsewhere in Asia, Japan and Korea will

continue to grow slowly, but we're looking at increasing strength in the market in Pakistan, an impending surge in the Philippines, a new offshore market in Taiwan, and the 'next big thing' in Vietnam, pending critical regulatory changes which are expected during the course of 2017. Overall, we expect the Asian market to add 154 GW in the next five years, for a total of 357 GW by the end of 2021.

Overall, the European market was up very slightly in 2016, despite a lull in offshore installations, and the EU-28 market was down only very slightly. Germany had another strong year, passing the 50,000 MW mark in cumulative installations, and 2017 is also expected to be strong, before the new auction system kicks in. France, Turkey and the Netherlands, all had strong years in 2016, and are expected to repeat in 2017.

Offshore installations are expected to be up again in 2017, as well as in subsequent

years, with much greater growth after 2020 given 2016's dramatic price reductions. A number of countries have announced they are considering accelerating their offshore programmes in light of the price points which have been reached in the past year.

Overall, we expect Europe to proceed in line with its 2020 targets, and the evaluation of the Commission's proposals for the post 2020 renewables regime, along with a strengthening Euro-zone economy, give rise to cautious optimism. We expect Europe to install about 73 GW of new wind power in the period out to 2021.

After the deal struck at the end of 2015 for the extension and phase out of the Production Tax Credit in the period out to 2020, the US wind industry entered its longest ever period of policy stability and the 2016 market numbers bear this out. The results of the 2016 elections initially cast this expectation of policy stability into doubt, but continued support at the state level, wind power's increasingly competitive pricing and the more than 100,000 jobs (and growing) in the sector all bode well for a strong US market for the next several years.

While the Canadian market is off its peak installation period of 1-1.5 GW/year from 2011-2015, we expect stable markets of .7-1 GW going forward. Mexico should have its first year installing more than 1,000 MW in 2017, in line with the new energy reform and government targets. Overall, we expect 61.5 GW to be installed in the North American region over the next five years.

The cancellation of all renewable energy auctions in Brazil in 2016 as a result of Brazil's political and economic woes is the dark spot in an otherwise bright picture for Latin America as a whole. Brazil's market was down to just over 2 GW and although installations are expected to remain at least at that level through 2017, unless there are new auctions then the newly established supply chain in the country will be in trouble.

Elsewhere, we have a vibrant new market in Argentina, a dramatically strengthened Chilean market, the end of the big build-out in Uruguay and continued growth in Peru. The small markets in Central America will continue to make a contribution, and new climate and energy targets in the CARICOM countries mean that there will be significant activity there, although small in absolute terms. Overall, we expect just under 25 GW of new installations in the region in the period out to 2021.

After a relatively quiet 2016, we expect the Africa and Middle East region to start growing again in earnest this year. In South Africa, we hope the standoff with ESKOM will break, unleashing an enormous backlog of projects, with more to come in the next bidding rounds. South Africa's new Integrated Resource Plan, if it becomes policy, will facilitate this key African



market's reaching its potential.

Elsewhere in the region, Kenya's 310 MW Lake Turkana project is now ready for commissioning in the next few months, and we expect the initial buildout from last year's auction in Morocco to begin this year, and carry on through 2020. There is also a pipeline of projects in Ethiopia; and we hope that the bottlenecks will be removed in Egypt so that country can begin to fulfil its potential as well as government targets. Overall, we expect just over 12 GW to be installed in the Africa and Middle East region over the coming five years out to 2021.

After a very quiet 2016 where the only

installations were 140 MW in Australia, we expect that an increase in policy stability in that major market will lead to an increase in the Pacific for the next several years. With the clarification of Australia's MRET (Mandatory Renewable Energy Target) in 2016, increased investment has led to a pipeline of more than 1,500 MW of new wind projects either under construction or with construction expected to begin this year.

We don't see much activity in the rest of the region in the near future, and Australia will be the main market driver leading to the installations of about 4.7 GW in the Pacific region in the period out to 2021.

These are our expectations for the next five years, as we see it at as of mid-April 2017. No doubt we will have both positive and negative surprises (there always are), but we have a lot of confidence in the wind power market going forward, as the technology continues to improve, prices continue to go down and the call for clean, renewable power to reduce emissions, clean our air and create new jobs and new industries only gets stronger with each passing year.

See more details in our freshly released Global Wind Report.

www.gwec.net/publications/global-wind-report-2/