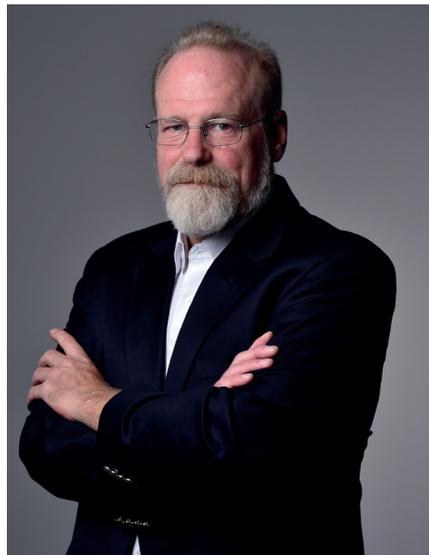




© On top of a turbine in Madeira, Portugal by Jason Bickley

## Good forecast ahead

At the beginning of March 2017 PES asked Steve Sawyer, secretary general GWEC, for his informed perspective on current wind production worldwide and his short term predictions.



Steve Sawyer

Overall, the wind industry globally started the year in good shape, with solid prospects for 2017 and beyond.

Although we didn't reach the 60 GW mark in 2016, largely because China 'only' installed 23 GW instead of last year's phenomenal 30 GW, the industry chalked up 12.6% growth in cumulative capacity; with a 54.6 GW market leading to a total capacity at the end of the year of 486.7 GW, which will have by now (March 2017) passed 500 GW in total. In addition to China, Brazil, Mexico, South Africa and Canada were down a bit on the 2015 market; but these are largely cyclical issues, except in the case of South Africa and we expect to see them all turn around in 2017.

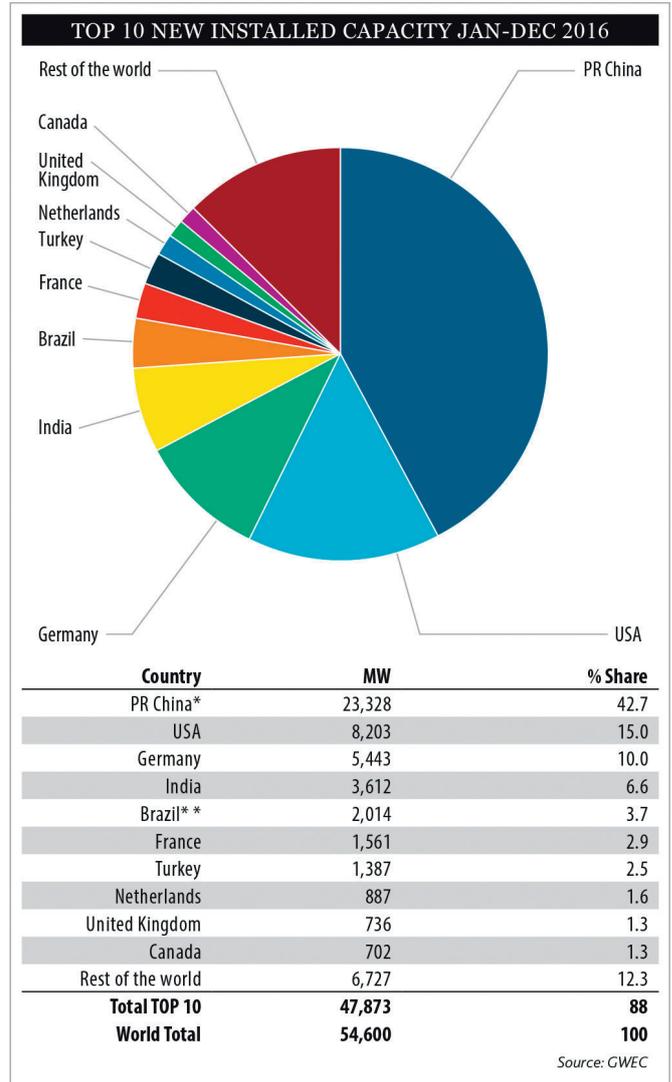
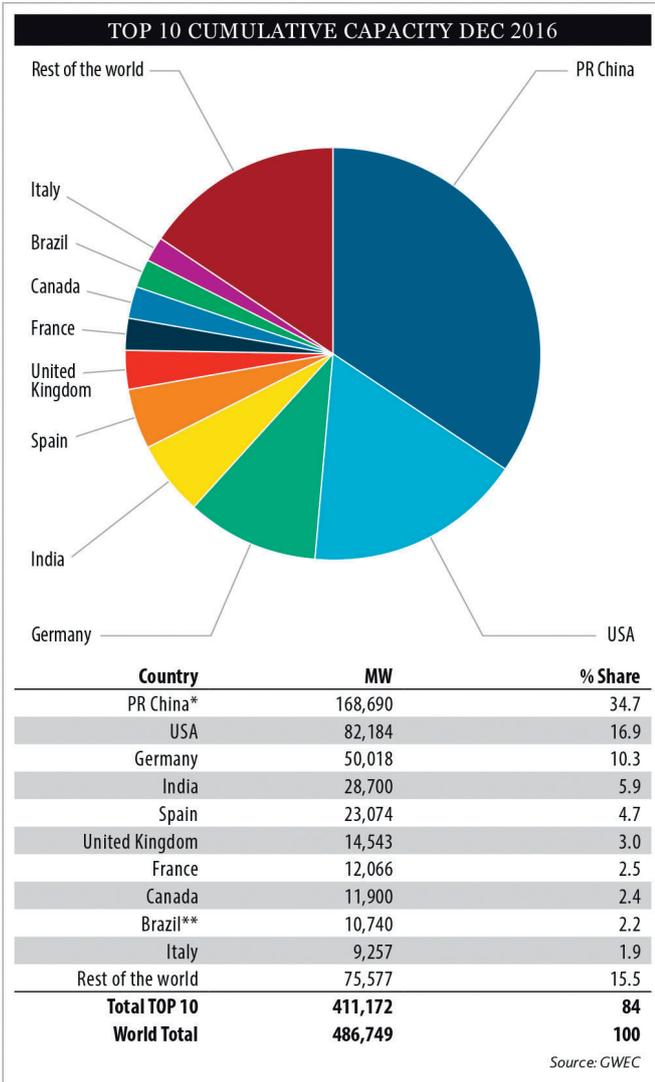
India set a new national record with 3,612 MW of new installations, pushing it into fourth place in terms of annual capacity growth, and cementing it's fourth place position in cumulative terms, behind China, the US and Germany. Germany passed the 50 GW mark in 2016 with installations of 5,443 MW, which was nonetheless down a little bit on 2015's figure which was somewhat inflated by late connections of offshore wind projects which were actually ready to go in 2014.

US installations of 8,203 MW were about the same as 2015's, and despite the political goings-on, seem to be on track for a strong 2017, with 18+ GW either under construction or in advanced stages of development. So far so good – fingers crossed!

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 a moribund industry, but ended the year with a solid 1.4 GW pipeline and more to come.

Both Africa and the Pacific were quiet with contributions coming only from the big markets of South Africa and Australia.



**So what's in store for 2017?**

We expect China's market to return to growth in 2017, in anticipation of yet another cut in the feed-in tariff scheduled for the beginning of 2018. The country's curtailment problem persists, averaging a whopping 17% in 2016, although new HVAC and HVDC transmission lines should help a bit. However, the main problem is not the lack of transmission, but the lack of willingness of the regional system operators to give wind power the priority dispatch that it is supposed to have under the country's Renewable Energy Law, and the unwillingness and/or inability of the central government to enforce the law.

This problem will persist until and unless there is real electricity market reform, which will create a real market driven by economics and the country's very aggressive policies to reduce CO2

emissions and reduce air pollution. The national emissions trading system which is being implemented this year will help with that, at least on the economics, but that will only be evident after several years, and will only reach its full potential with real electricity market reform.

We expect strong repeat years from the US, Germany, and India, and there is hope that the Brazilian economy will start to recover and put some demand back in the market. In South Africa, the impasse between President Zuma and his cronies on the one hand, and the regulator and the industry, which has held up more than 2 GW of renewable energy projects for more than a year and a half, is coming to an end. Again, fingers crossed.

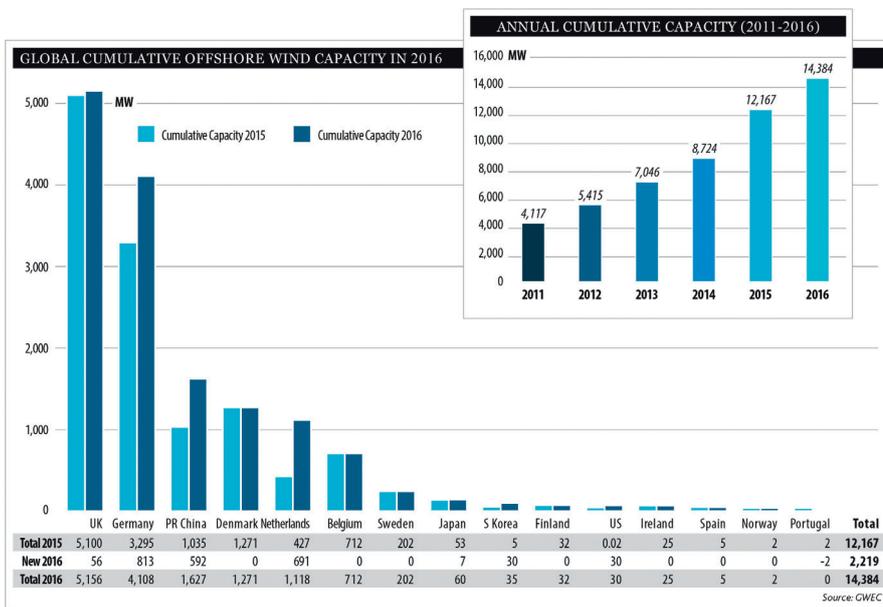
Elsewhere in Africa, the 850 MW auctioned in Morocco in 2016 at record low prices will start to be built out, and the pioneering

Lake Turkana project in Kenya, which will be Africa's largest wind project as well as the largest private investment ever in Kenya, as now completed construction, and will be commissioned very soon.

In Latin America, as well as the hoped-for recovery in demand in Brazil, we expect to see many construction starts in Argentina, although by no means all of the 1.4 GW pipeline will be completed in 2017. Chile's wind sector is now going strong, the Peruvian market is picking up, and we see first stirrings of a potential new market in Colombia. Mexico is looking at its first year ever with more than 1,000 MW of installations in 2017.

After a quiet year or two, the Australian market is picking up again, and both the Philippines and Viet Nam seem poised to develop their substantial market potential.





But the big story that developed in 2016 and promises to begin to bear fruit in 2017, is the cratering of offshore prices. It started with the Dutch tender for Borssele 1 & 2 in June coming in at €72/MWh, well below expectations; followed by a Danish nearshore tender in September at €64/MWh. This was followed in November with the winning bid for the Danish Krieger's Flak project coming in at an astonishing €49.90/MWh; and then Borssele 3 & 4 in the Netherlands coming in at €54.50/MWh in December.

These prices have certainly gotten everyone's attention, and we have the bizarre situation in some European countries (at least temporarily) that offshore wind is cheaper than onshore! Many have questioned whether or not it is possible to build offshore projects at these prices. While these projects are exceptional in some ways, I believe that prices well below €100/MWh are in fact the 'new normal', meeting industry and governments well ahead of the 2020 timeframe it had set for these prices.

The reasons are many: the maturing of the industry, the improvement and maturation of the technology and management thereof, growing investor confidence, and the introduction and deployment of a new generation of 6-8 MW (and now 9MW with the up-rating of the V-164) machines, with enormous swept area and tremendous output. On the basis of this I think we will finally begin to see the spread of the offshore industry beyond its northern European home to North America, East Asia, India and perhaps elsewhere in the near future.

Elsewhere on the technology front, we see the continued evolution and spread of new 'low wind speed' installations, with taller towers, longer blades, down-rated generators and lower cut-in speeds increasing capacity factors substantially. This has made wind power commercially competitive in a much wider range of geographies than was previously the case, which has huge ramifications across global markets.

Record low prices for offshore wind, as well as for onshore wind in major markets in both the OECD and emerging markets, will be the primary drivers for development of wind power in the short to medium term; and with the evolution of the Paris Agreement, with or without the US, will only add to the industry's momentum.

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