Saudi Arabia – “Hot Wind” is Blowing Strong
Ethiopia – A Look at Our Five-Year Journey
USA – Distributed Wind Coming to the Forefront

Brazil – We are Innovation and Commitment Driven
Australia – The “Hybrid” Approach
Uzbekistan – Goldwind is Breezing
I. GWI Business Performance

II. Market Activities and News Highlight

- China-Saudi Investment Forum – Goldwind Attends as Chinese Corporate Delegate
- Goldwind ADAMA wind farm in Ethiopia delivered upon completion of warranty terms
- “Innovation for Brazil” Roadshow
- Goldwind USA Continues to Punch the Distributed Wind Market
- White Rock Solar Farm Celebrates the Start of Construction
- Argentina Entering a New Renewable Energy Era
- Aramco Asia Vice President Visits Goldwind
- Goldwind Breezes into Uzbekistan’s Untapped Wind Market
- Secretary-General of WWEA Revisits Goldwind after 10 Years

III. Global Wind Industry Insight

- Q3 2017 Global Wind Market Overview, State of Play and Short-Term Forecast
- Selected Country-Specific Market Outlook

The editorial staff would like to take this opportunity to express our gratitude to Ms Lauren La Marche, Senior Communication Manager with Goldwind USA, who kindly offered help with proofreading this Edition.
We present to you in this chapter, the Q3 updates on Goldwind International, on top of an interim review of Goldwind Group’s business performance.

During the third quarter of this year, GWI’s regional units actively engaged in negotiating projects and exploring opportunities with local business partners. Goldwind successfully acquired its first Argentina-based project package totaling 350 MW—the Loma Blanca (phase I, II, III and VI) and Miramar projects. The investment will lay the groundwork for GWI’s future market deployment in South America. Goldwind USA also signed agreements to supply Ohio, USA-based One Energy Enterprises LLC with a total of 60 MW of Goldwind turbines for various distributed generation wind energy projects as part of One Energy’s Wind for Industry® model. As part of the framework agreement, a firm order of 20 GW 87/1500 turbines is scheduled for immediate delivery.

On the execution front, installations were progressing well for projects in various markets including the U.S., Australia, Turkey and Uzbekistan. The White Rock solar farm ground-baking ceremony in Australia and the unveiling ceremony for successful delivery of the Sachal project in Pakistan were both eye-catching events and attracted high-level government officials, further showcasing the significance of these projects in their respective markets.

In Central Asia, GWI completed the installation of Uzbekistan’s first wind turbine, another breakthrough in the expansion of Goldwind within Central Asian countries.

By 30 Sept. 2017, Goldwind International cumulative:
- **Contracted capacity** 2,193.25 MW (Note: investment projects that are not in installation stage are excluded)
- **Installed capacity** 1,322.25 MW

I. GWI BUSINESS PERFORMANCE

Goldwind International oversees seven regional centers. Most recently, GWI’s Turkey market was re-assigned to the GWI Middle East and North Africa (GWI MENA) region. The GWI Europe regional center will work closely with Vensys, another Goldwind subsidiary, to explore more effective and innovative ways to develop the global wind market.

More details on our project development and market activities to follow in SECTION II...
Goldwind Science & Technology, Co., the publicly-listed parent company of GWI, released its interim financial results in August for the first half of 2017. From the report, Goldwind has experienced considerable movement in R&D and product iteration, strong growth in the service sector and the offshore wind market, and an admirable financial achievement from sales and asset management -- all of which provide strong support for GWI in its future endeavors.

Continued momentum for a stronger tomorrow.

R&D and Product Iteration

Goldwind is committed to continual improvement of R&D capabilities, which provide a solid foundation for customer value maximization through enhanced product competitiveness in the global market. The domestic market has seen optimization and upgrades for existing turbine platforms on top of the launch of new product platforms that target the low wind speed sites. In the international market, after the launch of GW3.0MW(S) platform at the end of 2016, progress has been made in the siting and installation efforts of a 3(S)-model prototype in Texas in the United States. Two other prototypes of 3(S) model already completed installation in China.

Aftermarket Service

As an increasing number of projects are entering into post-WOM stage and service market wide open, Goldwind O&M service team is also dedicated to react to clients’ needs as promptly as possible and seeking innovative ways to meet their differentiated demands in the service market.

Goldwind has invested in and constructed smart service support platforms including the Goldwind Big Data Platform, Goldwind New Energy Meteorological Statistics Assets Management Platform, Goldwind Global Monitoring Center, Full Lifecycle Asset Management System and Big Data Early Warning System. Leveraging leading information technology, Goldwind combined its operating statistics of WTGs from the past 20 years, and the professional technical capability and resources, to provide comprehensive smart operation and maintenance services.

Earlier this year, Goldwind has developed business expansion plans for the Energy Nest system — a plan that aims to optimize the control strategy of existing projects and carry out upgrades of intelligent wind farm controls, further enhancing modular solutions for wind power plant assets.

Offshore Wind

The wind power market has experienced great success in the offshore sector and this market is expected to grow. Europe is experiencing considerable momentum in the offshore sector, and China is likely to follow. Goldwind has actively expanded and explored the offshore wind power market and made steady progress in various initiatives. Goldwind’s global R&D has tested the waters with offshore projects on China’s east coast and established the offshore wind power industrial base in Dafeng, Jiangsu, which served as the key WTG R&D and manufacture base, taking advantage of its geographic location, environmental conditions and wind resource.

The prototype installation of Goldwind’s 6MW beta direct-drive offshore WTG in Fujian Province is scheduled for the end of 2017. In addition, a customizable turn-key solution for offshore wind farms, which includes integrated support structure design, tower layout, transport and installation, as well as smart operations and maintenance plan, has also been developed.

During the first half of 2017, RFPs for more than 2GW of offshore wind power capacity were opened in China, accounting for 13.5% of the total capacity tendered nationwide. Goldwind was awarded 503MW of the offshore wind power projects. By the end of H1 2017, Goldwind had a cumulative 825MW of order-book for offshore wind projects, comprising primarily of 3.X and 6.X turbine models.

Goldwind Financials

During the reporting period, Goldwind Science & Technology, Co. revenue was $1.48 billion USD. With our advanced technology and integrated solutions offered to the market, sales totaled 1,874.5MW in capacity, among which WTGs and component sales revenue was $1.1 billion USD. New orders for WTGs concluded in the first half of 2017 was 3.1GW, total order-book hitting a historical high level of 15.1GW. In addition, with increased equity of wind farm assets and improved standard operation hours, Goldwind achieved $251.7 million USD revenue from wind farm operation, a total of 16.9% of the Goldwind’s overall revenue.
As a result of Goldwind’s forward-looking strategy and well-established presence in the target markets, GWI has made steady progress in global expansion during the first six months in 2017. As at the end of the reporting period, GWI has a total reserved pipeline of 1,770.3MW and backlog orders of more than 1GW.

Also during the first half of 2017, Goldwind received tax equity financing commitments from MidAmerican Wind Tax Equity Holdings (a Berkshire Hathaway Energy subsidiary) and Citi for the 160-megawatt (MW) Rattlesnake Wind Project located in Texas, USA. The Goldwind Americas team originated and structured the acquisition and financing of the Rattlesnake Wind Project – the first of its kind for a Chinese wind energy technology company.

Goldwind also acquired the Stockyard Hill Wind Farm Project in Victoria, Australia with a total capacity of 536.4MW. this project will feature the new GW3.0MW(S) WTGs and, upon completion, become the largest wind farm in Australia to date.

Lastly, the company acquired 350MW in projects in Argentina (Loma Blanca Wind Farm projects and the Miramar project), the first for the company in this market.

In the first half of 2017, revenue from international business amounted to approximately $161.5 million USD, representing for an increase of 62.76% YoY.
In late August, the China-Saudi Investment Forum took place in the city of Jidda in west Saudi Arabia. The forum – jointly organized by the National Development and Regulatory Commission (NDRC) of China, the country’s top economic planner, and the Ministry of Energy, Industry and Mineral Resources (MEIM) of Saudi Arabia – brought together more than 200 delegates. Representatives from the energy, infrastructure, science and technology, and financial sectors came together to address cooperation between the two countries as part of China’s One Belt One Road initiative and Saudi’s 2030 Vision. Goldwind, which attended as a corporate representative, had the honour to be invited to the Forum, and participated in the opening ceremony.

The Saudi 2030 Vision took center stage at the Forum and key discussions centered on investment opportunities brought by the Vision plan, and the synergies that exist between both the Chinese initiatives and the Saudi development vision. Renewable energy investment, transportation investment and digital transformation of smart cities as well as refining financial investment were the main dimensions from which the topics were dissected.
Mr. Wu Kai, Executive Vice President of Goldwind, expressed at the Forum that renewable energy development represents a significant part in the diversification of the country’s energy mix and economic structure and that it helps reduce the consumption of fossil fuel in Saudi Arabia domestically, thus contributing to an increase of reserves for foreign export.

“Goldwind has installed more than 38 GW of wind turbines globally, and we have extensive experience in the design and operation of wind turbines under different conditions in terms of meteorology, climate, geographic location and geology,” said Mr. Wu Kai, “Goldwind is committed to providing integrated solutions for the Saudi market, and we will take an active part in renewable energy projects in Saudi, contributing to its 2030 Vision.”

According to Mr. Turk Alshehri, Saudi’s Renewable Energy Project Development Office (REPDO) of MEIM, renewable energy is one of the important pillars for Saudi’s 2030 Vision. The administration has initiated a renewable installation target of 9.5GW by 2023, among which 3.45GW before 2020. The projects will be announced for RFP in 2017 and 2018.

The Forum yielded fruitful results. Several companies, including Goldwind, signed MoUs with departments of the Saudi government, among which a tri-party agreement was inked among Goldwind, Saudi Industrial Property Authority (MODON) and National Industrial Clusters Development Program (NICDP), to jointly explore the opportunity to develop wind power technologies in the Saudi market.
In 2011, Goldwind installed 34 units of GW77/1500 turbines for the ADAMA project located in central Ethiopia, a total capacity of 51MW. At the end of the project’s five-year warranty, service and maintenance contract, the ADAMA project was officially turned over to the Ethiopian state utility company. From the beginning, the project was faced with a myriad of challenges including the inadequate supply of goods, harsh environmental conditions, and grid instability.

To mitigate some of the project’s issues, Goldwind conducted technical upgrades to turbines to improve their long-term operation stability and power generation efficiency. After five-years of operation, the 1.5MW machines surpassed initial expectations and are operating efficiently despite the country’s outdated grid infrastructure, and high altitude and high temperature site conditions.

Goldwind not only prides itself on the quality and availability of its industry-leading turbines, but also on the commitment to its warranty, service and maintenance work. The ADAMA project is a true testament to ongoing work Goldwind does to provide exceptional products and services to its customers worldwide.

The ADAMA Wind Farm consists of 34 units of Goldwind wind turbines along the mountain ridge in the suburb of Adama City in central Ethiopia. Goldwind commissioned the project five years ago, and most recently the project was officially turned over to the Ethiopian utility company after a complete five-year WOM service contract.

The ADAMA wind farm was not only the first wind power project in a country collaboration between China and Ethiopia, but it was also the first wind farm installed on the Ethiopian territory. The green power transmitted from the project to the Ethiopian power grid is proof of Goldwind’s contribution to the China-Ethiopia energy cooperation.
Up: Goldwind is committed to serving the communities in which we work. The Goldwind ADAMA team donated time and funds to the local community near the ADAMA wind farm.

Down: Photos of Goldwind engineers and project managers with local communities, ADAMA Wind Farm Projects
The vibrant, bustling city of Rio de Janeiro played host to this year’s annual Brazil Windpower Conference & Exhibition. Goldwind, for the first time, participated as an exhibitor at the annual wind power conference—the largest in South America. In addition to showcasing Goldwind’s latest products and services for the Brazil market during the main exhibition, Goldwind International executives hosted an Innovation for Brazil roadshow.

It is widely known that Brazil’s local content requirement for OEMs in order to qualify for low-interest financing from BNDES has been a topic of great discussion in the wind power sector. Goldwind’s Innovation for Brazil roadshow—centered on three themes, Heart of Innovation, Collision of Innovation, and Plan for Innovation—provided a platform for healthy debate among a small group of stakeholders. Though local supply chain requirements have proven effective for the domestic wind manufacturing industry, different perspectives from developers were also voiced at the event, as such a requirement would limit overseas’ OEMs efforts to diversify their locally offered product portfolio.

“At its core, Goldwind believes in providing exceptional value to our clients in the local Brazilian market. Regardless of whether we move forward with local manufacturing with a BNDES loan or importing equipment financed by overseas capital, our end goal remains the same—to provide remarkable products and services to our customers,” said Mr. Liang Xuan, General Manager of Goldwind South America. “Our Innovation for Brazil summit and participation in Brazil Windpower 2017, is further underscores our commitment to the Brazil market.”
Mr. Andreas Dupius, Deputy General Manager of Goldwind International, introducing Goldwind to guests of the Innovation for Brazil roadshow.
Goldwind USA Continues to Punch the Distributed Wind Market
60MW Master Turbine Supply Deal with ONE ENERGY

The total 60 MW of Goldwind turbines, under a framework agreement with One Energy, will be used for various distributed generation wind energy projects as part of One Energy’s innovative Wind for Industry® model. Under the agreement, a firm order of 20 units of GW 87/1500 turbines is scheduled for immediate delivery. The financing for One Energy’s projects is being provided by Prudential Capital Group as part of a combined senior and subordinated debt facility.

“We are delighted to be working with One Energy and Prudential Capital in directly powering industrial facilities for some of the largest companies in the United States,” said David Halligan, Chief Executive Officer of Goldwind USA. “With their exceptional performance, reliability, and high-power quality, Goldwind’s Permanent Magnet Direct Drive (PMDD) turbines are equally well-suited for utility-scale and distributed generation projects.”

The first four turbines will be installed for Wind for Industry® projects to supply wind energy to Whirlpool Corporation facilities in Marion and Ottawa, Ohio, USA.

“Manufacturers are taking control of their energy future. They want clean energy, they want low fixed rates, and they want it now; and that is exactly what we give them. Goldwind has earned their seat at the table for this emerging Commercial & Industrial (C&I) market over the last five years. We know their technology and their management team very well and they continue to demonstrate a worldwide commitment to support these direct-to-load projects,” expressed Jereme Kent, Chief Executive Officer of One Energy Enterprises. “We look forward to continuing to grow our fleet of Goldwind turbines.”

As part of this order and continued growth, One Energy plans to start stocking turbines at its yard in the United States in order to shorten the project delivery time for Wind for Industry® projects. This turbine agreement was designed to create a framework where One Energy can work towards delivering wind projects in 90 days.

“We aren’t there yet, but we are headed that way as fast as we can,” said Jereme Kent.

One Energy’s Wind for Industry® model is designed to achieve a significant reduction of an industrial facility’s electrical consumption from the grid as well as provide manufacturers with 20 years of electricity-rate certainty through installing one or more utility-scale wind turbines and interconnecting them on the facility’s side of its utility meter.

About One Energy

Headquartered in Findlay, Ohio, One Energy is a trusted expert in on-site wind energy generation, and is responsible for the largest commercial net-metered wind projects in the United States. One Energy provides Wind for Industry® solutions for large electricity consumers. The One Energy family of companies delivers project assessment, development, engineering, procurement, construction, finance, and operations.
This ceremony marks the start of construction of the solar farm to be co-located with White Rock Wind Farm in New England Tablelands. The award of a large-scale solar competitive grant by the Australian Renewable Energy Agency has allowed the White Rock Solar Farm to proceed to construction,” said John Titchen, Managing Director of Goldwind Australia at the event.

Deputy Prime Minister, Mr. Barnaby Joyce said he was looking forward to the project completion targeted for early 2018.

“It is positive news for the New England Electorate that the White Rock Solar Farm project construction is now commencing. This was made possible following the Federal Government’s $5.4 million funding commitment from the Australian Renewable Energy Agency towards the project in September last year,” Mr. Joyce said.

“With other projects like the Sapphire Wind Farm going ahead, it also shows that the New England is leading the way in renewable energy production and I will continue to advocate for the region as a growing power supplier for Australia,” said Mr. Joyce.

White Rock Solar is Goldwind’s second wind-solar hybrid project following the 10MW Gullen Solar project, which is now at an advanced stage of construction.

Sidebar note on the White Rock Wind Farm:

All installation work for the 175MW wind farm project was completed in September 2017. Among the 70 units of GW121/2500 turbines, 46 units have already commissioned. Installation commenced in late January 2017 and took a total of only 226 days to finish – well ahead of schedule.
The Goldwind South America team, together with their China-based investment and finance, technical support, and HR colleagues, were all busy building Goldwind's local capacity and connections in Argentina. It's not only for the near-term execution of these acquired projects, but also for paving their way for the long-term future in this market.

But of course, they were there also for another event, the Argentina Renewable Energy Congress 2017 (AIREC 2017), which was held from 2nd to 5th Oct. The regional convention drew participants from government agencies, financial institutions, developer community, suppliers and consulting firms, and Goldwind had the pleasure to share our beliefs and exchange practices with all these professionals.

During the event, Mr Ruben Sanchez Perco, Goldwind Argentina country manager, presented Goldwind competence and its history to the audience, and particularly explained the company's vision and belief in the renewable energy cause. He also highlighted the R&D capability in product and solution design as well as the aftermarket service that Goldwind could offer.

"We believe in our ability to help build the renewable market in Argentina into an even better shape. It requires patience and confidence building," said by Goldwind South America team, "That's why we start with who we are, what we believe in and what can offer. What comes next is to build up our local team and work closely with our business partners. The end is to make a real contribution."

The Argentinian government published in 2015 its renewable energy policy and targets. It targets to have 20% of the nation's electricity installed capacity to come from renewable energy sources by 2025. This has placed Argentina under the region's spotlight as one of the most attractive renewable energy markets in South America.

Goldwind also made a bold and decisive move in the Argentinian market. In May this year, Goldwind acquired a package of projects up to 350MW, including Loma Blanca project (Phase I, II, III and VI) in Chubut Province and Miramar project in Buenos Aires Province. The projects will use GW3MW (S) PMDD technology and construction work is expected to commence from early 2018. The series of projects will enter COD consecutively from 2019. Average annual full load hours are estimated exceeding 4,200 hrs.

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As Ruben detailed the PMDD technology to the local industry's professionals and explained the company's commitment to providing the most suited renewable solutions and a variety of business models to the Argentinian market, it is we making a positive effort to try to build confidence and trust with the local industry community and to prove ourselves with the quality of our products and the capability of our team in our future engagement with them.

Argentina will soon launch its RenovAr Round 2.0 renewable auction, for which Goldwind is also busy preparing and negotiating cooperation with business partners. In compliance to Argentina's policies and auction rules, Goldwind plans to procure some parts of component locally for the turbines to be used in the project to raise the local content ratio and thus improve competitiveness through facilitating our clients to benefit from fiscal incentives. This round of auction will release a total 550MW capacity for wind in three regions: Buenos Aries, Comahue and Patagonia, with ceiling bid price set at 56.25 $/MWh.

Argentina’s President raised a proposal to expand the scope of cooperation with China during the “One Belt One Road” International Conference in June this year.

Under a solid economic reform plan initiated by the current Argentinian administration, the market environment has seen substantive improvement and international financial market also regained some confidence to the country. With a better macroeconomic and political situation, Goldwind would like to increase its visibility and presence in the market, and to provide competitive offers to the local clients, in addition to assisting in finding financing solutions for projects.
As the Saudi wind market is accelerating, Goldwind has also increased its presence in the region and is taking initiatives to build an extensive network of potential business partners.

In September, upon invitation, Mr. Mansour Al-Ohal, Vice President of Aramco Asia, in charge of Asia Business Integration Office.

At the invitation of Mr. Andreas Dupuis, Vice President of Goldwind International (GWI) and Mr. Ma Xiaohui, Director of GWI Middle East, North Africa and Turkey regional center (MENA), Mr. AlOhal and his delegation paid a visit to Goldwind headquarters in Beijing and discussed possible collaboration opportunities with the regional team.

Mr. AlOhal expressed his desire to develop clean energy in the Saudi Arabia region, a view which he believes is also shared by others in the country.

"Saudi Arabia’s renewable energy development can be realized to its full potential with positive policy transition," Mr. Dupuis commented as he introduced to Mr. AlOhal Goldwind’s technological capabilities and what the company could contribute to Saudi’s clean energy target. “Goldwind has more than 40GW of global installed capacity and has rich experience in the design and operation of wind turbines under vastly different conditions in terms of meteorology, climate, geography and geology. We are keen to take an active part in Saudi Arabia’s renewable energy programs, and are committed to providing to the Saudi market integrated clean energy solutions that are tailor-made to local conditions."

The visit of Aramco took place in the wake of the Saudi-China Economic and Trade Forum held in August where Goldwind signed a Memorandum of Understanding with several departments in the Ministry of Energy, Industry and Mineral Resources (MEIM) of Saudi Arabia.
In September, Goldwind installed the first 750kW wind turbine for a pilot project in Uzbekistan – the first wind project for this region.

The pilot project was launched by the local state-owned company Uzbekenergo, located in the Tashkent Region. This project is particularly significant as it broke the “zero” record of wind power generation in Uzbekistan, and it also marked Goldwind’s first wind project in Central Asia.

Goldwind, which started its business from Xinjiang the autonomous region in the northwestern part of China, sees the importance of expanding wind power in Central Asia — especially the region with which Xinjiang shares a long and circuitous border. The project with Uzbekistan and its successful operation resonates with China’s “Belt and Road” initiatives.

The execution of this project signifies the company’s continued partnership between Goldwind and relevant parties and stakeholders in Uzbekistan. Goldwind is also committed to further promoting the development of the wind energy sector in Uzbekistan.

In addition to Uzbekistan, Goldwind also has existing and upcoming projects in several other countries along the “Belt and Road”, including Kazakhstan, Turkey, Thailand, and the Philippines.
July 24-25, Mr. Stephan Gsänger, Secretary-General of World Wind Energy Association (WWEA) and Prof. Choong-Yul Son, Korean Vice President of WWEA, as well as Mr. Eugeni Nikolaev, CEO of Russian Wind, visited Goldwind in Beijing.

It had been a decade since Stephan Gsänger first made a visit to Goldwind. Since that time, the once-familiar industrial park has transformed into a global epicenter of industry after a renovation and expansion project. Goldwind not only welcomed guests to the new campus but shared the expanded business structure and updated product designs with its long-time friends and colleagues.

Mr. Wu Gang, Chairman of Goldwind Science & Technology Co. warmly received Mr. Stephan Gsänger and other WWEA colleagues at the Intelligent Energy Building and hosted the welcome dinner.

On the first day, the WWEA delegation was guided through the newly expanded corporate campus, including the new Intelligent Energy Building, which integrates a dozen of different energy conservation technologies and applications; the R&D center building where the brilliant minds of Goldwind’s research engineers in Beijing contribute to the company’s technology and product advances; the company’s electrical component manufacturing line in the Etechwin factory together with the Smart Micro-Grid pilot project; the Goldwind Greenhouse where various energy solutions and plantation techniques are adopted in the way that green leaves could best harness the nature’s energy sources; and finishing with a tour of the signature Goldwind University.

The set-up of a Goldwind University with various sports venues and classes not only showcase a sport spirit of continuously fighting for the better result that is deeply entrenched in the corporate culture, but also, the company’s belief that sports, exercise and arts are essential for the health and benefits of its employees.
Ms. Zhu Fang, Deputy General Manager of Goldwind Culture and Sports in the Goldwind University, led the tour inside the University where WWEA guests found themselves engaging in an intense game of table tennis, China’s national sport. Realizing that Ms. Zhu Fang used to be a professional ping-pong player and for many years taught table tennis in Spain, Stephan and his colleagues couldn’t resist the temptation to try their skills and take on a champion table tennis player.

The visit of the WWEA delegation was substantiated with a fruitful meeting held on 25 July. Mr. Wu Gang, Mr. Stephan Gsänger, and Mr. Qin Haiyan, Secretary-General of China Wind Energy Association (CWEA) continued what they had discussed many times in various occasions on the evolution of wind industry and energy transition. The agenda spanned a wide range of topics including the development of the wind power sector, potential cooperation within the community of wind energy associations and among associations, research institutes and the private sector, industry branding and regional market development. WWEA has been essential in promoting the non-profit activities in the wind energy sector to help shift perception on wind energy, to facilitate substantive policy analysis and present recommendations.

Several different business units of Goldwind Group also sat with WWEA visitors after the meeting, presenting the depth and width of Goldwind business across the value chain.
III. GLOBAL WIND INDUSTRY INSIGHT

Q3 2017 Global Wind Market Overview, State of Play and Forecast

As the latest quarterly market update of Bloomberg New Energy Finance (BNEF) extends its mid-term forecast to 2025, a pronounced drop in wind capacity in the early 2020s is expected (assuming no new policy support after 2020), before a gradual recovery in the mid-2020s. Long-term growth continues to shift away from established markets into new markets. Record bids in both offshore and onshore wind in the past quarter show the industry can pick up the pace quickly when under pressure.

Short-term onshore demand forecast: BNEF expects some 52.7GW of installations in 2017 (whereas BNEF Q2 forecast for 2017 was 54.3GW), on par with 2016, which was the second-best year on record.

Medium-term onshore forecast: BNEF maintains its view that activity will continue to pick up after 2018. This will be driven largely by growth in the U.S. European demand remains flat but the region will continue to punch out 10 GW annually until 2020. The Indian market presents uncertainties, according to the Q3 update, though India was identified as a forward-looking market in its Q2 update, expected to contribute to sustained growth in new installations. Nonetheless, MAKE shares the same view with BNEF in its Q3 update and has revised down Indian market forecast.”

Long-term onshore forecast: With policy support running out and structural oversupply in key markets China and Europe, a challenging period lies ahead in the early 2020s. However, BNEF’s view on auction announcements and soft policy targets suggests that there is the chance of an upside surprise.

Offshore: The UK contract-for-difference auctions consolidated the price trend in the market and the tariffs agreed, marking a new boundary for European prices.

Project financing and investment: Total wind asset finance increased 20% to $34.1 billion in Q2 2017 from $28.4 billion in Q1 2017. North America was the largest factor, contributing $13.2 billion.

Supply chain: Staff cuts and closures of manufacturing hubs have dominated recent news. These reflect post-merger rationalization and likely medium-term overcapacity in Europe.
Notable changes to BNEF global forecast from Q2 2017:

- The U.S. forecast in 2018-20 is raised by another 2.2GW on the back of a strong pipeline, with more projects pushing towards the end of the period.
- Germany took a considerable hit in 2019-20, as citizen wind farms winning in auctions are upsetting what was planned to be a stable pipeline. Conversely, 2017-18 is looking very strong.
- Regulatory turmoil in India’s FiT market reduces 2018 by over 1.5GW and 2019 by 0.6GW.
- Two cancellation rounds in Brazil reduces forecast in 2018-20 again – however, there is finally light at the end of the tunnel with new auctions announced by the end of this year.
- In China, 2017 new build forecast was slightly revised down by 0.4GW with projects delayed to 2019. Long-term, the market is heading for a new reality of 14-16GW, annually.
- South Africa’s forecast is revised down by 2GW in 2018-20, although there is more hope for a 2020-23 pipeline.

As we below briefly compare the latest outlooks (Q3 2017) by Bloomberg and MAKE on the global onshore market (extended to 2025), their trends read similar, though their projected installation volumes for each year vary, more so into the longer future.
Mexico

The Mexican market is an auction-based market, and in previous years experienced a boom in development in the wind sector. However, 2017 is expected to be relatively quiet in comparison to 2016, with only hundreds of megawatts to complete by year end. As third-party databases have revealed, the market has no short of pipeline projects, legacies of previous auctions; however, the critical issues faced by these horded projects center on financing difficulties. A nearly 1.5GW of projects with permits to start operation in 2017 have not yet secured financing or started construction, though they are still targeting completion this year. Most of these delayed projects come from the historical arrangement for self-supply (before the power sector reform).

BNEF’s forecast, which tends to present a more radical scenario, is expected to see accelerated wind market activities from 2018, and both BNEF and MAKE have projected a rather high level of installation in 2019, along their respective forecast spectrum.

Due to Mexico’s proximity to the U.S. and various OEMs’ local manufacturing bases covering the whole regional market, the hike in market activities in that period of time may cause turbine supplies to fall short, thus spiking up the prices.

The Mexican market projections for the upcoming years:

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<th>2018</th>
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<th>2020</th>
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</tbody>
</table>

Argentina

Argentina’s power mix is largely dominated by natural gas, but its wind resources are plentiful, waiting to be tapped. As the Macri government has set its economic policies onto the right track, the market is expected to thrive. Recent years have seen legislation and policies promulgated to provide incentives for clean energy development, and renewable capacity is being awarded to developers through competitive tenders.

The recently announced RenovAr Round 2 technology-specific auction has clarified some new rules. With 550MW allocated to wind, more flexibility is now given to PPA contractual arrangements, allowing for corporate PPAs (bilateral PPA) between large consumers and generators. The Round 2 auction sets a ceiling price for wind at 56$/MWh, down from previous rounds, whereas the Round 1 and Round 1.5 awarded wind projects at average prices of 59.4$/MWh and 54$/MWh, respectively. In the meantime, a transmission bottleneck will be addressed and new transmission lines are being planned, scheduled operation from 2020 onward. The Round 2 auction will receive bid submissions on 19 October and results will be announced in late November.

The Argentinian market projection for the upcoming years:

<table>
<thead>
<tr>
<th>Argentina (MW)</th>
<th>2017</th>
<th>2018</th>
<th>2019</th>
<th>2020</th>
<th>Subtotal</th>
</tr>
</thead>
<tbody>
<tr>
<td>BNEF</td>
<td>0</td>
<td>1,009</td>
<td>650</td>
<td>250</td>
<td>1,909</td>
</tr>
<tr>
<td>MAKE</td>
<td>40</td>
<td>545</td>
<td>510</td>
<td>305</td>
<td>1,400</td>
</tr>
</tbody>
</table>
In light of the escalating cost of support for renewables, Germany has switched from a FiT-based mechanism to an auction-based one, exposing renewable generators to competition. As of the start of 2017, Germany’s renewable energy action (EEG) came into effect, through which the government introduced tenders to auction a total of 5.6GW of utility-scale onshore wind between 2017 and 2018.

Capacities will be awarded to the lowest bids (under the ceiling price of 70EUR/MWh), cumulated up to the total tendered volume in each round. A distinctive feature of the German auction is the “grass-root element” design, with a set of relaxed conditions applicable to community developers (known as citizen groups or community projects), who will enjoy, inter alia, a generous commissioning window and the benefit of not having to secure all required permits (EIA, for instance) beforehand.

The first two rounds of onshore wind auctions carried out in 2017 have seen the relaxed conditions fully played. Discontent has been widely verbalized from both developers and OEMs as citizen wind parks took almost all capacity in the two rounds. The consequence of 95% (1.7GW) of capacity won by community developers is the likelihood that these projects will not even come through, as these projects are without permits or even sites. It will take 3-5 years for the pipeline to commission, if they ever will. In addition, most of these projects are located in Northern Germany, this will only aggravate the already serious grid congestion situation. As such, the German market prospect has been, in general, revised down, especially concerning the 2019-20 window.

Results from German onshore wind auctions:

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Total capacity</td>
<td>807MW (70 projects)</td>
<td>1,030MW (67 projects)</td>
</tr>
<tr>
<td>Citizen wind farms</td>
<td>776MW (65 projects)</td>
<td>962MW (60 projects)</td>
</tr>
<tr>
<td>Aver. Weighted bid</td>
<td>57.8 €/MWh</td>
<td>42.8 €/MWh</td>
</tr>
</tbody>
</table>

The German market projection for the upcoming years:

<table>
<thead>
<tr>
<th>Germany (MW)</th>
<th>2017</th>
<th>2018</th>
<th>2019</th>
<th>2020</th>
<th>Subtotal</th>
</tr>
</thead>
<tbody>
<tr>
<td>BNEF</td>
<td>4,978</td>
<td>3,400</td>
<td>1,800</td>
<td>1,650</td>
<td>11,828</td>
</tr>
<tr>
<td>MAKE</td>
<td>5,000</td>
<td>3,120</td>
<td>1,500</td>
<td>3,680</td>
<td>13,300</td>
</tr>
</tbody>
</table>
**Turkey**

Though initially stunned by the low winning bid price for the 1GW YEKA project of 34.8$/MWh by Siemens-Gamesa with its local partners, the market has pulled itself together to face the fact that auctions can constantly challenge the OEMs’ bottom line in pricing. The low bid price is significantly lower than the estimated LCoE in the Turkish market; however, this may not necessarily mean a loss of profit on the part of winners. As Siemens-Gamesa will build a local nacelle factory, the bonus premium eligible for the 1GW YEKA project and expected future revenue from nacelle sales in the local market may be factored in when it was committed to such a plummeting bid price, among other strategic considerations.

The Turkish government has an ambition to achieve 20GW wind capacity by 2023, which will call for around 2GW new installation per year on average. However, recent years’ performance has revealed the market has an appetite for 1-1.5GW annually, which is a reasonably achievable target. Though Turkish government officials have stated their intent to launch additional auctions, industry players expect that the outcome of this YEKA auction will determine whether there will be subsequent rounds in the mid-term future (after 2021 when the 1GW coming online).

The Turkish market projections for the upcoming years:

<table>
<thead>
<tr>
<th>Turkey (MW)</th>
<th>2017</th>
<th>2018</th>
<th>2019</th>
<th>2020</th>
<th>Subtotal</th>
</tr>
</thead>
<tbody>
<tr>
<td>BNEF</td>
<td>1,063</td>
<td>1,148</td>
<td>1,048</td>
<td>1,448</td>
<td>4,707</td>
</tr>
<tr>
<td>MAKE</td>
<td>825</td>
<td>665</td>
<td>1,285</td>
<td>1,400</td>
<td>4,175</td>
</tr>
</tbody>
</table>

**The Philippines**

Though the Philippines market has for some time been waiting for the confirmed policy direction, the market still needs to deal with a policy deadlock on the Renewable Portfolio Standard. Projects developers are struggling to secure PPAs in the absence of a regulatory scheme, according to BNEF. The latest 2017-2040 Energy Plan favors base-load capacity and hence does not support intermittent energy sources such as wind. It is now expected that the final details on the Renewable Portfolio Standard policy will be postponed to H1 2018.

The Philippine market projections for the upcoming years:

<table>
<thead>
<tr>
<th>Philippines (MW)</th>
<th>2017</th>
<th>2018</th>
<th>2019</th>
<th>2020</th>
<th>Subtotal</th>
</tr>
</thead>
<tbody>
<tr>
<td>BNEF</td>
<td>0</td>
<td>200</td>
<td>250</td>
<td>260</td>
<td>710</td>
</tr>
<tr>
<td>MAKE</td>
<td>109</td>
<td>246</td>
<td>200</td>
<td>200</td>
<td>755</td>
</tr>
</tbody>
</table>

Photographed by Goldwind Staff, Negrete Wind Farm, Chile.
**South Africa**

The market has stalled for almost two years, though policy-wise it has a well-crafted REIPPP program. The execution of contracts for REIPPP Round 4 projects was interrupted by the lack of intent to sign PPAs on the part of state-owned utility (Eskom) and the Department of Energy.

On 1 Sept, the Department of Energy finally announced its long-awaited commitment to the pending renewable projects from the previous round of auctions. However, the pledge came at a price: PPAs will be signed at renegotiated lower tariffs. Though the delivery window will have to be pushed back to 2020-2021, instead of 2018-2019, this may better fit with the projected power demands in South Africa, according to a BNEF insight. As the ceiling tariff will be set at 770 Rand/MWh (roughly 58$/MWh), all but three wind projects (from Round 4) are facing renegotiations with the government in order to sign PPAs.

Though OEM’s turbine delivery after 2018 will benefit from lower equipment cost, the downgrading of South Africa’s credit rating will probably increase financing costs. Additional uncertainties include Eskom’s quotation for grid connection, which can easily affect the grid connection CAPEX for Round 4 projects, as almost all of them would require new 132kV or 400kV substations.

The South African market projections for the upcoming years:

<table>
<thead>
<tr>
<th>South Africa (MW)</th>
<th>2017</th>
<th>2018</th>
<th>2019</th>
<th>2020</th>
<th>Subtotal</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BNEF</strong></td>
<td>637</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>637</td>
</tr>
<tr>
<td><strong>MAKE</strong></td>
<td>573</td>
<td>300</td>
<td>700</td>
<td>685</td>
<td>2,258</td>
</tr>
</tbody>
</table>

**Australia**

Australia’s large-scale Renewable Energy Target (LRET) is a traded certificate system that provides an incentive for 33TWh of additional electricity by 2020 from large-scale renewable sources. Liable entities should submit their LGCs for annual compliance. However, years of political debate had hampered the ability of LRET as a robust mechanism to stimulate renewable asset investment. As such, the market is seeing inadequate supply of certificates.

Only from 2016, investment in Australia’s onshore wind market became active. BNEF has reported over 1GW new onshore wind capacity already closed financing by Q3, more to expect by year-end to break the record set in 2016. The surge in investment has been driven by rising power prices and demand for new LGCs. The buoyed LGC price has been over A$80 for a number of years, as the market is projected to fall short of certificates in the years to come.

Though Australia has a 2030 emission reduction target of 26-28% below 2005 levels, the long-term market seems unpredictable nonetheless, as LRET only lasts till 2020 and policy positions for post-2020 period are yet to be clarified. This has expedited the creation of new financing deals with shorter tenors of 5-13 years as opposed to the 18-plus years financing in the past. BNEF places the installation spike in 2019, while MAKE in 2018, to address the shortfall of LGCs in the market.

The Australian market forecasts for the following years:

<table>
<thead>
<tr>
<th>Australia (MW)</th>
<th>2017</th>
<th>2018</th>
<th>2019</th>
<th>2020</th>
<th>Subtotal</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BNEF</strong></td>
<td>350</td>
<td>622</td>
<td>1,787</td>
<td>211</td>
<td>2,970</td>
</tr>
<tr>
<td><strong>MAKE</strong></td>
<td>528</td>
<td>1,464</td>
<td>700</td>
<td>800</td>
<td>3,492</td>
</tr>
</tbody>
</table>