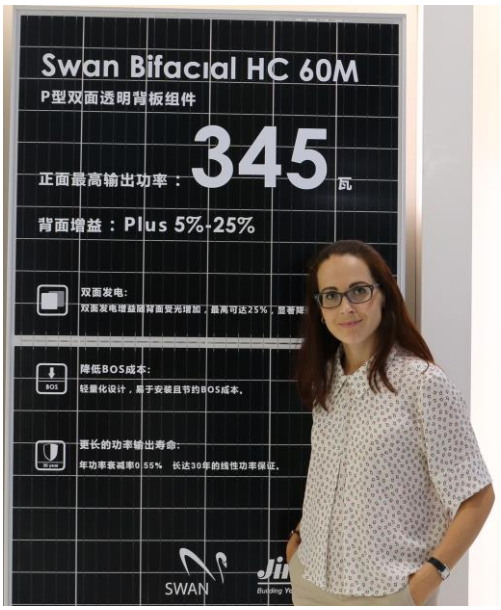
Interview with Gulnara Abdullina, General Manager Africa and Middle East at Jinko Solar Co., Ltd.



JinkoSolar (NYSE: JKS) is one of the leading and most innovative solar module manufacturers in the world. JinkoSolar distributes its solar products and sells its solutions and services to a diversified international utility-, commercial- and residential customer base in China, the United States, Japan, Germany, the United Kingdom, Chile, South Africa, India, Mexico, Brazil, the United Arab Emirates, Italy, Spain, France, Belgium, and other countries and regions. JinkoSolar has built a vertically integrated solar product value chain, with an integrated annual capacity of 11.5 GW for silicon wafers, 8 GW for solar cells, and 12.6 GW for solar modules, as of June 30, 2019.

When it comes to product quality, Jinko's No.1 ranking in shipments for three consecutive years and a solid track record speaks for itself.

As a leading module manufacturer, JinkoSolar has shipped over 43GW of solar modules to customers in 108 countries around the globe.

JF4S: Thank you so much for taking the time for this interview! The solar industry is currently rushing into the market of the MENA region. As an expert, where do you see the special potential of these countries?

In the MENA region, a few main markets have emerged in the past couple of years. These are UAE, Jordan, which is the oldest market for solar PV, Egypt and Morocco. These four markets have been driving the deployments in the MENA region for the past couple of years. The newest markets are Saudi Arabia and Oman, thanks to the reverse tenders both countries have implemented not long ago.

JF4S: How will the growth of the solar industry in the MENA region directly affect the lives of the population? Are there already visible changes that the solar business has caused?

When it comes to the Gulf countries, the impact is rather limited, as here we are mainly talking about diversification of the power mix, and not a basic access to electricity. If I look in the North African regions in Egypt, Morocco, Algeria and Tunisia, and the francophone countries such as Mali, Burkina Faso etc. they all see that the significant impact, as

electrification rates are getting improved, and distributed PV generation improves daily lives and optimizes how businesses are run. Steady electricity supply is a game-changer.

In terms of job creation, you need a lot of manpower for construction and operations, especially in desert and sandy areas, so you are actually engaging the local population. And I think it is worth mentioning the application of photovoltaics to the agriculture, such as solar pumps – especially in the North of Africa such as Egypt, Sudan, Morocco, Mali, and Burkina Faso etc. Apart from the installation, we also want to think about the upstream value chain where there has been a business created around solar distribution and installations. We have distributors and system integrators in different countries that we support.

JF4S: Which countries in the region are currently particularly interesting for the business of JinkoSolar? You have already answered this partially, but is there a country that JinkoSolar is the most active in at the moment?

Now we see new countries coming up with the increasing potential to soon become gigawatt markets. In addition to those I mentioned, there are Oman, as they have a successful tender system for large-scale utility projects; and Saudi Arabia; finally, the giant has woken up and we will see that they have a very ambitious renewable energy program to diversify and defragment their industry, as well as invest in industrialization, creating manufacturing hubs. We also believe North Africa will continue to grow. In Tunisia we have seen quite a bit of development. They have a relatively small population, however, they successfully tendered the PV capacity, and continue to grow to meet their renewable energy targets, as well as become a more independent power producer domestically. Countries like Senegal, Mali and Burkina Faso are interesting markets for us. All mentioned markets are growing not only in the utility scale segment, but also in distributed generation, such as commercial and industrial: with removal of subsidies in some countries and energy tariffs increase in others, the production and consumption of their own energy from PV makes a solid business case with an attractive payback period. However, regulatory framework around net metering and wheeling programs and/or liberal power market are the main stumbling blocks for a full roll-out of C&I projects and corporate PPAs. In the MENA region, Jinko is proud to have the biggest local footprint: our employees are spread across six countries, and this proximity as well as the understanding of local culture, play an important role for winning the clients' trust.

JF4S: What technological breakthroughs have particularly changed your industry in the recent past? What are the next technological challenges to overcome in order to make solar technology even more efficient?

I think this question is not region specific but rather focuses on the global evolution of solar. A solar power plant is now able to generate power at under 2 cents! Thanks to technological innovations, increased efficiency and system optimization, and as well as other support on driving the soft costs down, we see that solar is already more competitive than the conventional power sources when it comes to the leveled costs of electricity (LCOE). When we look to Sub-Saharan Africa, it was unprecedented that for scaling solar in Ethiopia the tariff was less than 2.5 cents. In Tunisia, just two months back, it was another beat submitted for around 2.2 cents as well. As we reach grid parity on unsubsidized basis, solar PV is spreading across the continents, and governments worldwide are coming to the party to support solar deployment.

Solar modules make up around 40-50% of the cost of the total system. As our technologies are becoming more efficient and less expensive, apart from reducing the CAPEX, it contributes to lower LCOE and improved returns for the stakeholders of the solar plants. So in the past, there was a huge move in the industry to improve the efficiency of the product, but obviously not compromising the costs. I think as an industry we have done an incredible job in achieving such goal. So just to give you an idea: even three years ago we were talking about poly-crystalline products. There was a poly-crystalline module, which was the answer and it was a plain-vanilla commodity product with a current output of 330W. Today, for the same dimension of the module, usually two square meters, we are providing 410W for mono PERC module. So that is 25% improvement per panel right there! How does this translate into the benefits to the EPC? They are using less balance of systems, which in its turn contributes to lower operation and maintenance cost. You will have fewer modules to clean, fewer strings or string inverters to manage. Or, you can fit more MW into the same piece of land or roof and generate more power! In my opinion, this is the major breakthrough, and it does not stop there. We just launched our 460W Tiger module, for example. Another elephant in the room are obviously bi-facial modules. I still remember five years ago, there was an Italian entrepreneur who was trying to commercialize bi-facial modules, and industry was very skeptical about it. At that time the technology was not viable: It was a niche technology and the costs were extremely high. So now, bi-facial is becoming a mainstream product and actually, within a course of 3 years, bi-facial could take up 30% percent of the total solar market. Of course, there are still questions to be answered about the standardization and certification of the bi-facial modules, but debt providers are more and more comfortable financing the bi-facial solar plants.

Storage is becoming a more viable business case and that is quite relevant to North Africa where a lot of mines are run on diesel fuel; so offering a storage solution in order to bring electricity costs down and insure the continuous supply of electricity and independence from the grid is also going to be a great asset. As costs of batteries continue to drop, we will see PV+ storage projects spurring globally and across the region.

JF4S: What kind of product from your portfolio has the most potential for the MENA market and why? Which new product are you particularly proud of and why?

MENA region is known for harsh climate conditions. We have high temperatures and high humidity as well, sandy environment etc. So there is a specific need to reinforce your product reliability. We have launched our Cheetah mono-perc product back in 2018. We created this technology by using a slightly bigger wafer to achieve a product which reaches 405/410W per module. This specific product has been extremely well received in the MENA region, simply due to the fact that it provides a higher power density. We are talking about 20% plus efficiency on the module level. We are offering the enhanced warranty, better than the industry standard as well; furthermore, this product has lower temperature coefficient that decreases power output at a slower pace as temperature rises. Reliable product with superb bill of materials, such as Tedlar backsheet by DuPont, higher efficiency, better electrical properties, enhanced warranty – all these factors have contributed to a big success of Cheetah on a MENA market.

Second product is our new bi-facial module, Swan, which uses a standard module glass-backsheet configuration, replacing a standard backsheet with a transparent one, which also uses DuPont components. Swan is basically a lighter product, which takes fewer people to install, and offers better isolation properties and a proven track record. The first Jinko Swan modules are being installed in the region, as we speak.

We just launched our new product, called Tiger, which comes in monofacial and bifacial formats, and is able to reach 460W output per panel. We are using a Tiling Ribbon technology, coupled with half-cut cells and nine bus bars. It's breaking into 20% efficiency even for a bifacial version. This product will be commercially available in early 2020, and our clients have started showing their interest, specifically with regards to ground-mounted projects.

Thanks to superior technology, leading service and great local team, Jinko enjoys #1 market share in the region, 30% across Middle East and Africa as of end of 2018. Overall, we are very bullish on the region's prospects, and Jinko Solar will continue to invest in and increase its presence in MENA region

JF4S: Thank you very much, Gulnara!

Questions by

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