

# Opportunity knocks for Brazilian PV

**Market update** | Several rounds of auctions for large-scale projects and a favourable policy environment for distributed systems have helped create the right conditions for PV to flourish in Brazil. Rodrigo Saucia and Juliana Vasconcelos explore the biggest areas of opportunity for foreign firms looking to access this promising new market

As the one of the 10 largest economies on the planet and the largest electricity market in Latin America, Brazil stands out as one of the world's most promising emerging PV markets for several reasons. The country ranks as one of the best in the world in terms of its solar resource, with irradiation levels ranging from 1,500kWh/m<sup>2</sup> per year in the least sunny regions of the south to over 2,500kWh/m<sup>2</sup> per year in large areas of the sunny north-eastern region, with a national average above 1,800kWh/m<sup>2</sup> per year. This is approximately twice as much as the average irradiation level of a typical temperate-climate European country, such as Germany or the UK. Additionally, Brazil is the fifth largest country in the world in terms of total landmass area, meaning there are vast strips of land available for the deployment of large-scale PV projects.

So far, only about 50MW of cumulative grid-connected PV capacity has been installed in Brazil, but this number is poised for substantial growth in the coming years. Regarding large-scale PV projects, until 2018, more than 3,200MW of already contracted PV systems are expected to come online. Additionally, PV deployment is set to increase significantly in the coming decade in response

to the government pledging to contract more than 7GW of large-scale PV by 2024 (doubling its previous plan of 3.5GW by 2023).

In terms of regulatory and legislative drivers, a range of supportive policies and incentives has been developed for the PV sector in Brazil. Reserve Energy Auctions (or LER in Portuguese) establish a reliable pipeline for large-scale PV growth out over the coming years. These auctions are based on low-risk, guaranteed, 20-year PPAs. In the first state solar auction of the country, in 2013, 92MW of PV were contracted over five projects, some of which are already operational. In the 2014 national solar auction, over 1GW of PV was contracted through 30 projects and in 2015 more than 2GW of large-scale PV projects were auctioned.

**A healthy development pipeline and new distributed PV policies have put Brazil's emerging solar market in a strong position**

In relation to PV distributed generation (PVDG), the recent revision of the Brazilian Electricity Regulation Agency's (ANEEL) net-metering regulation represents a key upgrade in supporting the growth of the PV market in the country. The revision incorporates several of the international best practices recommended for net-metering regulations, therefore establishing Brazil as a reference in terms of positive policies to fast-track the adoption of small- and medium-scale PVDG. The main strategic improvements of this so-called Normative Resolution n° 687/2015, in effect since March 2016, are summarised in the box below.

Apart from these market and regulatory drivers, favourable financing conditions are available through the Brazilian Development Bank (BNDES) and from

## New net-metering policies in Brazil

- Establishment of a nationwide "virtual net-metering" mechanism
- Establishment of a nationwide "community net-metering" mechanism
- Increase in maximum net-metering system installed capacity from 1MW to 5MW
- Nationwide standardisation of subscription forms and basic procedures for new net-metering connection requests throughout all distribution companies
- Reduction of deadlines for distribution companies to approve and connect new net-metering customers
- Meter equipment used in small-scale net metering provided directly by the distribution company
- Net-metering electricity credits (surplus electricity injected into the grid that can be used to compensate future electricity consumption) now valid for five years compared to only three years previously
- From 2017, all Brazilian distribution companies must offer an online process for receiving and following up new net-metering connection requests from consumers

foreign capital sources (especially given the current devaluation of the Brazilian real, which makes the country very attractive for international investors). Numerous tax breaks and statewide incentives act to attract global suppliers and PV project developers to Brazil.

In terms of taxation, in 2015 the states established a national agreement that exempts the electricity from net-metering systems from paying ICMS, a value added tax. Since then, ABSOLAR has worked tirelessly to mobilise states to adopt this exemption. Currently, a total of 20 out of the 27 Brazilian states have already adopted this exemption.

In terms of local funding for small-scale PV projects, in April 2016 the Northeast Regional Bank (BNB) created a specific financing product named FNE SOL ("sol" means "sun" in Portuguese) to support PVDG projects, which can finance full PV systems, including the project, PV equipment and installation. The BNB financing can be paid in up to 12 years with a grace period of one year and competitive local interest rates.

Based on this scenario, the government is expecting PVDG to develop into a 1.5GW to 5GW market by 2024, resulting in between BRL12 and 40 billion (US\$3.7-12.5 billion) in cumulative investments by that period. This market development trajectory creates a huge opportunity for new and established PV companies, local and international. When we consider the total market potential, the country has a total of 66 million residential consumers, 5.7 million industrial consumers and 5.5 million commercial consumers who could still benefit from PV.

In summary, both the present and the future hold great opportunities for PV in Brazil. According to this year's forecasts from Bloomberg New Energy Finance (BNEF), when considering the contributions from small-, medium- and large-scale PV in Brazil, the share of PV in Brazil's electricity matrix is projected to increase from 0.01% in 2015 to more than 30% in 2040.

### What are the opportunities?

There are strategic opportunities in different segments of the PV sector in Brazil, as well as for companies with different business models and profiles.

On the one hand, due to the market projections and governmental plans for large-scale PV projects in the country,

there are untapped opportunities for companies working with solar resource assessment, as well as project developers, engineering, procurement and construction companies, service and insurance providers and consulting companies, amongst others. Additionally, project developers will require new components and equipment to bring auctioned projects online. This creates a large potential for the local manufacturing of PV components and equipment in Brazil, as well as for the sourcing of bankable goods from international markets. Currently, there

*"By the end of 2018 it is expected a pipeline of between 3 and 6GW of of auctioned PV projects will be built in the following year. These numbers will position Brazil as a young but promising and evolving PV market"*

are local content requirements to obtain access to financing from the BNDES. This serves as an additional incentive for new investments in the establishment of local manufacturing operations by foreign companies already experienced in the fabrication of PV modules, inverters, mounting structures, tracking systems, string boxes, as well as other balance-of-system BOS components. Additionally, the government is also interested in attracting the fabrication of PV solar cells to the country to supply the local manufacturing of PV modules.

In fact, some of the leading PV component and equipment manufacturers, both national and international, have already announced or started manufacturing operations in Brazil and new companies are expected to take advantage of this opportunity in the near future.

On the other hand, due to the high electricity prices in Brazil and falling PV system costs, distributed PV has started to reach grid parity through the national net-metering regulation. The new regulatory framework is enabling new business models, such as third-party ownership and PV electricity as service, spurring a new wave of entrepreneurs

and investors searching for the best business models for growth, scalability and profitability. This environment is fostering new opportunities for companies working throughout the distributed generation segment, such as installers, engineering companies, financial institutions, legal offices specialised in contract drafting, equipment distributors and retailers, service providers in sales, marketing, customer support and many more.

Foreign investors could see a high rate of return when investing in PV projects in Brazil. National interest rates are relatively high and BNDES loans can cover up to 70% of a PV project's total investment – driving PV project developers to source the remaining capital from alternative sources, locally or overseas. Private equity funds can benefit from this opportunity.

Due to the establishment of a local manufacturing base, which is currently under progress, there are also opportunities for the development of R&D centres and projects in Brazil, especially those aiming to transfer state-of-the-art PV technology to the country, adapting it to the local climate and electricity grid characteristics.

### What are the risks and setbacks?

Financing in Brazil can be challenging, due to the high local interest rates. This has been a difficulty not only for the PV sector, but in fact for many infrastructure projects in Brazil, from power plants, to ports, airports and roads. The favourable conditions offered by BNDES goes some way to solving this, though companies are often still left with the need to find additional external funding from other sources to complete the project funding. Large-scale PV investors especially are usually limited to approximately 70% of their project funding through BNDES.

Brazil's currency has also devalued in the last two years, increasing local costs of developing and deploying PV projects, as the prices of PV raw materials, components and equipment coming from abroad are frequently linked to foreign currency. The possibility of additional currency fluctuations in the future represents a risk for foreign investors in Brazil, which is both hard to predict and complex to value.

Having said that, the local currency devaluation also means that investing

in Brazil is currently cheaper for investors with foreign capital, with PV assets acquired in the country in the short term likely to gain value in the medium and long term, when the local economy and currency recover.

Though the Brazilian government has demonstrated its determination to support PV growth, the political instability observed in recent times has brought additional complexity to the local economy. However, the new leading decision makers of the Ministry of Mines and Energy of the interim government have clearly signalled their support for continued solar PV development by guaranteeing the execution of a Reserve Energy Auction for PV in 2016, announced for 16 December 2016.

On behalf of the Brazilian PV sector, ABSOLAR has also brought forward technical, legislative, regulatory and market recommendations for the minister of mines and energy and his team.

### Near-term development of the Brazilian PV market

In relation to the large-scale PV segment, we expect new large-scale PV auctions in 2017 and 2018, with between 1 and 2GW of new contracts auctioned every year. By 2018, the large-scale PV market is expected to surpass the 2GW mark in terms of total cumulative installed capacity, as a result of projects from 2014 and 2015 being realised. Additionally, by the end of 2018 it is expected a pipeline of between 3 and 6GW of auctioned PV projects will be built in the following years. These numbers will position Brazil as a young but promising and evolving PV market.

In regards to the distributed generation PV segment, we expect this year's market to continue its exponential growth in the number of installed systems throughout the country, with an annual growth rate above 400% in 2016, compared to more than 300% in 2015. So far, the market has been strongly based on small residential and commercial installations, which account for more than 90% of all net-metering PV installations. Nevertheless, this may soon evolve to new business models, once the advantages of virtual net-metering and community net-metering mechanisms are successfully incorporated into the market status quo. ■

*The Brazilian Trade and Investment Promotion Agency (Apex-Brasil), ABSOLAR, the Brazilian Ministry of External Relations and the Consulate General of the United States of America in Sao Paulo are hosting an event on solar opportunities in Brazil in Las Vegas on 14 September 2016. For further information, email [apexbrasil@apexbrasil.com.br](mailto:apexbrasil@apexbrasil.com.br).*

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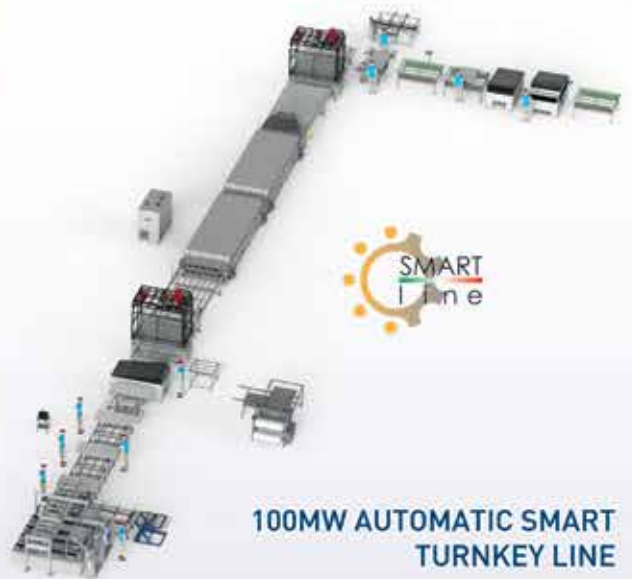


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