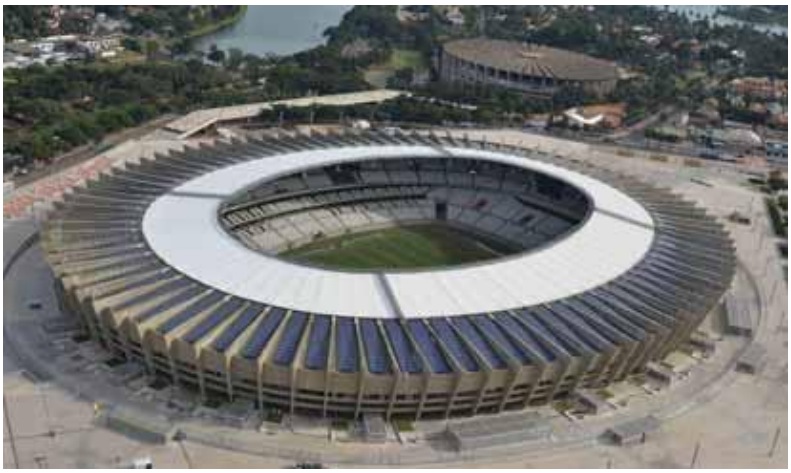
Brazil's solar waiting game nearly over

Solar auctions | Months after becoming an unexpected star of the 2014 football World Cup, solar struck gold once again in Brazil when it attracted huge interest in a national energy auction. But low bidding prices and the complexities of a local content requirement have tempered some of the excitement about Brazil's emergence as a solar heavyweight. Lucy Woods weighs up its prospects



Credit: Luan SR, Wikimedia Commons.

After taking a starring role atop a number of the 2014 Football World Cup stadia, solar is poised for further success in Brazil.

Brazil's government has finally turned its focus to solar. "Finally, after all these years of waiting - everyone thought Brazil would come a long time ago and now [the government] has given a pretty clear signal: we are going for PV," says Christian Hallén, business director of developer Solatio Energia.

The announcement of solar-only auctions, the re-election of pro-solar President Dilma Rousseff last October and Brazil's latest national energy expansion plan to 2023 including 3.5GW of solar all signal that Brazil's leaders have finally cottoned on to solar energy's mass potential in the country.

"Politicians just waited and waited till the prices were even lower, to buy even cheaper electricity; they let others, like Europe, subsidise PV in the starting phase," says Hallén. "Brazil decided to stay outside in the beginning, and only started to come in when the prices were low; now they have come down the level is low enough that Brazil has said, 'let's bring PV in,'" says Hallén.

The world's fifth largest country straddles the equator, which runs through its northern reaches, providing swathes of land with high natural solar irradiance. Yet the country's inhabitants suffer exorbitant electricity prices, and a booming middle class is pushing up energy demand; the huge country is pleading for solar energy.

With more than 75% of Brazil's energy capacity relying on hydro-power, a sudden and severe drought that began last summer caused energy prices to rocket. Expensive thermal power replaced power from parched hydro plants. Predictions from the Brazilian Photovoltaic Solar Energy Association (ABSOLAR) for 2015 show the drought and a lack of cheap alternative energy sources, will cause electricity prices to rise by another 20-25% on top of last year's 20% rise.

But there is now an economically viable solution. In 2014 ministers announced BNDES, Brazil's national development bank, would help fund solar energy projects. The rules set a number of different local content requirements that must be met for different components of a solar module and system. These will gradually be ramped up to 2020, after which a blanket 60% local requirement will be in place for modules.

BNDES said in a statement last August that the aim of the funding was to "seize the opportunity".

With funding in place, on the 31 October 2014, the national reserve (renewable energy-only) auction attracted investments of BRL7.1 billion, for the construction of 31 solar projects and 31 wind projects. The national auction saw very low project prices bid, averaging out at less than US$87/MWh.

With fossil fuel plants selling power at up to BRL800 (US$325) per megawatt hour, the recent national energy auctions set a ceiling price of BRL260/MWh (US$96) for solar energy, offering Brazil the chance of replacing some fossil fuel generation with renewables at an incredibly low price: 31 out of 400 PV project bids totalling 889.7MW were granted approval at providing electricity at the fixed price of US$86.78/MWh for 20 years, beginning on 1 October 2017.

Although this also means delays in development will result in high penalties, the auctions were overall a "positive surprise", says Rodrigo Lopes Sauaia, executive director of ABSOLAR. The results of the auctions show that "if price levels are adequate the government is interested in introducing more PV into the country; these are very positive signs", Sauaia says.

The BNDES funding provided the financial rocket fuel required to spark international interest and bargain prices. Without BNDES "the prices would be much higher, you would have to go to commercial banks and get interest rates around 12% or more", says Sauaia. There could still be PV in Brazil, but the prices would be much higher, "and the government would not find it interesting at this price, so instead of giving subsidies, BNDES can give financing", adds Sauaia.

Low bidding

The flipside of this is that there are now concerns circulating in the industry that the very low prices bid in the government solar auctions will mean solar projects fail to reach completion, will not come online in time and face penalties, or operate at an unsustainable loss. But others believe that the low profits implied by the level of the bids could be a sacrifice worth making just to get on the first rung of what is a potentially huge emerging market.

"There are no developers that will not have the financial resources, or technical capacity to bring the projects to operation," says Marcos Meireles, the CEO of Rio Energy, a major winner of solar energy tenders last year, in conjunction with Fotowatio. Meireles points out that the winners are not small risk takers, but the likes of global renewable corporates such as SunEdison and Enel Green Power. Big players appear to be the only participants, with consequently little risk of any solar projects being undermined with capital shortages.

The low prices demonstrate Brazil's solar industry is attracting market leaders, agrees Sauaia. "Companies wanted to position themselves as a leading participant in a very strategic emerging market and therefore they were open to reduce some of their financial returns," he explains.

What's more, Hallén believes many concerned commentators of Brazil's solar industry missed the inflation factor: every year the strike prices awarded for solar energy will increase with inflation; by the time the winning solar bids are fully constructed in three years, ready for the 2017 deadline, the contracted price for energy will already have been increased three times with the inflation rate – which is currently about 6% in Brazil.

Hallén predicts by the time projects come online, the price will already have increased by almost 20%, meaning the average selling price will have increased from BRL215/MWh to BRL256/MWh. Inflation will increase every year for the 20-year power purchase agreements signed for solar energy generation too. This "fits perfectly with financial calculations and high radiation," says Hallén. Solatio Energia itself was one of the biggest winners in Brazil's 2014 solar only auction, winning tenders for 360MW by partnering up with ACS Cobra and Canadian Solar, bidding around BRL216 /MWh (US$80).

Successful parties in Brazil's 2014 auction

Investor	Installed capacity (MW)
ACS/Solatio	270.00
Enelgreenpower	210.00
Fotowatio (FRV)	149.91
Renova/Sunedison	99.75
Canadian Solar/Solatio	90.00
JMP	30.00
Inharé	30.00
Grupo FCR	10.00
Total	**889.66**

Domestic manufacturing

The catch to getting such convenient cash injections from BNDES and seemingly super-cheap deals on solar development is of course the local content rule, something that has caused no end of problems in other countries. But the domestic content restrictions on the BNDES funding have been planned out to be slow and progressive, hoping to avoid the mistakes of India and Canada's restrictions in stifling international interest, while tentatively growing Brazil's very own home-grown PV manufacturing industry.

As a result, Sauaia believes Brazil can repeat with solar what it achieved with wind and develop a local manufacturing

base. "Brazil very successfully implemented a wind sector locally, including bringing in manufacturing, even though the international market was overloaded with wind equipment. I believe the government can use this knowledge and experience with the wind sector to promote a PV value chain," he explains.

At first, only module assembly lines are needed to meet the BNDES funding requirements. "It makes sense, as it is difficult for a country to fully develop manufacturing in a short amount of time. You need more time to establish a downstream value chain so that you can go up in the value chain in time; it is the natural process in time," says Sauaia.

Meireles also says that cell producing in Brazil right now would be "too aggressive", but Brazil can certainly do the assembling. Solar projects that have won government tenders are required to come online by 2017, and a few years is needed for manufacturers to set up base camps. "2015 will be a very important year for these decisions," says Sauaia. "You need the factories to be able to run by the end of 2015 or there will be a lack of modules for the [winning] projects."

From 2015, BNDES funding requires locally produced aluminium, then from 2018- 2019 additional components will need to be made locally such as junction boxes, then from 2020 onwards, solar cells will be produced in Brazil, along with inverters, structures and cables.

If developers cannot get locally produced modules they will not get the funding, but Hallén is confident this will not be the case. "I am sure everyone will get locally produced modules; in three years you can set this up, and there are now plans with module manufacturers," he says. "If everything continues as it has started now, then there will be enough [locally produced] modules."

As an example of this, at the end of last year it emerged that a consortium of German research institutes was carrying out a feasibility study for the establishment of a fully integrated, Brazilian PV manufacturing facility on behalf of the Brazilian-Paraguayan power company, ITAIPU and industry association, FIEP. The study is to test the waters for a 10,000MT polysilicon plant and integrated wafer, cell and module production with a capacity of 680MW.

Credit: Gehrlicher Solar.

Latin America has also become a key emerging market focus for module manufacturer, Yingli Green, which has recently announced that it plans to partner up in Brazil to operate a PV module assembly plant too. Several other tier-one module manufacturers "are evaluating bringing their assembly lines to Brazil", says Sauaia. Sauaia and Meireles cite Canadian Solar, Jinko Solar and First Solar as being among the big-name manufacturers looking at ways to bring manufacturing to Brazil. "But these are not established decisions, they are still evaluating the possibilities," adds Sauaia.

Hallén says demand is all that is required to spur domestic manufacturing in Brazil. "As long as the volume is big enough and there is an attractive market to enter for manufacturers, then it should all work."

Credit: Solatio Energia.

The site for one of Solatio Energia's proposed PV projects in the state of Sao Paulo.

However while the continuity of Rousseff's presidency, decided in national elections in 2014 also "provided some certainty for developers and first buyers trying to get PV off the ground" in Brazil, says Adam James, Latin America expert at market research firm, GTM, not 24 hours into Rousseff's second term leading the world's seventh largest economy, Brazil's currency and market tanked after government bonds were downgraded on the back of her re-election.

Before Brazil can inject life into its small domestic solar manufacturing, it has to address its falling currency. The value of the Brazilian real against the dollar means an additional challenge for solar projects looking to attract foreign equipment. "You have to watch out for conversion; a currency rate is one thing that is very difficult for investors to predict: how the dollar will behave, it could make a lot of difference between a huge loss and huge gain," says Meireles.

With the elections over, if Brazil can keep currency, solar development financing and domestic manufacturing in harmony, ABSOLAR is planning to advocate for a 1GW solar market in 2015, with Brazil playing a stronger role in manufacturing. For this to happen ABSOLAR is specifically advocating 1GW to be contracted through more auctions.

Meireles reckons the success of the solar auctions last year is just the beginning. "To have solar well developed in Brazil, start with the auctions and then go to the distributed energy – imagine how many jobs you would have," he says.

Hallen says for 2015, "if it is a big enough market, I am convinced there will be more than 1GW a year going forward. Not just speaking about the auction but the residential market too."