



## OPINIÃO

# DISTRIBUTED GENERATION AND THE RISE OF THE BRAZILIAN PROSUMER

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For a long time around the world, electricity has been generated in a centralized system through power plants that are located away from urban centers. In the last few years, however, with the technological progress associated with the development of renewable energy, captive electricity consumers have been able to generate their own electricity, for instance, by installing photovoltaic solar panels on their rooftops. They have become “prosumers”, that is, they simultaneously produce and consume electricity. As a result, the generation of electricity has become more decentralized.

Taking the United States as an example, this trend becomes clear. Data from the U.S. Energy Information and Administration shows that, between January 2014 and April 2016, solar photovoltaic distributed generation has increased from 560 MWh to 1.447 MWh, a growth of 173% . In Germany, private citizens owned 48% of installed photovoltaic energy capacity in 2012 , while energy utility companies owned only 4%. Given this expansion of distributed generation around the globe, how is this trend evolving in Brazil?

Distributed generation was introduced in Brazil in the end of the 1990s and early 2000s, but its expansion has been limited. This scenario is changing, however, since legislation was modified last December to increase the power limit and allow for new forms of distributed generation in the country. Prosumers cannot commercialize the electricity they generate among themselves, but they can group in communities, consortiums or aggregate multiple consumer units and share the energy generated. "Remote consumption" is also allowed, when the energy is generated in one of the prosumer's properties and consumed in another, as long as the utility company is the same in both locations.

The distributed generation policy adopted in Brazil is net metering, in which the prosumer is still connected to the grid. Depending on the volume produced, energy is inserted or consumed from the grid. In a given month, if the production of electricity is greater than its consumption, this surplus rolls over to the following month, with a rollover limitation of 60 months. The Brazilian prosumer is compensated at retail rate for the energy produced.

Given these changes, the Brazilian electricity regulatory agency, ANEEL, predicts that the country will reach 1.2 million prosumers in 2024 (in July 18, 2016, they were 3.811), with 4.500 MW of installed capacity.

There are a few challenges, however, regarding net metering, which were observed in other countries as well. First, energy consumption is not charged separately from grid usage for captive consumers, including prosumers generating energy through

distributed generation. As a result, the utility must bear these costs or pass them along to other consumers, which can potentially increase electricity rates. Moreover, utilities' profits are a function of the volume of electricity they sell. With the rise of the prosumer generating their own electricity, utilities will sell less electricity and, consequently, their profits will fall (the famous "utility death spiral").

In order to address these issues, ANEEL has declared that the net metering policy will be reviewed in 2019, when the number of prosumers will be estimated at 200.000, with installed capacity of 500 MW. They argue that, at that point, since there will not be too many prosumers yet, the impact on other consumers and the utility companies will not be significant, but it will still be possible to analyze what effects distributed generation will have on the grid. Utilities are anxious about this reviewing deadline, however, claiming that 2019 is too late to evaluate the policy. They believe it would be better to review the current tariff system now so that consumers were charged separately for their energy consumption and their grid usage.

The regulator and the industry should consider, as well, if net metering is the best policy to incentivize the development of distributed generation in Brazil. Besides the negative externalities imposed on other consumers that do not generate their own electricity, net metering does not assess the positive externalities that distributed generation, especially distributed solar, brings to the system, such as reduction in greenhouse gases emissions, for instance. Therefore, the adoption of another incentive structure should

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<sup>1</sup> In 2014 and 2015, distributed solar accounted for 35% and 31% of total solar generation in the country, respectively. Total solar generation, in turn, was responsible for 0.66% and 0.94% of total electricity generated in those years.

<sup>2</sup> Institutional and strategic investors owned the remaining 48% of installed photovoltaic energy capacity. Source: Definition und Marktanalyse von Bürgerenergie in Deutschland, by trend:research and Leuphana Universität Lüneburg.

<sup>3</sup> Source: Cadernos FGV Energia – Distributed Energy Resources, June 2016 (available in Portuguese only. The English version is forthcoming).

<sup>4</sup> The Value of Solar Tariff (VOST), a tariff system utilized in some states in the United States, aims to incorporate the positive externalities that solar generation brings to society

<sup>5</sup> In addition, new technologies that can contribute to the progress of distributed generation, such as consumer-sited storage systems, must also be incentivized.

also be considered when the rules of distributed generation are reviewed in 2019 .

Another issue related to the growth of distributed generation concerns the Brazilian power grid, which needs to be updated to a smart grid. This process is still under analysis and is being tested in small pilots throughout the country. Distributed generation, in large scale, however, needs a smart grid, but its implementation is still uncertain. Given the fact that distributed generation has already started to evolve in the country, and given Brazil's continental size, it is

worrying that grid modernization has not started yet .

In sum, Brazil seems poised to win with the rise of the prosumer. At this moment, the country experiences one of the worst recessions in its history. Government investment in renewable energy, which is necessary in order to fulfill the country's commitments to the Paris Agreement, is in jeopardy. A promising way to develop distributed generation fully in the country is by incentivizing prosumers, with infrastructure, technology and incentives in place that will allow them to thrive. Government, regulators and the industry must work together to make this happen.



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