

The role of net metering solar photovoltaic (PV) systems for improving the energy performance of buildings in Brazil.

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This presentation comprises:

- An introduction to the main policy support schemes for rooftop solar PV.
- An analysis of Brazil's net metering scheme.
- Users' considerations of the Brazilian net metering.

Policy schemes for supporting small-scale PV can take the form of:

- **Feed-in Tariffs (FITs)** – they kick-started rooftop solar PV in many countries (e.g. the UK), but are mostly abandoned today worldwide due to rapidly falling PV costs.
- **Net metering** – this is widely implemented today (e.g. in Brazil), often very successfully (e.g. in Italy).
- **Self-consumption** – it looks similar to the net metering scheme but usually does not allow electricity credit transfers. Portugal is a leading example of self-consumption for rooftop PV.

Net metering in Brazil

- Introduced in **April 2012** by Brazil's electricity regulator (ANEEL) for systems up to 1 MW of capacity connected to low- or medium-voltage grids. Credits can be recuperated within 36 months.
- ANEEL passed a new net metering resolution (No. 687) in **November 2015** allowing:
 1. The installation of systems up to 5 MW.
 2. The distribution of credits among multiple electricity accounts (e.g. a residential apartment or multi-tenant shopping mall).
 3. Virtual net metering (sites need to be owned by the same customer and serviced by the same distributor).
 4. Shared/community solar power generation.
 5. Credit exchange within 60 months.

Net metering in Brazil

- In addition, there are several tax incentives aiming to boost net metering. Most importantly, state value added tax (ICMS) is exempted on net electricity fed back to the grid.
- The scheme currently also allows the integration of net metering systems into the bilateral electricity market (the Free Contracting Environment).
- A drawback is net metering isn't included in the National Energy Efficiency Policy, which appeared in 2008 & sets goals and policies to be implemented until 2030.
- The Energy Efficiency Law (2001) provides mandates & methods for public agencies in order to devise the minimum energy efficiency standards for buildings. Energy-efficient building standards are currently implemented on a voluntary basis & do not include net metering requirements.

User influences on performance

- To date, there are about 200 MW of net metering installations (23,175 systems) in Brazil, out of about 1 GW of total solar PV installations in the country.
- These are dispersed among residential consumers (78%); commerce and services (15.6%); rural consumers (2.9%); industrial users (2.3%); & other types, such as public lighting (0.2%) & public services (0.03%).
- 500 million BRL (US\$154.3 million) will be available in 2018 to finance residential net metering PV in the nine states of the Amazon Basin.
- Net metering installations are currently being developed mostly in regions with high industrial development & high energy prices such as Sao Paulo, Rio & Minas Gerais.

User influences on performance

- Several installers claim the IMCS exemption is not decisive for the bankability of a project.
- Some local electricity grids are hesitant to facilitate net metering connections.
- Net metering PV started to grow in Brazil between 2015 and 2016, two years in which the country's GDP dropped by more than 3%.
- PV installers say the biggest challenges are the pressure on prices (39.3%), the lack of financing options (25%), misleading advertising (15.5%) & products of low quality (14.8%).
- Energy storage could also comprise part of the future net metering scheme.
- Brazil's net metering should learn from the country's solar water heating (SWH) legislation. Certain municipalities possess mandates for the use of SWH; SWH is integrated in social housing programs; standards & certifications for SWH equipment have been developed since 1998.

Thank you / Obrigado!

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