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MINISTÉRIO DE MINAS E ENERGIA

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Energy Storage Technologies

The key to the transformation of the energy system in Brazil

Initial status

The Brazilian electricity market is one of the largest in the world. Renewable energy is therefore becoming increasingly important in Brazil, especially under the national plan to tackle climate change, which is currently being implemented. The supply of renewable energy, in particular solar and wind power, is not consistent, so relying on it causes fluctuations in the country's electricity supply. Renewable energy is growing, leading to greater fluctuations in electricity supply.

Renewable energies are therefore becoming increasingly important in Brazil, especially because of the National Plan on Climate Change, which has been under deployment. Since renewable energies, especially solar and wind energy, are not continuously available, they cause fluctuations in energy supply. Consequently, the increasing participation of renewable energies in the Brazilian energy mix leads to greater fluctuations in the power grid.

In order to counteract these fluctuations, storage technologies are needed that improve grid stability and security of supply. Currently, the most advanced and economically viable energy storage technology is battery storage. Therefore the focus of the DKTI Energy Storage project is on the integration of battery storage into both On-Grid and Off-Grid systems. The successful use of energy storage technologies plays a central role in achieving energy and climate policy objectives.

Brazil is only at the beginning of a rapid growth in renewable energy, whose temporary surplus generation will make storage technologies increasingly necessary. It is therefore extremely important for the future growth of the renewable energy market and the stability of the country's electricity grids to create the technical and regulatory conditions for the use of storage technologies.

Title	DKTI - Brazil-Germany Partnership - Energy Storage Technologies
On behalf of	German Federal Ministry for Economic Cooperation and Development (BMZ)
Country	Brazil
Partner	Ministry of Mines and Energy (MME)
Overall Term	2020 - 2023
Budget	5 Mi €

Energy storage technologies also enable a link between different areas of the energy sector and industry. The focus here is on the areas of electricity, heat supply, transport, and industry, which are analyzed and optimized in a joint approach. Power-to-X technology, or in short PtX - the term for various processes and technologies for storing surplus electricity from renewable energy sources - is expected to make a significant contribution in the future.

PtX enables a flexible power system, allowing excess electricity to be stored in different areas and used in specific locations. "Green hydrogen" generated from renewable energy, for example, can be used to produce fuels, combustible gases and climate-neutral fertilizers. It is therefore a key element for a successful energy turnaround.

Brazil has excellent conditions to develop a national green hydrogen economy and also to become an important exporter. Not only does it have the largest production base in the German industry outside the country, but it is also ideally positioned due to its climate conditions, logistics infrastructure and strong business relations with Germany.

Left: Wind farm in desert region for energy generation.

Right: Installation of photovoltaic systems on roofs of houses.

Goal

The Brazilian government makes extensive use of energy storage technologies

Approach

The project advises political decision-makers, regulators, power utilities and grid operators on assessing possibilities and options of technical usage of energy storage and the creation of the necessary framework conditions. It also advises independent power utilities and grid operators in northern Brazil on planning and integrating energy storage in isolated power grids. Moreover, it supports governmental and private research institutions in Brazil in establishing cooperation arrangements and networks with international companies and conducting application-oriented research, with a special emphasis on partners from Germany.

It also also carries out analysis/studies on topics such as technical utilization options, costs/benefits of integrating energy storage, energy planning models, the use of grid storage technologies, and the integration of energy storage into the Brazilian electricity grid.

One of them is planned in cooperation with the Energy Research Company (EPE) in order to present detailed proposals for the integration of renewable energies in remote Brazilian systems (SISOL).

Another front of the project establishes research networks oriented to storage technology applications. In July 2021, the project organized a networking event with German and Brazilian universities and research and development organizations that must be replicated. Thus, the project opens a dialogue between Brazilian public and private research institutions and international organizations and companies, identifies demands and synergies in the academic environment on renewable energies and pinpoints opportunities for cooperation between organizations and companies.

Through a professional training strategy, the project holds capacity -building sessions for different actors in the sector and offers technical and political consultancies to support the wide use of energy storage technologies in Brazil.

Organizational development measures improve project bidding and financing and support the development of new service offerings, such as business and financing models. In addition, they establish interdisciplinary work structures, for example, in public-private research and development projects, in order to establish connections between specialists and promote the exchange of experiences. Within the society, the project works on establishing connections, such as cooperations of associations, to intensify the international exchange of experiences.

Editor

Deutsche Gesellschaft für
Internationale Zusammenarbeit (GIZ) GmbH
Sitz der GIZ: Bonn und Eschborn

GIZ Agência Brasília
SCN Quadra 01 Bloco C Sala 1501
Ed. Brasília Trade Center
70711-902, Brasília-DF, Brasilien
T +55 61 2101 2170
giz-brasilien@giz.de
www.giz.de/brasilien

Responsable

Dr. Markus Francke
markus.francke@giz.de

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Partners

Ministério de Minas e Energia (Ministry of Mines and Energy)
Setor de Autarquias Norte, Quadra 1, Asa Norte, Brasília - DF. CEP 70297-400

Commissioned by

German Federal Ministry for Economic Cooperation and Development (BMZ)

Address BMZ

BMZ Bonn
Dahlmannstraße 4
53113 Bonn
T +49 (0)228 99 535-0
F +49 (0)228 99 535-3500

BMZ Berlin
Stresemannstraße 94
10963 Berlin
T +49 (0)30 18 535-0
F +49 (0)30 18 535-2501

poststelle@bmz.bund.de www.bmz.de