

WHITE PAPER

The future of battery storage in Belgium

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List of Acronyms	
aFRR	automatic Frequency Containment Reserve
BESS	Battery Energy Storage System
BELPEX	Belgian Power Exchange
CIM	Continuous Intra-day Market
CRM	Capacity Remuneration Mechanism
DA	Day-Ahead
DAM	Day-Ahead Market
DNO	Distribution Network Operator
FCR	Frequency Containment Reserve
mFRR	manual Frequency Containment Reserve
PGM	Power Generation Module
PPM	Power Park Modules
RES	Renewable Energy Sources
RfG	Requirements for Generators
R&I	Research and Innovation
SPM	Storage Park Module
TSO	Transmission System Operator
VLAIO	Flemish (Vlaamse) Agency for Innovation and Entrepreneurship
VREG	Flemish (Vlaamse) Regulation Entity for the Electricity and Gas

1 Introduction

1.1 White Paper Objective

Belgium is about to take some important decisions about the future of its electricity system. The so-called Energy Pact, which is currently being drafted by regional and federal administrations, will set out the long-term future of a sector that is undergoing rapid and fundamental changes in a transnational context.

The purpose of this paper is to discuss the current and future opportunities in Belgium regarding energy storage development. More specifically, the paper examines the institutional and regulatory framework for the development and participation of energy storage units in the electricity markets and power mechanism in Belgium, with a focus on Battery Energy Storage Systems (BESS). Unless highlighted otherwise, the terms 'BESS', 'energy storage', 'battery storage', and 'storage' are used interchangeably with the same meaning in the paper.

1.2 Background

Battery storage in recent years has faced an extremely high level of multidimensional development, which spans across all levels of the electrical system (production, transmission, distribution, and final use), in sizes ranging from kW to GW and for uses covering a wide range of technical services and market operations. The battery storage technology is a convincing response to several issues that global electricity markets have to deal with, with some of its key benefits being:

- It is an important tool to assist the further integration of Renewable Energy Sources (RES) and enhancing grid stability, the decongestion of saturated grids, the promotion of self-consumption, and overall, the energy transition to a cleaner energy future.
- It is capable of both reducing peak demand and providing flexibility to the network operator, by balancing real-time differences between forecast and actual supply and demand, as it allows any surplus electricity to be temporarily stored, in order to be made available again as electricity when needed. The industry has clearly picked up on this opportunity: the European energy storage market is expanding rapidly, having grown from 0.6 GWh in 2015 to 8.3 GWh in 2021¹, a tremendous 14 times up increase in just 6 years [2].
- It is highly versatile and scalable and can be used for both residential and utility-scale short-duration storage applications in distributed or centralized setups. With the drop in the cost of lithium-ion batteries, there has been an increased demand for battery storage. In particular, the co-location of BESS with PV (Figure 1) or wind farm power plants is a growing global trend nowadays.

¹ These figures are applicable to stationary electrical, electrochemical, and mechanical storage (with the exception of pumped hydro storage).

- Even large-scale BESS plants have minimum space and environmental requirements (Figure 2) and can be installed in a relatively short period of time.



Figure 1: A 20MW/10MWh containerized BESS combined with 570MW of solar PV (source: ccj-online.com)



Figure 2: Artist's impression of the proposed 320MW/640MWh Gateway BESS site, one of the world's largest battery projects (source: intergen.com)

Energy storage can undoubtedly provide Belgium's power system with cleaner energy, ensuring safety, flexibility, and stability, while also enabling the reduction of electricity prices for the benefit of the end consumers. However, to enable new services and ensure the security of the power network, the Belgian electricity market design, and the legal and regulatory framework for the deployment of battery storage will need to adapt and reflect the flexibility that this technology can offer.

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