

WHY BESS ALSO NEED ECONOMIC SUPPORT?

ATEE



BESS (Battery Energy Storage System): a growing Market

A booming market

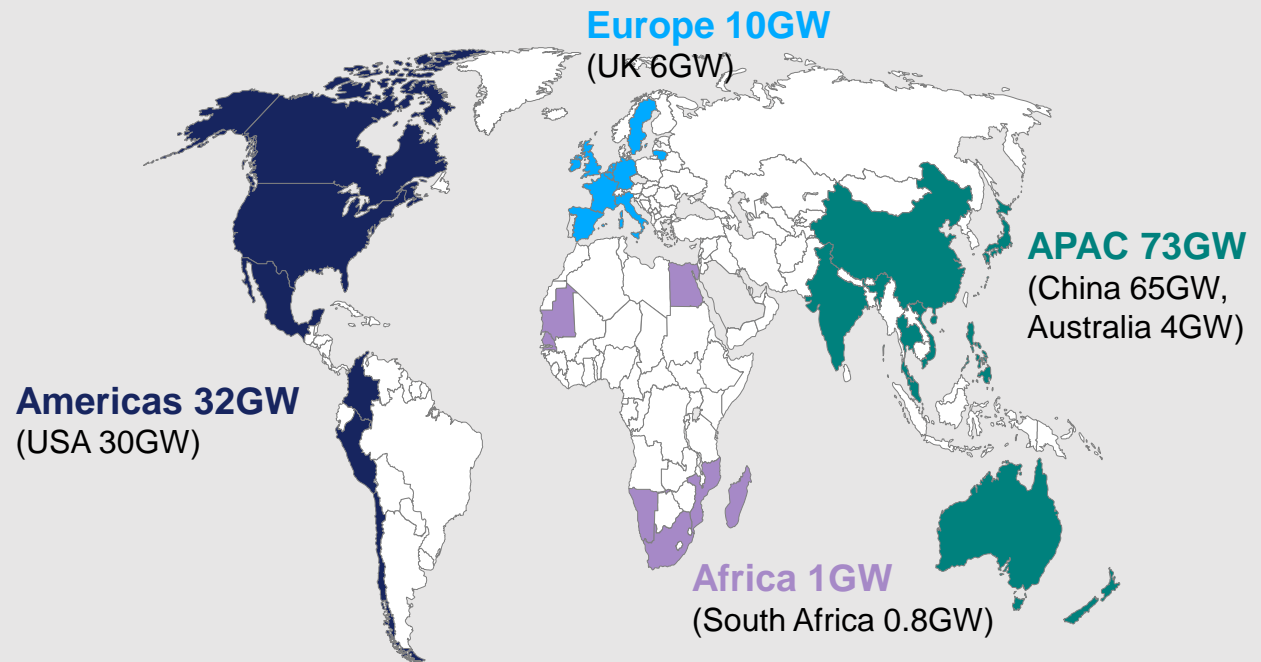
4X

growth in flexible capacity
in Europe by 2050¹

0.15GW

of BESS is needed to balance
every 1GW of RES added²

Already 116GW of capacity installed worldwide³



**BESS is a fast growing market but is very country and use case specific.
Profitability is a challenge in many regions, even in mature countries.**

Why do we need BESS in the electricity market?



Renewable generation is growing, partly due to solid policy

Demand growth and electrification is uncertain, partly due to fragmented policy

Supply security risks
Market price risks
Higher subsidy needs
Congestion

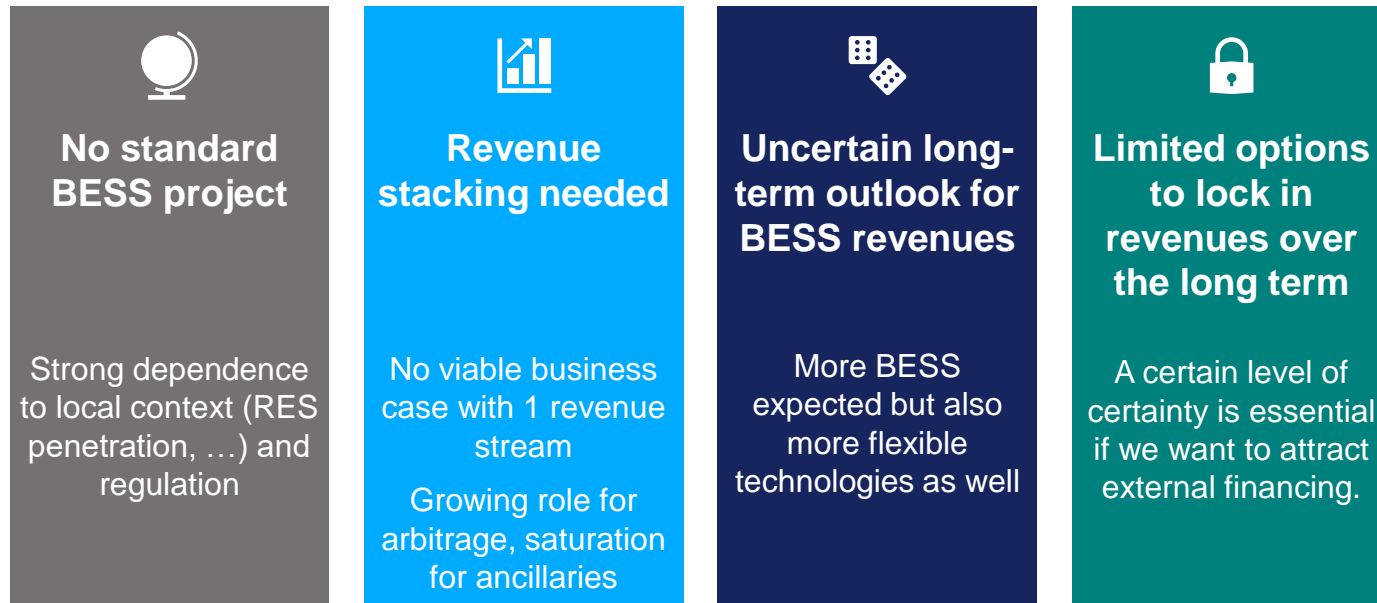
BESS can support the electricity market by balancing supply and demand

Each country needs to properly assess its flexibility needs, to enable regulators to facilitate the development of BESS

Do BESS also need economic support?

BESS are essential for enabling the transition to a clean energy grid.

The investment costs of BESS are high, and the revenues are uncertain and complex to assess:



From an investor point of view, BESS still face significant hurdles in making projects viable.

Economic incentives are needed to bridge the gap

Many countries develop support mechanisms to bridge the gap to their flexibility needs

Investment support

- + **Clear market signal providing certainty when conditions are met:**
 - ✓ Avoid lengthy qualification processes based on complex criteria
 - ✓ Ensure the right technologies are included to prioritize objectives

Implementation in US (IRA), Australia, Greece

CFDs

- + **Security on revenues when:**
 - ✓ Avoid dispute due to dispatch decision
- **More complicated to implement and anticipate side effects** (for the regulator, for the asset manager, ...)

Implementation in Greece, Hungary

CRMs

- + **Adequate market-based mechanism when:**
 - ✓ Providing long term remuneration >10 years for investors
 - ✓ Avoid claw back mechanisms
- + **Capacity to focus on non-fuel technologies**

Implementation in the UK, Belgium

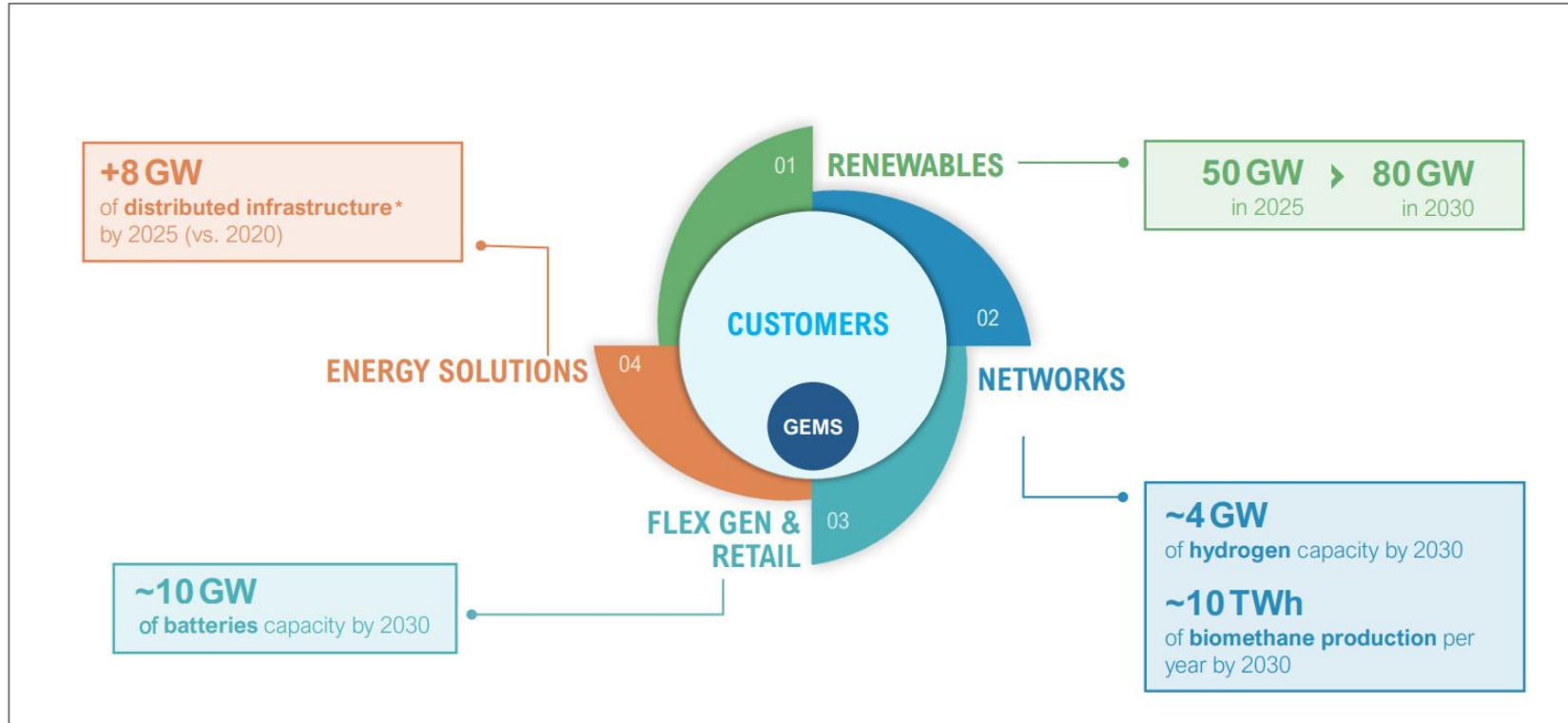
Grid tariff incentives

- Grid tariffs have a strong impact on BESS business case:
- ✓ Grid tariff exemption in Belgium
 - ✓ Favorable mechanisms in UK and Germany

In addition to favorable context (high RES penetration, thermal phase out, high demand and grid congestion), economic support is key.

Companies will focus on countries with both favorable local context and LT support schemes

ENGIE well positioned to capture BESS market growth



ENGIE BESS

0.7 GW Under construction
0.2 GW Already in operation worldwide

In line with ENGIE's ambition to reach **10 GW** of BESS by **2030**

* **FLEXISUN** FLEXISUN, Engie's new global offer bundling Onsite Solar with BESS for Commercial & Industrial Clients

Australia – Hazelwood (150MW/150MWh)



150MW

Commissioned in H1 2023

- Flagship project in Australia illustrating ENGIE's commitment to the energy transition worldwide
- Installed capacity of **150MW / 150MWh** allowing to:
 - Store equivalent of 1h of solar power generated by **30K homes** in Victoria State
 - **Inject power** into the grid in periods of peak demand
- Providing **flexibility** and guaranteeing electrical grid **reliability**

Rehabilitation of a former coal-powered plant, in line with ENGIE's commitment to energy transition



BEFORE
Coal fired plant

AFTER
Hazelwood BESS

Business model

**Energy
arbitrage**



**Grid
services**

Co-located assets – Chilca Uno (Peru) & Coya (Chile)

Co-located BESS with Renewable

With RES increase in Chile, the addition of BESS becomes needed to:

- ✓ **Optimize curtailment hours** by charging the BESS
- ✓ **Time-shift energy injection** on the grid during the night hours when spot prices are high



Coya – Chile
139MW / 638MWh

Co-located BESS with Power Plant

As large power plants are obligated to provide PFR services in Peru, the addition of BESS can:

- ✓ **Avoid extra forced derating** for power plant
- ✓ **Increase the power plant available nominal capacity** by releasing it from its PFR duties (BESS performs the PFR service)



Chilca Uno – Peru
26,5MW / 14MWh



6 key BESS revenue streams in UK market

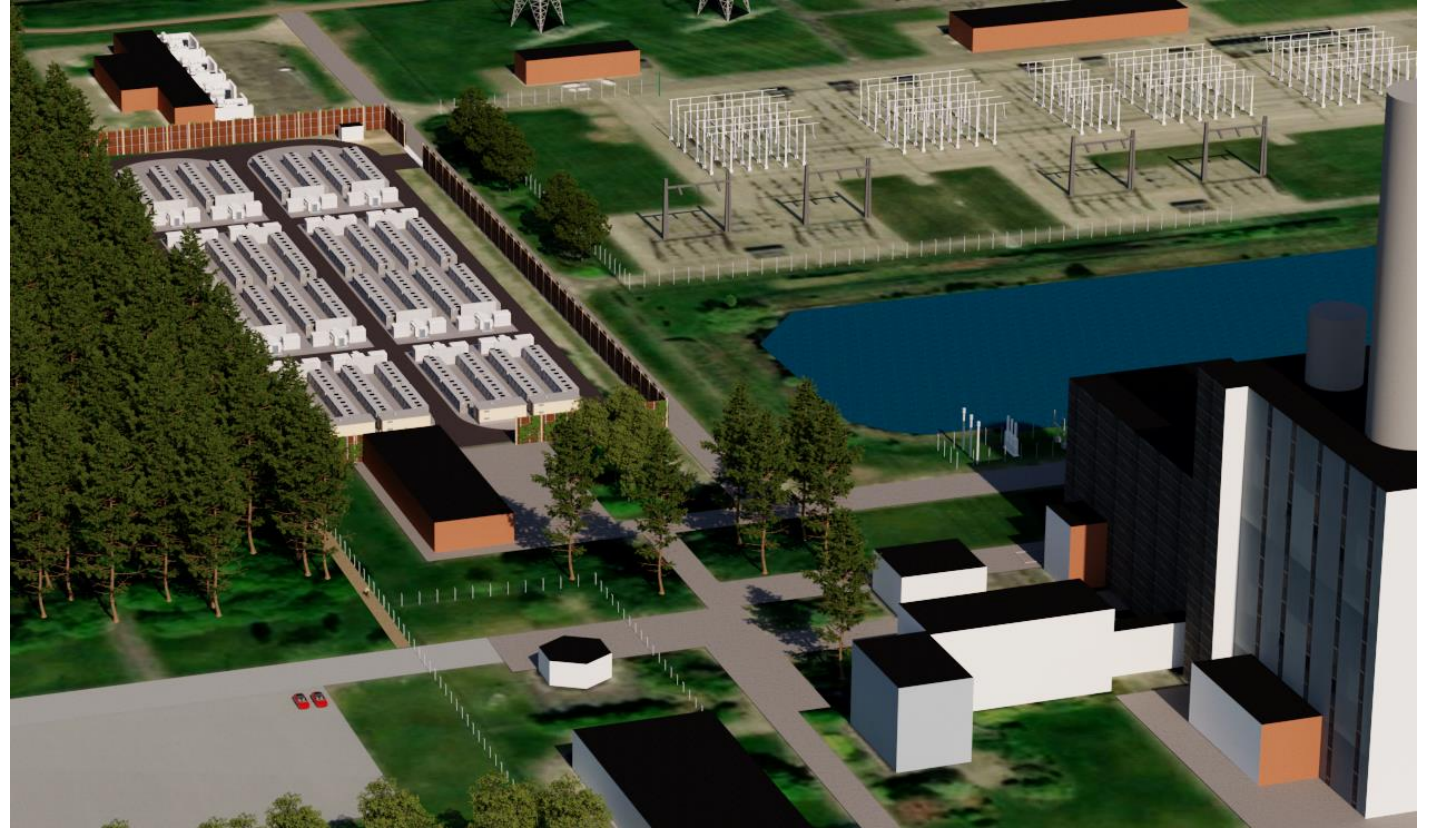
- ✓ Energy arbitrage value on the **day-ahead market**
- ✓ Energy arbitrage value on the **intra-day market**
- ✓ Revenues from the **balancing mechanism**
- ✓ **Capacity Market** contracts (with 1 year and 15 years secured contracts)
- ✓ **Ancillary Services**
- ✓ **Locational benefits**



The various types of revenue, in addition to CRM, have enabled ENGIE to invest in the UK

NL – Bergum (100MW/400MWh) « project under development »

On existing powerplant site
Close to HV grid connection
Permitting ongoing



Need for up to 9GW BESS announced by TSO, but current grid tariff exposure is biggest hurdle for viable Business Cases for Large scale BESS.



APPENDIX



Illustration of schemes in Europe and outside Europe



Hungary

- ✓ **Investment aid:** limited to 350 k€/MW
- ✓ **Operational aid:** 10-year two-way CfDs (calculated monthly)

Requirements: projects must be completed within 36 months after signing the contract

Target of 800 MW / 1600 MWh



USA

Investment Tax Credit (ITC): 30% ITC over a period of 10 years plus 3 additional 10% incentives credit for:

- ✓ Low-income community
- ✓ Brownfield sites or retired coal mines
- ✓ Domestic content (40 to 55% of total cost in the US)



Greece

- ✓ **Investment aid:** limited to 40-50% of Capex investment
- ✓ **Operational aid:** 10-year two-way CfDs (calculated annually)

Requirements: max 100 MW with 2h duration at least, application due by 31 Dec. 2023 (projects must be completed by end of 2025)

Target of 1 GW (411MW awarded in July)



Australia

Federal Capacity Investment Scheme (CIS)

- ✓ Fixed payment in exchange of a percentage of merchant revenues for revenues **above a certain threshold**
- ✓ Eligibility: projects with a minimum of 4 hours duration storage

Victoria State Electricity Commission (SEC)

- ✓ Profit sharing: fixed payment in exchange of a percentage of merchant revenues

State Aid rules adapted to support flexibility development

Government support generates advantage for a company over its competitors, and are therefore generally prohibited by the EU, unless it is justified by reasons of general economic development. The European Commission ensure that State aid complies with EU rules .

In the context of the Ukraine war, a temporary crisis and Transition framework has been signed and has been prolonged on March 9, 2023.

This framework aims to:

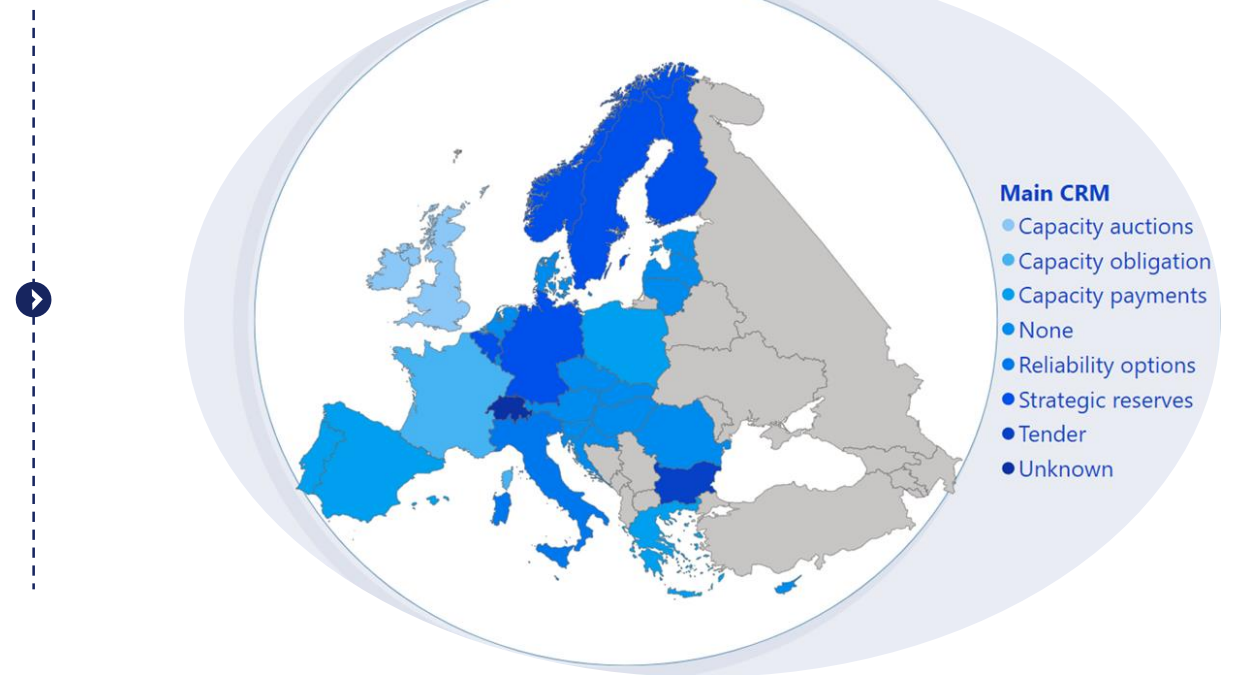
- ✓ **Enable investment support for the manufacturing of strategic equipment:** Battery manufacturing support implemented in 5 member states as part of the NZIA framework (Italy, Slovenia, Hungary...)
- ✓ **Ease the design and implementation of schemes to support energy storage:** approval of Spain 350 million scheme to develop energy storage in June
- ✓ **Speed up developments:** General Block Exemption Rules include certain energy storage applications, exempting Member States from prior approval

Over a year, storage has become a topic addressed directly or indirectly in a number of regulations in preparation or adopted, as a reaction to energy crisis and IRA

Capacity Remuneration Mechanisms in Europe



- ✓ **Until 2019, CRM were considered as a last resort mechanism**, the European Commission considering that a sound liberalized market would foster investment.
- ✓ The position has changed after the crisis and the assessment of the need for additional flexibility in the EU: acknowledgment that flexibility needs are not covered.
- ✓ This translates into a much more favorable position as regards capacity markets. **Commission will present a report on capacity mechanisms as a structural element of the electricity market design**



Capacity Remuneration Mechanisms in France



- ✓ An **obligation for large consumers or electricity suppliers to contract an amount of capacity** linked to their self-assessed future consumption or supply, plus a reserve margin.
- ✓ This is usually done by means of certificates that are issued by capacity providers.
- ✓ Suppliers or consumers are penalized financially if they have not contracted the required level of capacity

