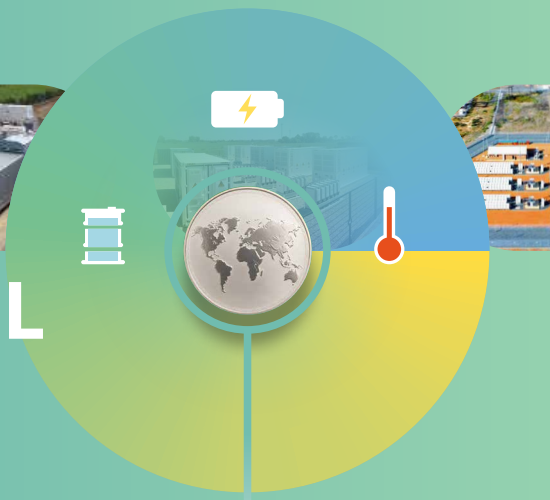

UNLOCKING GLOBAL INVESTMENT IN ENERGY STORAGE

KEY INSIGHTS FROM THE CLEAN ENERGY MINISTERIAL SUPERCHARGING ENERGY STORAGE INITIATIVE

The Clean Energy Ministerial (CEM) is an international clean energy leadership platform that brings together a large community of global clean energy transition experts around the world. At COP28 (Dubai, 2023) the Supercharging Battery Storage (SBS) initiative was launched, with the aim to advance battery storage on a global scale and meet the 2050 net-zero goals. The workstream expanded its scope in 2026 and rebranded as the Supercharging Energy Storage (SES) initiative, designed to unlock the full potential of energy storage across a wide range of applications.

At COP29 in Azerbaijan, global organizations have endorsed the Global Energy Storage and Grids Pledge, committing to deploy 1500 GW of energy storage in the power sector by 2030. This pledge aims for a six-fold increase in installed capacity in 2030 compared to 2023, requiring significant action. Reaching this target will require unprecedented levels of investment across battery storage, long-duration storage, thermal storage and molecular (e.g. hydrogen) storage technologies. While technology costs continue to decline and deployment is accelerating worldwide, financing remains one of the most significant barriers to scaling energy storage.

Energy storage plays a critical role in supporting renewable integration, system reliability, resilience and energy security. However, many projects face difficulties securing financing due to uncertain revenues, evolving market frameworks and limited operational track records. Insufficient investment in grids and energy storage is increasingly constraining renewable energy deployment and new electricity demand connections, including AI data centres. Across regions and technologies, successful projects consistently demonstrate that predictable revenues, supportive regulation and effective risk allocation are essential for unlocking investment.

The purpose of this whitepaper is to explore how energy storage as one of the options for providing resilience and flexibility can become a financially viable asset class at the scale required for the global energy transition. The research is based on semi-structured interviews with public institutions, development finance institutions, banks, industry associations, project developers, and technology providers.

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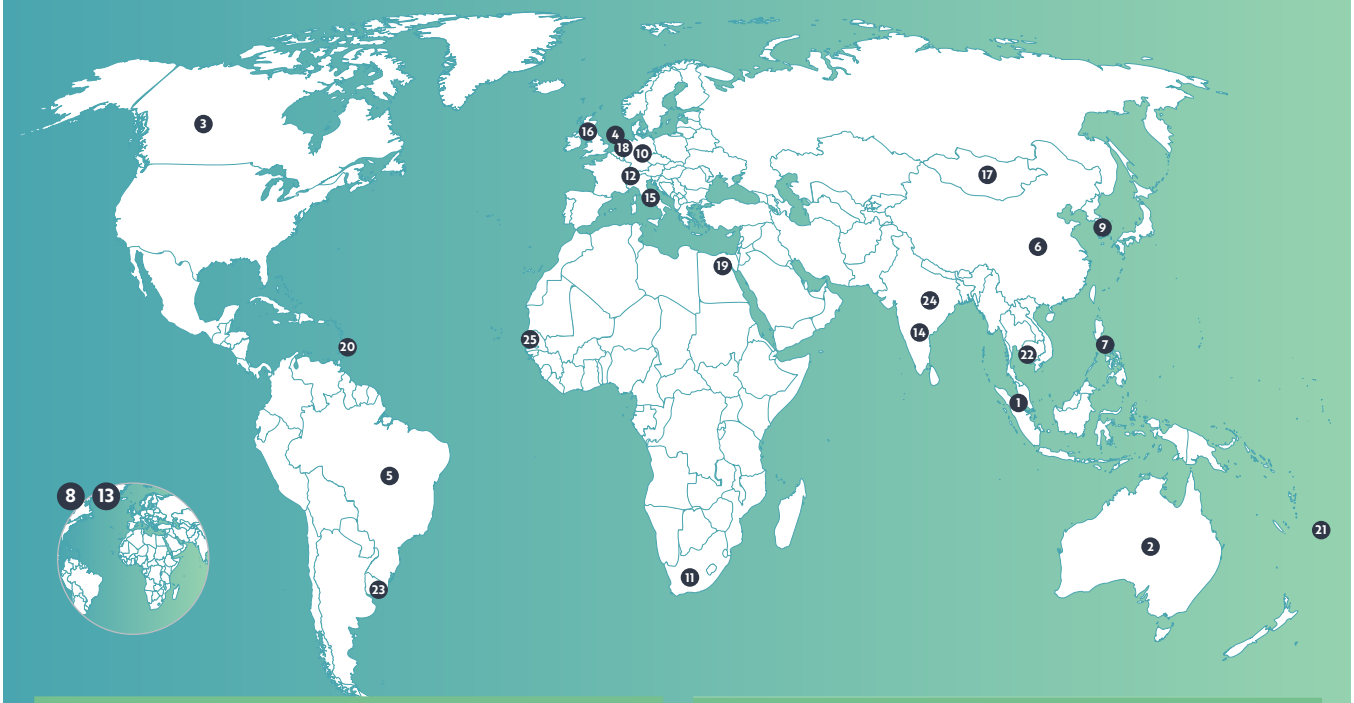
THE ROAD TO FINANCIALLY VIABLE ENERGY STORAGE

Energy storage technologies do not follow a single financing pathway. As technologies mature from demonstration to commercial deployment, the dominant risks shift from technology performance and scale-up risks towards market and revenue risks. Consequently, financing structures also evolve, moving from grants, concessional funding and public support mechanisms towards project finance and private capital. While utility-scale battery storage increasingly attracts commercial investment in mature markets, emerging storage technologies often still rely on blended finance, public support and first-mover investors.

At the same time, regional conditions strongly influence the role and financial viability of storage. High-renewable systems may require storage primarily for renewable integration and congestion management, while island states and emerging economies often prioritize reliability, resilience and energy security. These differences influence the most suitable technologies, revenue mechanisms and financing approaches, highlighting the need for region-specific storage strategies.

Long-term revenue certainty remains one of the strongest drivers of investment. Mechanisms such as

Geographical overview of the included exhibits in this report



#	Country	Title
1	Asia	Asia Clean Energy Forum
2	Australia	Cheaper Home Batteries Program
3	Canada	Energy Innovation Program
4	Netherlands	Bommelerbuffer
5	Brazil	Brazil First BESS Reserve Capacity Auction
6	China	Compressed air energy storage
7	Philippines	Energy battery storage market mechanism
8	Developing countries	Energy Storage Partnership Academy
9	Republic of Korea	Energy Storage System Industry Development Strategy
10	Germany	Energynest project Germany
11	South Africa	ESKOM renewables support program
12	Switzerland	Flexbase
13	Worldwide	Global initiative for energy storage
14	India	India Green Finance Facility

#	Country	Title
15	Italy	Italy MACSE auction
16	United Kindom	LDES cap-and-floor mechanism
17	Mongolia	Mongolia grid-connected BESS
18	Netherlands	Mufasa
19	Egypt	Obelisk
20	Barbados	Renewstable PV + H2 + storage
21	Pacific island - Tonga	Tonga Renewable Energy Project (TREP)
22	Cambodia	Upper Tatay Pumped Storage Hydropower project
23	Uruguay	UTE BESS lease tender
24	India	Viability gap funding scheme
25	Senegal	Walo Solar Plus Storage

Energy storage deployment can be accelerated through clear regulation, long-term market signals and targeted public support.

power purchase agreements, tolling agreements, capacity contracts, and competitive procurement frameworks help translate system value into predictable cash flows that can support financing. Stable regulation and transparent market access further strengthen investor confidence and reduce the cost of capital.

Storage deployment can be accelerated through clear regulation, long-term market signals and targeted public support. Public finance should focus on reducing early-stage risks and crowding in private investment. At the same time, long-term procurement frameworks and revenue mechanisms are required to provide the certainty investors seek.

Staged financing pathway for energy storage deployment

1. Prepare

Develop a storage strategy based on quantified system needs
Identify flexibility gaps, priority use cases, required storage durations and geographic needs through integrated energy system planning

Establish a clear regulatory framework for storage
Recognize storage as a distinct asset class, remove regulatory barriers such as double charging, and ensure access to relevant electricity markets and grid service

Build institutional and market capacity
Strengthen expertise within ministries, regulators, utilities, financial institutions and developers to assess, procure, finance and operate storage projects effectively

2. Deploy

Use public and concessional finance strategically
Deploy grants, guarantees, concessional loans and blended finance to address specific first-mover risks and crowd in private capital.

Create predictable revenue streams
Introduce procurement mechanisms and long-term contracts such as capacity agreements, tolling contracts, CfDs, storage-as-a-service arrangements or availability payments

Generate operational track record and standardization
Ensure performance validation, technical due diligence and standardized contractual structures to create confidence among lenders and investors

3. Accelerate

Provide long-term investment certainty
Maintain stable and predictable regulation, market design and procurement frameworks that support financing over the full asset lifetime

Mobilize large-scale private capital
Enable project finance, portfolio finance, infrastructure funds and refinancing structures that reduce financing costs and support market scaling

Expand beyond early applications and technologies
Develop revenue mechanisms and market access for a broader portfolio of storage technologies, including long-duration storage solutions and sector-coupled applications

Finally, energy storage **solutions of various types (heat, molecules and electricity) and durations (e.g. 4-20-100+ hrs)** should be integrated into broader energy system planning as a key enabler of renewable integration and energy security.

Achieving the Global Energy Storage and Grids Pledge will require more than continued technology improvements. The next phase of growth depends on creating financially viable projects supported by clear regulation, predictable revenues and effective financing structures.

By combining enabling policies, capacity building, and strategic public support that leverages private investment, energy storage can become a mainstream infrastructure asset, supporting the global clean energy transition and contributing to secure and affordable energy systems worldwide

Risk scale indication for early innovation, pre-commercial and commercial energy storage projects and portfolios. The scoring of risks and applicable financing sources and instruments is indicative and for illustrative purposes. Note that combinations of financing sources and instruments are often project and context specific.

	Early innovation	Pre-commercial	Commercial
	Low risk → High risk	*Low risk → High risk*	*Low risk → High risk*
Technology risks	● ● ●	● ● ○	● ○ ○
Market risks	● ● ●	● ● ○	● ○ ○
Regulatory risks	● ● ●	● ● ○	● ● ○
Main risks	Technology performance	Business case & market readiness	Long-term revenue certainty
Financing sources	Seed investors, governments, state-owned enterprises, philanthropic organizations, R&D budgets	Governments, climate funds, state-owned enterprises, multi-lateral development banks, first-mover banks, seed investors	Commercial banks, state-owned enterprises, multi-lateral development banks, private equity
Financing instruments:	*Low share → High share*	*Low share → High share*	*Low share → High share*
Public grants & loans	● ● ●	● ● ○	● ○ ○
Public guarantees	○ ○ ○	● ○ ○	● ● ○
Public equity	● ● ○	● ● ○	● ○ ○
Concessional grants & loans	● ○ ○	● ● ○	● ● ○
Private equity financing	● ○ ○	● ● ○	● ● ●
Private debt financing	○ ○ ○	● ○ ○	● ● ○