energy storage europe

The Missing Link: Long-Duration Energy Storage and the Future of Europe's Energy Security

Webinar

2 June 2026

10:00 – 11:00 CEST

FCA Future Cleantech Architects

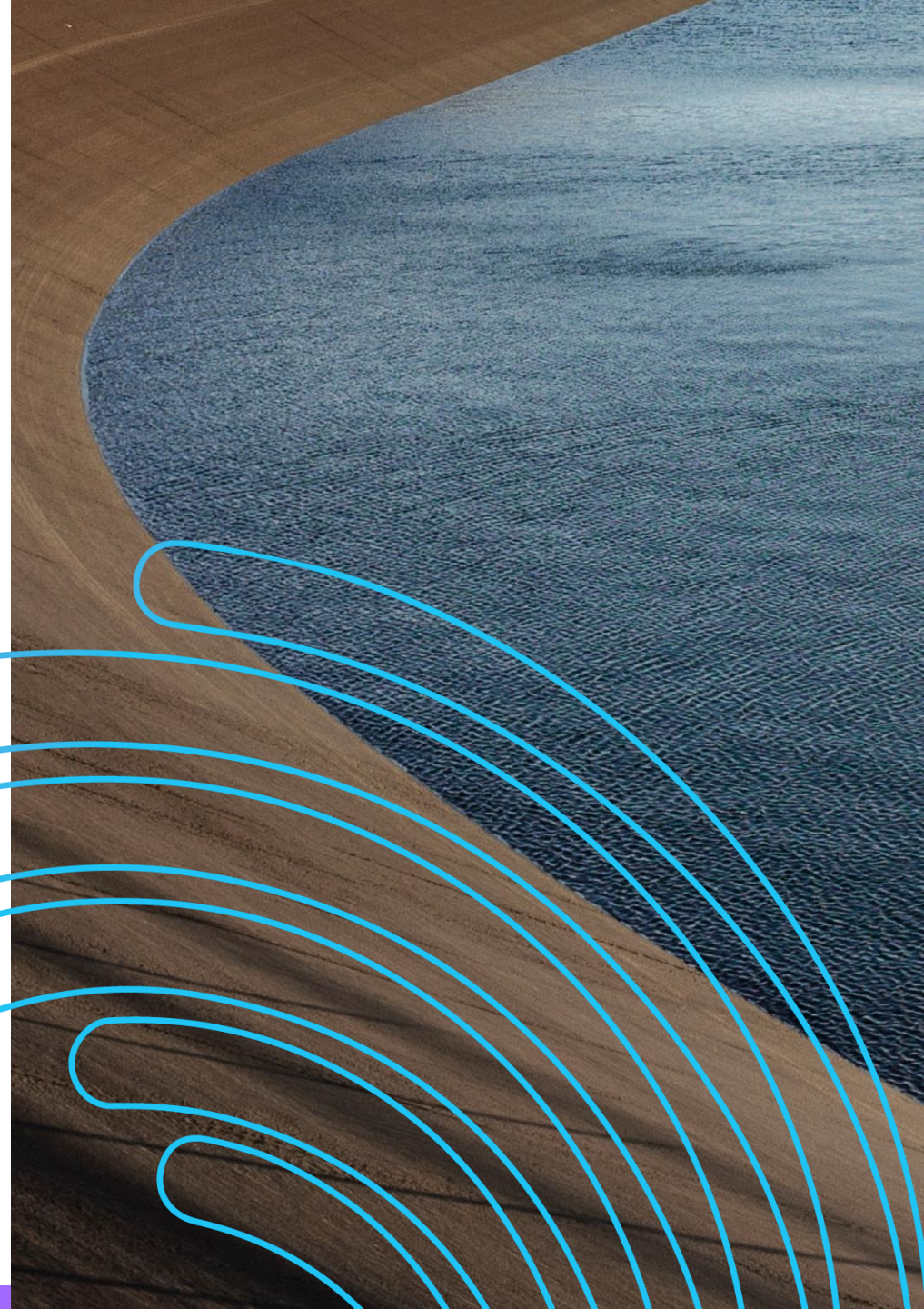
Cleantech for Europe

LDES LONG DURATION ENERGY STORAGE COUNCIL

WBCSD World Business Council for Sustainable Development

EnergyTag

FLOW BATTERIES EUROPE
A united voice for flow batteries



Carolina Cruz

Representative of the Long Duration Energy Storage Task Force

Energy Storage Europe

Agenda

Timeline	Presentation
10:00 – 10:30	**Opening and Welcome** Introduction by Energy Storage Europe
	Cleantech for Europe
	World Business Council for Sustainable Development
	Energy Tag
	Future Cleantech Architects
	Flow Batteries Europe
	LDES Council
10:30 – 10:50	**Roundtable Discussion**
10:50 – 11:00	**Q&A from the Audience**

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Moderator:
Carolina Cruz
Representative of the Long Duration Energy Storage Task Force

EnergyTag

Killian Daly
Executive Director

WBCSD World Business Council for Sustainable Development

Celine Le Goazigo
Energy Lead

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Ruben Davis
Senior Policy Officer

LDES LONG DURATION ENERGY STORAGE COUNCIL

Oghosa Erhahon
Policy and Markets Manager

FCA Future Cleantech Architects

Antoine Koen
Lead Analyst for Energy Systems

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Aurelien Ballagny
Head of Policy

A coalition call for a sequenced EU framework to deploy long-duration energy storage

1. Embed LDES in system planning and adequacy assessments
2. Reform ancillary & stability markets, grid fees and tax frameworks in line with EMD Reform
3. Align capacity mechanisms with ERAA outcomes and the Clean Industry State Aid Framework
4. Deploy targeted investment instruments and enable long-term contracting

Scan to read the full letter!

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Ruben Davis

Senior Policy Officer

Cleantech for Europe

Cleantech *for* Europe

Celine le Goazigo

Energy Lead

World Business Council for Sustainable Development

240+

Member companies

24%

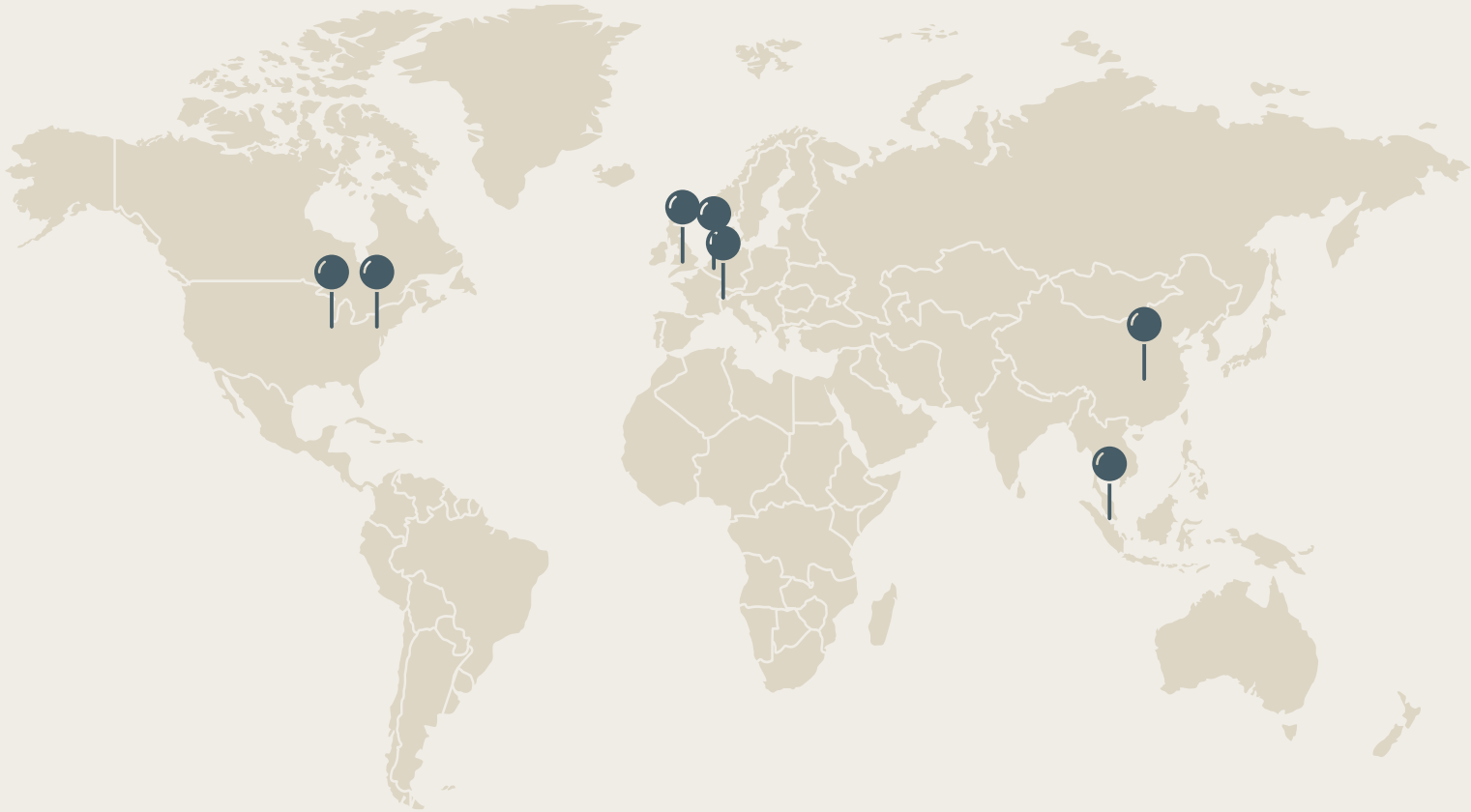
Of global corporate revenues

19 million

employees

60+

Global network partners



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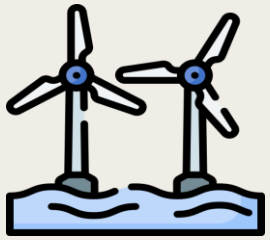
Making sustainability performance a key driver for competitiveness

Insights

LDES benefits for businesses and the energy system



Enable higher shares of renewables

LDES can store excess renewable reducing curtailment (wasting renewables) and makes 24/7 renewable grids possible.

Improve grid reliability and resilience

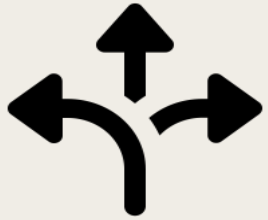
LDES can bridge long outages (from hours to days) caused by extreme weather, cyberattacks, or unexpected demand spikes. It provides a backup to ensure critical services keep running even when the main supply is interrupted.

Lower system costs over time

LDES smooths out peaks and valleys in supply and demand, reducing the need to build expensive, redundant infrastructure. Over time, it can lower the overall cost of electricity for consumers.

Support deep decarbonization

A clean, resilient grid will require LDES to manage the massive, variable loads from various sectors creating new energy demands without relying on fossil fuel backup.



Unlock new business models and flexibility markets

LDES can participate in multiple markets (energy shifting, frequency regulation, capacity services, congestion management), creating new revenue streams and providing flexibility tools for grid operators.

Enhance energy security

LDES can reduce dependence on critical minerals and mitigate supply chain risks by diversifying storage options beyond lithium-ion batteries. Technologies like thermal storage, compressed air, pumped hydro, and flow batteries are less vulnerable to material scarcity.

Insights

Challenges for deployment

Understanding the **challenges and roadblocks** associated with the deployment of LDES is central to define effective actions and next steps for businesses, investors and policymakers.

Challenges

- Definition
- Technical constraints
- Siting
- Economic viability
- Grid integration
- Policy and regulation

Challenges	*Description*
Lack of definition	LDES do not have a universally agreed, cohesive definition in the energy industry and governments. Some sources define it as over 4 hours, others as over 8 hours. This paper suggest using 4+ hours.
Low energy density	LDES typically have lower energy density compared to traditional lithium-ion batteries. This leads to larger physical footprints with environmental and social impacts.
Siting constraints	Following the low-energy density characteristic, siting LDES requires dealing with land availability, geology and proximity to demand or generation.
Scaling capacity issues	Rapid scaling of supply chains for new technologies presents logistical and manufacturing challenges, requiring sourcing and producing large volumes of specialized components quickly.
Performance and reliability	Material degradation, the limited availability or sustainability of key raw materials, and component wear over long durations make it critical to develop systems that can maintain performance and reliability over 20 to 40 years with minimal maintenance.
Safety	Any failure or safety issue can undermine trust, disrupt operations and pose risks to both users and the grid.
Round-trip efficiency	Technologies such as thermal and mechanical storage have lower round-trip efficiencies (typically 50–70%) compared to lithium-ion batteries (~85–90%). Therefore, they must offset these losses through lower capital costs or by delivering additional system value, such as enhanced resilience or capacity support.
Cost-effectiveness	Achieving a balance between affordability and performance can be challenging for long-duration systems. High-performance technologies often require expensive materials and complex engineering, while cost constraints demand efficient, scalable solutions without compromising functionality.

Insights

Pathways to decarbonization

Several pathways exist to contribute to the decarbonization journey, depending on :

- how the storage is **connected to the grid**
- which **service the storage** provides to the grid
- if the storage is **co-located** with renewables
- how **large** is the project

The underlying objectives of these projects can be :

- *24/7 clean energy*
- *Grid efficiency*
- *Revenue generation*
- *Autonomy and access to decentralized energy*

*Note : **Customer Energy Management (CEM) and Co-location** projects (or 'hybrid') are both collocated pathways, distinguished by their scale, level of decentralization, and ownership structure.*

Stand-alone grid storage

→ The storage system functions as an independent asset connected directly to the grid. Such storage can generate revenue by participating in wholesale electricity markets, capacity markets and ancillary service markets.

Storage-as-transmission asset

→ Grid operators can integrate LDES systems into the power infrastructure to improve grid efficiency, reduce congestion and lower the costs of grid expansion. Unlike stand-alone storage, the goal of these projects is not revenue generation. This category includes transmission system operator (TSO) and state-owned storage projects.

Customer energy management

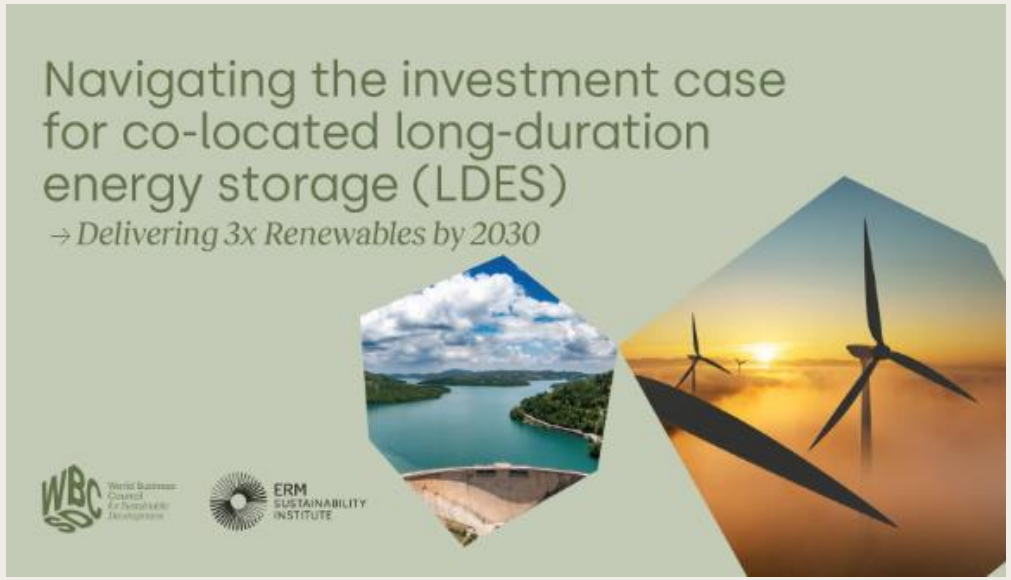
→ Companies can also use LDES on a residential scale to ensure a reliable electricity supply for multiple households or entire remote communities. By combining on-site renewable energy production with LDES solutions, they can offer greater autonomy, cost optimization for end-users, and improved resilience through a continuous power supply.

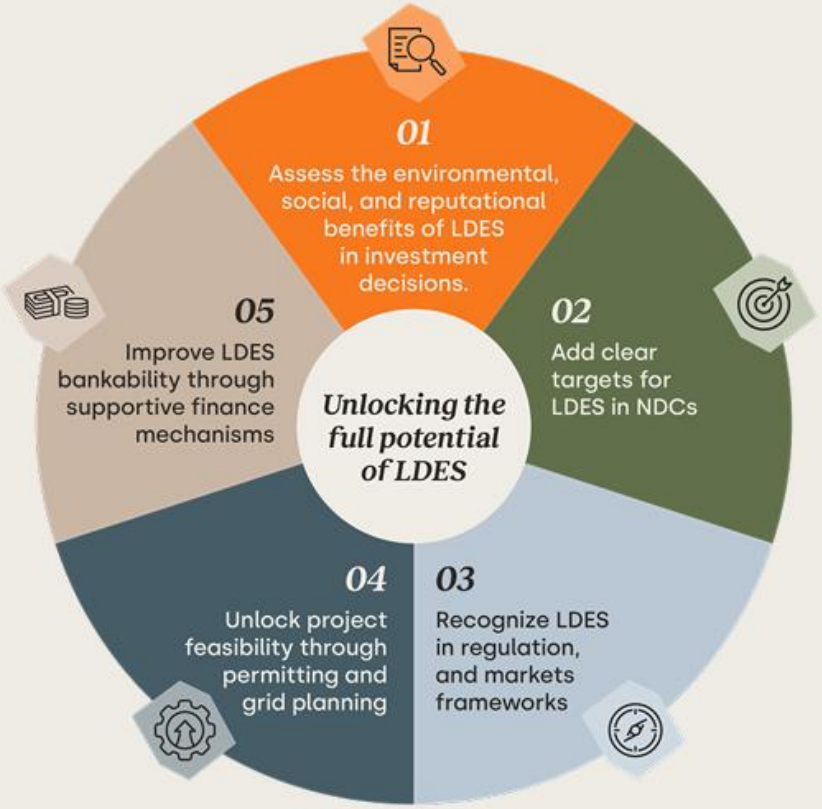
Co-location with renewables

→ This involves placing a storage facility alongside one or more renewable energy sources, typically solar photovoltaic (PV) or wind projects. Another name for this setup is a "hybrid" plant. In this pathway, LDES and renewable energy systems share a single grid connection and are treated as a unified hybrid generation system. The LDES solution must comply with the requirements set by the renewable energy generator.

WBCSD publication

'Navigating the investment case for long-duration energy storage (LDES)'





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Killian Dally

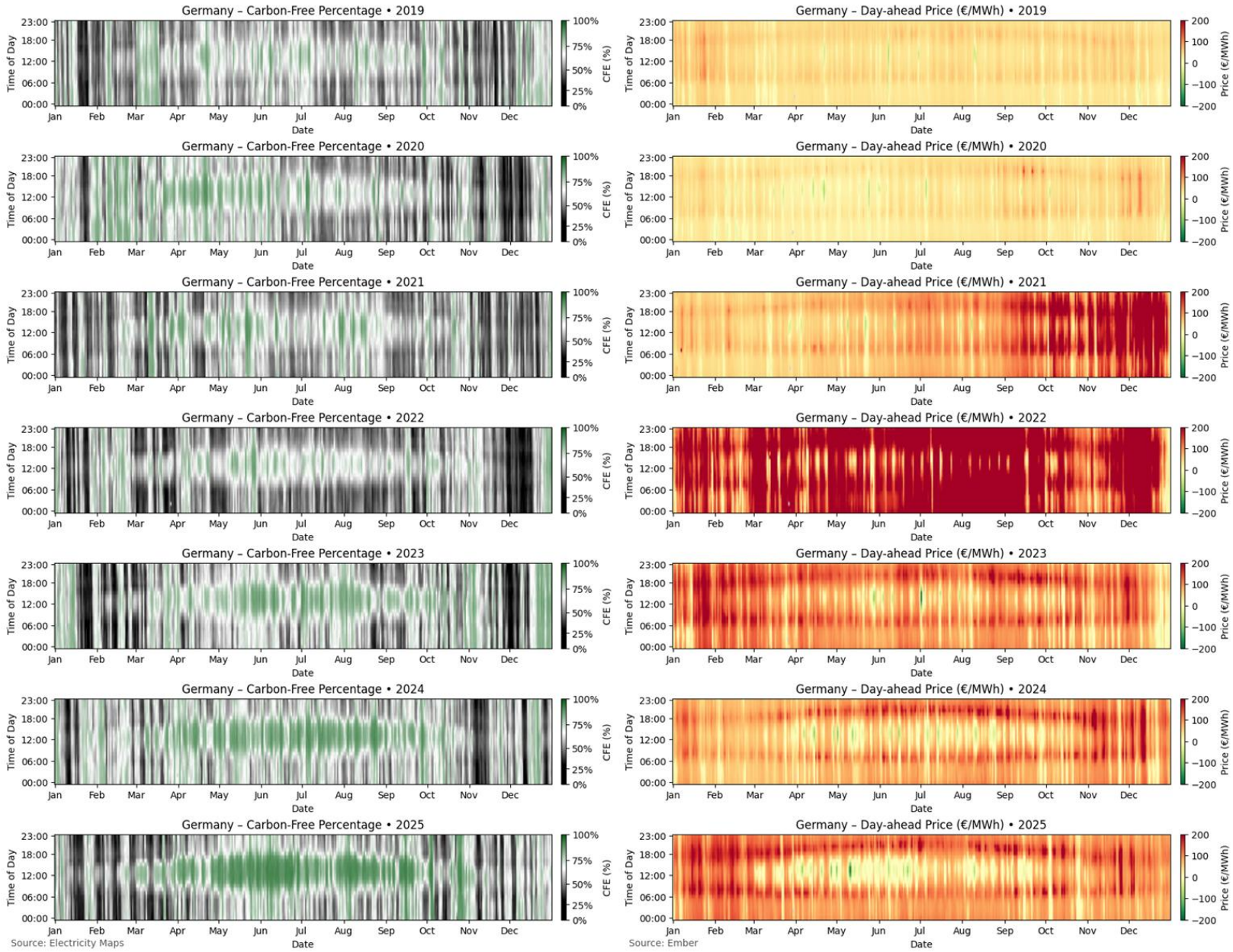
Executive Director

EnergyTag

We Must Value Clean Power *When* Needed Most

EnergyTag

Germany



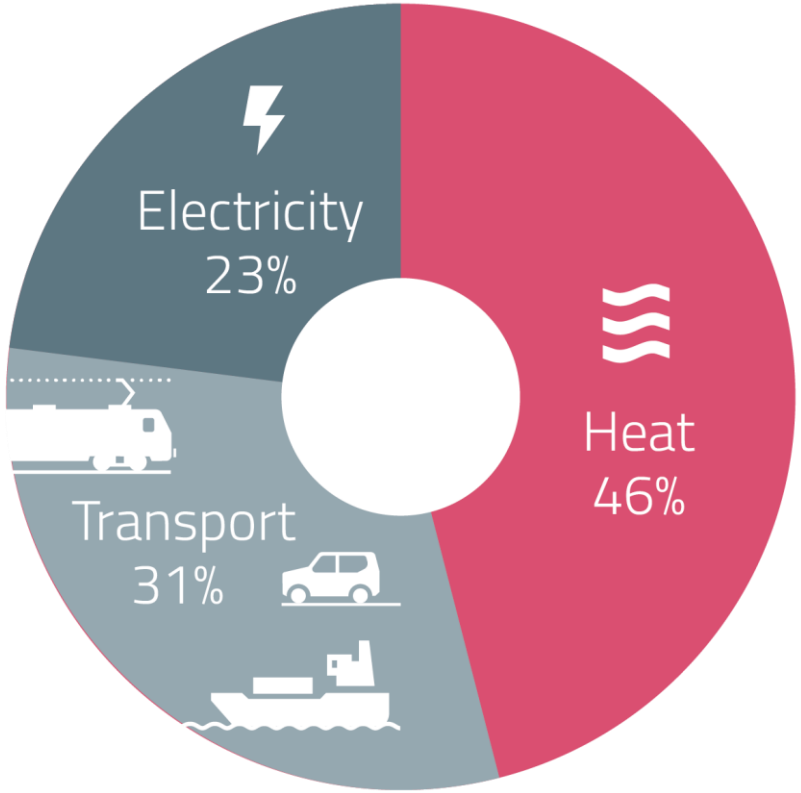
Antoine Koen

Lead Analyst for Energy Systems

Future Cleantech Architects

FCA Future Cleantech Architects

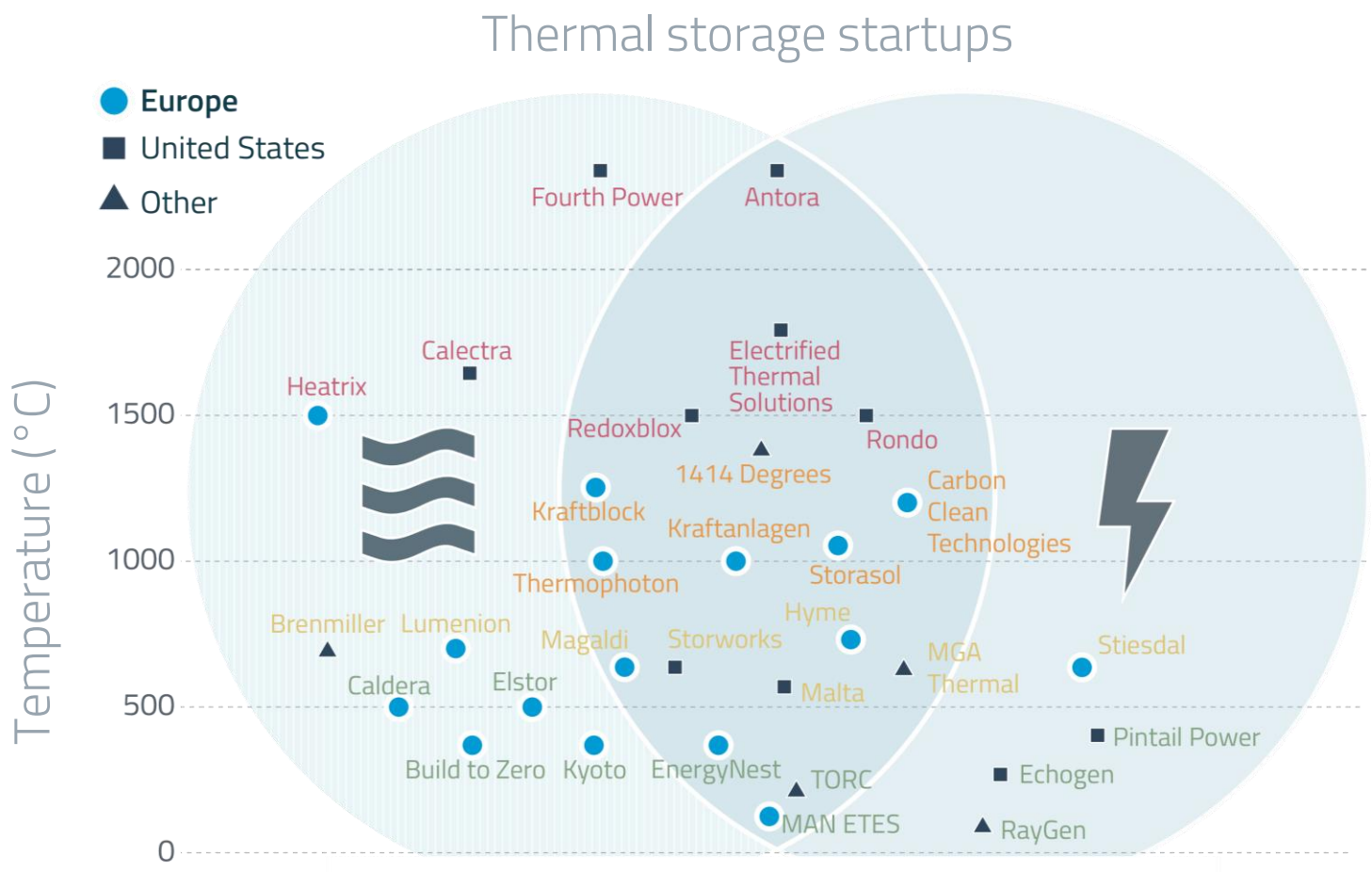
LDES beyond electricity grids:
Thermal storage for industrial heat



EU final energy use

Source: Eurostat, 2023

Current inflection point for widespread commercial deployment… depending on the grid!



100 hours, 5 GWh_{th}

Source: Future Cleantech Architects, company websites

Aurelien Ballagny

Head of Policy

Flow Batteries Europe

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The LDES Imperative

01

Renewables & Electrification

The integration of renewables & electrification requires more investment, including both short & long duration storage.

02

European Industries

Among the various LDES industries, many are well-rooted in Europe and benefit from a diversified supply chain.

03

Energy Independence

LDES is essential to achieve energy independence in Europe.

Already Delivering: the AI example

FlexBase Technology Centre, Laufenburg

Flow batteries for AI fast load peaks, grid stability and backup

The FlexBase project shows how flow batteries perform where safety, space and resilience matter. Its redox flow battery system helps manage the fast load peaks of an energy-intensive AI data centre while supporting grid stability designed to be stacked in the basement without creating a fire hazard.

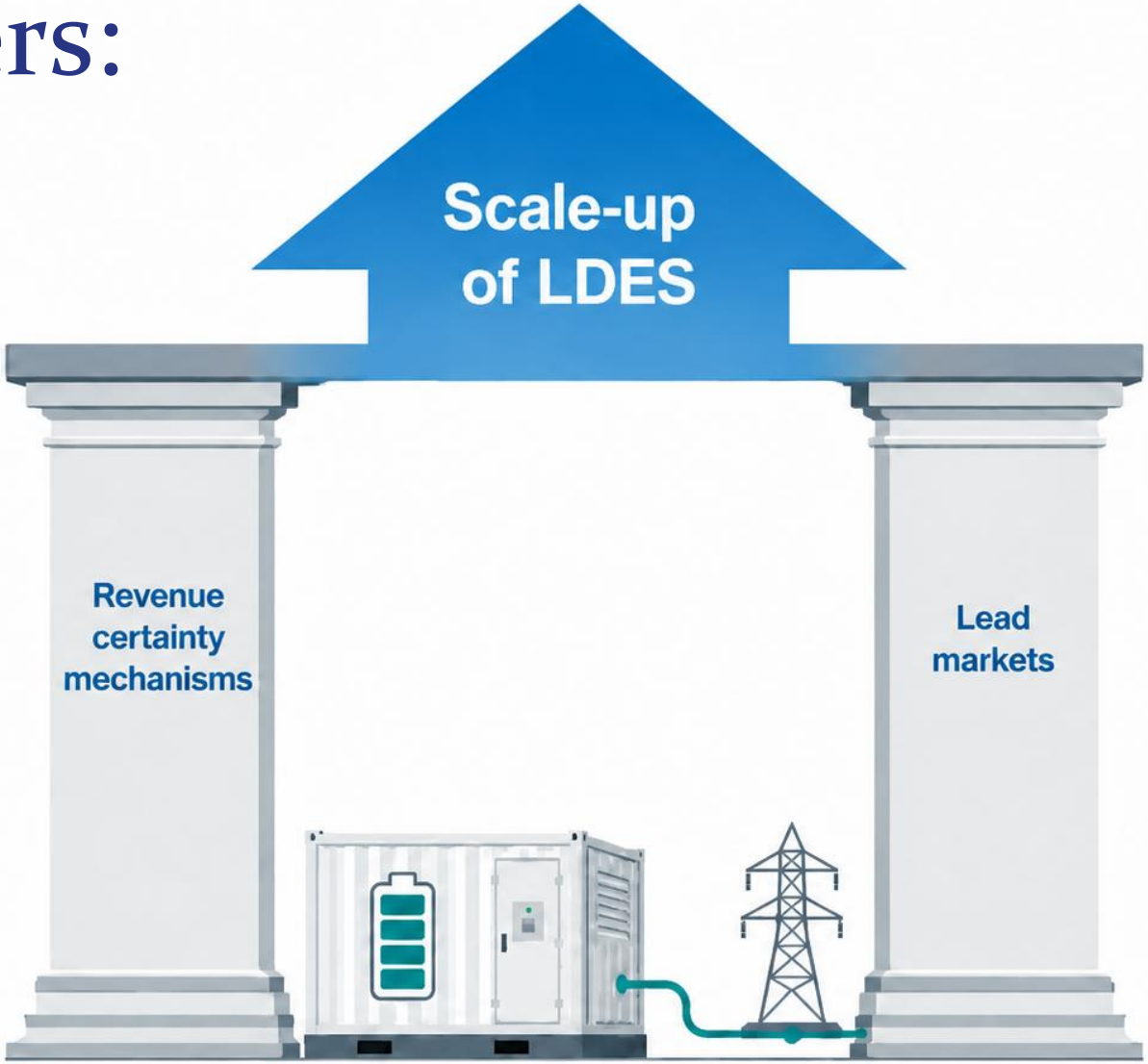
2.1+ GWh

Battery capacity
≈ 1 million households for 5h, or 210,000 for 24h

1.2 GW

Power output
comparable to the Leibstadt nuclear power plant

Two drivers:


Scale-up of LDES
Revenue certainty mechanisms
Lead markets

CONTACT US!

For more information, please contact a.ballagny@flowbatterieseurope.eu and check out our platforms below:

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Oghosa Erhahon

Policy and Markets Manager

Long Duration Energy Storage Council

Beyond Europe – Global Snapshot

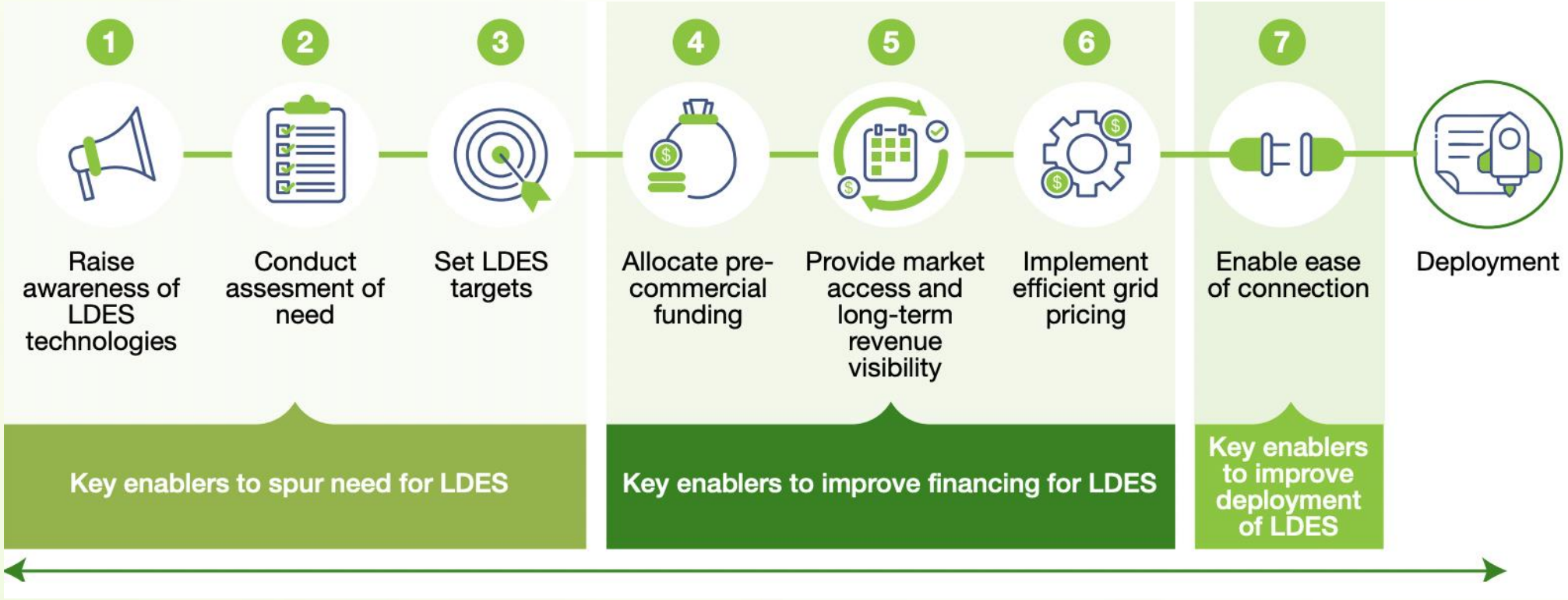
Region	Why this matters for LDES Procurement, Deployment & Development
USA – Virginia	2026 Bill for a landmark clean energy procurement mandate for 4.5GW LDES by 2045. Incl. **10-hour Rule and balanced duration** for grid LDES up to 24hours and ultra long 24hours. 20% of utility LDES to be built in coalfield region.
USA – New York	NY is modifying the state's Index Storage Credit (ISC) to support **12-hour+** energy storage. NYSERDA proposed specific methodologies for Reference Energy Arbitrage Price (REAP)
USA – California	CPUC authorised centralised procurement upcoming for **multi-day (24-100hrs**) LDES. Ongoing Non-lithium LDES funding for demonstration 'clean grid planning USD 247m.
Australia - Federal	**AU Capacity Investment Scheme –** revenue support mechanism underwrites new storage.
Australia – NSW	**Long-Term Energy Service Agreement (LTESA)** provides revenue certainty for generation firming, and LDES. The first national tender round launched in May 2024; Tender Round 5 is currently procuring **13.8 GWh** of dispatchable capacity.

Positioning Europe for a Stronger LDES Market: Key Considerations

- Design markets that fully value duration, ensuring LDES (8+ hours) is appropriately rewarded and supported with long-term revenue certainty.
- Set procurement mechanisms that encourage a portfolio of storage technologies and durations to address a wider range of system needs.
- Recognize thermal energy storage in industrial decarb. policy ensuring schemes capture full system benefits of power to heat LDES solutions.
- Avoid energy only market signals but align tariff structures to incentivize flexibility from LDES assets that reduce network congestion.
- Establish dedicated procurement tracks/streams for technologies needing long term delivery timelines.
- Support flexible industrial and data centre demand alongside LDES deployment to improve grid utilization, unlock flexibility value, and reduce overall system costs.

The 7 Enablers That Turn LDES Potential Into Deployment

The practical pathway from need and finance to real-world LDES deployment.



Source: https://ldescouncil.com/wp-content/uploads/2025/05/2024LDESAnnualReport-1.pdf

Submit your question in the Q&A box!

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energy storage europe conference

6-8 October 2026
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Day 1 - Policy
Day 2 - Market
Day 3 - Benelux

The 3-Day Conference is a key meeting point for **industry**, **researchers**, and **policymakers**, with discussions centred on Europe's energy storage priorities.

The conference is deliberately **content-focused,** with a strong **emphasis on the quality**, **depth**, and **relevance of discussions**. Visit the website here!

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