LCPDelta

Energy Storage Research Service

Brochure & Research Highlights

About LCP Delta

Our mission is to enable a better, faster energy transition for all

Founded in 2004 and based across the UK, France, Norway, the Netherlands and beyond, LCP Delta provide data-driven research, consultancy, technology products and training services to companies investing in and navigating the energy transition.

We are a diverse team from a variety of backgrounds including engineers, data analysts, environmentalists and more.

LCP Delta is a mission driven organisation - all of us want to make a difference to the energy transition and accelerate the path to a low carbon future.

The energy market is becoming increasingly complex. As consumers become more empowered and as energy systems around the world decarbonise, there is a need to understand both the generation and demand side to effectively navigate the rapid changes occurring.

We know it's a complicated topic, and we're here to help.

Andy Bradly, Partner, LCP Delta

LCP Delta was formed through the merger of Delta-EE and LCP Energy to bring together deep generation and consumer-side expertise, to provide our clients with a single partner to help them on their journey and provide them with a 360° view across the energy spectrum.

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200+
Global clients

6
offices

110+
Colleagues

LCP Delta provides the best advice, support and tools to enable the energy sector to drive the energy transition

Subscription research services

Our portfolio of subscription research services offer in-depth insights across the energy transition landscape. We have been undertaking primary research with organisations active in the energy transition since 2004 – we have an unparalleled international network of contacts we can draw on. Each service focuses on a particular aspect of the energy transition.

Market and strategic advisory consulting

We provide support across the full energy value chain with bespoke research, insight, forecasts and advice tailored to them. Our consultancy offerings draws on expertise and data from across LCP Delta, from strategic market entry analysis through to detailed half-hourly revenue forecasting.

We support our clients in four ways

Technology & data

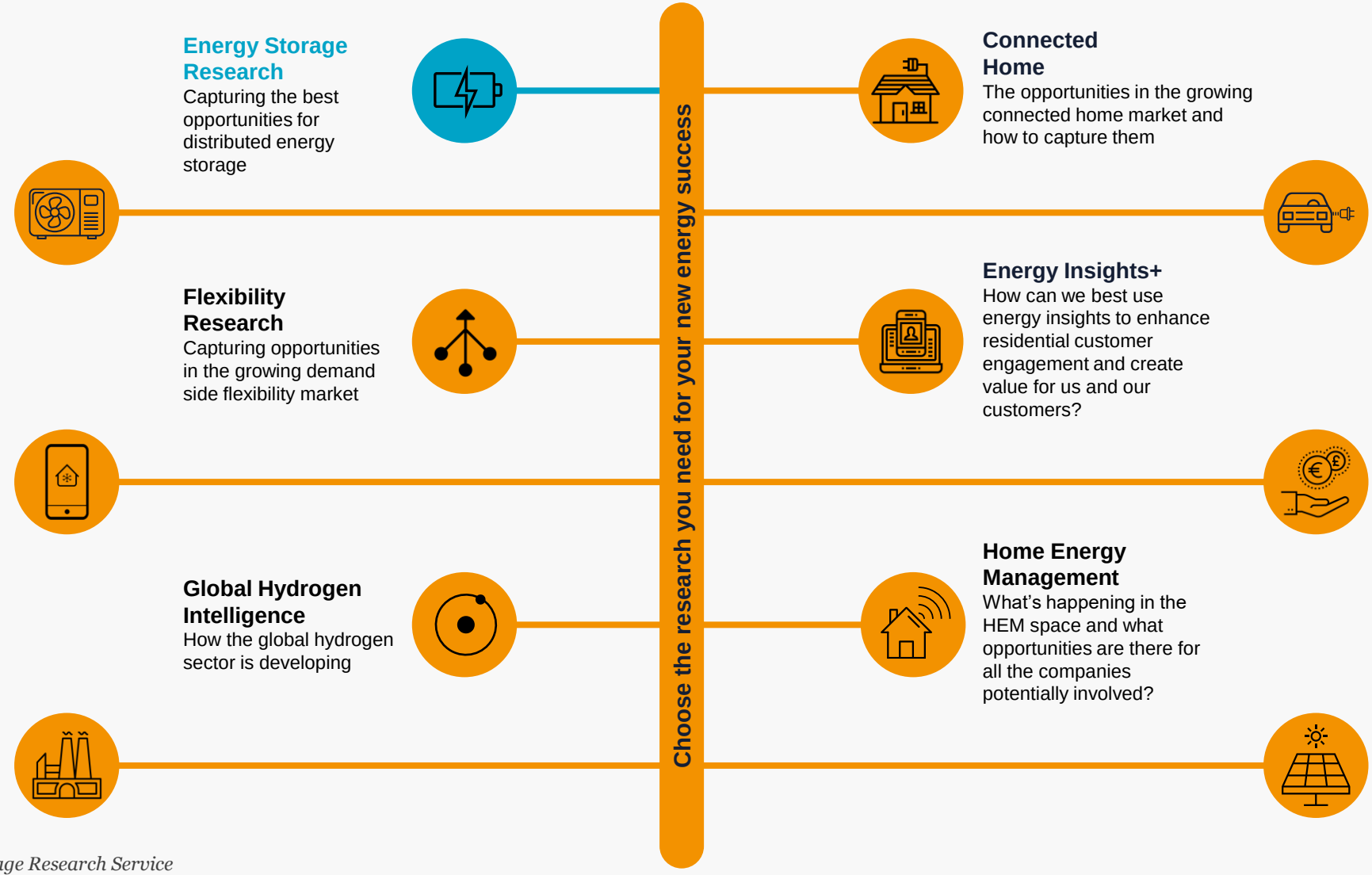
Data integration and analysis is at the heart of the energy transition. However, sourcing and navigating complex, wide-ranging datasets is challenging. At LCP Delta, we combine and curate proprietary and public datasets to provide you with a single source of truth across the energy spectrumand make this data interactive using our cutting-edge technology.

Training

Our training helps professionals quickly develop their new energy knowledge, accelerating their impact for organisations who want to capture opportunities. We provide meaningful, concise and easy to understand short courses.

Subscription Research Services

Use a combination of our subscription research services, bespoke consultancy projects and training services to gather the information you need to ensure your business's success in the energy transition.



Energy Storage Research
Capturing the best opportunities for distributed energy storage

Decarbonisation of Heat
Gain a holistic understanding of the future of the heating sector from a product and policy point-of-view

Flexibility Research
Capturing opportunities in the growing demand side flexibility market

Heating Business
How to evolve from selling individual products and commodities to become a successful home energy solution provider

Global Hydrogen Intelligence
How the global hydrogen sector is developing

Distributed Power
How to succeed in the global distributed power market

Connected Home
The opportunities in the growing connected home market and how to capture them

EV Charging
How to best develop position and activities to succeed in the rapidly growing eMobility market

Energy Insights+
How can we best use energy insights to enhance residential customer engagement and create value for us and our customers?

New Energy Business Model
Understand, identify and implement the most promising commercial opportunities from the increasing disruption in the energy sector

Home Energy Management
What's happening in the HEM space and what opportunities are there for all the companies potentially involved?

Solar PV
Understanding the growth of solar PV across Europe

Using energy-related data to help companies with their customer engagement, energy efficiency and value creation initiatives.

Energy Storage

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Market landscaping and strategy

What does the energy storage value chain look like and future development?

Which countries are most attractive markets, and which are emerging? What is driving this?

Which companies are leading the storage market for the different storage technologies?

Technology landscape

When will other technologies beyond Li-ion get traction in the market? In what applications would that be and why?

What types of energy storage are being installed in Europe now and how will it evolve?

Who are the companies offering alternative forms of energy storage?

Business case

How are companies making money in the European energy storage market and how is it this likely to evolve?

What are the business models for energy storage in European markets?

What can you learn from the successes of companies in leading European storage markets?

Clients we support

- ***Govt, Regulators & System Operators***
- ***Energy retailers***
- ***Product manufacturers***
- ***Solution providers***
- ***Investors***

Headline Report: European Market Monitor on Energy Storage 7.0

EMMES 7.0 is the most comprehensive dataset for battery projects in Europe and includes forecasts to 2030.

Scope

- The report covers 12 countries in detail, Belgium, Finland, France, Germany, GB, Norway, Netherlands, Ireland, Italy, Spain, Sweden and Switzerland. The accompanying database includes project information for 26 European countries.
- The focus of the report is electrochemical storage technologies (Lithium, non-Lithium and Flow batteries).
- The storage market is segmented into:
  - Behind-the-meter
  - Residential
  - Commercial & Industrial
  - Front-of-meter
  - Each segment includes both co-located and standalone projects.

STOREtrack database

- In addition to this report, we have also created a interactive database where users can select and manipulate the data. https://storetrack.lcpdelta.com/
- While the report is focused on electrical storage, the database holds project information for multiple other storage technologies (e.g. pumped hydro, CAES, gravity, large-scale thermal etc).
- Energy Storage Research Service subscribers gain access to the “Overview” and “Market trends” pages of the database as part of their subscription.

Understanding the market landscape and competitors

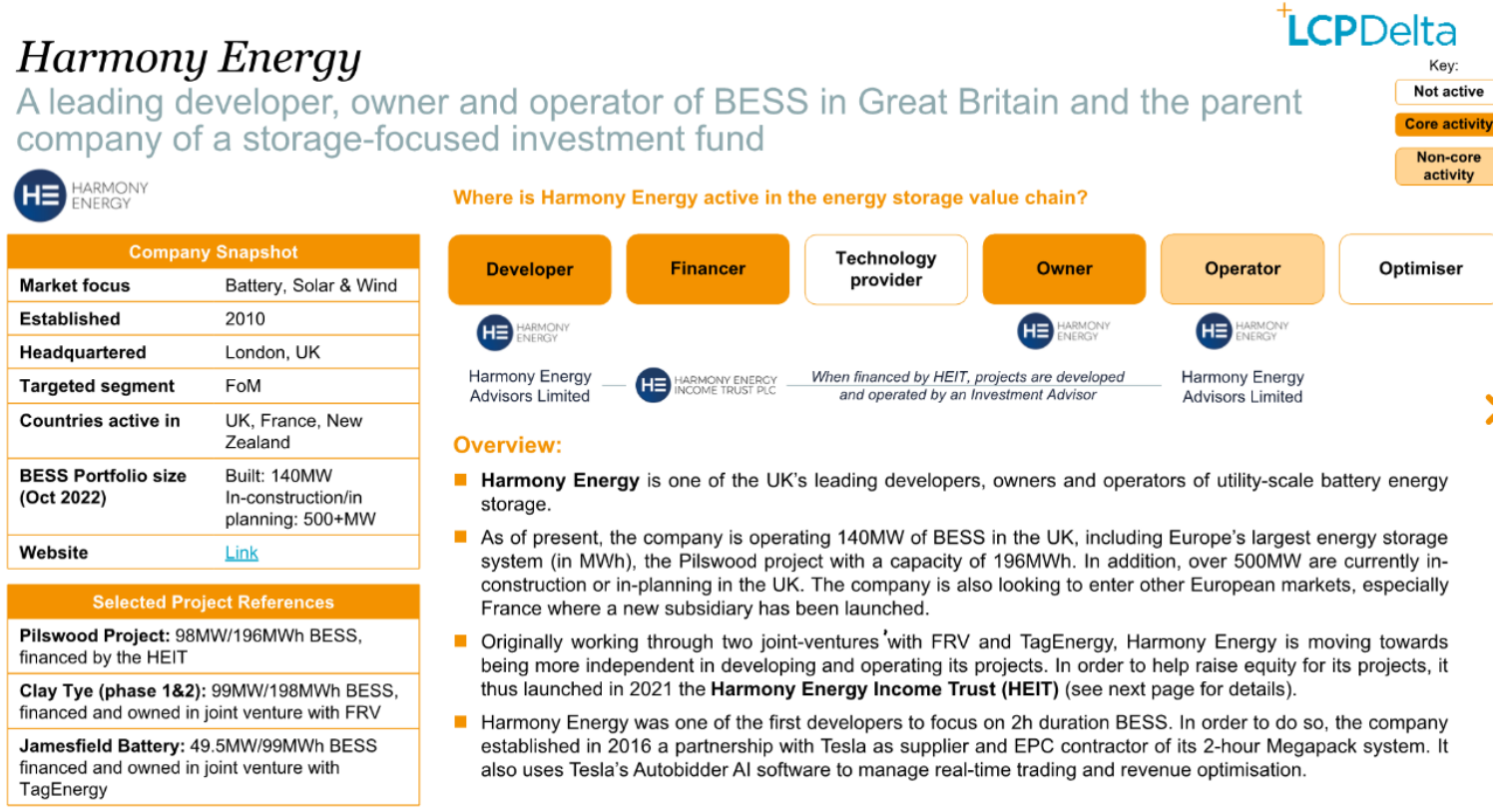
Company Profile Example

Detailed case studies looking at:

- Company overview
- USP
- Business Model
- Customer Proposition
- Value chain

Helps subscribers to:

- Learn from your competitors
- Compare and differentiate storage players
- Understand how to position yourself



Harmony Energy

A leading developer, owner and operator of BESS in Great Britain and the parent company of a storage-focused investment fund

HARMONY ENERGY

Company Snapshot	
Market focus	Battery, Solar & Wind
Established	2010
Headquartered	London, UK
Targeted segment	FoM
Countries active in	UK, France, New Zealand
BESS Portfolio size (Oct 2022)	Built: 140MW In-construction/in planning: 500+MW
Website	Link

Selected Project References
Pilswood Project: 98MW/196MWh BESS, financed by the HEIT
Clay Tye (phase 1&2): 99MW/198MWh BESS, financed and owned in joint venture with FRV
Jamesfield Battery: 49.5MW/99MWh BESS financed and owned in joint venture with TagEnergy

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Key: Not active / Core activity / Non-core activity

Where is Harmony Energy active in the energy storage value chain?

Developer	Financer	Technology provider	Owner	Operator	Optimiser
Harmony Energy Advisors Limited	HARMONY ENERGY INCOME TRUST PLC			Harmony Energy Advisors Limited	

When financed by HEIT, projects are developed and operated by an Investment Advisor

Overview:

- **Harmony Energy** is one of the UK's leading developers, owners and operators of utility-scale battery energy storage.
- As of present, the company is operating 140MW of BESS in the UK, including Europe's largest energy storage system (in MWh), the Pilswood project with a capacity of 196MWh. In addition, over 500MW are currently in-construction or in-planning in the UK. The company is also looking to enter other European markets, especially France where a new subsidiary has been launched.
- Originally working through two joint-ventures with FRV and TagEnergy, Harmony Energy is moving towards being more independent in developing and operating its projects. In order to help raise equity for its projects, it thus launched in 2021 the **Harmony Energy Income Trust (HEIT)** (see next page for details).
- Harmony Energy was one of the first developers to focus on 2h duration BESS. In order to do so, the company established in 2016 a partnership with Tesla as supplier and EPC contractor of its 2-hour Megapack system. It also uses Tesla's Autobidder AI software to manage real-time trading and revenue optimisation.

Insight on hot industry topics

> **Gigafactories and the European supply chain**
> **C&I storage value propositions**
> **Storage in resource adequacy mechanisms (capacity markets)**
> **French capacity market mechanism**
> **Financing of FoM battery projects**
> **Country reports**

Example Country Report: Greece

Published in September 2023

Synopsis

Greece is becoming one of the most interesting European markets for energy storage. 2023 has been a pivotal year as:

- A storage auction will fund 1,000 MW of Front of the Meter battery storage by 2025
- A new residential solar scheme will drive several thousands of residential battery storage systems.

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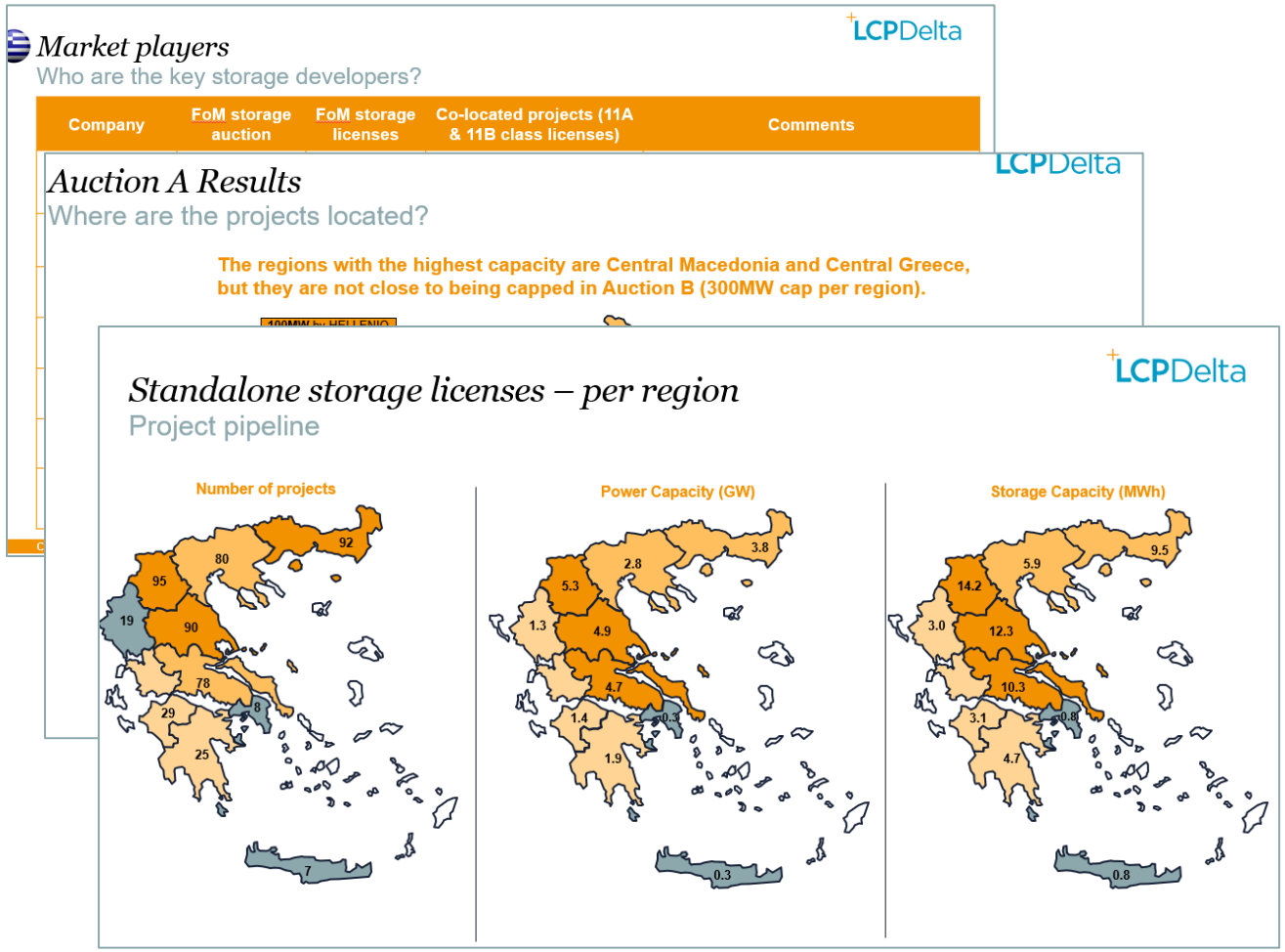

Why battery optimisation needs specialists?

Published in November 2023

Synopsis

Optimisers are key actors of the storage value chain, making the link between storage assets and the value streams that they can generate revenues from. This is especially the case for Front-of-Meter Battery Energy Storage Systems (BESS) which need to actively chase revenues to be financially profitable.

This report aims at better understanding :

- What are the different functions needed to trade the flexibility of FoM BESS in value streams
- Which of these functions optimisers cover
- Which companies are active in the optimiser space in Europe

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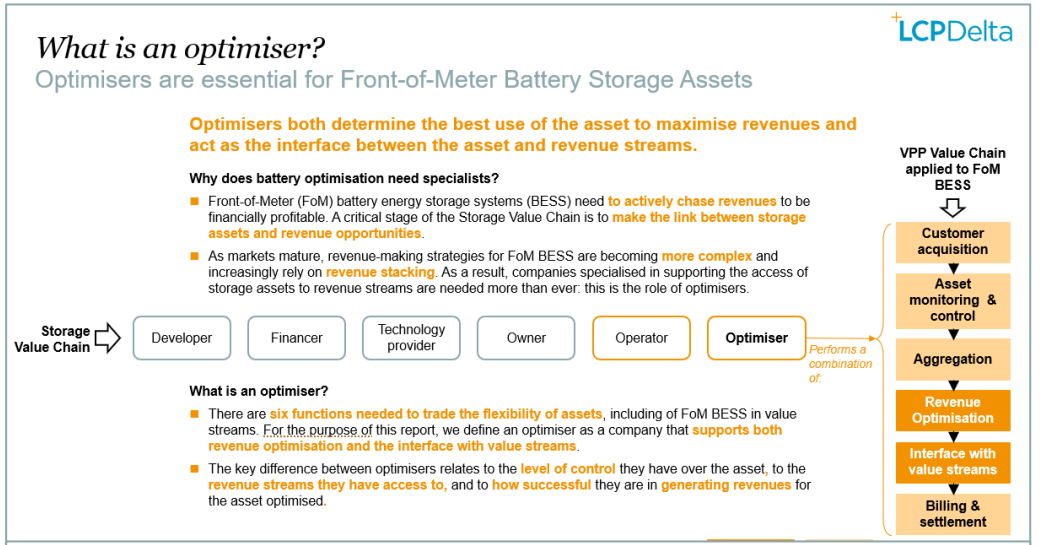

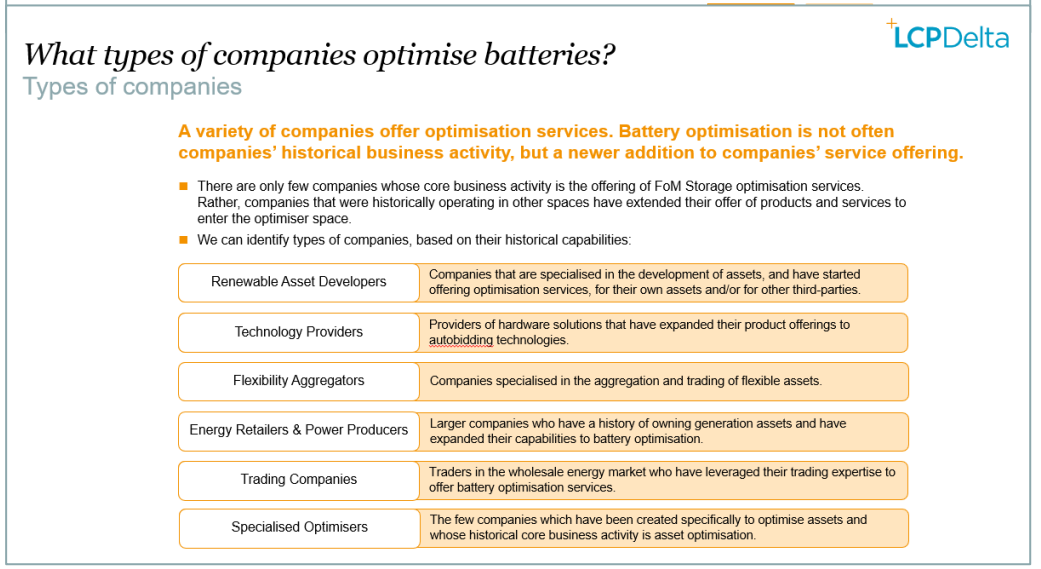

Storage technologies report

Published in October 2023

Synopsis

As the grid decarbonises, the inability to schedule renewable generation raises concerns for the security and stability of the power system. Energy storage has the potential to mitigate such issues with the current landscape dominated by Pumped Hydro and Lithium-ion battery systems. This report investigates alternative storage technologies which can output electricity.

Storage technologies are commonly categorised into: Mechanical, Thermal, Electromagnetic, Electrochemical and Chemical systems. Companies are racing to develop and commercialise these technologies, targeting a range of applications and scales. Competitiveness in the future energy system will be judged on certain key technological, economic and commercial metrics.

This report focuses on the technical performance of developing systems without a quantitative comparison of project costs.

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Performance comparison:
- Power vs energy capacity
- Power capacity vs response time
- Efficiency
- Maturity vs energy capacity

Technology overviews 24
- Mechanical
- Thermal
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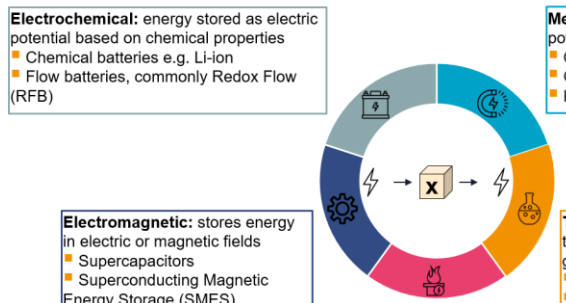
- Chemical
- Electrochemical

Developing storage technologies

Overview

Technologies for new Energy Storage Systems (ESS) are commonly categorised by the form in which energy is stored or the energy transfers that occur.



European battery manufacturing (series of reports)

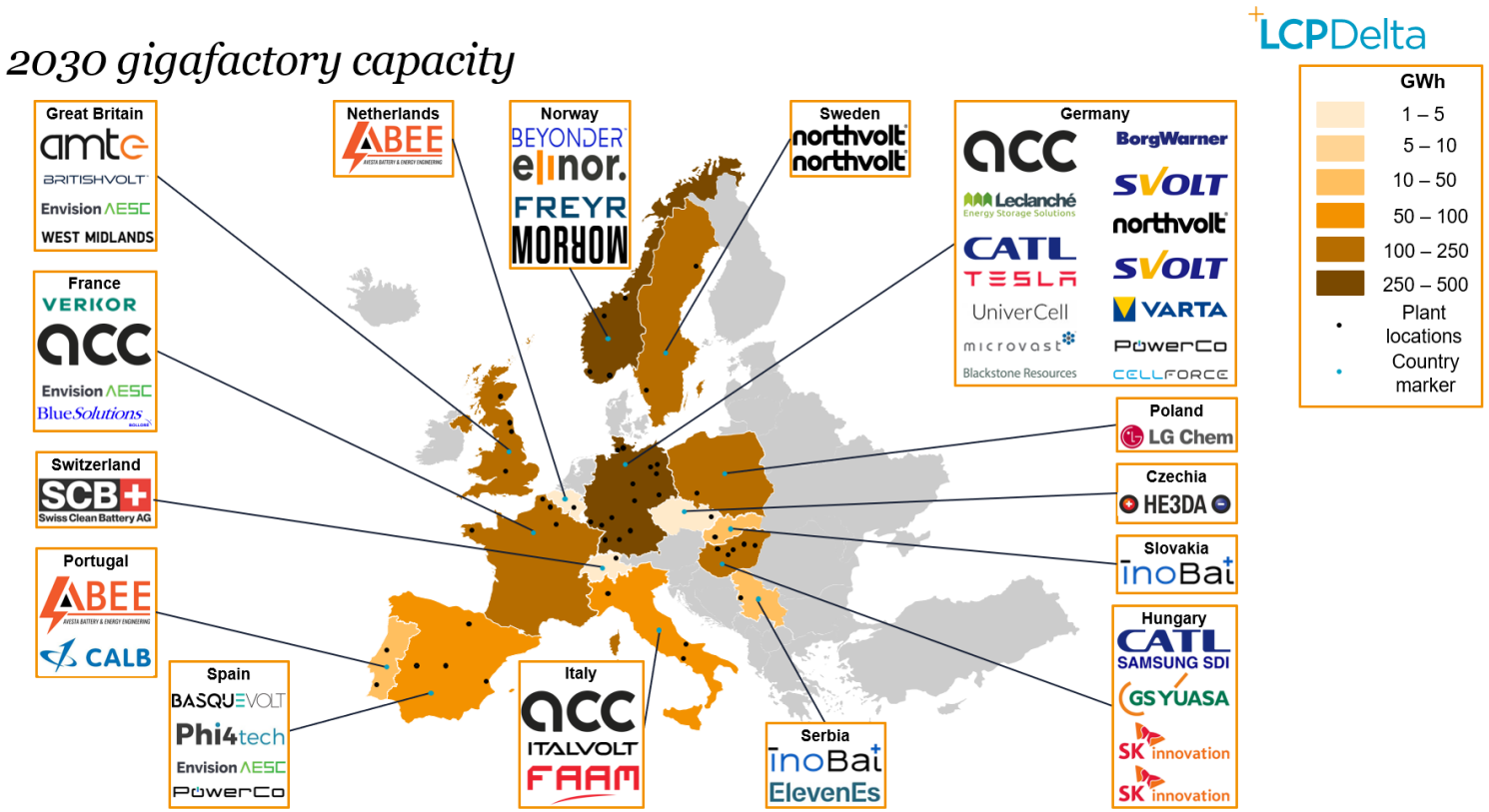
Published in May, June and August 2023

Synopsis

These 3 reports discuss the current status of European battery manufacturing. We track the current status of Gigafactories projects in Europe and analyse data in order to answer the following questions:

- Which companies are investing in battery manufacturing in Europe and where?
- What are the current market drivers and barriers?
- What has been the impact from the announcement of the IRA in the USA?
- What are the public funding mechanisms currently available in Europe?
- How is market development affected by raw material availability?

2030 gigafactory capacity



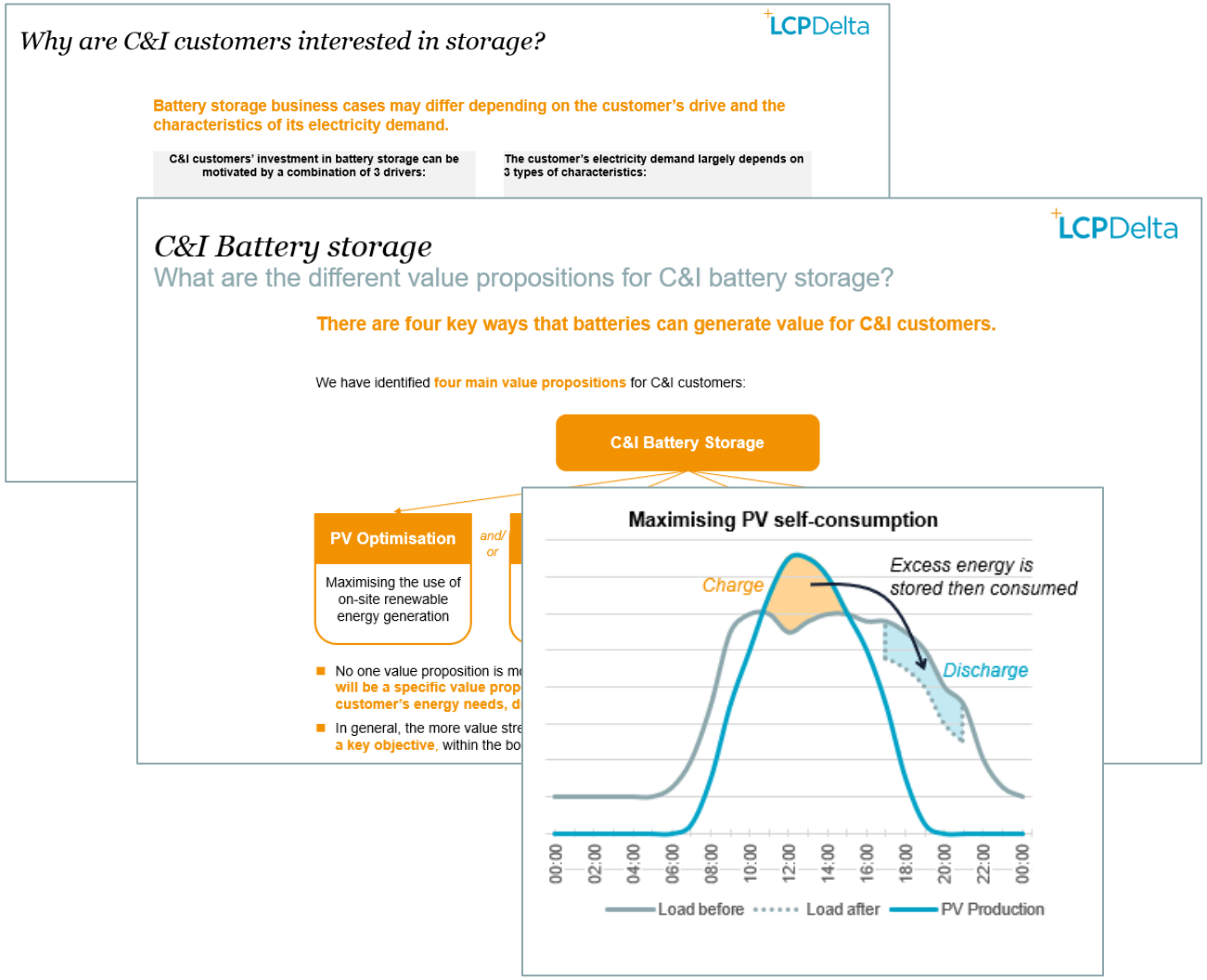
What value propositions are offered to different C&I customers?

Published in June 2023

Synopsis

Although small in comparison to the Front-of-Meter and Residential segments, the C&I segment has experienced significant growth in 2022, and interest from C&I customers is increasing. The C&I market segment is however complex as there is a wide variety of customers, with different drivers and electricity demand characteristics. The report aims to answer the following questions:

- What are the drivers for C&I customers?
- What are the main value propositions offered to C&I customers?
- How different is the popularity of these proposition in different countries ?



Storage in Resource Adequacy Mechanisms

Updated March 2022

Synopsis

This report focuses on battery storage in 12 European countries' Resource Adequacy Mechanisms (RAM). The report aims to:

- Outline the main structure of the Resource Adequacy Mechanisms in 12 countries (where they exist).
- Determine the volume (MW) of battery storage capacity awarded in each capacity auction and the percentage of battery storage awarded compared to the total volume of capacity awarded.
- Assess how easy it is for battery storage to access these RAMs and specific features of the mechanisms like compensation, lengths of contracts and derating factors.

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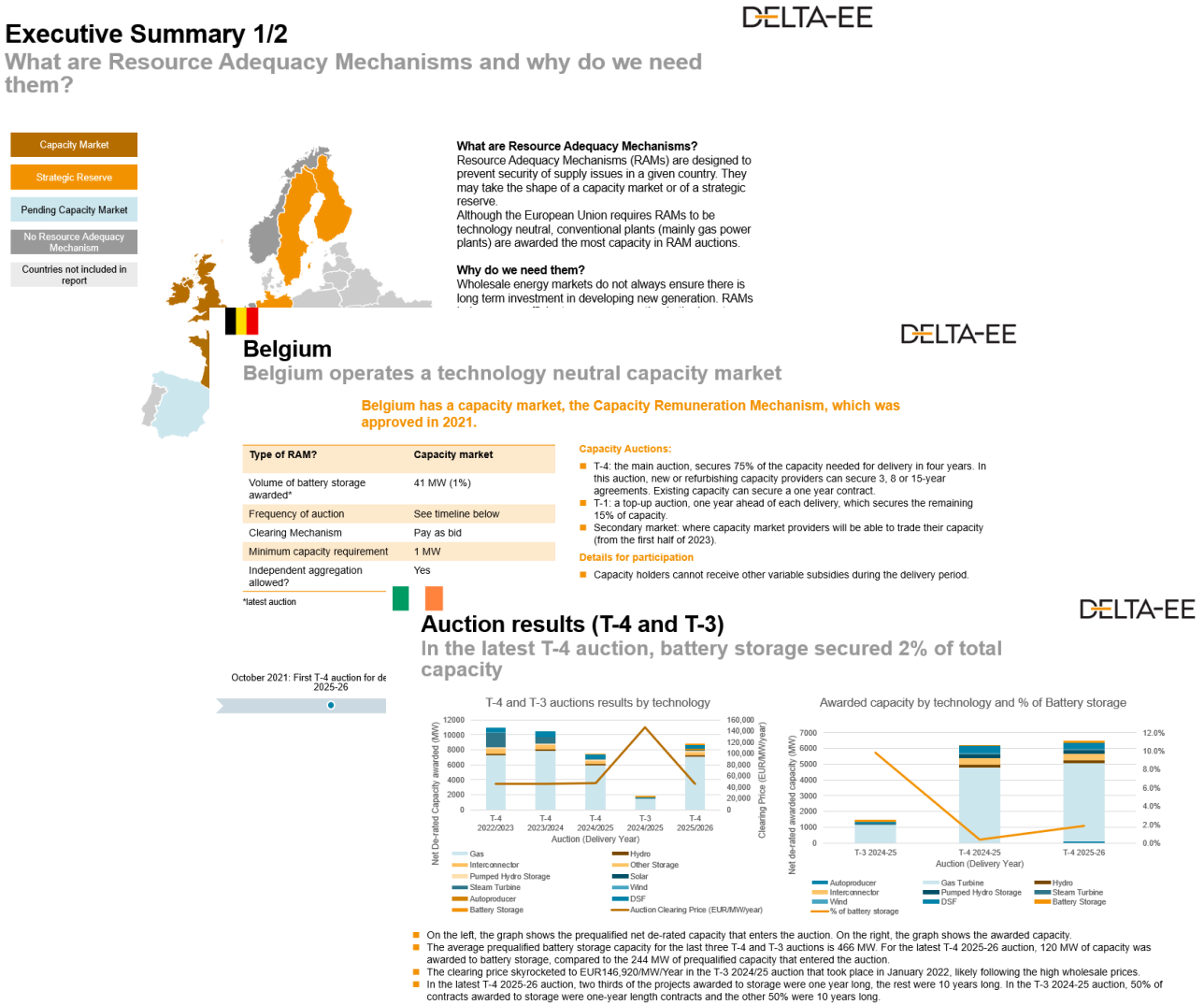

How are grid-scale battery projects financed?

Published November 2022

Synopsis

This report looks at the financing space for Front of Meter energy storage projects and discusses the financing models that currently exist in the storage market, the main providers of energy storage investments, and the relationship with project development and bankability.

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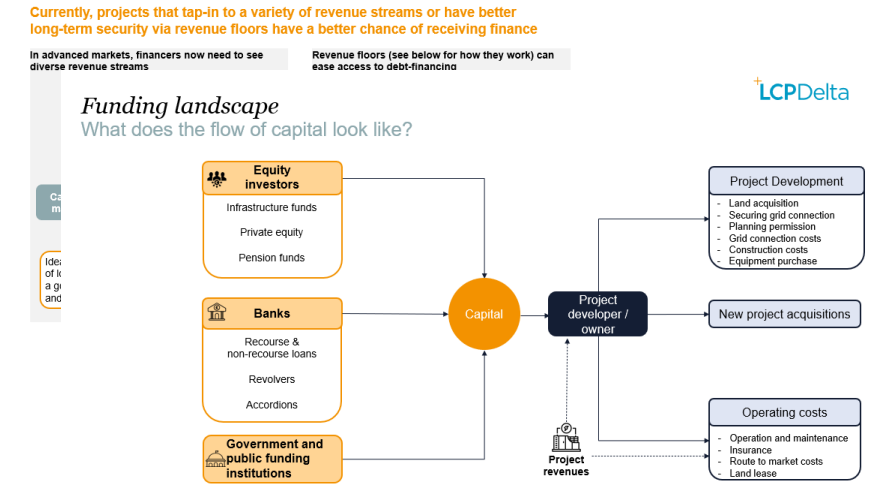
The transition of financing in the GB market

How to increase chances of receiving finance



How do you build a big battery?

Published September 2022

Synopsis

This report describes a framework used to classify and further segment the different roles companies play in large-scale energy storage project. In summary, there are 6 main roles in the project's development and operation phases: developers, financers, tech providers, owners, operators and optimisers. The framework established in this report will be used as the reference point for future deliverables that will look into these roles into further detail.

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What are the different roles?

DELTA-EE

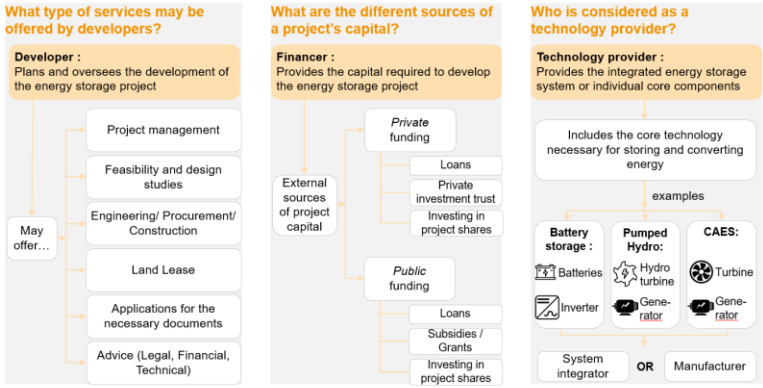
The different roles involved in grid-scale storage projects can be broadly summarised into 6 categories, each with a unique set of characteristics.

Developer	Plans and oversees the development of the energy storage project	Development
Financer	Provides the capital required to develop the energy storage project	
Technology provider	Provides the integrated energy storage system or individual core components, such as batteries or inverters	
Owner	Owns the energy storage project, receiving revenues from its operation	
Operator	Operates and maintains the energy storage project	Operation
Optimiser	Aligns the operation of the asset with ancillary service, capacity and energy market opportunities	

How can the roles be segmented?

DELTA-EE

Development stage of the project



Existing and upcoming reports

Release date	Report title	Description
	Country Reports	Reports that look in-depth at the storage market in particular countries. Includes data and forecasts for deployment, policy and landscape analysis and key developer analysis. Currently available for : Belgium, Greece, Poland, Spain with more to come
Q4 2023	Why battery optimisation needs specialists?	A report that looks into the optimiser space, explaining what these companies do, their importance in the market and highlighting some key players that are currently active with this role
Q4 2023	Storage technologies report	A comparative analysis across alternative storage technologies
Q2 2023	Energy Storage for C&I customers	A report that will look at the main value propositions with which batteries are being sold to C&I customers
Q2 2023	Will the EU Green Deal Industrial Plan be enough to respond to the Inflation Reduction Act?	This report will discuss the development of electrochemical energy storage in Europe and the USA, following the announcements of the Inflation Reduction Act in the USA in August 2022 and EU Green Deal Industrial Plan in 2023.
Q1 2023	European market monitor 7.0	The 7th edition of the European Market Monitor on Energy Storage (EMMES), with updated project data based on StoreTrack database, and a forecast towards 2030.
Q2 2023	European battery manufacturing: European Gigafactory landscape	This report looks at the development of manufacturing facilities with an annual capacity of more than 1 GWh per year in Europe. The analysis included in the report shows the projected manufacturing capacity in Europe, regional and national trends and discusses the main drivers and barriers faced by developers of these facilities.
Q1 2023	How much battery storage is being procured in resource adequacy mechanisms?	This report outlines the main structure of the Resource Adequacy Mechanisms in 12 countries (where they exist) and determines the volume (MW) of battery storage capacity awarded in each capacity auction and the percentage of battery storage awarded compared to the total volume of capacity awarded.
Q4 2022	How are grid-scale battery projects financed?	This report looks at the financing space for Front of Meter energy storage projects and discusses the financing models that currently exist in the storage market, the main providers of energy storage investments, and the relationship with project development and bankability.
Q3 2022	How do you build a big battery?	A report establishing a framework to classify and further segment the different roles that companies play in a large-scale energy storage project

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About LCP Delta

LCP Delta is a trading name of Delta Energy & Environment Limited and Lane Clark & Peacock LLP. References in this document to LCP Delta may mean Delta Energy & Environment Limited, or Lane Clark & Peacock LLP, or both, as the context shall require.

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