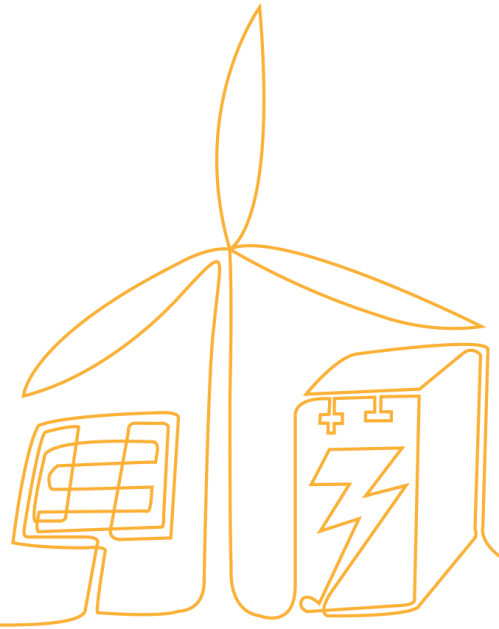
DELTA-EE



CAN EUROPE MEET 2030 REPowerEU TARGETS WITHOUT ENERGY STORAGE?

CONTACT:
Jon Ferris– jon.ferris@delta-ee.com
Susan Taylor– s.taylor@ease-storage.eu

Today's presenters

Jon Ferris
Delta-EE

Head of Flexibility & Storage

Jon.Ferris@delta-ee.com

Lucy Murley
Delta-EE

Senior Analyst / Flexibility Research Service Manager

Lucinda.murley@delta-ee.com

Jacopo Tosoni
EASE

Policy officer

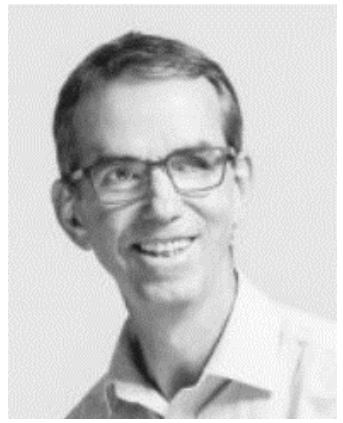
j.tosoni@ease-storage.eu

Susan Taylor
EASE

Energy Storage Analyst

s.taylor@ease-storage.eu

Andy Bradley
Delta-EE



Director

andy.bradley@delta-ee.com

Agenda

> Introduction
> Regulatory update
> Market Monitor
> Q&A

Delta-EE

Breadth and depth of expertise across the new energy space

Research and consulting services helping organisations to develop the best strategies, business models and customer propositions for the energy transition

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

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

Distributed Power Service
How to succeed in the global distributed power market

Electrification of Heat Service
Identify and capture the increasing range of opportunities from growing electrification of heat

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

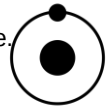
Energy Storage Research Service
Capturing the best opportunities for distributed energy storage

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

Flexibility Research Service
Capturing opportunities in the growing demand side flexibility market

Gas Heating Service
What is the future of gas in buildings and how can you best capture the opportunities and respond to the threats?

Hydrogen Intelligence Service
How the green hydrogen sector is developing – electrolyser build-out, demand & use cases, and the competitor / partner landscape.

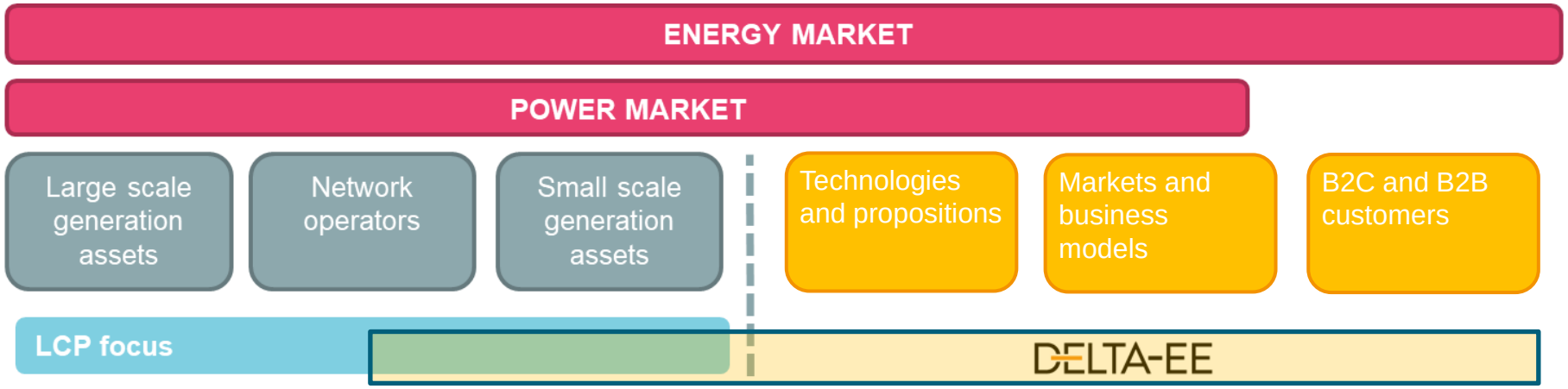


Heating Business Service
How to evolve from selling individual products and commodities to become a successful home energy solution provider

Local Energy Systems Research Service
Understand and respond to the challenges and opportunities from the growth in energy communities, microgrids and local energy markets

Delta-EE has become part of LCP

An integrated energy transition team addressing the critical need for whole system thinking



UPSTREAM **DOWNSTREAM**

LCP Enact	Gas recip, battery, pumped storage & electrolysers revenue forecasts	Long duration storage	Data, analysis and forecasts on Europe's distributed energy storage markets	Business models, propositions & competitor landscape for behind-the-meter storage

The energy transition is creating the need to align customers, retail supply, networks, energy markets and generation. LCP and Delta-EE's combined skills and expertise in the upstream and downstream parts of the energy system creates a unique offering

[Read the whole press release here](https://www.lcp.uk.com/energy/) https://www.lcp.uk.com/energy/

About EASE

The European Association for Storage of Energy (EASE), established in 2011, is the leading member-supported association representing organisations active across the entire energy storage value chain.

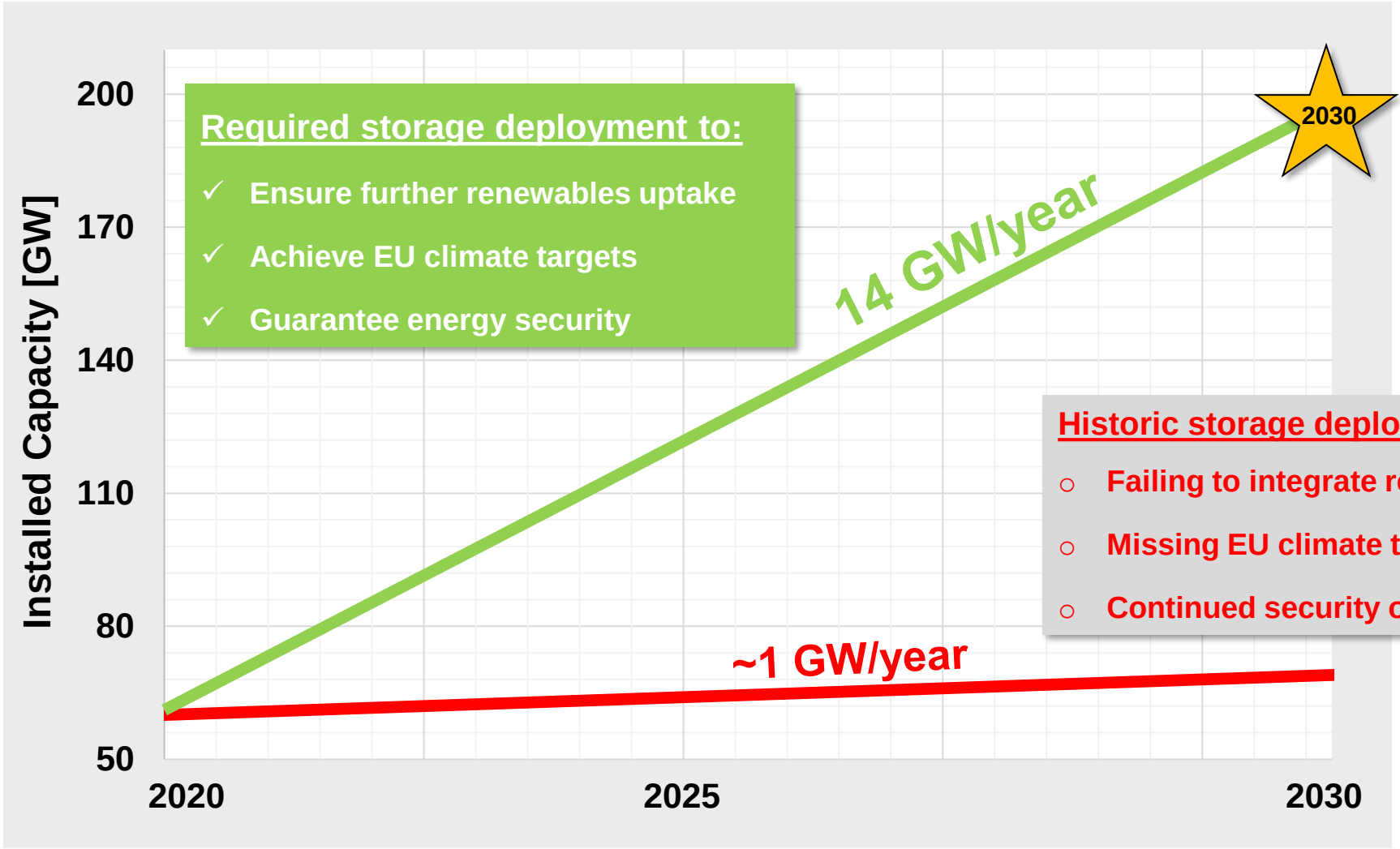
EASE **represents over 60 members** including utilities, technology suppliers, research institutes, distribution system operators, and transmission system operators.

EASE **supports the deployment of energy storage** to enable the cost-effective transition to a resilient, carbon-neutral, and secure energy system.

- Awareness raising
- Information-sharing
- Market design

Need for ~200 GW Storage by 2030

Historic deployment vs. energy system needs



Growing demand for battery storage

Battery installation milestones

2021	2022
> 1GW residential installations	> 10GW cumulative battery capacity
> 3GW installations	> 5GW installations

Growing demand for battery storage

Grid batteries are getting bigger

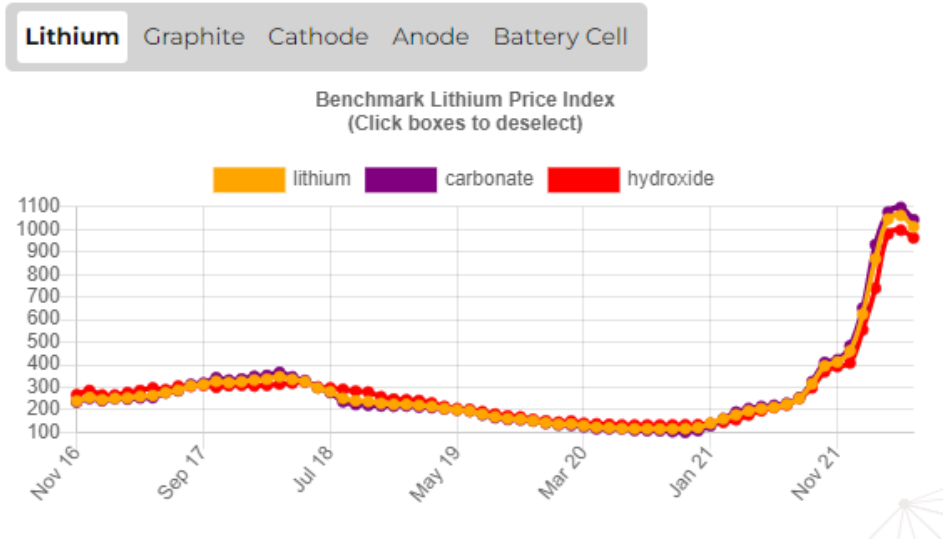
	2021	2022
>10MW	48 projects	59 projects
>50MW	16 projects	33 projects
	1.8GW from 154 projects	2.6GW from 72 projects

Forecasting

3 key factors affecting short and medium term uncertainty

Supply chain issues

- Cobalt
- Nickel
- Lithium
- Cost of living crisis



Source: Benchmark Minerals Intelligence

Technologies

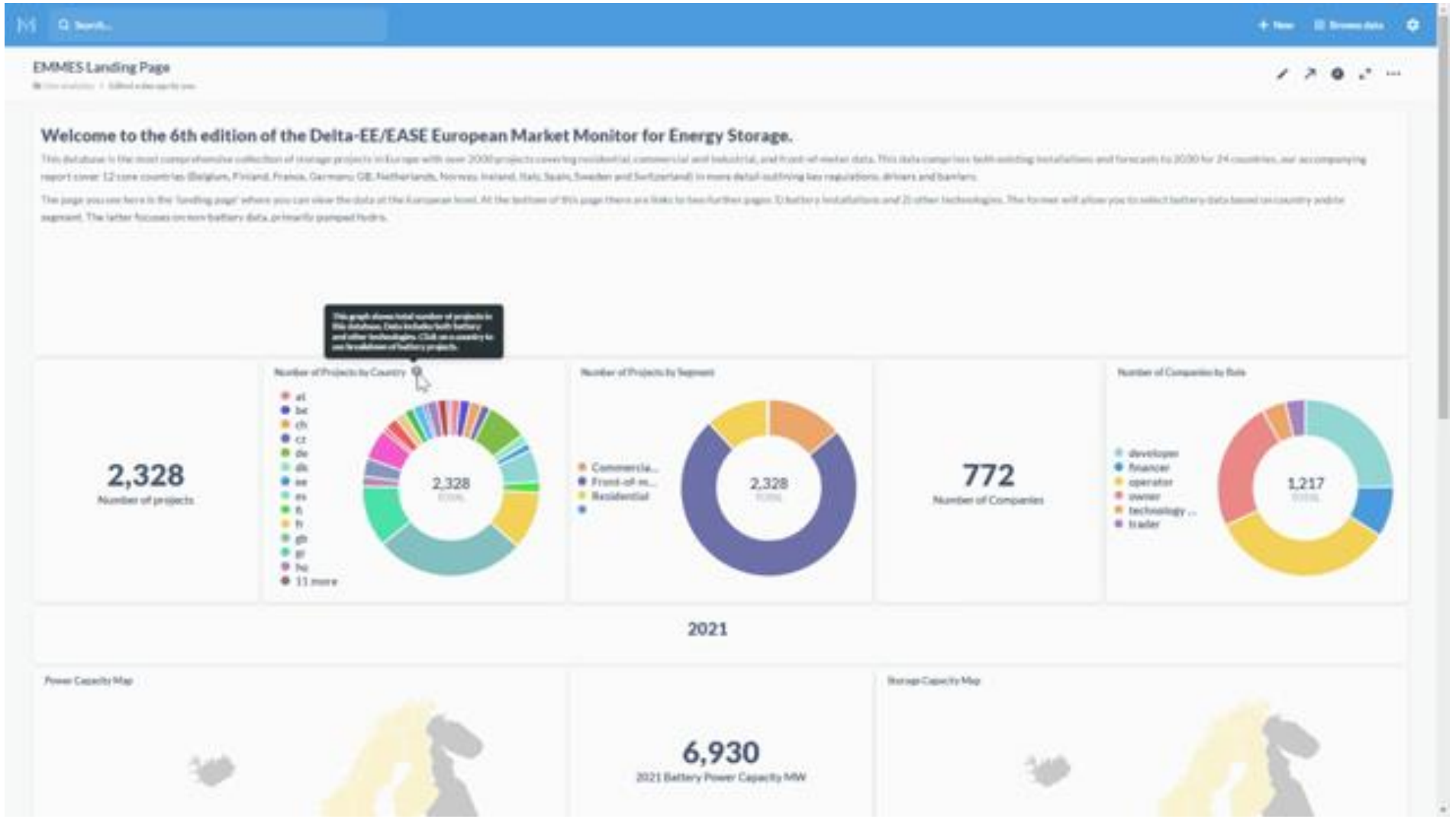
- Battery chemistries
- Pumped Hydro
- LDES
- Heat storage

Government intervention

- Country targets
- Tenders and auctions
- Regulations
- Markets

Revised approach for EMMES 6.0

Subscription data portal



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Regulatory Update

Energy regulation in an age of crisis

The Russian invasion of Ukraine has been a rough awakening for the European Union.

With the REPowerEU plan, presented on the 18th of May 2022, the EU looks into:

1. **Saving energy**
2. **Producing clean energy**
3. **Diversifying the EU energy supply**

Reforms and investments that before the conflict were not even on the table are now considered by the EU and member states – they are the perceived enablers of REPowerEU.

Regulatory Update

Energy regulation in an age of crisis

The number of REPowerEU initiatives that have an *indirect* positive impact on energy storage is huge.

1. **Increase the headline 2030 target for renewables from 40% to 45%**
2. **Increase from 9% to 13% the binding Energy Efficiency Target**
3. **Double solar photovoltaic capacity by 2025**
4. **Improve permitting processes for renewables**

Yet, the number of initiatives that have a *direct* positive impact on energy storage are few. How they will be put into practice is unclear.

1. **Recognition of the role of energy storage for e.g. system flexibility and in the context of renovations**
2. **Improve permitting processes for energy storage**

Regulatory Update

Energy regulation in an age of crisis

The European Union is therefore in a unusual situation, on the topic of energy storage:

1. **Especially since Fit for 55, EU legislation for the energy transition is at least as ambitious as any country in the world**

2. **Still, EU provisions have not yet addressed two key energy storage enablers:**

   a. **A market design that rewards the services that energy storage provides**
   b. **Clear investment signals for investors**

Paradoxically, the issues of market design and investment signals for storage have been better addressed in countries whose decarbonisation efforts are not as ambitious as the EU.

Regulatory Update

Energy regulation in an age of crisis

The European Union is planning to address market design soon: what will be decided will shape energy storage uptake. Much is not clear:

1. **Will the EU be the first region to design market products able to reward energy storage for long periods of time?** → **If that was the case: a dramatic, now under-forecasted uptake of weekly/monthly/seasonal energy storage technologies will materialise.**

2. **Will the EU be able to create the market conditions so that gas peakers will be replaced by energy storage?** → **Backup generation will become more and more relevant as renewables increase. Backup generation is a huge market dominated by fossil fuels. Continued dependency on gas peakers may become unacceptable for policymakers.**

Unfortunately, despite the European Parliament asked to elaborate an energy storage strategy – like the one for hydrogen – the European Commission has not yet picked up this recommendation.

Regulatory Update

Energy regulation in an age of crisis

In a nutshell, what kind of forecast can we do, if we just look at the legislation?

1. **Energy storage uptake will increase. EU's efforts on decarbonising the energy system are so ambitious that growth is ensured.**

2. **For the next few years, we can still expect to see untapped potential – an EU strategy and a new market design are missing, and even their possible arrival would not have an immediate impact on the energy storage deployment.**

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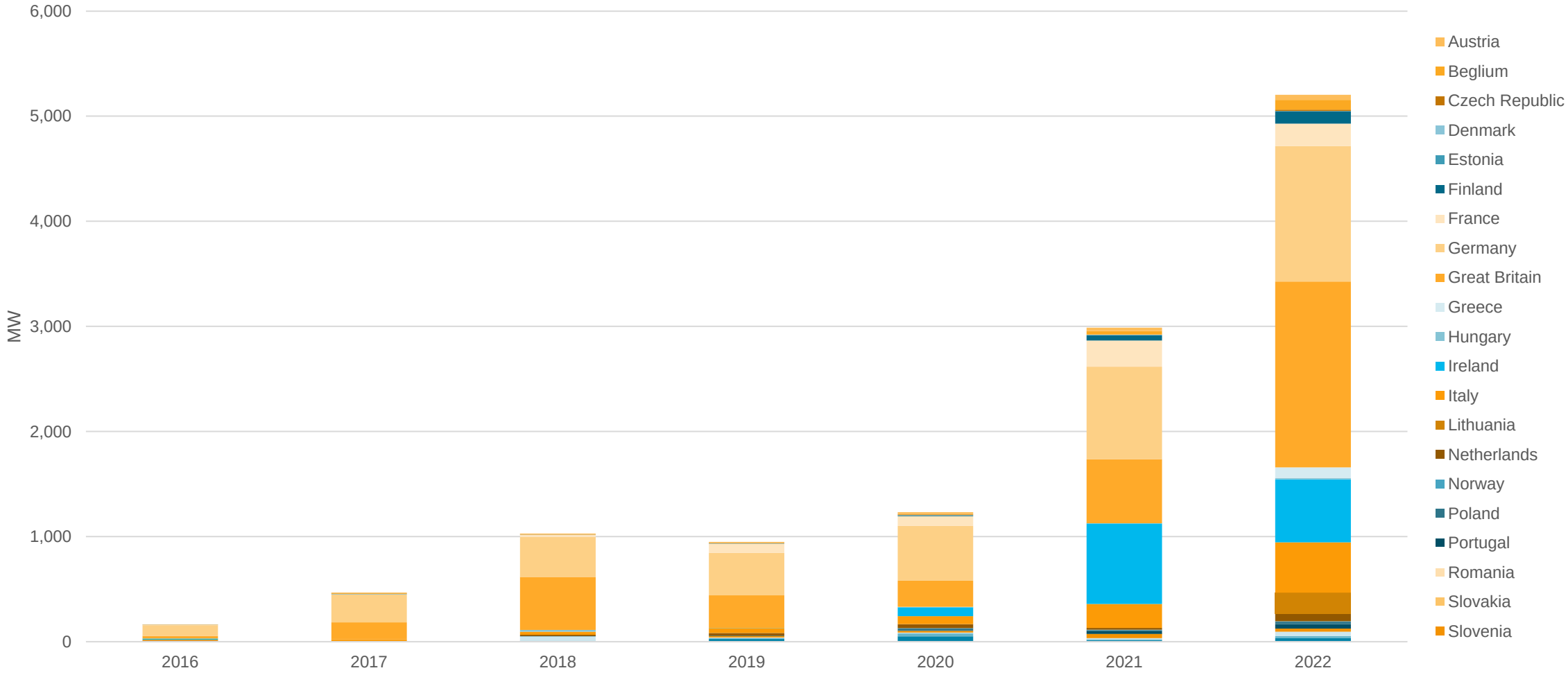
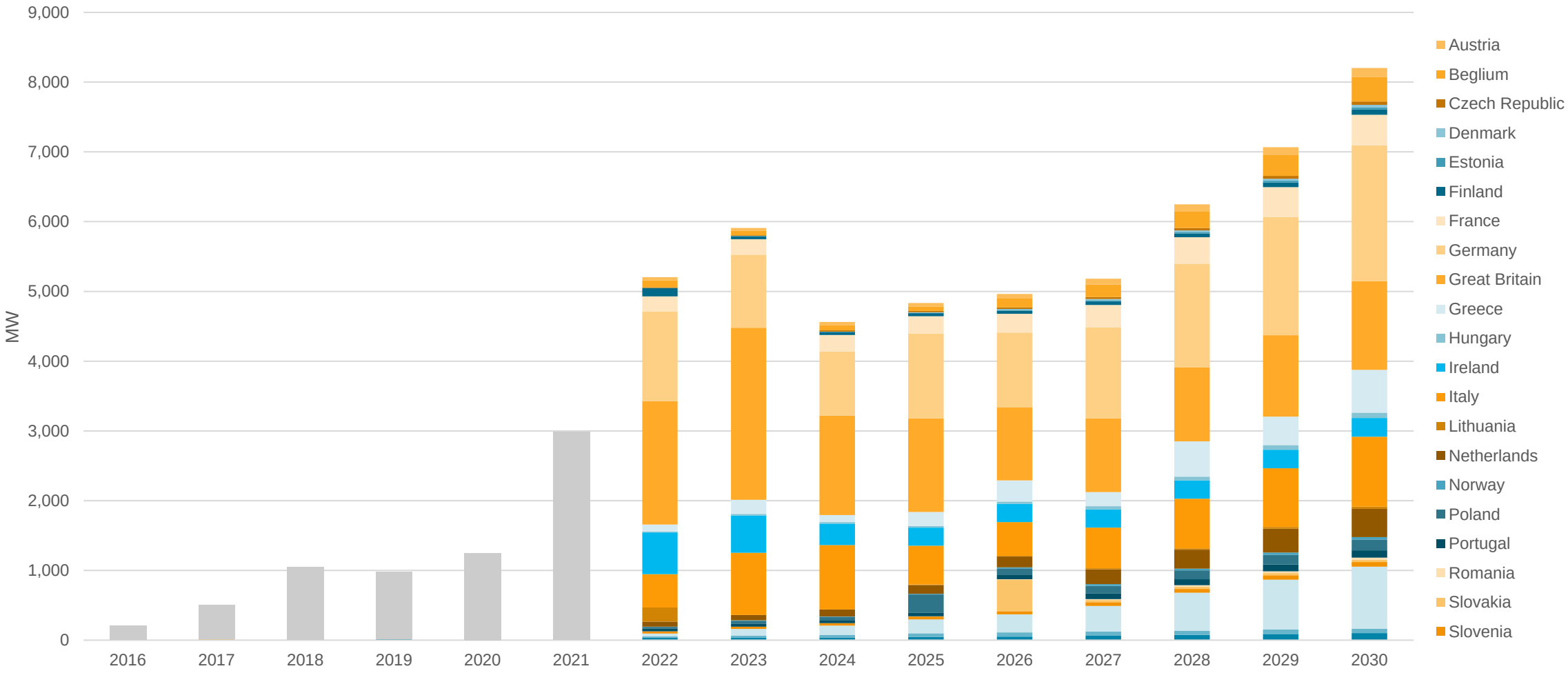
Annual battery installations (MW)



Forecast annual battery installations (MW)



Great Britain

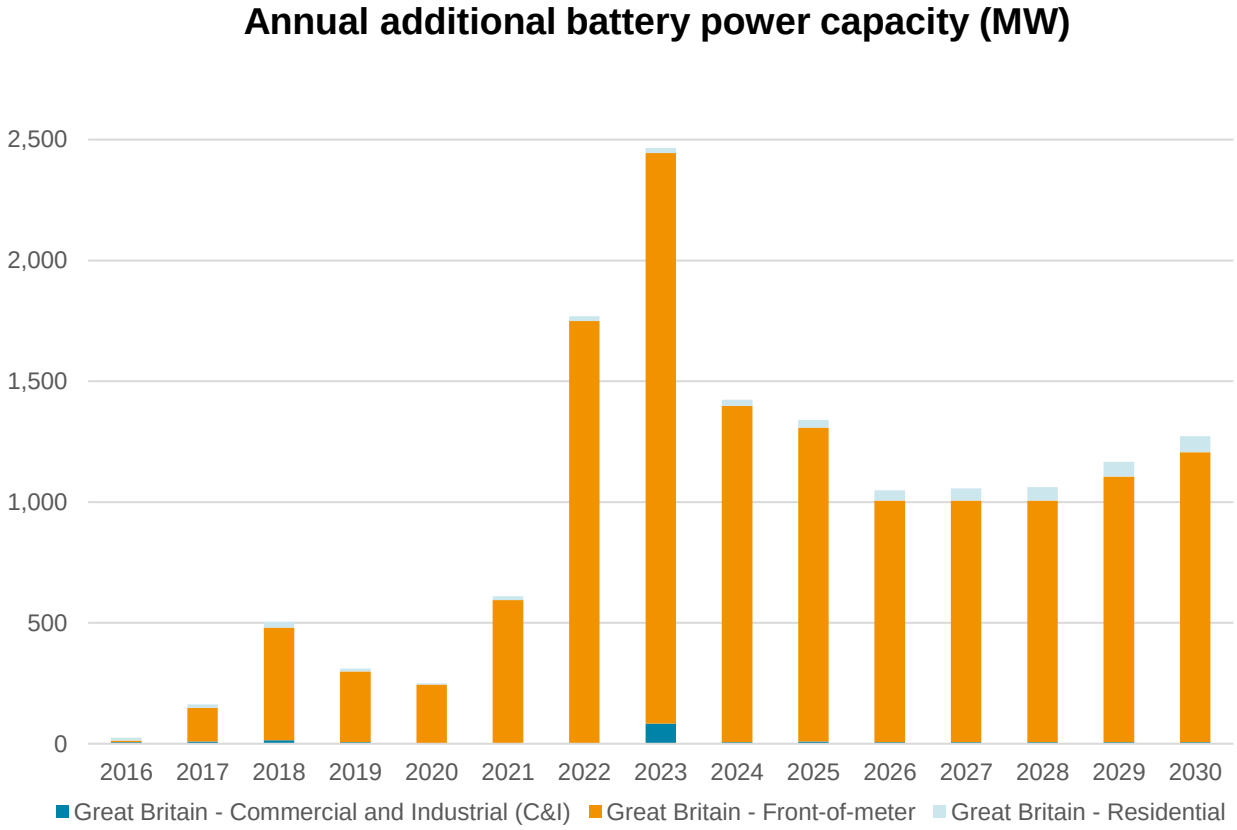
2022 installed batteries:

3,600MW

2030 forecast installed batteries:

14,400MW

- Huge project pipeline ~13GW with front-of-meter installations dominating.
- New suite of ancillary services + wholesale optimisation makes GB an attractive market.
- Does the slow down in project announcements suggest market saturation?



Germany

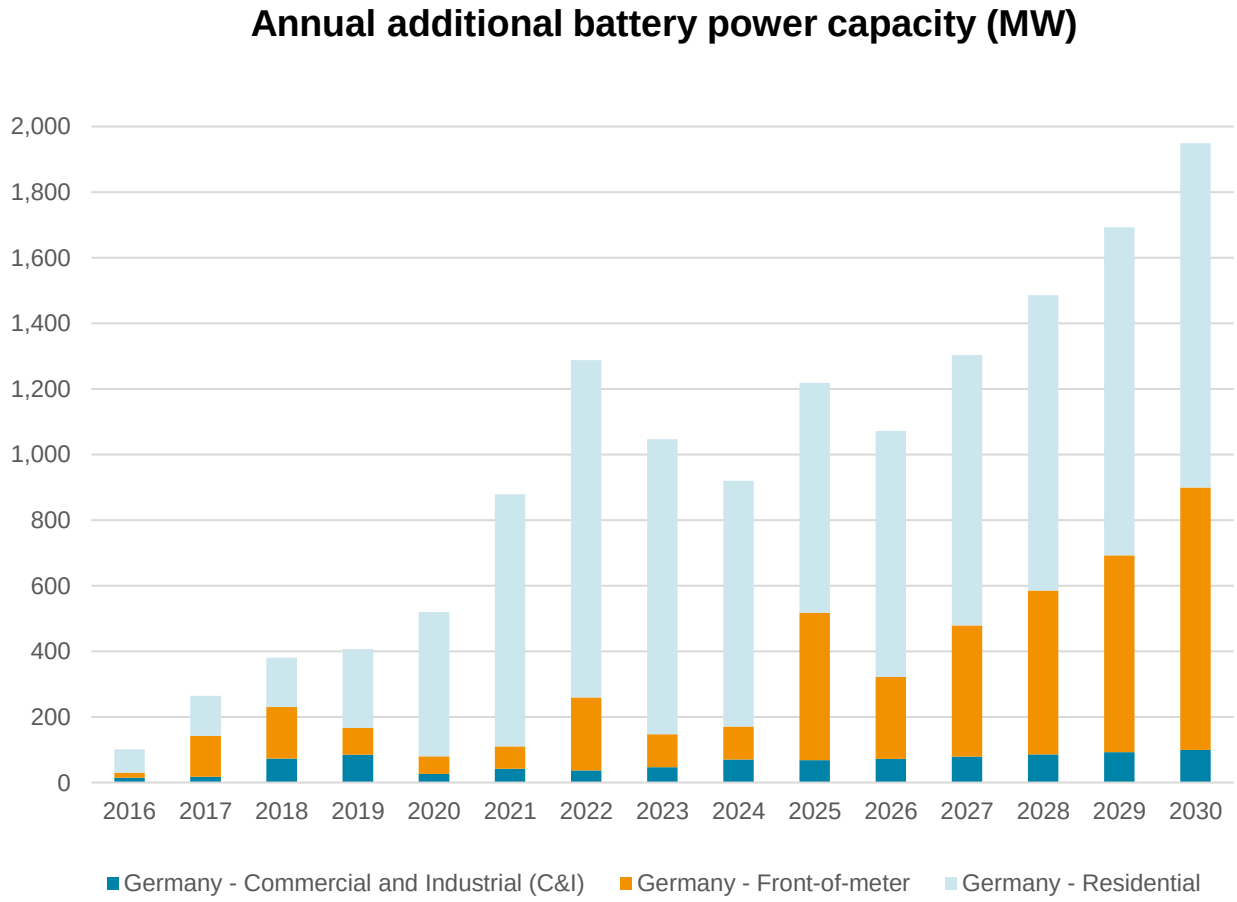
2022 installed batteries:

3,900MW

2030 forecast installed batteries:

14,500MW

- Largest residential market that is still a growth market. Of the ~1250MW installed in 2022, ~1000MW from residential assets.
- Relatively small front-of-meter market but will grow to accommodate rise in renewable generation.



Italy

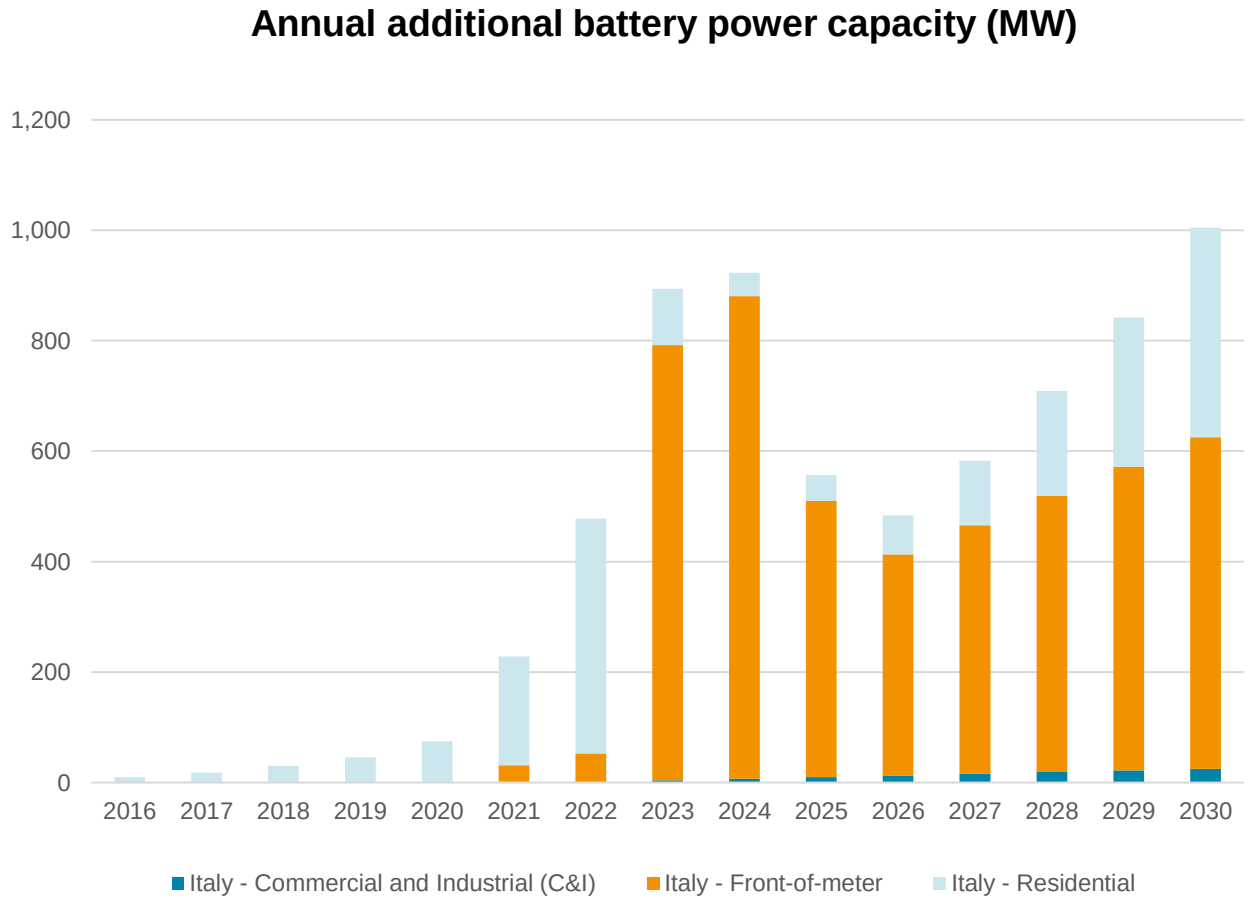
2022 installed batteries:

900MW

2030 forecast installed batteries:

5,200MW

- Only market to show significant developments in both residential and front-of-meter assets
- Government subsidy (superbonus) is the driving factor behind the development of the residential market
- Fast Reserve and Capacity Market are the main value streams for front-of-meter assets



France

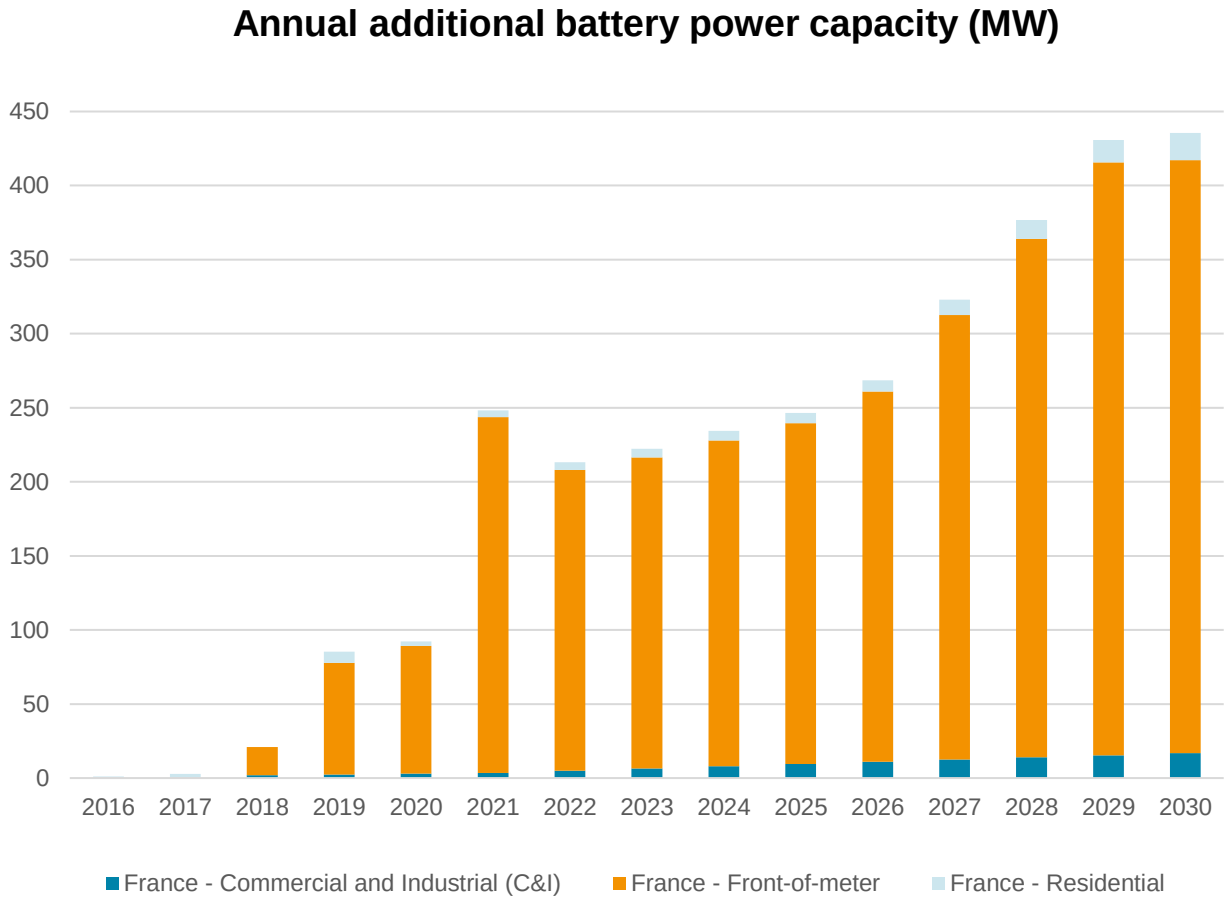
2022 installed batteries:

670MW

2030 forecast installed batteries:

3,200MW

- Multiple GB/Irish service providers looking to expand into the French market
- Residential flex market is dominated by Voltalis (with electric heating optimisation) which limits the need and business case for residential batteries.



Ireland

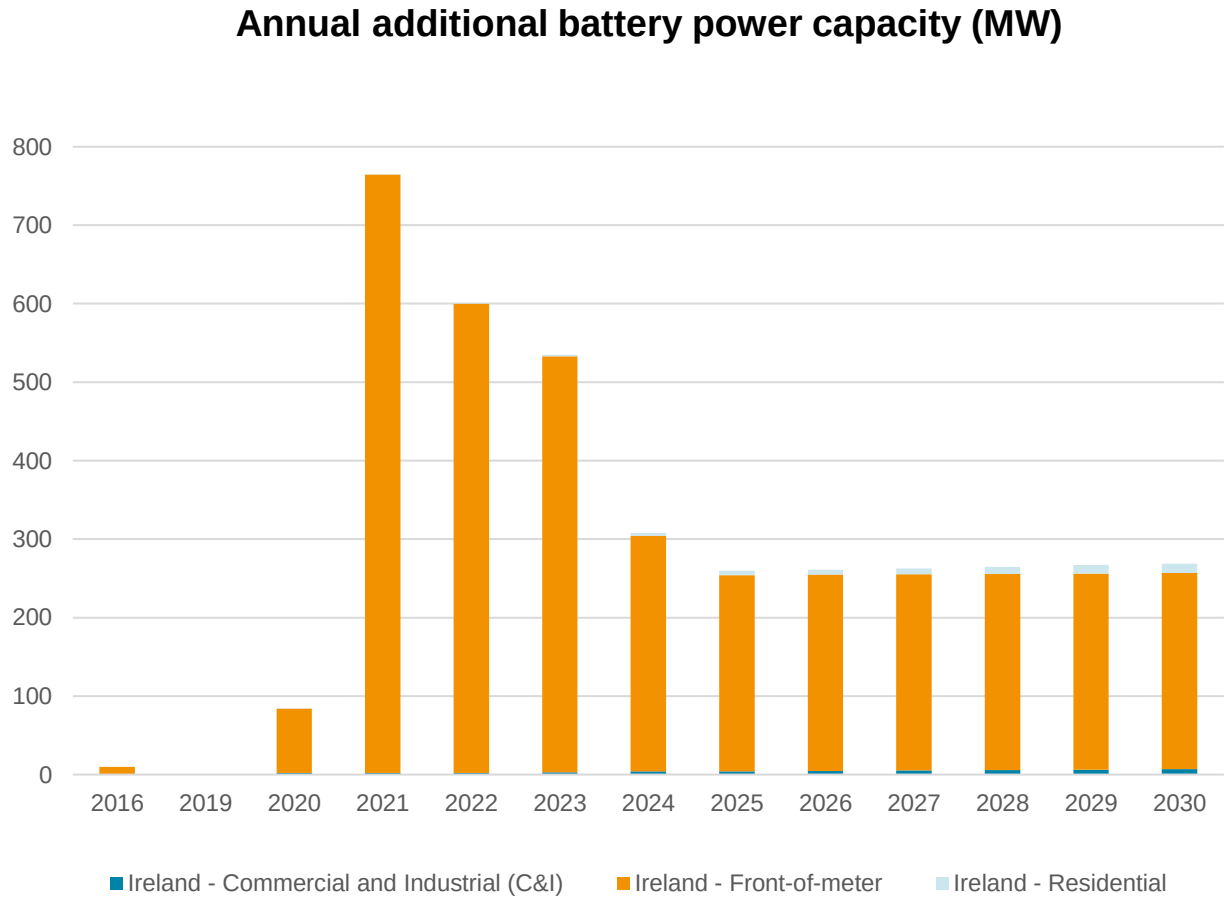
2022 installed batteries:

1,400MW

2030 forecast installed batteries:

3,800MW

- Lack of smart meters and subsidies has resulted in a very small residential market
- Fast acting and technically challenging ancillary services makes battery installations popular
- Ireland's geographical isolation and 70% renewable targets increases the need for storage



Greece

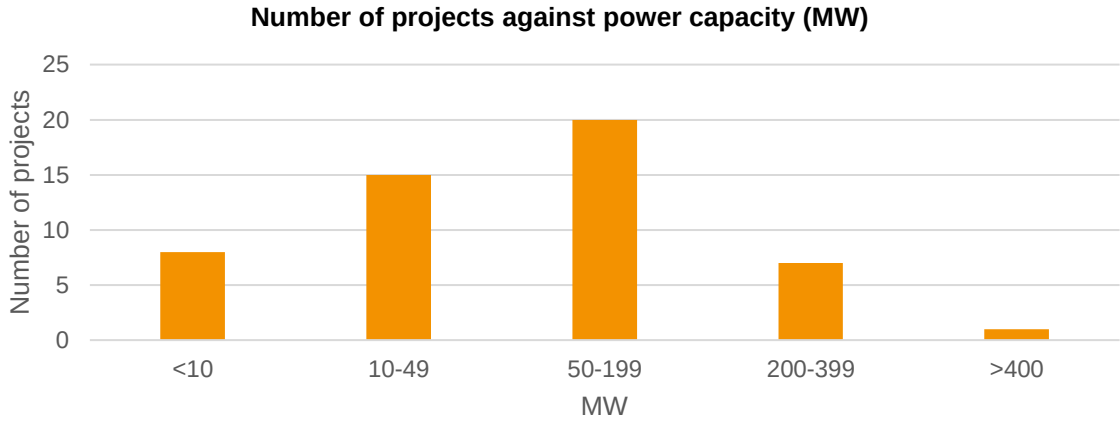
2022 installed batteries:

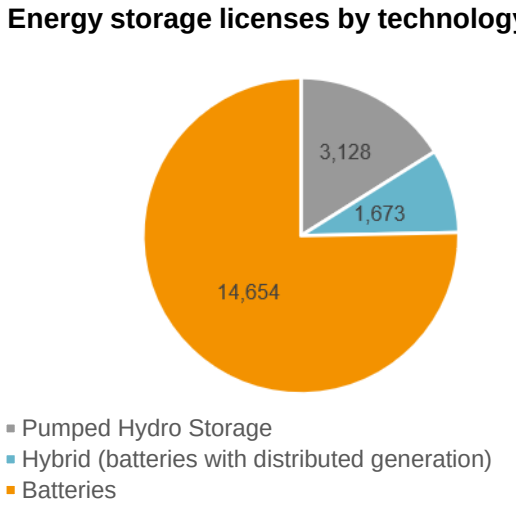
103MW

2030 forecast installed batteries:

3650MW

- Greece has recently announced a storage target of 3GW by 2030. This is the main driver for new projects.
- A new storage auctions for 700MW has been announced with auctions expected to take place in Q3 2022.
- Greece has ~16GW of approved battery projects in its pipeline. It us highly unlikely all of these will become operational.





EMMES in numbers…

Key takeaways

1. Cumulative installations of **batteries** to reach **10GW in 2022 and 50GW in 2030**
2. Lithium deficit to **challenge growth over next 2-3 years**
3. **40GW of installed pumped hydro** in 2022
4. By **2030** there will be >**50GW of pumped hydro** and >**50GW of batteries**
5. Despite this growth, still short of the **200GW EASE 2030** storage requirements

Thank you

We will be sharing the slides

Contact information:

Jon Ferris
Delta-EE jon.ferris@delta-ee.com
https://www.delta-ee.com/

Susan Taylor
EASE s.taylor@ease-storage.eu
https://ease-storage.eu/

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