



E - WORLD

NEW ENERGY SYSTEMS FORUM HALL 1 |
FEBRUARY 12TH | 5 – 5:30 PM

Navigating contracting and financing challenges in German energy storage

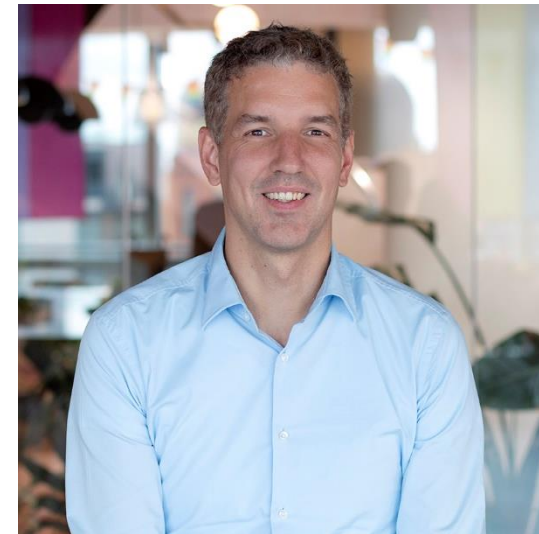
Marc Daube & Sam Ebohon



Navigating contracting and financing challenges in German energy storage



Sam Ebohon
Expert in flexibility & storage



Dr. Marc Daube
Expert in European energy markets

We are a globally leading advisory business helping organisations navigate the energy transition

>800 energy experts

300+ clients

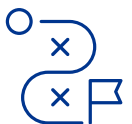
60 countries where we model the energy system

\$150bn of capital advised on into low carbon

WHAT WE DO



Analyse and design markets and policy



Identify new commercial opportunities and manage risk



All underpinned by a world leading energy market modelling capability



Determine strategy and investment decisions



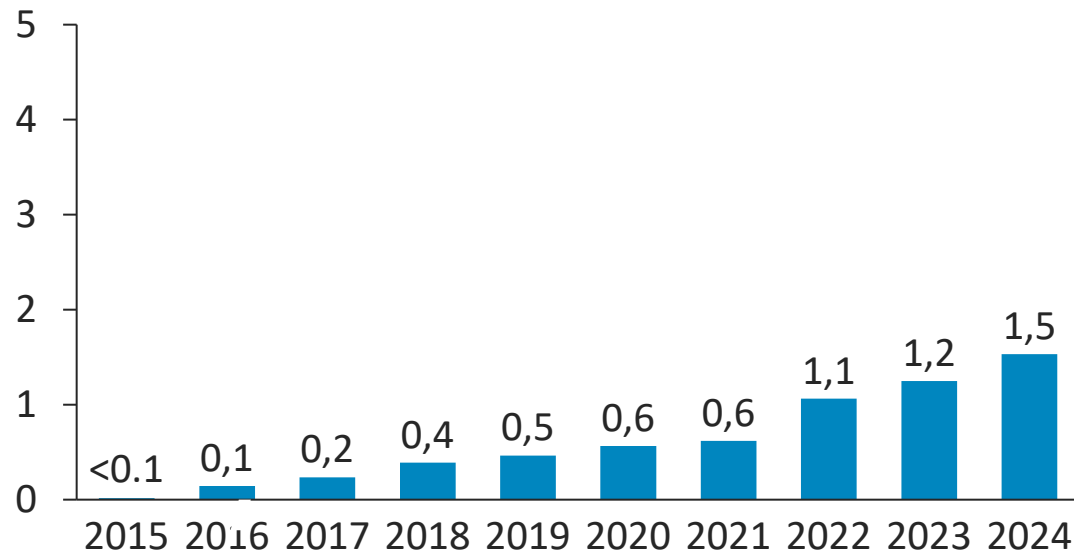
Structure and run more effective businesses

The GB BESS market developed a few years earlier than Germany, but both markets have a large volume of capacity under development



GERMANY

Installed capacity of utility-scale BESS in Germany (GW)



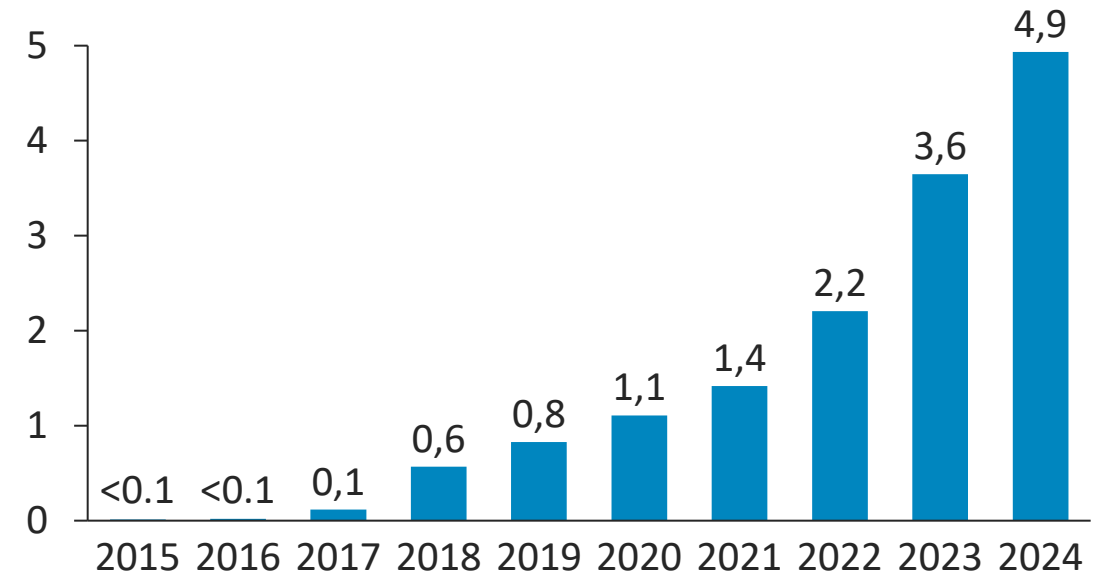
TSO CONNECTION REQUESTS:

226 GW



GREAT BRITAIN



Installed capacity of utility-scale BESS in Great Britain (GW)



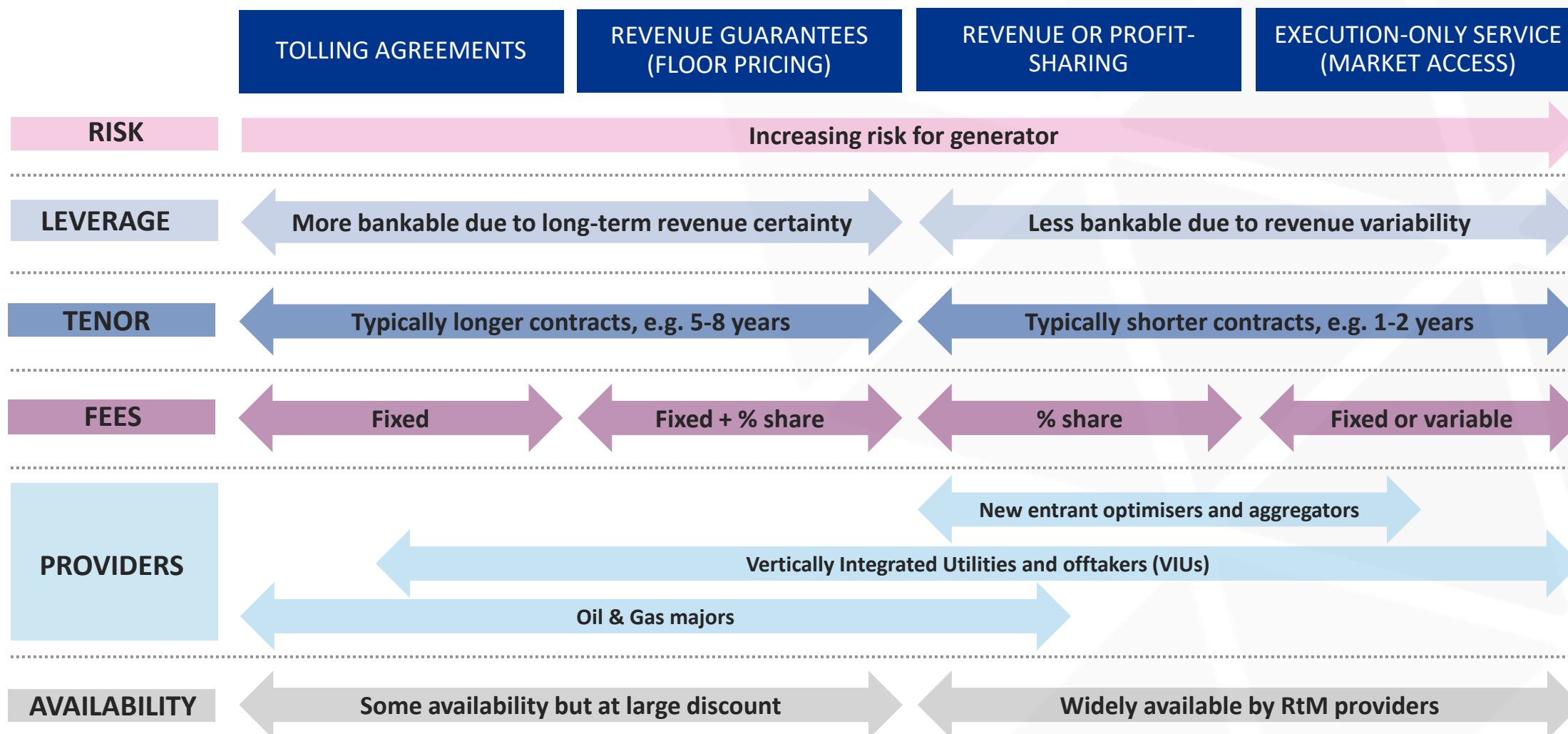
DEVELOPMENT PIPELINE:

63 GW

The composition of the core value stacks of utility-scale BESS in Great Britain and Germany have similarities but also significant differences

		 GERMANY		 GREAT BRITAIN	
		RELEVANCE TO BUSINESS MODEL	INDICATIVE SHARE	RELEVANCE TO BUSINESS MODEL	INDICATIVE SHARE
SHORT-TERM MARKET EXPOSURE	Balancing Market	Not available	-	Core	20-40%
	Intra-day	Core	20-40%	Supplementary → Core	10-20%
	Day-ahead	Core	20-40%	Core	35-50%
	Frequency response and reserves	Core	20-40%	Supplementary	10-20%
	Non-Frequency Services	Niche	-	Niche	-
LONG-TERM CONTRACTED	Capacity Market	Not available - yet	-	Core → Supplementary	5-10%

Contracting structures typically reflects the level of revenue guarantee sought by the asset owner and investors



The financing of BESS projects in GB has evolved from pilot schemes to a mature market with diversity in the available financing models

Early Stages: Pilot Projects and Grant-Based Funding

Funded through public grants and pilot programs by the UK government.

Organizations like Innovate UK and Ofgem provided seed funding to demonstrate battery storage potential.

Early Commercialisation: VIUs and IPPs capitalise projects

Vertically Integrated Utilities (VIUs) and Independent Power Producers (IPPs) financed early projects via balance sheets.

Many early projects were later 'flipped' for further commercialisation.

Scaling Up: Project Finance and Institutional Investment

Commercial banks introduced debt financing for BESS projects with improving terms.

Specialised infrastructure funds, such as Gore Street Energy Storage Fund and Gresham House Energy Storage Fund, invested in utility-scale projects.

Market Maturity: Diversification of Financing Models

Continued financing by VIUs and IPPs, alongside project finance and institutional investment.

Introduction of financing innovations such as accelerated repayment during high cash generating periods.

Pre-2015

2015 – 2018

2018 – 2021

2021 onwards

Deferred network reinvestment and system services (e.g., frequency response) played a key role in early business models.

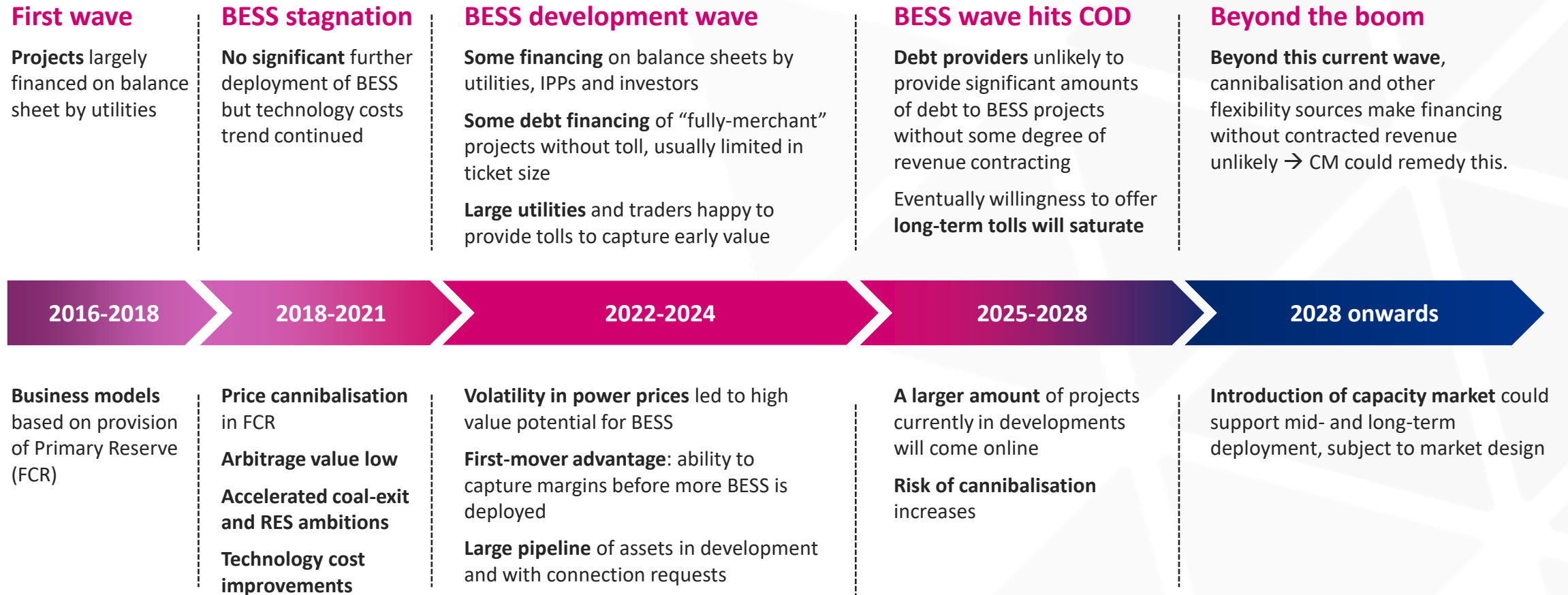
Revenue models focused on frequency response services, e.g., 2016's 4-year contract for 201 MW of BESS under Enhanced Frequency Response (EFR).

By Oct 2020, BESS assets began benefiting from CM agreements.

Energy arbitrage gained importance, with rising power price spreads in late 2021 reducing reliance on frequency response revenue.

Revenue streams expanded beyond CM and ancillary services to include reactive power, stability services, and restoration reserve contracts.

The German BESS market is currently undergoing a major development boom but there is uncertainty how BESS assets will be financed beyond the initial wave



Five key considerations for developers and investors looking at BESS projects in the German market

SO FAR THERE HAS BEEN A CLEAR FIRST-MOVER ADVANTAGE

High market revenues also made tolls more available

Developers have been racing to secure grid access rights. Only a fraction of the projects will be realised but the optionality is cheap

Co-location / over-build of existing connections could be way to get projects realised faster



AWARENESS FOR THE RISK OF CANNIBALISATION INCREASES

Cannibalisation risk will make financing more difficult and tolls be subject to larger discounts



TOLLING AGREEMENTS HAVE BEEN AVAILABLE SO FAR, BUT THE DEPTH OF THE AVAILABILITY IN THE FUTURE IS UNCERTAIN

When is the appetite of the providers with the necessary balance sheet saturated?



YOU MAY BE ABLE TO RECEIVE DEBT FINANCING FOR AN UNCONTRACTED ASSET IN INDIVIDUAL CASES

The terms may not be as favourable, and it will likely be limited to smaller assets

A partial recourse deal could make banks more comfortable, but it requires the necessary balance sheet

Explore options for debt financing of portfolios of long-term contracted RES together with merchant BESS



THE INTRODUCTION OF A CAPACITY MECHANISM COULD PROVIDE CONTRACTED REVENUE BASE IN THE MEDIUM TERM

We have seen from other capacity markets that a CM is more likely to be valuable for longer duration BESS (i.e. 4-8 hours)





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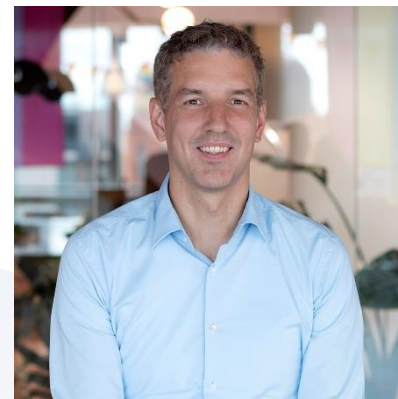
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