

# Grid-scale battery storage: enhancing returns

Burwell site visit

4 October 2022



# Agenda

1. **Introduction**  
Tim Mortlock, CEO
2. **Battery overview**  
John Flaherty, MD Grid-scale battery storage
3. **Balancing the grid**  
Barry Hatton, Director of Asset Management UKPN
4. **Battery manufacturing and sourcing**  
Daniel Greten, Head of Trina Storage EMEA
5. **Battery lifecycle**  
Lily Coles, Director
6. **Revenue generation and optimisation**  
James Taylor, Director
7. **Concluding remarks**  
Tim Mortlock, CEO
8. **Q&A**

## SMS Team



Tim Mortlock, CEO



Gavin Urwin, CFO



Dilip Kejriwal, IR



John Flaherty, MD



Lily Coles, Director



James Taylor, Director

## Industry partners



Daniel Greten, Trina



Barry Hatton, UKPN





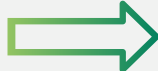


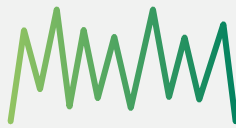




# 1. Introduction

Tim Mortlock, CEO



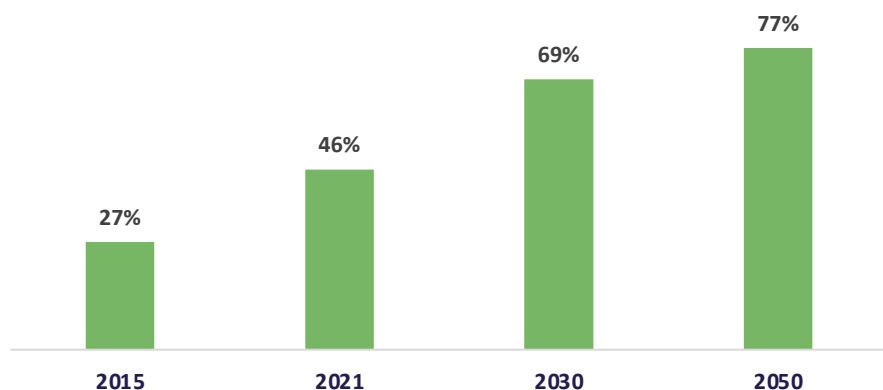
# Evolution of the UK's electricity grid system

	The old way		The new way	
1 Generation	Centralised 	Dispatchable 	Decentralised 	Variable 
2 Electricity / information flow	One directional 		Multi-directional 	
3 End users	Passive / predictable 		Active / unpredictable 	
4 Energy security	Global energy sourcing 		Self reliance 	

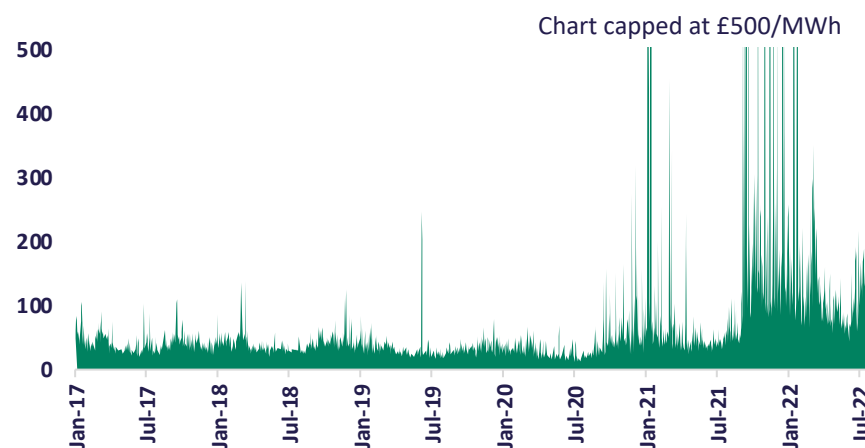


# Increased renewables widening base-peak power price spreads

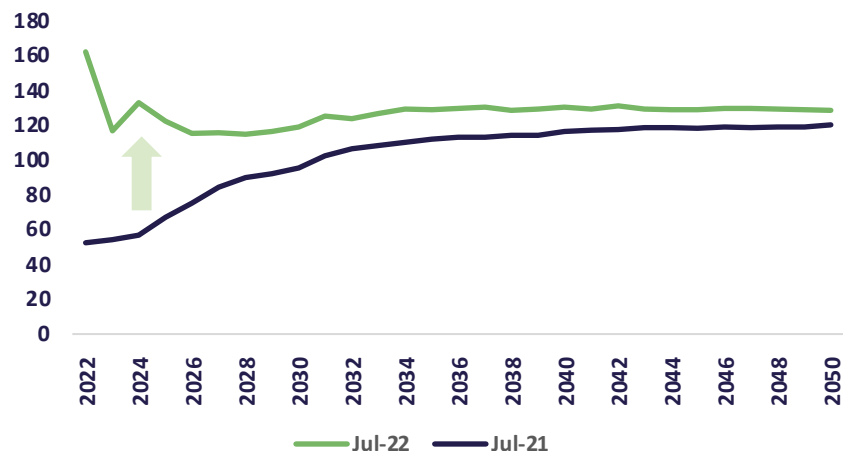
Renewables as % of total generation capacity<sup>1</sup>



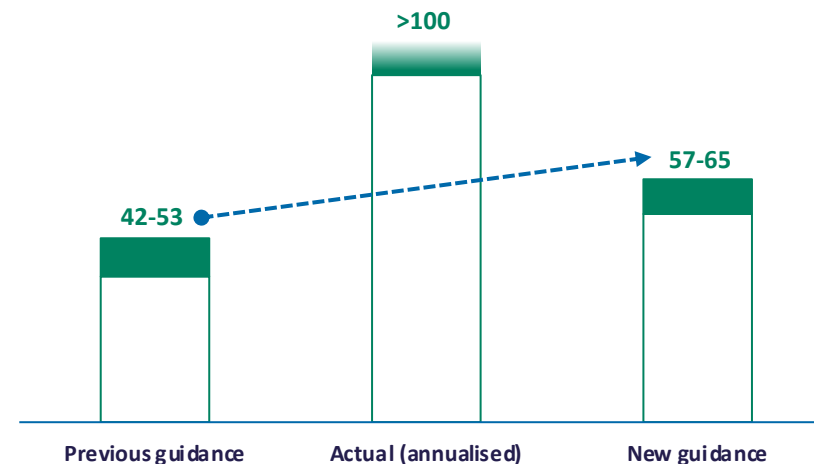
UK power price spread (£/MWh)<sup>2</sup>



Storage spread projections (£/MWh)<sup>3</sup>

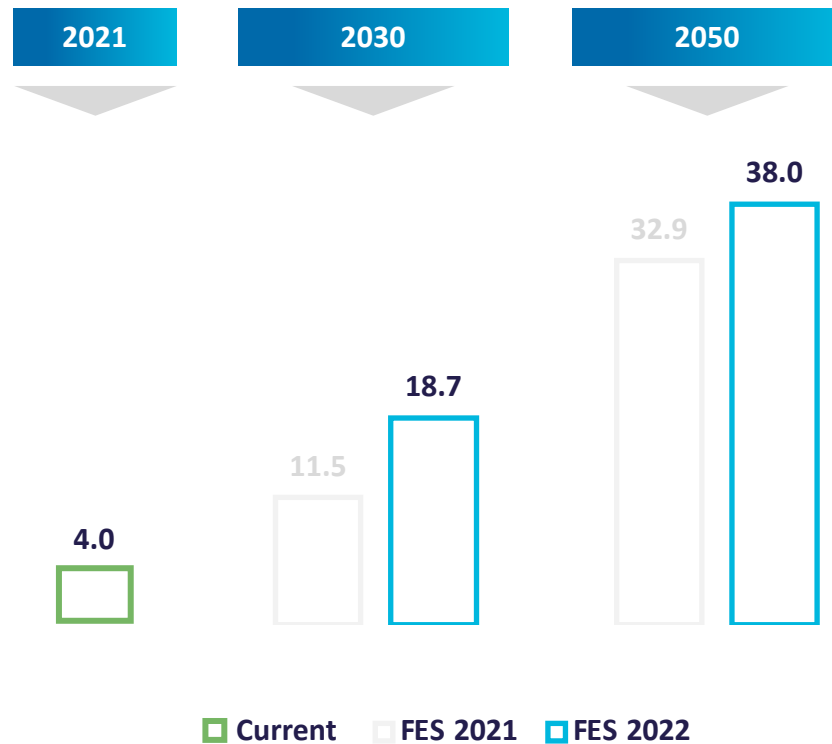


SMS's EBITDA guidance for Burwell project (£'000/MW)



# Storage capacity requirement

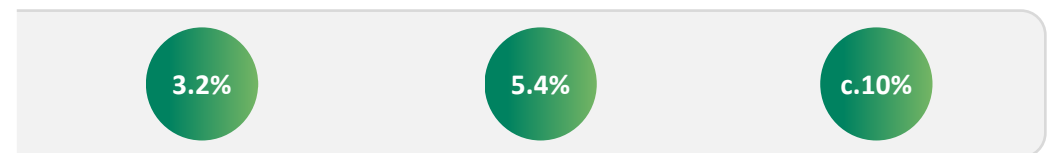
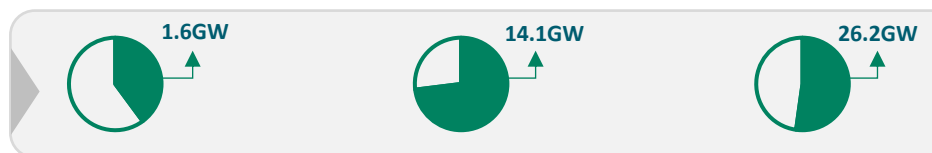
## Total storage capacity required<sup>1</sup> (GW)



## SMS market share



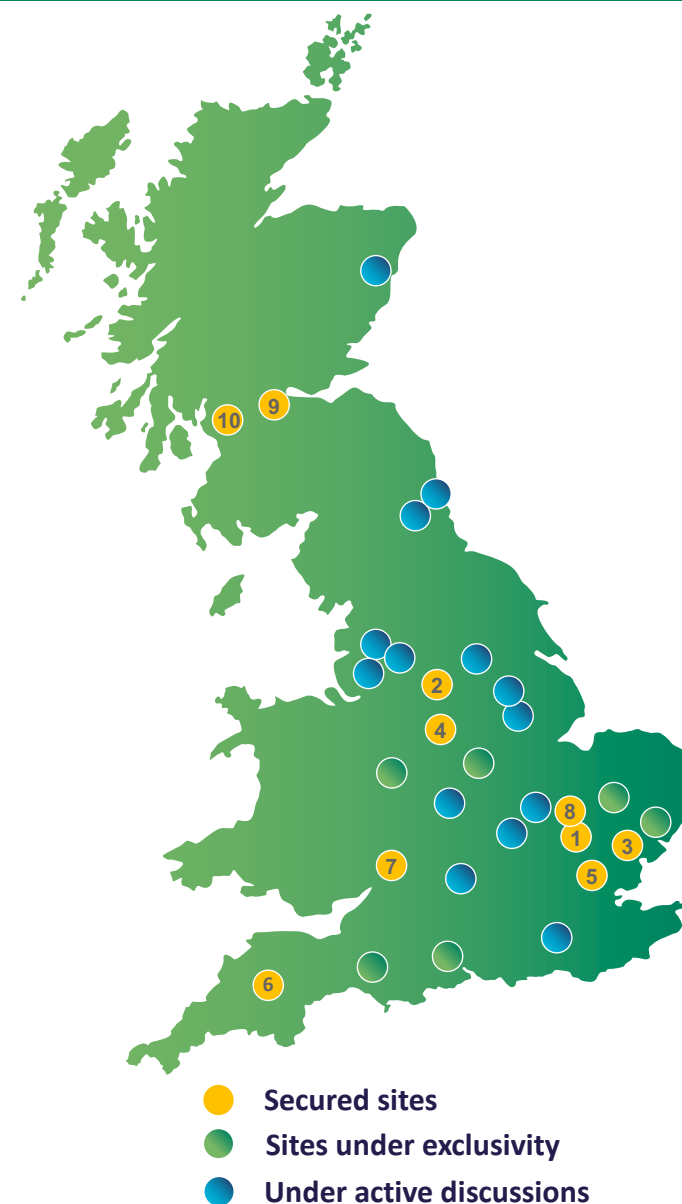
Battery storage



1. Average of the National Grid Future Energy Scenario's 2022 (FES)

# Portfolio overview

Asset		Size (MW)	Ownership	Ownership Status	Development Status	Operational Date
1	Burwell	50	100%	Operational		Jan-22
2	Barnsley	40	100%	Energised		Q4 22
3	Brook Farm	50	100%	Acquired	Construction	H1 23
4	Newtonwood	50	100%	Acquired	Construction	H1 23
5	Brentwood	50	100%	Acquired	Construction	H2 23
6	Berkeley	50	100%	Acquired	Pre-construction	H2 23
7	North Tawton	30	100%	Acquired	Pre-construction	H1 24
8	Burwell 2	30	100%	Acquired	Pre-construction	H2 24
9	Drumcross	30	100%	Acquired	Pre-construction	H1 25
10	Erskine	30	100%	Acquired	Pre-construction	H1 26
11-16	Six Sites	350	-	Exclusivity	Due Diligence	2025-28
Pipeline		760	100%			





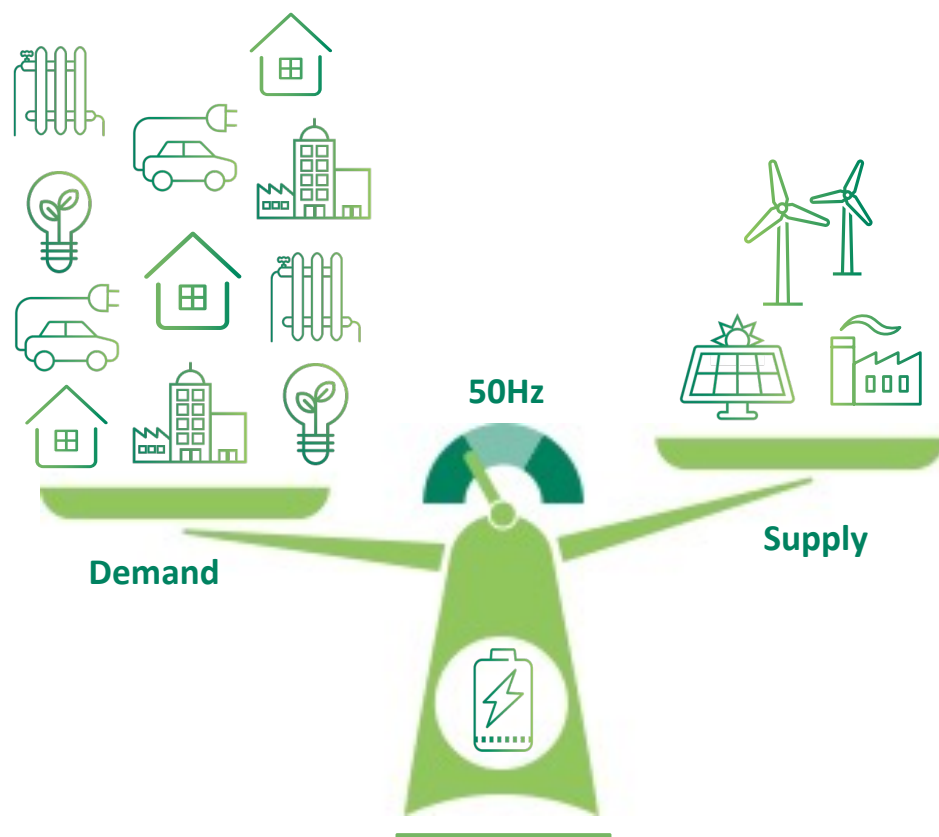
## 2. Battery overview

John Flaherty, MD Grid-scale battery storage

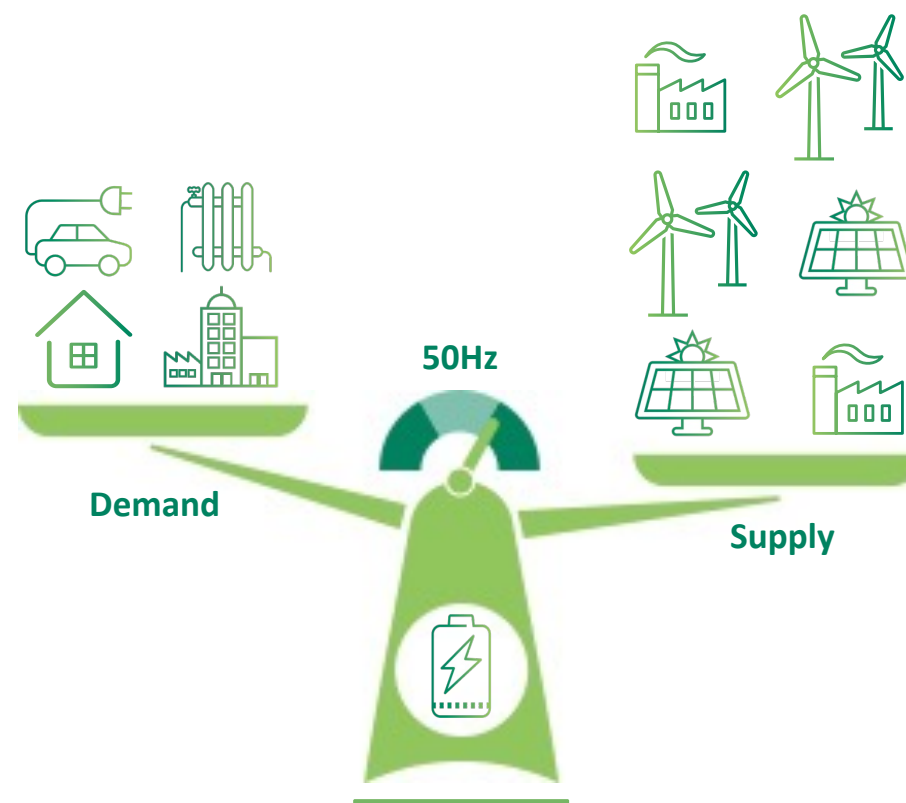


# Requirement to balance flow of energy

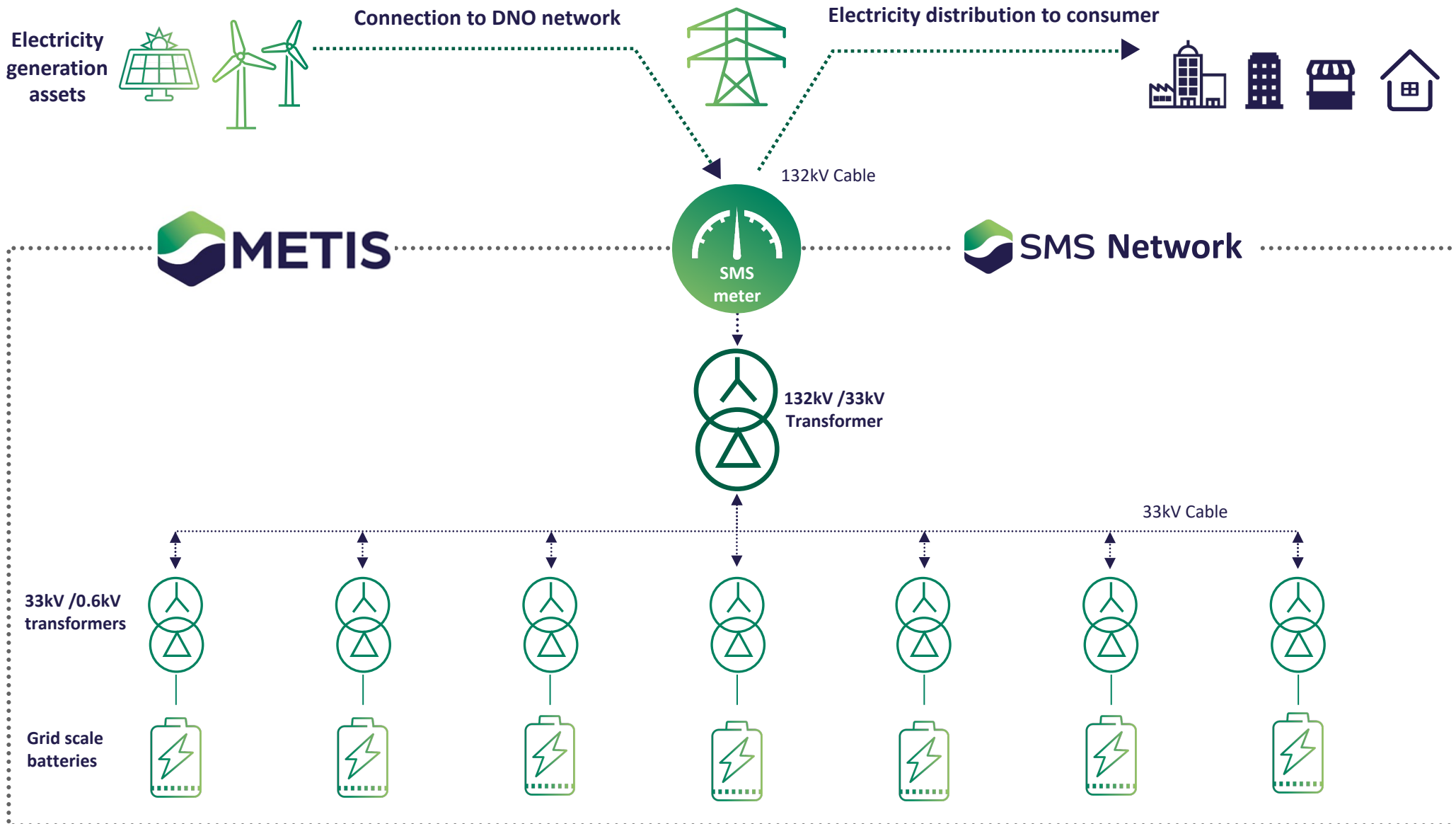
Provide incremental generation by discharging batteries



Absorb incremental generation by charging batteries



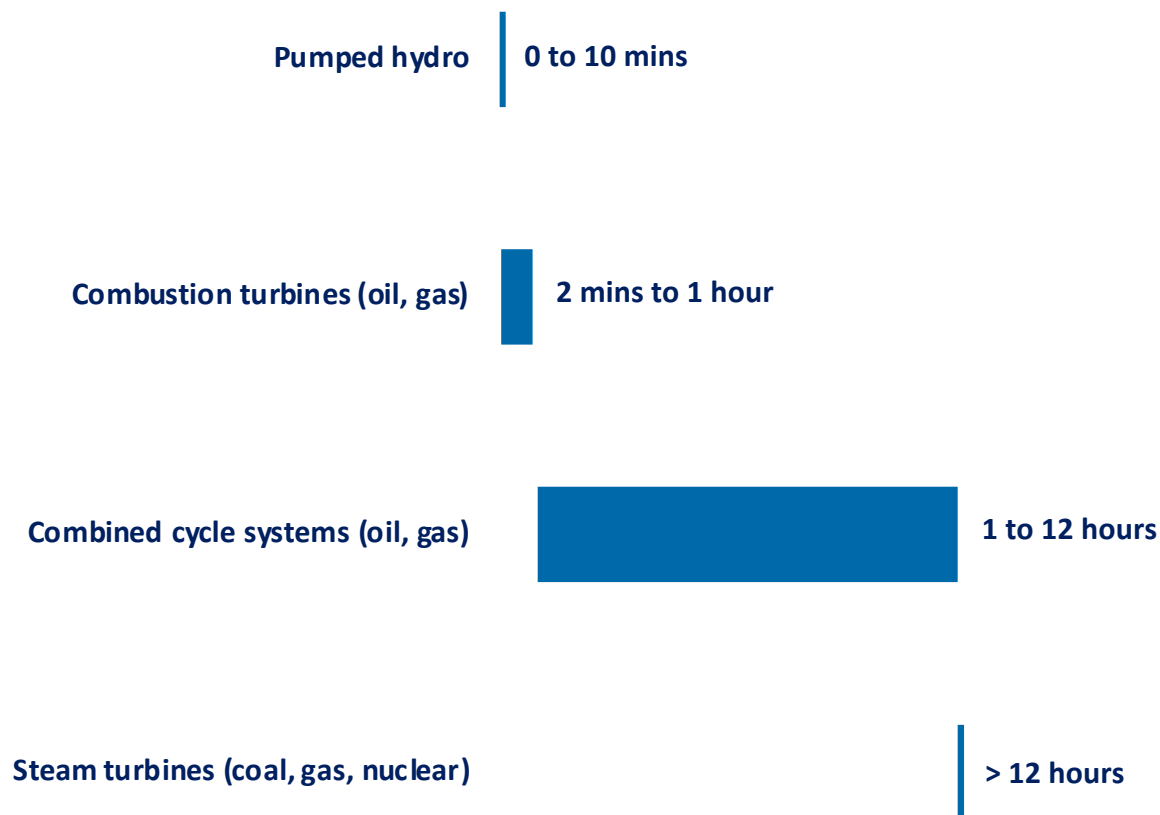
# Grid-scale battery storage infrastructure





# Batteries overcome limitations of traditional generation & storage

## Average minimum time taken from cold shut down to full load<sup>1</sup>



1 Curtailment of cheap renewable

2 Increase price volatility

3 Dependency on imported fuels

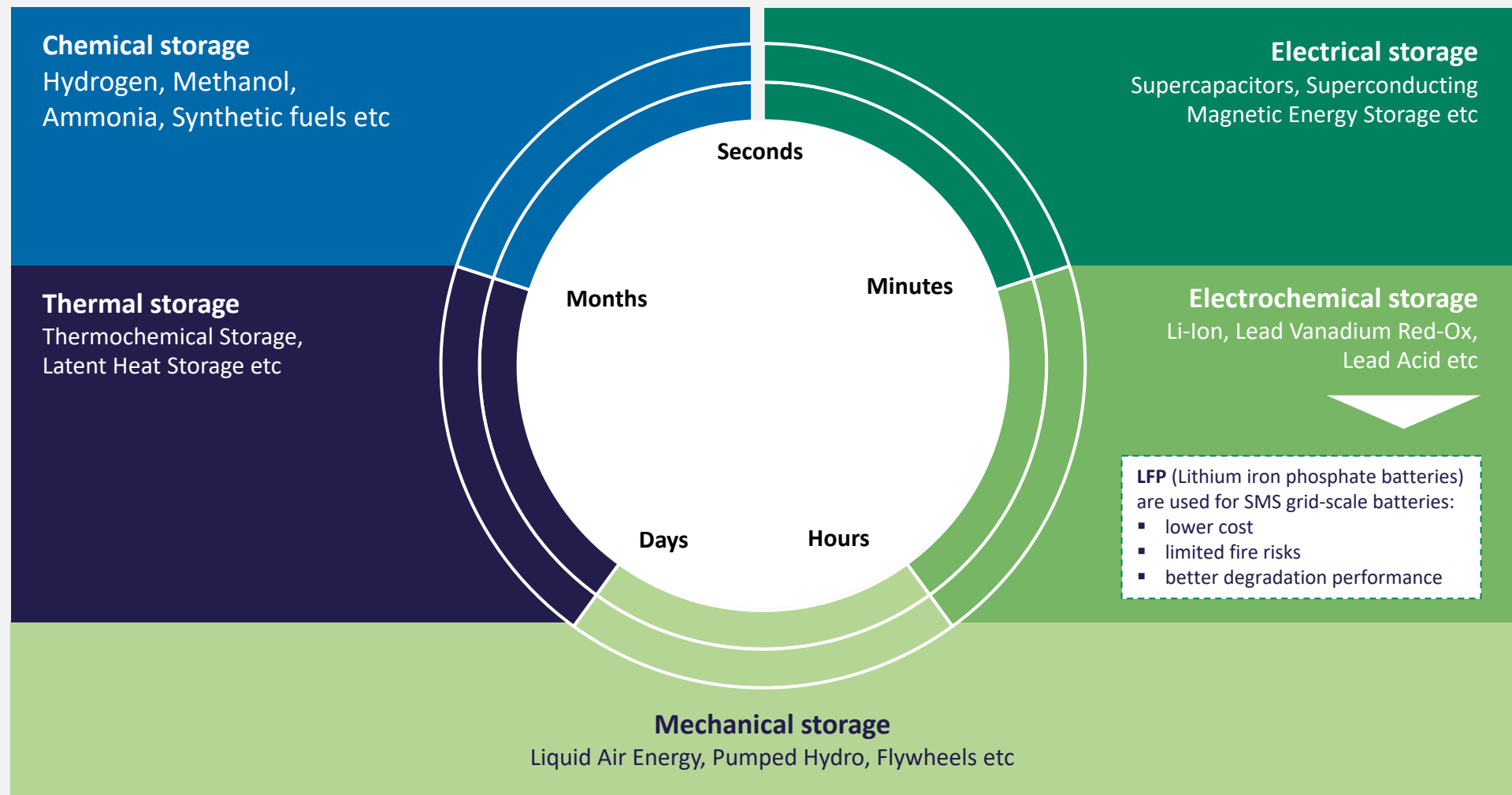
4 Risks of outages

5 Increase in emissions

Grid-scale batteries response time is <20 milli second making it suitable for voltage and frequency fluctuations

1. Source: SMS internal estimates

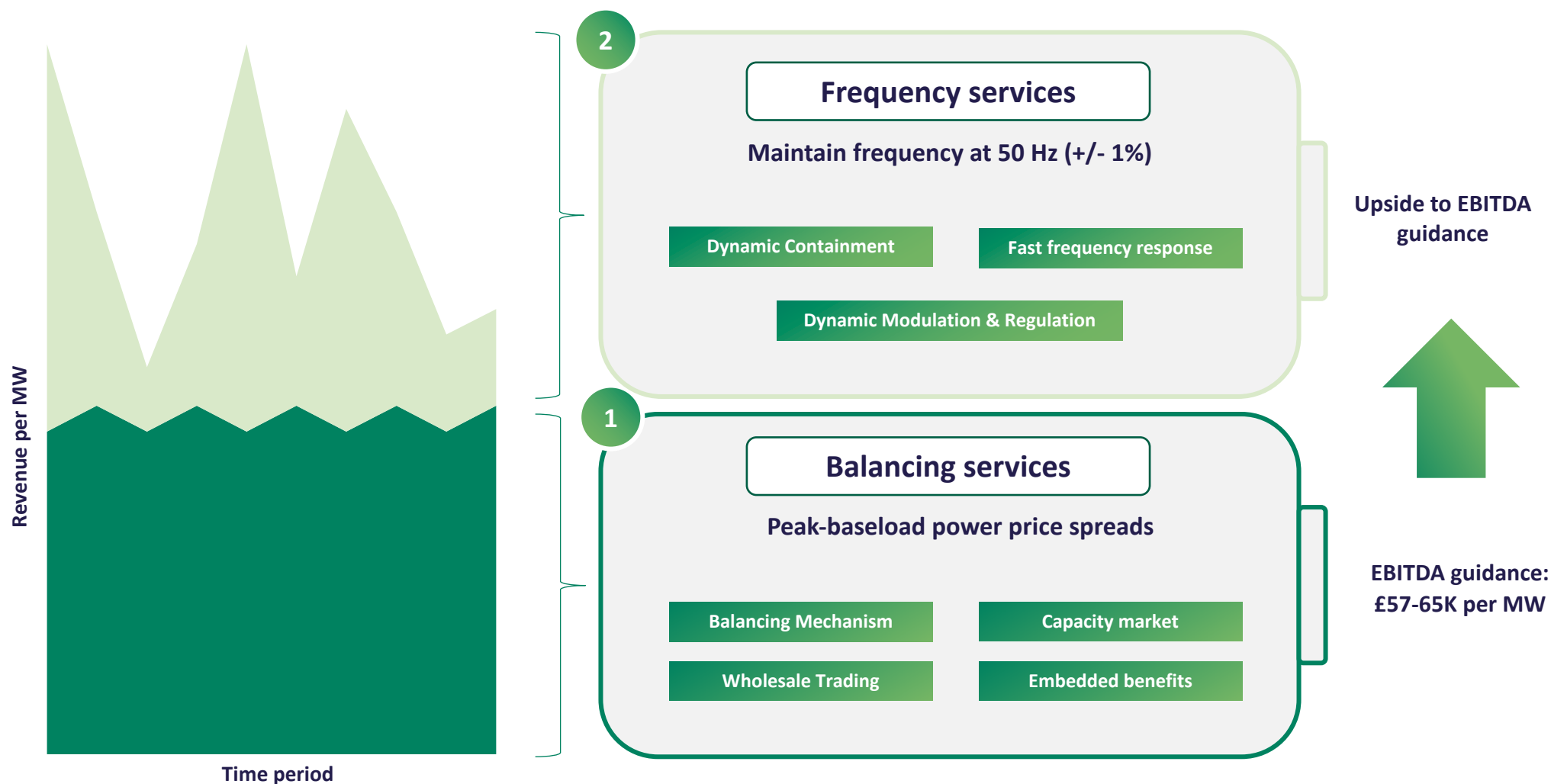
# Technology: Electrochemical (LFP) batteries best suited



Source: SMS analysis

# Revenue and EBITDA drivers

Illustrative Revenue streams<sup>1</sup>

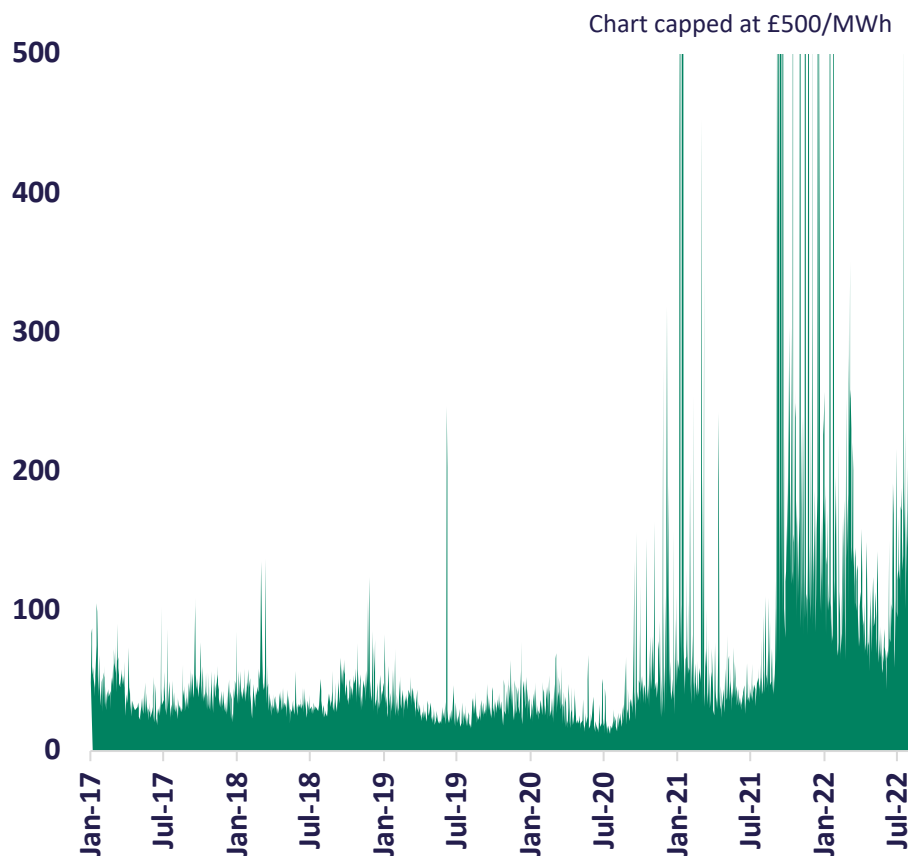


1. This chart is purely for illustration. In reality, depending on the trading opportunity and strategy, one revenue stream would be replaced by another

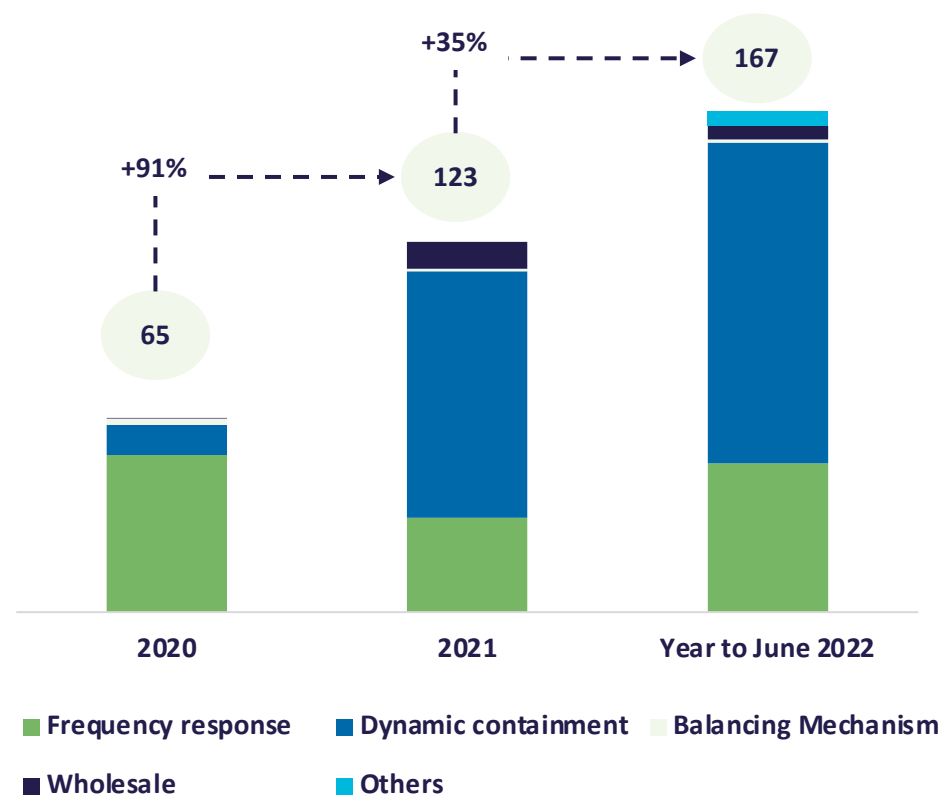


# Increased volatility has been driving strong growth in revenues

UK power price spread (£/MWh)<sup>1</sup>



Revenues of average grid-scale battery in UK (£'000/MW)<sup>2</sup>

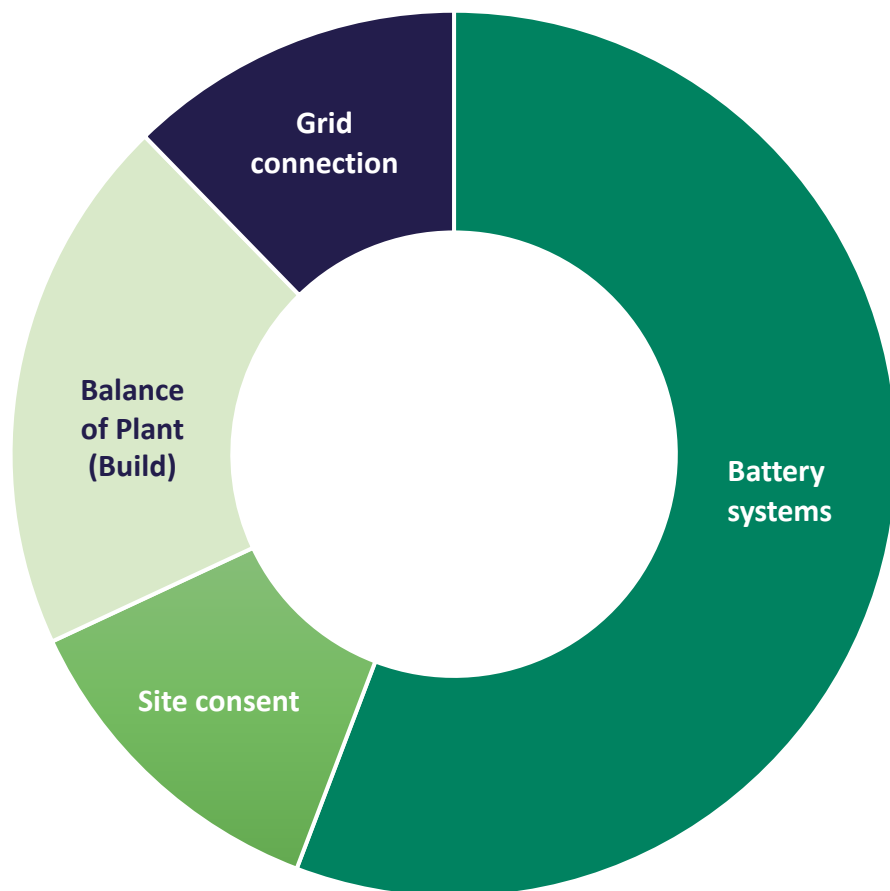


1. Source: Modo. Spread = difference between the highest and the lowest price in a day

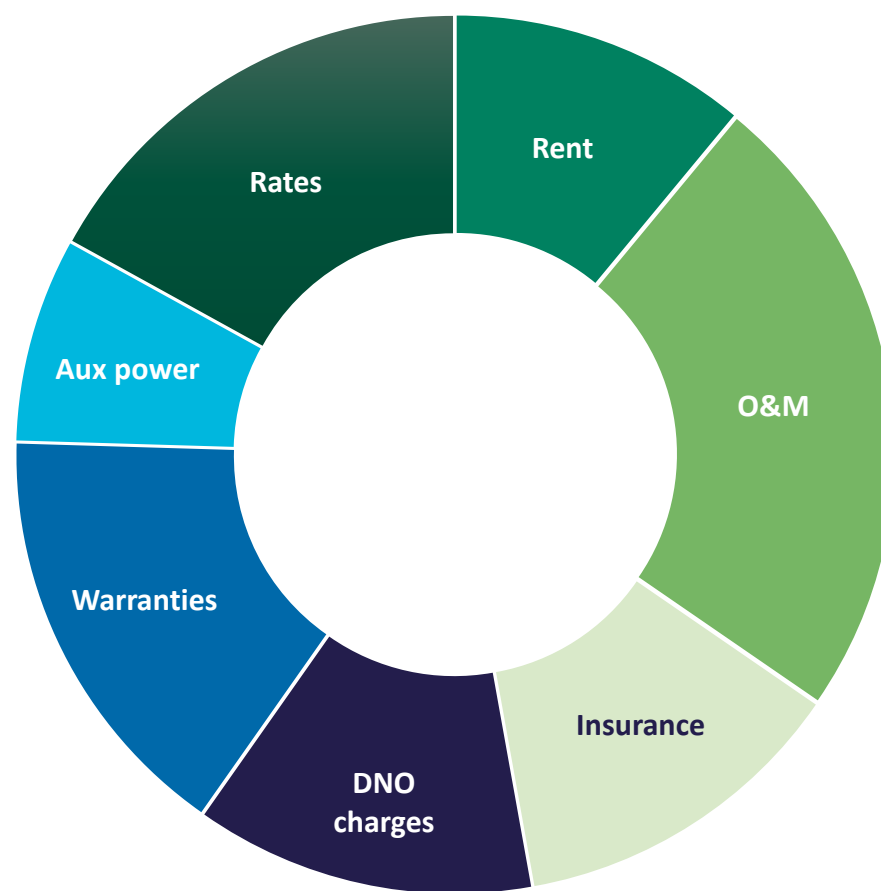
2. Source: Modo

# Capex and opex breakdown of standard grid-scale battery project

Typical capex components



Typical opex components (c25% of revenues)



# Key factors considered during battery sourcing process

## Tier 1 technology

- Highest rated suppliers for both quality and stability

## Tier 1 manufacturers

- BESS units: Trina, BYD and Risen
- Major plant: Siemens and ABB

## Warranties

- BESS warranties for availability and capacity: 10yrs
- Major plant: 5yrs

## ESG

- Externally audited by Achilles
- Employment standards, sourcing, environmental compliance

Batteries are purchased c.12-18 months ahead of energisation



# Competitive landscape

								
Origination	✓	X	✓	X	X	X	✓	X
Design, Project manage	✓	X	X	X	X	✓	✓	X
Independent Connection Provider	X	X	X	X	X	✓	X	X
Supply and install	✓	✓	X	X	X	✓	✓	X
Operate and maintain	✓	✓	X	X	X	✓	✓	X
Optimise	✓	X	X	X	X	X	✓	✓
Funding	✓	✓	✓	✓	✓	X	X	X

Source: Based on SMS understanding of the market

# 3. Balancing the grid

Barry Hatton, Director of Asset Management UKPN



# 4. Battery manufacturing and sourcing

Daniel Greten, Head of Trina Storage EMEA

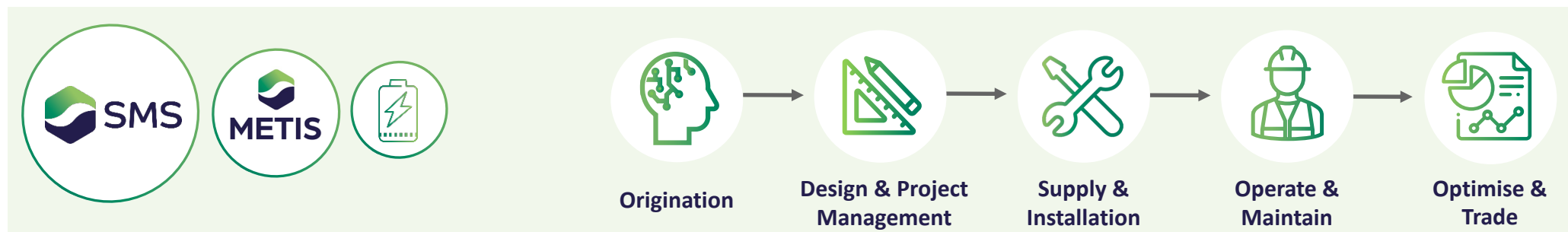


# 5. Battery lifecycle

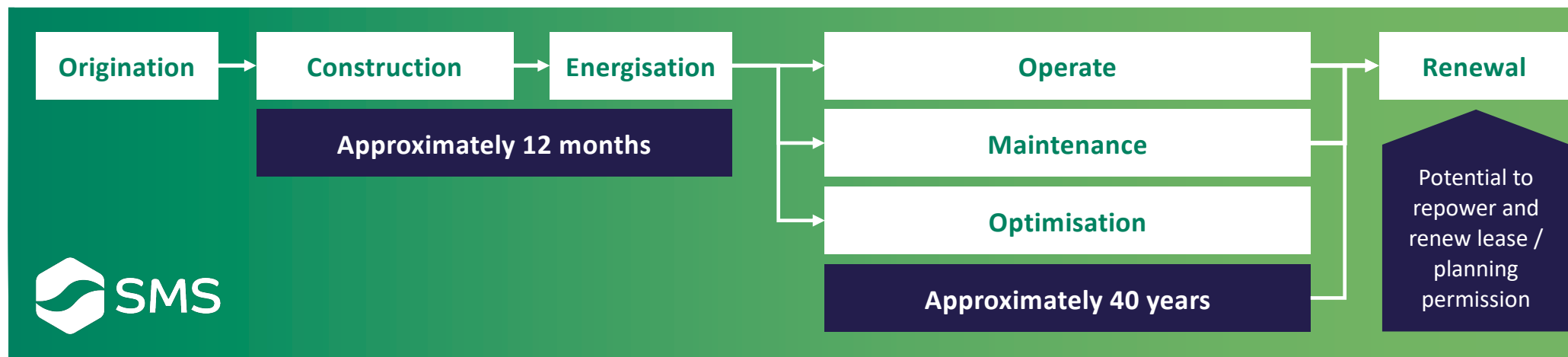
Lily Coles, Director



# Life cycle of a battery project

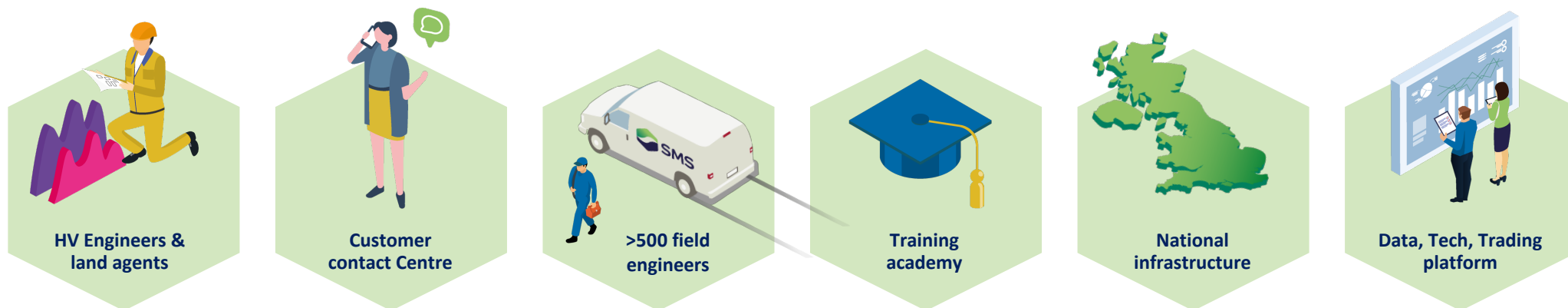
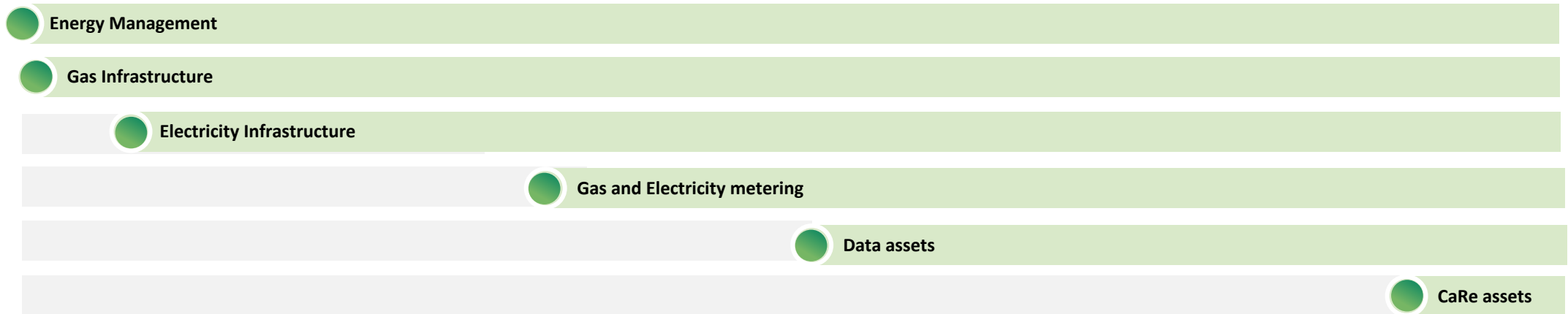


## Indicative Life Cycle Overview

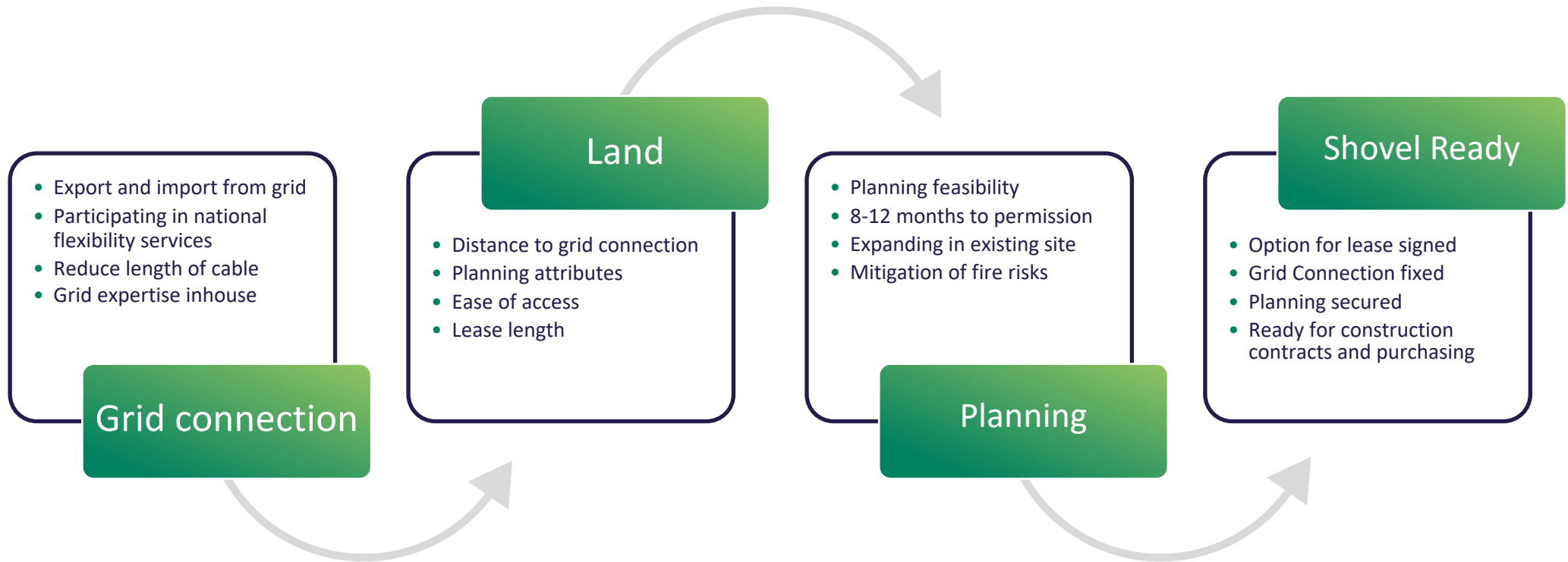




# 25 years of expertise in electricity and gas infrastructure



# Origination



**In-house origination platform with a typical site origination period of up to 24 months**

# Design and Project Management

1

Maintain and improve biodiversity within the design

2

Optimise connection to manage cost

3

Design tried and tested secure perimeters for unmanned site



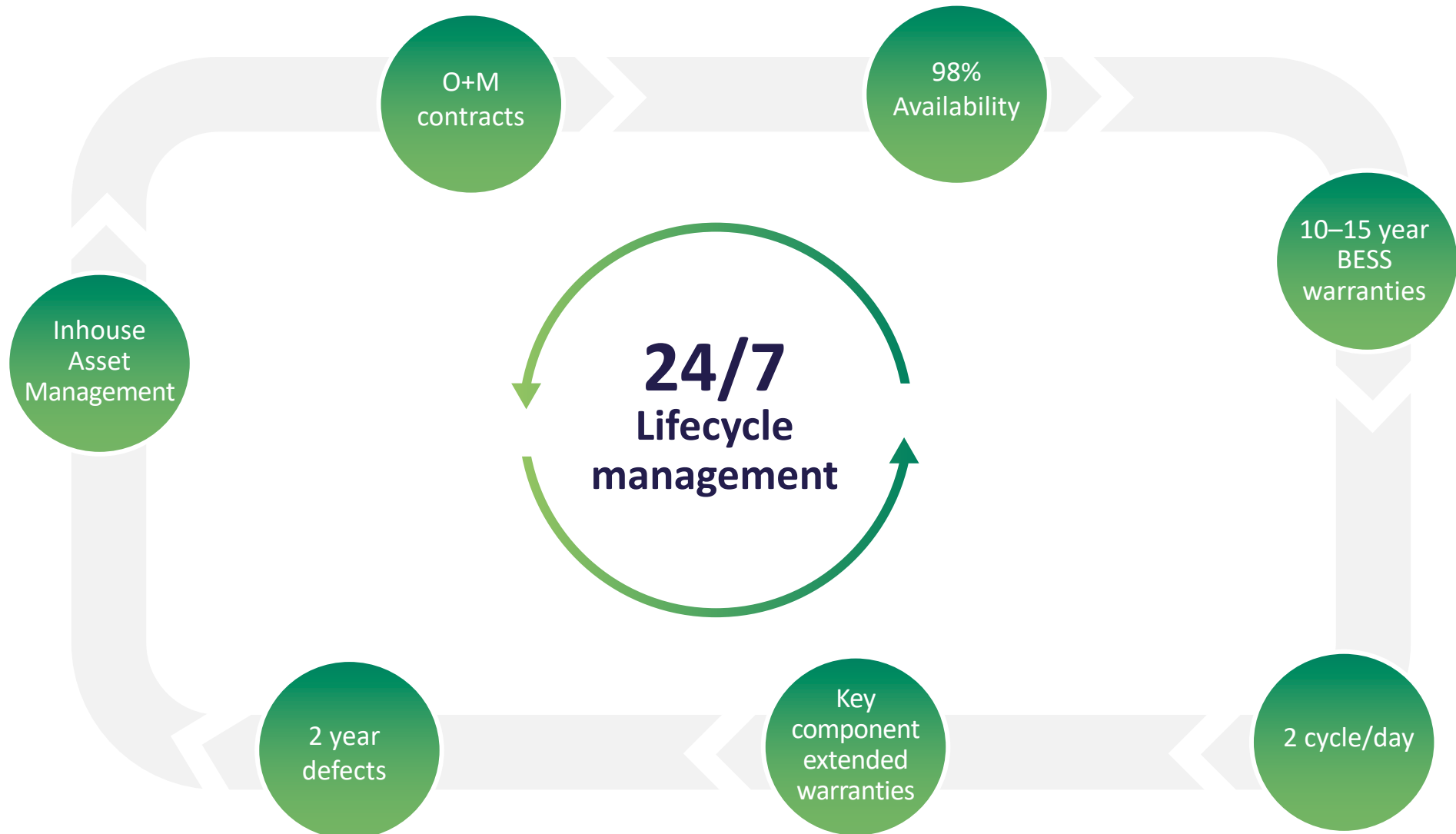
4

Manage noise levels through fencing and planting

5

Maximise MW output within footprint while  
- maintaining access  
- preventing fire propagation with spacing

# Operation and maintenance

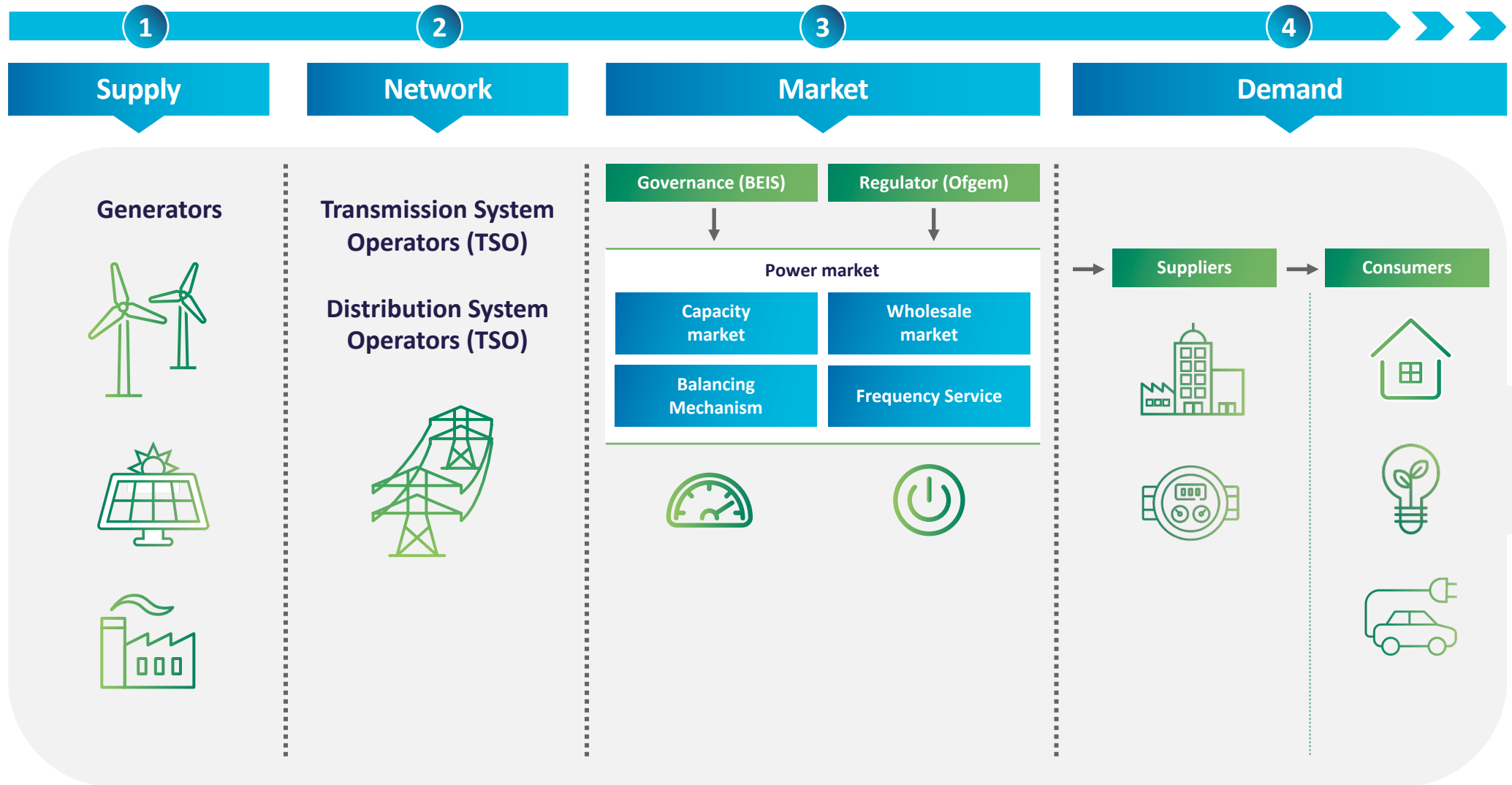


# 6. Revenue generation and optimisation

James Taylor, Director

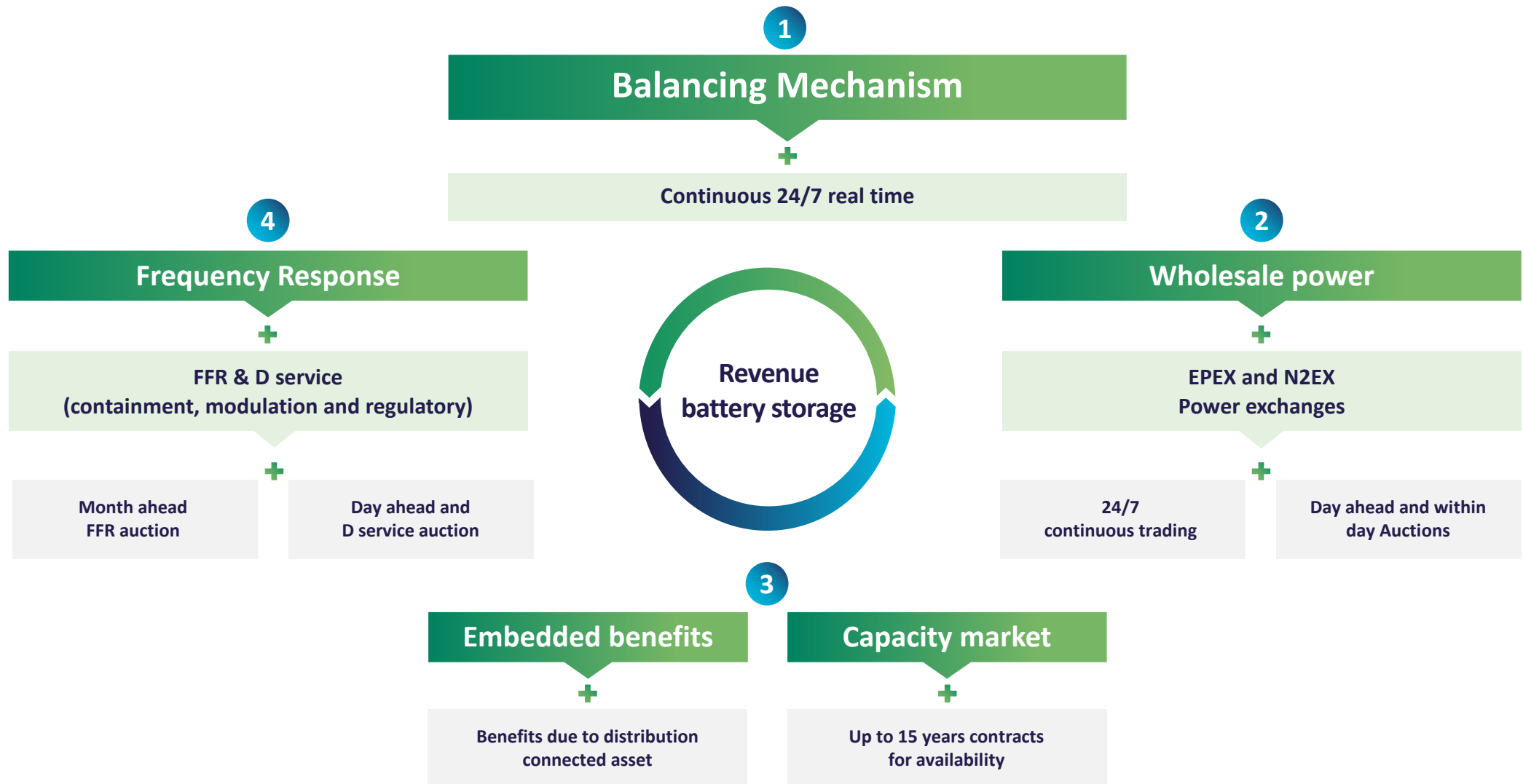


# The UK power system





# Accessing all potential revenue streams



# 7. Concluding remarks

Tim Mortlock, CEO



## 8. Q&A

