



# How to assess DSR schemes and maximise revenue?

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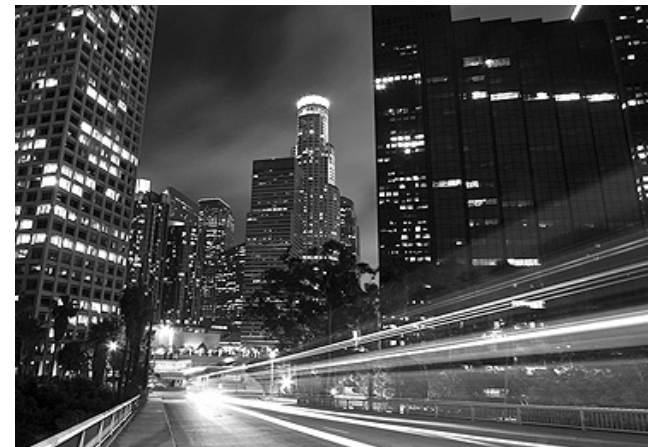
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Reputation built on results

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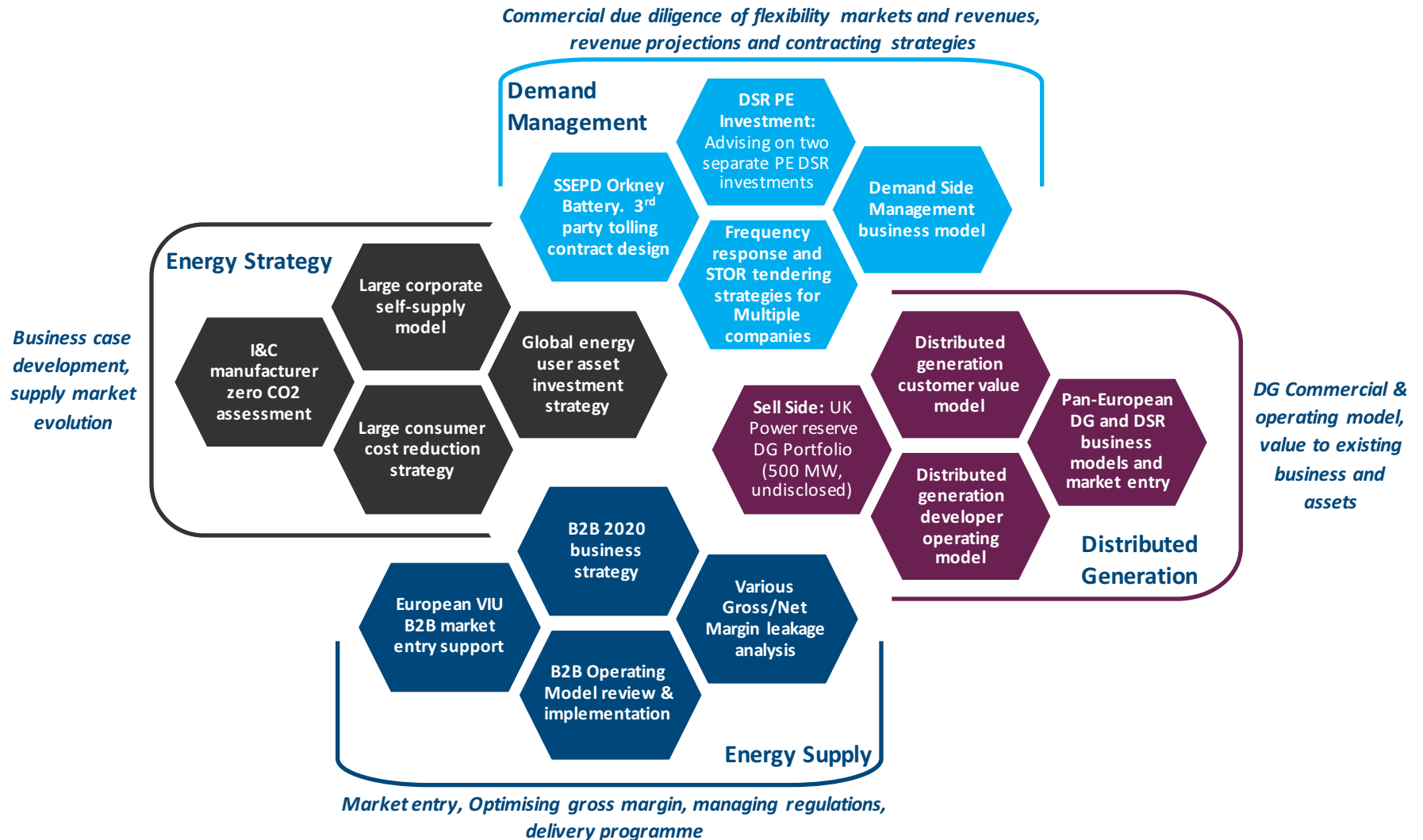
# Introduction to Baringa

- ▶ Baringa Partners LLP is a market-leading consulting company with a focus on energy, commodities and financial services
- ▶ Founded in the UK in 2000 – Baringa Partners has a market turnover of approximately €135m, with more than 450 professionals. Our German branch office has been opened in 2011 to increase support of our clients in central and eastern Europe
- ▶ Baringa Partners has a strong track record working with numerous companies in the international commodities trading markets – our capabilities and experiences extend across Oil, Gas, Power, Coal, Carbon and Soft Commodities; our clients comprise Oil Majors, Utilities, Investment Banks, Exchanges and Investment Funds
- ▶ Baringa is recognised both in the UK and internationally for its unique culture, which has been acknowledged by a number of awards and accolades and continues to reaffirm Baringa’s status as a leading people-centred organisation.



# A selection of our recent and relevant work

We have worked with governments, regulators, system operators, investors, developers and utilities to understand the new world of distributed energy (DE)



## **Monetising the value of Demand Side Response (DSR) in GB**

- What is DSR, what are the revenues available to DSR, what is their value and how are they accessed?

## **Roadblocks to the mass deployment of DSR**

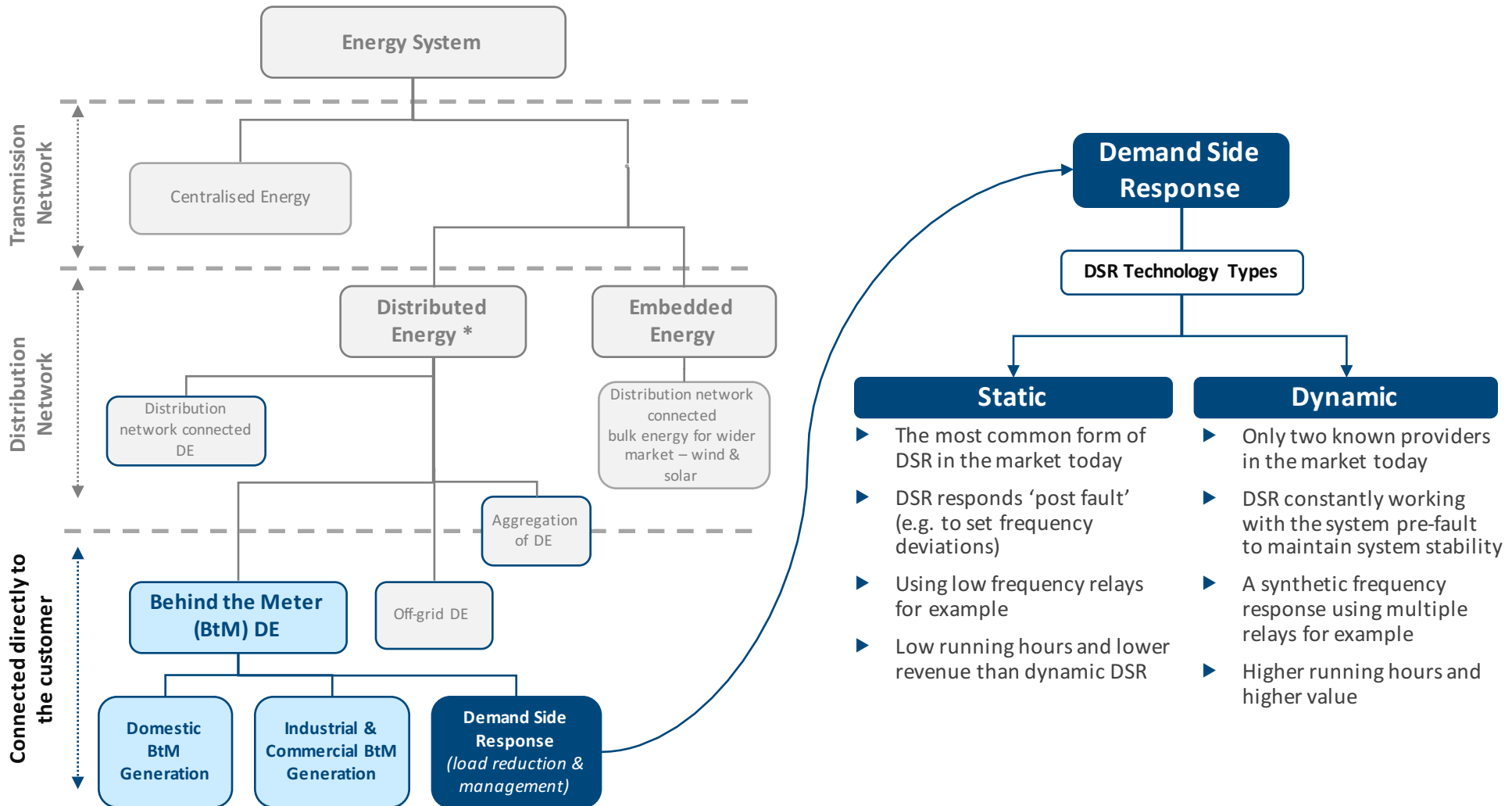
- What are the barriers limiting the deployment of DSR in GB?

## **Predictions for the DSR market in GB over the next 5 years**

- How might the DSR market evolve?

# What is our definition of Demand Side Response?

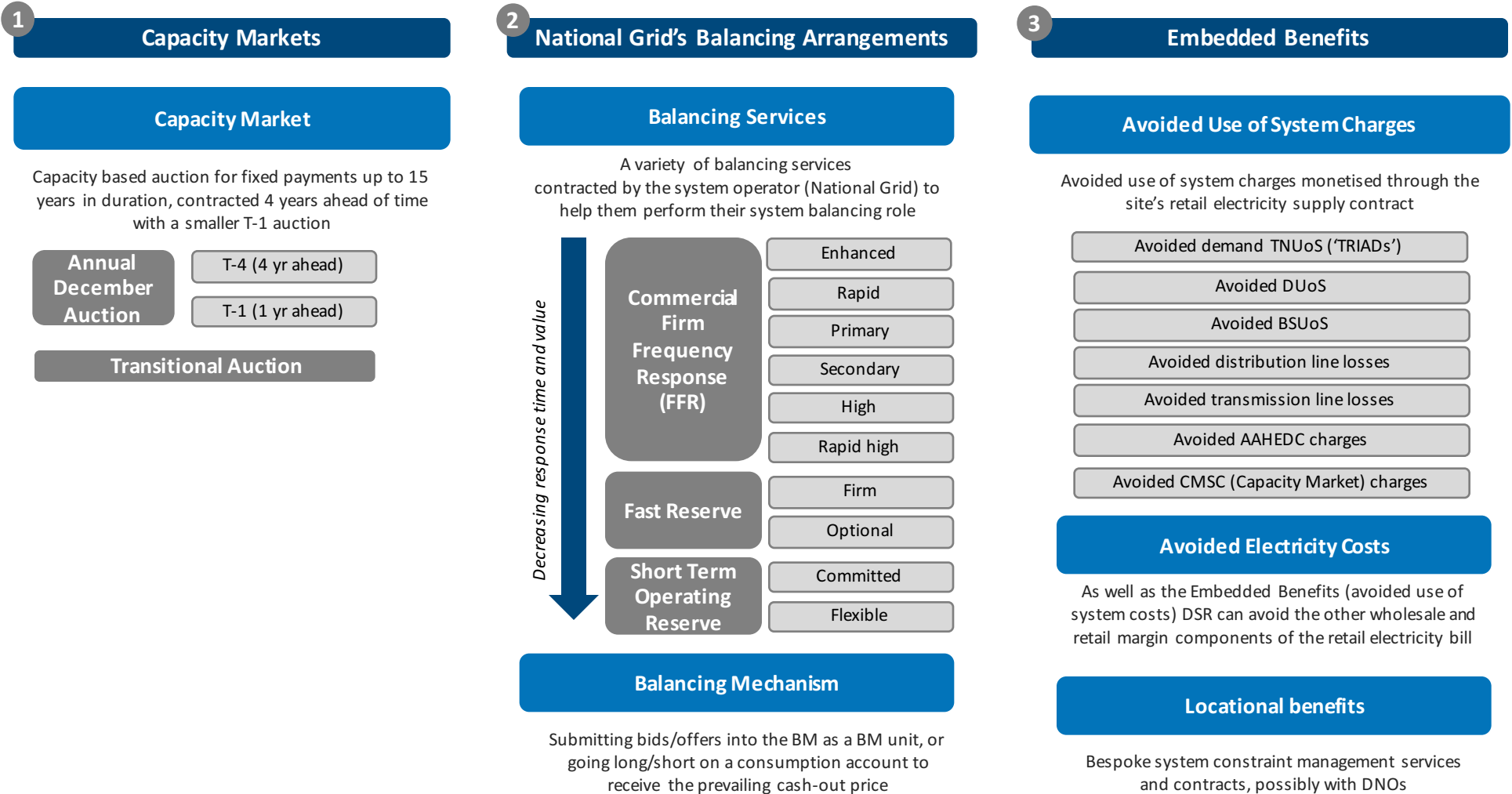
We limit our DSR definition to genuine load reduction and management, not behind the meter (on-site) generation or storage. This is important when considering the revenues DSR can access





# How does DSR monetise its flexibility value?

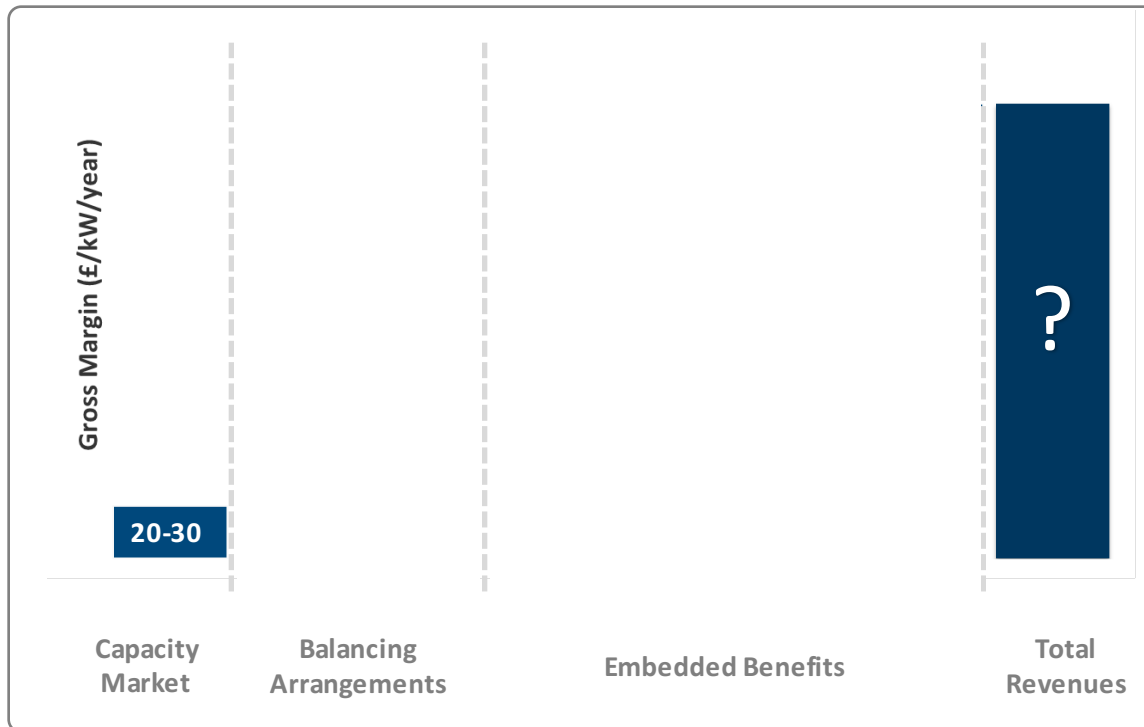
The revenue streams available to DSR can be broadly categorised as Capacity payments, Balancing Arrangements and Embedded Benefits



# Capacity Market Payments

The Capacity Market offers a fixed annual payment to DSR, though concerns remain around testing requirements

- ▶ CM payments are one of the low risk revenue streams available to DSR, though CM revenues have some year on year volatility, and CM payments have potentially onerous response duration requirements
- ▶ The 2014 CM auction cleared at £19.40/kW, the 2015 auction at £18/kW and the 2016 transitional auction at £27.5/kW



## Key Considerations

### Market Access

Contract with Capacity Market Delivery Body (National Grid) although energy needs to be accounted for either through trading directly or via a supplier

### Tech Limits

2 MW de minimis threshold (possibly aggregated). Need to be dispatchable during periods of system stress for potentially indefinite periods

### Key Risks

The out-turn price is unknown and may be volatile within years. The number of auctions is also unknown

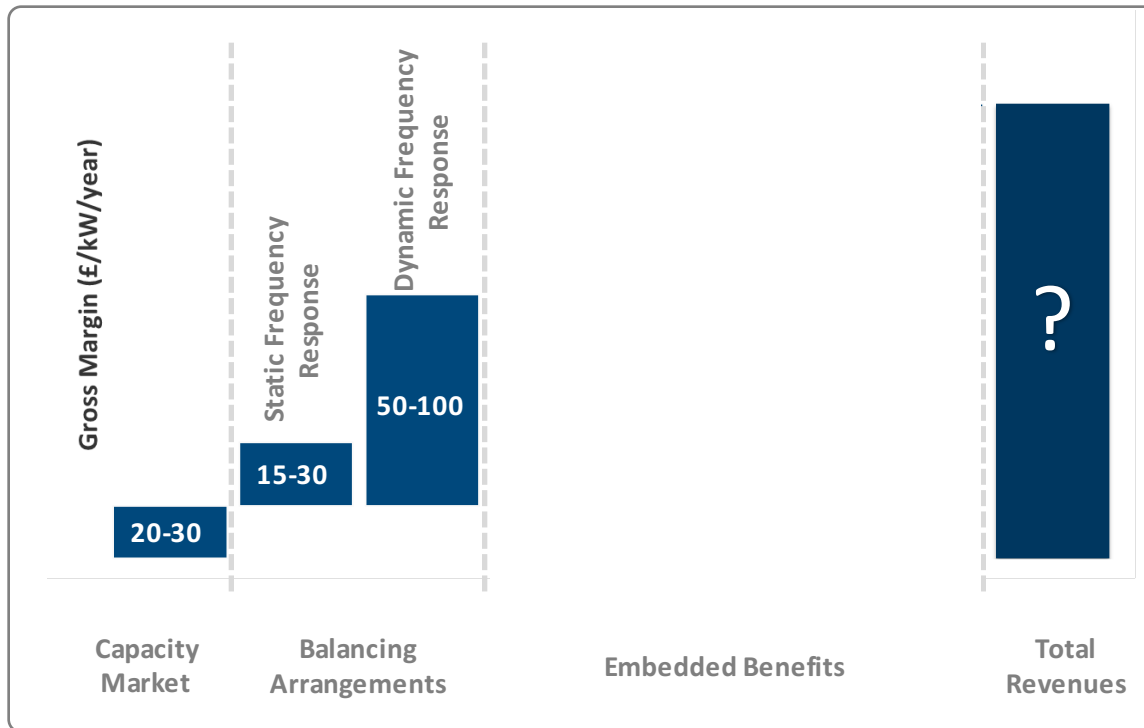
### Competitors

T-4, T-1 and transitional auctions will be competitive pay as clear auctions

# Balancing Arrangements

National Grid as the System operator procures a suite of balancing arrangements with fast response time plant to help manage system stability in real time

- ▶ Balancing Services are the principle revenue stream of commercial DSR. Each of the Balancing Services have different response times, de minimis thresholds and revenues which make them more or less attractive to DSR
- ▶ Frequency Response (contracted with National Grid) is the most attractive of the Balancing Services available to DSR in the market today, requiring response within 10-30 seconds, depending on the reserve being provided, either dynamically or statically, contracted monthly for up to 23 months in duration
- ▶ National Grid offers multiple 'incubator' type products to DSR, such as 'FFR Bridging' and 'STOR Runway'



## Key Considerations

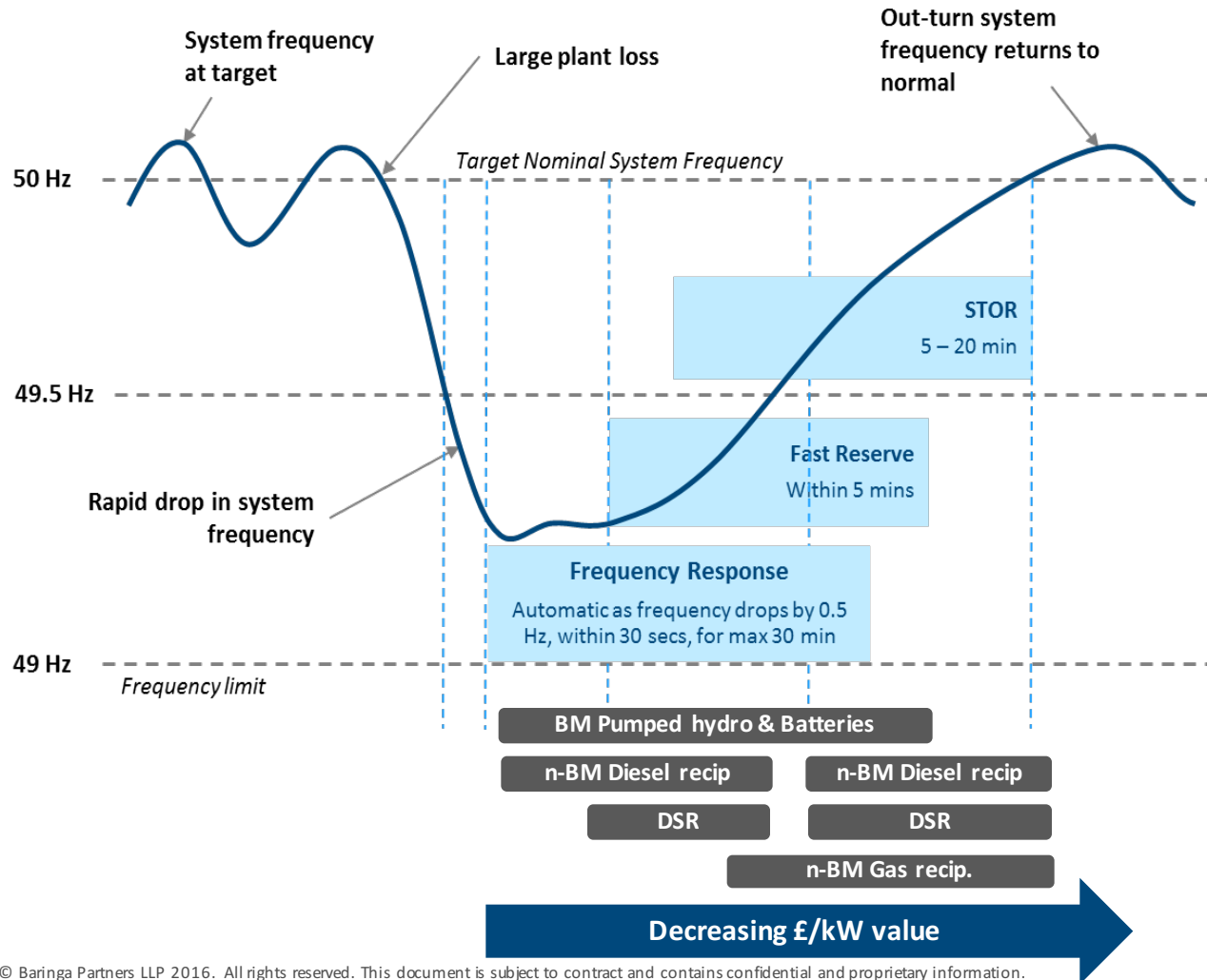
	Revenue (Market value)	Market Volume (MW)
STOR	£15 – 35/kW (£52 - 98 m/annum)	Up to 3,000 MW Accepted
Firm Fast Reserve	£60 – 80/kW (£10 -15 m/annum)	400 MW Accepted <i>(With an additional bi-lateral market)</i>
Commercial Frequency Response	£40 – 150+ /kW (net) (£65 m/annum)	600 MW Bi-Lateral 600 MW Primary 1,000 MW Secondary



# Illustrative imbalance event

National Grid dispatch a series of balancing services through an imbalance event, paying a premium for services with the quickest response time

## Illustrative System Energy Imbalance Event

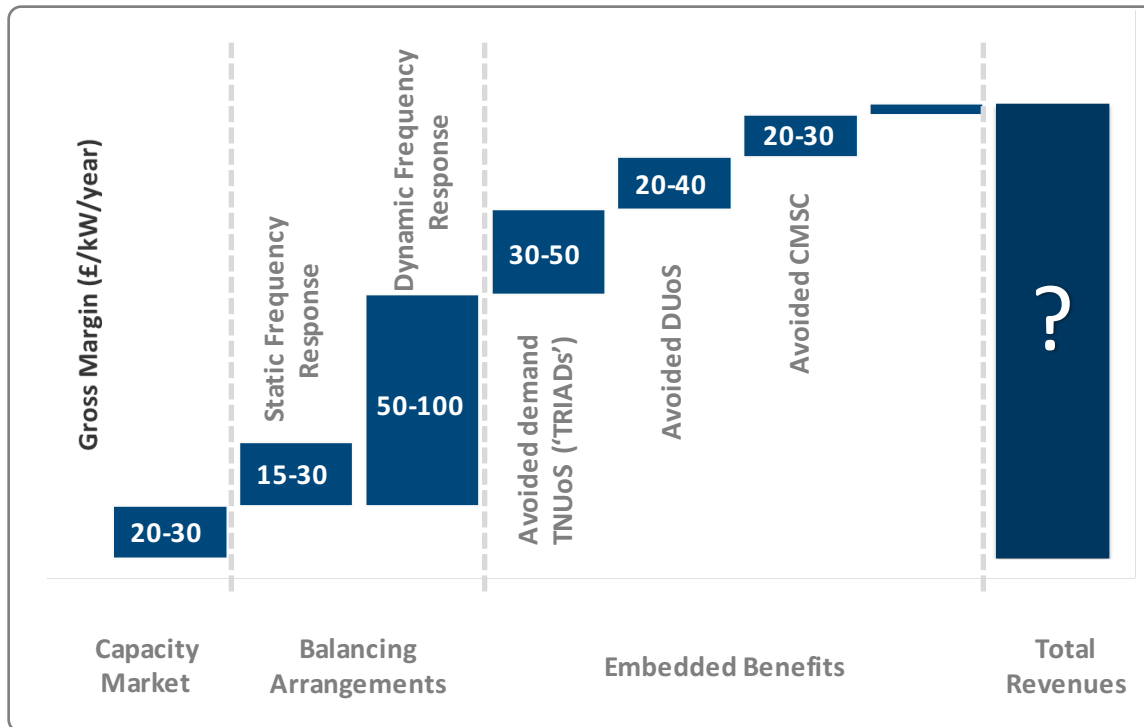


- ▶ National Grid requires this spectrum of Balancing Services to increase resilience across different types of imbalance event, but also to alter between differing products as the system is brought back to equilibrium
- ▶ There is a price premium paid for rapid response services that National Grid may not want to use for the full imbalance period, switching to cheaper but lower response time products that it can utilise for longer as the system equilibrium is reached
- ▶ There is an incentive scheme in place for National Grid to dispatch Balancing Services in an economically efficient manner

# Embedded Benefits

Owing to the high costs of transporting electricity through the grid during certain periods, the benefit of avoiding use of system charges can be quite high

- ▶ DSR allows customers to avoid some of the use of system costs passed to them through their supplier. Demand TNUoS ('TRIADS') is charged during the three periods of peak demand, DUoS during the evening 'Red-Band' periods, typically 4-7pm, and CMSC similarly in the winter evening peaks
- ▶ If DSR reduces load during these periods it saves the electricity supplier a cost
- ▶ **Note that these benefits critically accrue to the electricity supplier, and not directly to the DSR company or the customer**
- ▶ Embedded Benefits are under considerable scrutiny by Ofgem and DECC, though DSR is to some extent protected from many of the proposed changes



## Key Considerations

**Avoided Demand TNUoS ('TRIADS')**  
Necessitates the accurate forecasting of 3 peak demand periods  
Considerable policy risk

**Avoided DUoS & CMSC**  
This would necessitate that the site reduces load for ~3 hrs each day

All these revenues accrue to the site's electricity supplier, not the DSR company, necessitating additional revenue sharing contracts

Market pricing today returns most of these revenues to the customer, with the electricity supplier likely taking a share before the DSR company receives any revenues

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## Predictions for the DSR market in GB over the next 5 years

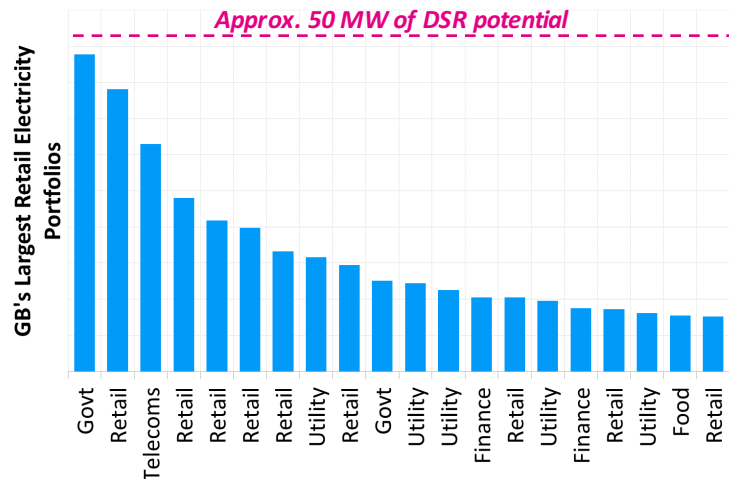
- How might the DSR market evolve?

# Roadblocks to Mass Deployment of DSR

While the revenue contracting is complex, there are strong price signals and reasonable commercial certainty for DSR. However, there are other more fundamental barriers to DSR

## 1 Getting Market Share

- ▶ In GB there are a finite number of large DSR portfolios to pursue
- ▶ The cost of sale increases dramatically as DSR companies target individual one off sites
- ▶ In particular if the DSR company has low brand recognition and needs to displace an incumbent utility



- ▶ While the economics for individual sites might be high, the cost of sale and management costs of the customer might make the proposition unattractive

## 2 Returns to the Customer

- ▶ While the £/kW economics for a MW of DSR might seem attractive, savings as a % of total energy spend might be small
- ▶ A typical I&C DSR customer saving could be 1-3% of their annual electricity bill, or £5-15,000/year for a site with 1 MW of load

## 3 Accrual of Revenues

- ▶ As mentioned already, the avoided use of system revenues (embedded benefits) accrue directly to the site's electricity supplier, not to the DSR company or to the customer
- ▶ If the DSR company doesn't hold the site's supply contract they need to have a separate contract with the supplier, which may prove commercially challenging

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# How might the DSR market evolve over the next five years



As price signals continue to increase interest in DSR the technologies and aggregation models deployed will become more sophisticated. Though the most attractive sites will be captured very quickly

## 1 Existing Utilities Will Look to Offer DSR to their Existing Retail Customers

*This is a defensive move to protect new entrant DSR companies from taking their retail market share, and offensive as it is a profit making opportunity*

## 2 DSR Companies Will Look to Become Retail Electricity Suppliers, or Form Strategic Partnerships with Suppliers with I&C market share

*Retail electricity supply and DSR aggregation will be one pre-packaged offering to the customer*

## 3 The Emergence of More Sophisticated DSR Technology and Aggregation Offerings

*Dynamic DSR provision will increase, along with the smart aggregation and control of assets with different response times in virtual power plant. This will create a unique differentiator for nimble new entrants compared to established incumbents*



