



# The Future of Short-Term Power Trading in Europe

**BRADY.**



## Introduction

Energy market landscapes continue to change at pace across Europe and across the globe. Prior to the global coronavirus pandemic, the proportion of energy generated from renewables was increasing consistently. The pandemic accelerated this pace, energy demand reduced, whilst renewables and other low carbon sources remained constant.

In this paper, we introduce the concepts of flexibility trading in short-term power markets and explain how markets are evolving. We use the GB markets Future Energy Scenarios (FES), published by the National Grid, as a framework document to discuss the sources of flexibility. However, the FES focus is on grid balancing and infrastructure build out. We focus on how energy market participants commercially balance in this exciting new world.

In this paper you will learn:

1

How the grid was balanced and what has changed in the last two decades

2

Flexible asset types and what you need to consider when setting up a short-term power trading desk

3

Inflexible asset types that you need to trade to reduce the costs of intermittency / inflexibility

4

Future considerations as the market continues to evolve

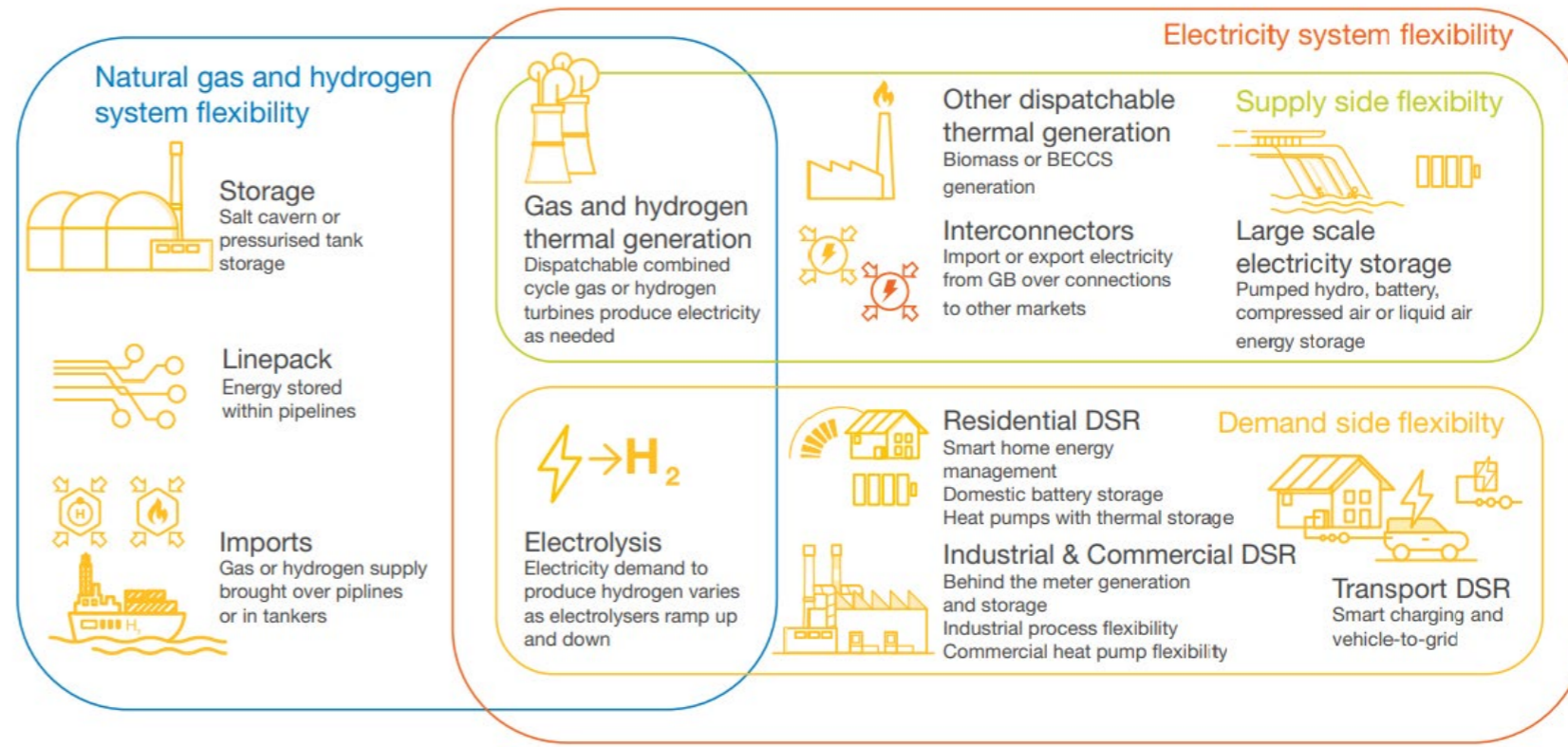


## Future Energy Scenarios

In the GB market, National Grid's FES provides an excellent platform on which we can consider how energy will be balanced.

The Summer 2020 publication contains a section for flexibility upon which we will build our vision for future short-term power trading scenarios, which from now on we will refer to as 'Brady Future Trading Scenarios'.

Whilst the FES considers the GB market, Brady Future Trading Scenarios is applicable to energy markets across Europe.



Source:  
National Grid – July 2020 Future Energy Scenarios  
[www.nationalgrideso.com](http://www.nationalgrideso.com)



## New ways to make profit

Power generation asset classes are evolving fast. New commercial opportunities lay ahead for market participants to seize. Trading desks need to adapt to take advantage of the flexibility afforded by these asset types for profitable outcomes.

Below, we provide an overview of the diverse asset classes available today and their varying levels of flexibility for trading.

### + Traditional Dispatchable Generation

Dispatchable generation remains a great source of flexibility. They include Gas powered Combined Cycle Gas Turbines (CCGTs), Coal-fired Power Stations (Coal) and many other existing sources of generation<sup>1</sup>.

Many of these power stations were never built for short-term flexibility but their high ramp rates (rates at which they can increase and decrease load), high levels of headroom and footroom (total amount that they can turn up or down) as well as their provision of system inertia (the weight of their big spinning turbines) means that they are now a great source of flexibility.

### + Battery Storage

Storage is fast becoming the 'go to' asset when considering flexibility trading. Most storage assets being built now are in the region of 1-hour to 2-hour duration (GB market), which maximises the forecast returns when considering short-term trading.

Batteries also help balance in real-time, as they can provide ancillary services such as primary frequency response as well as offer balancing contracts directly to the system operator.

<sup>1</sup> Other tech includes hydro, wind (turn down), nuclear, lignite and pumped storage



### + Industrial Demand Side Response (DSR)

Industrial DSR has been available across many markets for several years. Interruptible or variable processes can be varied to allow sales into reserve or wholesale markets. In the GB market, the TRIAD scheme has operated for circa 20 years sending a price signal to help balance the system.

Industrial DSR favours markets that are low probability activation (with a standby fee) that means that process interruption is minimised whilst income certainty is maximised. However, many manufacturing sites with backup generation (traditionally diesel generation) have seen their flexibility offerings reduced due to clean air requirements.

### + Residential DSR

As homes become smarter, coupled with the inclusion of batteries in domestic solar offerings, residential locations are offering increasing flexibility. Whilst individual homes are small, many added together can create significant balancing actions. More interactions with the supplier and improved integration into smart meter data will help this market expand.

### + Vehicle to Grid (V2G)

V2G is the ability of an electric vehicle (EV) to modulate its charging on a price signal. This can vary from simply not charging at the most expensive parts of the day, to more complex offerings such as discharging the car battery back into the grid or changing charge rates second by second and offering primary reserve services. With the expansion of EVs, this is expected to be a vast source of flexibility.

### + Hydrogen

Hydrogen production is a very exciting new market. The process of separating a substance (water) using electricity is known as Electrolysis. The resulting gases (in the case of water - hydrogen and oxygen) can be used as fuels and recombined back into water. Hydrogen production methods are at their heart flexible, with the operator deciding how best to balance electricity system needs with their needs to produce hydrogen fuel.

### + Buyers of flexibility

Through this process we should not forget one group of participants, energy market consumers and generators who need to purchase flexibility. These are not considered explicitly in the FES but are an equally important driver as, with all trades we need a buyer as well as a seller. These participants may supply residential power, operate intermittent assets (like wind farms) or operate unreliable assets (i.e. older dispatchable power stations). Their major concern is the ability to keep their costs low.





### Future challenges to address





## RELIABILITY

As decarbonisation progresses and larger dispatchable plants are used less frequently, short-term power trading alone will not be sufficient to keep these stations running. Asset operators will need to consider whether to “mothball” (put into a longer-term storage state) or gamble on being available for short-term price spikes.

In 2016, early closure of coal plant in GB led to a high-priced product being created in haste. The need for a Supplementary Balancing Reserve (SBR) is now recognised to ensure clearer price signals and avoid unpredictable spikes.

A clear ability for traders to **stack** long-term and short-term **revenue schemes** will be key for modern trading desks.



## TRANSPARENCY

With new forms of flexibility entering energy markets, one of the most difficult challenges will be how to work out how much flexibility has been given. For charging EVs, we would need to know how much we expected to charge and how much wholesale energy has been bought to cover this profile before we can offer flexibility (i.e. not charging our cars) to a system operator. We would need to understand whether manoeuvres create imbalance charges further up the value chain and these must be priced in. If customers offer to increase demand, we need to price this additional power usage or credit their accounts at rates higher than their tariff to compensate.

Modern, fast and transparent **position management software** will be needed for energy suppliers, local aggregators and EV charging facilitators to manage system balance.



## PRICE SIGNALS

Giving customers the ability to price flexibility will be key to getting new players to enter the flexibility market. Large energy consumers can already look at the business costs of interruption and price this into flexibility (for periods of undersupply). However, we saw weekend negative prices becoming more prevalent in 2020 under the coronavirus pandemic. Can these businesses shift production from weekdays to weekends for “free power?”. The entry of hydrogen production will require producers to accurately model the value of their inventory into their ability to meet their supply contracts. Accurate inventory price modelling combined with a good forward price curve (to catch up) will allow these producers to offer significant flexibility.

To thrive in these new short-term power markets energy traders will need to link their marginal costs of production / non delivery directly into their trading strategies. For this, they will need a **trading platform** that models industrial production such as storage assets.



## LOCAL MARKETS

Traditional market designs are based around competition at the transmission level and regulated markets at the local level (due to a historic lack of competition). However, the move to decentralised power production means that competition for local power can allow competition and hence market forces at local levels.

This means that an energy consumer or producer will have the ability to trade their energy at a national level as well as at a local level. There is currently some great work by Electron (<https://electron.net/>) and Nodes (<https://nodesmarket.com/>) on this trend. The ability to manage positions in cascaded markets and understand how to **balance multiple positions** will be key to future traders.



## VALUE PROPOSITION

One of the key blockers to the take up of flexibility trading in non-traditional assets has been the low value perception versus the cost of market entry. Two key barriers to entry will need to be lifted to help expand the market. Firstly, the value proposition needs to be compelling; for example, the current value of V2G (the ability of an EV to discharge back into the grid) is only marginally better than the value of V1G (the ability of an EV to just stop charging based on a price signal).

Clearly, owners of brand new EVs are less likely to risk their “pride and joy” cars with V2G if smart charging with V1G offers similar returns. The market needs to offer better returns.

Secondly the cost of market entry with trading software and trading desks is high with the need to purchase several on premise systems and large CAPEX expenditure. To reduce this barrier to entry a **holistic, SaaS trading system** offering availability within weeks not months is needed for traders of new value streams.



## MANAGING RISK

The typical energy participant is a buyer of flexibility. Residential consumers pay for flexibility by paying their supplier prices far higher than the wholesale price for constant power. Renewables producers sell their output at below market rates because they are intermittent – i.e. the opposite of flexible. As the value of flexibility increases, the costs of price volatility (when prices go up and down) will hit the simple consumer and reward the smart customer. Having the right systems to trade towards a better price will be key.



The meet the challenge of these new flexibility markets, Brady Technologies is developing **PowerDesk** – an innovative short-term power trading solution.

**Brady PowerDesk** is a single data driven and dynamic platform. It will enable you to capitalise on price volatility in day-ahead and intraday markets for greater returns. With intelligent visualisation of live P&L and market activity from one central place, you will be able to secure opportunities faster and make the most revenue out of assets.

**Contact us to learn more**

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