

Market Investigation into Demand Side Response

Low Carbon Network Report

Prepared for **Business Growth Hub** by **Sustain Success**

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EXECUTIVE SUMMARY

The DSR Market

DSR is a suite of mechanisms that assist National Grid (NG) to 'balance' the electricity transmission system. By 'balancing' NG aims to match the level of electricity generation to the demand on the system at all times and to keep the supply within its statutory frequency limits. This has become more difficult in recent years because of the introduction of renewable energy generation at different points on the electricity system coupled with a reduction in surplus mainstream generation capacity.

The overall DSR market is relatively complex with 15 DSR mechanisms, some of which overlap. Each mechanism requires the participating company to adjust their electricity demand either by shedding load or increasing generation at times specified by NG. No small energy users would have the level of flexible demand required (typically 1MW to 10MW) to participate directly in the DSR market so NG have encouraged the growth of '**Demand Aggregators**' to act as middle men in the process. These Aggregators deal with multiple smaller businesses and bid into the DSR mechanisms with 'aggregated' loads that meet the demand thresholds. The NG website lists 19 approved Aggregators, one of which is no longer in the market.

Although many of the Aggregators claim to offer the full range of DSR services, in practice for small businesses the mechanisms that they are likely to be involved in are limited to **Short Term Operating Reserve (STOR)**, **Demand Turn Up** and **Fast Frequency Response (FFR)**. Of these FFR is by far the most valuable, though it does require a response from the consumer within seconds of notification by NG.

DSR for Small Energy Users

Although the overall supply chain for DSR involves a number of large actors (Ofgem, NG, the District Network Operators (DNOs), electricity suppliers and larger businesses) the only entry route for small businesses is via the Aggregators. The Aggregator will recommend the appropriate DSR measures for the site and install the necessary software and control equipment to interface with NG. Once the system is up and running it will operate automatically with no intervention from the end user. The set-up will include over-ride devices such that the load will not be switched off if the process would be compromised in any way. A minimum flexible load of around 200kW is required. A site able to access a range of DSR mechanisms (including FFR) the savings would be around **£20,000 pa.**

The types of load most suitable for FFR are those where there is some 'inertia' in the system and so can stand frequent interruptions in supply for short periods. This would include:

- Large process refrigeration plants
- Cold stores
- Baking ovens
- Metal melting and heat treatment furnaces
- Some plastics moulding processes
- Water pumping systems
- Large buildings with air conditioning systems.

For the Business Growth Hub the most important sectors in Greater Manchester will therefore be **Food & Drink** (especially Frozen Foods), **Cold Storage Distribution**, **Data Centres**, some **Chemicals Manufacturing**, **Plastics Manufacturing** and **Commercial Buildings** (where owned by SMEs). The main challenge for the Business Growth Hub will be finding SMEs that have the required degree of flexibility. It implies that they would probably have a total electricity demand of at least 500kW and an electricity bill of at least **£5-600,000** per year.

DSR for Technology Suppliers

The main technologies used to provide DSR services are:

- Specialist software to control the site loads and interface with NG
- Meters (e.g. power and frequency)
- Sensors (e.g. temperature, pressure, level indicators)
- Actuators (e.g. electronic switching, relays, contactors).

The best route to market is again via the Aggregators since they are installing equipment at multiple sites. In theory the technology suppliers could also provide equipment to the large businesses involved in DSR but new entrants will be more difficult to identify and existing participants will already have the necessary equipment installed.

Without exception the Aggregators have developed their own bespoke software to interface between themselves, their customers and NG and none are likely to purchase new software in the future. There is therefore **no opportunity** for new software providers in the DSR market.

For suppliers of meters, sensors, actuators and other control systems there are **limited opportunities** to supply their equipment to the Aggregators. Much of the market is already served by multi-national controls manufacturers or suppliers of the equipment that is to be controlled, though some Aggregators are willing to talk to Greater Manchester business about supplying equipment. The positive note is that there is only a small number of Aggregators so the market is relatively easy to explore.

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Size of the Market

NG is looking to procure around 1000MW of new load within DSR. This would be worth **£50-60 million pa** nationally depending on the mix of measures selected. Since most of the suitable larger energy users will already be participating in the DSR market, most of the new entrants will be smaller businesses accessing the market via Aggregators.

The average installation cost of DSR control equipment is around £5000 at each site. This leads to a total UK market size for new sites of around £20 million. However, because much of the controls market is already covered by existing suppliers, the realistic market potential for new entrants is likely to be less than **£10 million**.

Because the Aggregators are the key players in the supply chain for both End Users of DSR services and Technology Suppliers, the report provides a comparison of their services and full contact details.

Conclusions

The priority for the Business Growth Hub should be to seek out businesses with sufficient flexible load within the identified key sectors, make them aware of the DSR opportunities and provide details of appropriate Aggregators.

The Business Growth Hub should also assist technology supplier businesses that wish to enter the DSR market, but make them aware of the limited scope. Again they should provide introductions to the Aggregators.