
ELEXON

Policy View: Setting up Electricity Flexibility Platforms



ELEXON is a proud member of the Plain English Campaign

ELEXON is proposing that nationwide ‘flexibility markets’ are set up, which would operate in a similar way to the existing wholesale electricity market, where buyers and sellers can trade electricity or capacity at prices set by the market.

The term electricity flexibility means services that are provided when consumers enter into agreements with another consumer, a network owner or a supplier allowing them to take electricity that they are producing or use the capacity that they have secured on the network.

It also covers homes or businesses agreeing to reduce or increase consumption when asked to do so by a network operator or supplier (known as DSR - demand side response).

In the future, there will be more opportunities for consumers to provide flexibility services either to each other, to local electricity distribution network operators (DNOs), or to suppliers.

Battery storage, locally-based renewable generation and increased availability of unused energy from electric vehicles will create more opportunities for DSR in the future.

In these markets electricity provided through DSR or from storage operators and locally based generators will be available to sell to DNOs or suppliers in a more economic and efficient way than at present. Buyers could also include consumers such as large businesses.

Unused capacity on DNO networks could be traded between generators that are connected, or with generators waiting in a queue to connect. It could also be purchased by a DNO and reallocated to other users.

Government will fund trials of three local flexibility exchanges and ELEXON will offer its expertise in electricity Settlement to the winners of this funding. ELEXON believes that the Government and Ofgem should encourage the industry to set up national flexibility exchanges, building on best practice and learning from these trials.

ELEXON believes that DNOs should also collaborate and bid for price control innovation funding from Ofgem to carry out further trials of how flexibility exchanges can be standardised and integrated into the energy system.



What is electricity flexibility?

In the last decade, the usage patterns of Britain's local electricity distribution networks have changed rapidly. There has been a sharp increase in more, low carbon generation connecting to local networks, as both consumers and businesses invest in their own generation equipment.

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Electricity consumers can 'flex' their demand, by reducing or increasing their consumption depending on the needs of network operators or electricity suppliers, in exchange for payments. Smart meters will make it easier for consumers to take up these opportunities in the future. The additional consumption data that smart meters provide can help suppliers to offer a greater range of 'time of use' tariffs. Through these tariffs, electricity will be either cheaper, or more expensive depending on supply and demand conditions. Electric vehicle (EV) charging and battery storage could assist network operators or electricity suppliers by offering to increase

consumption at times of the day when there is a surplus of electricity from renewables on the networks.

By acting as the middleman between consumers and the energy system, aggregators are likely to play an increasing role in helping consumers to realise the benefits of providing DSR.

An aggregator will negotiate with suppliers or network operators on behalf of consumers, ensuring that for example, a consumer is paid for reducing consumption when the gap between supply and demand is tight. Consumers could also be paid to use more electricity if there is surplus generation (for example increasing their demand, through charging of electric vehicles).

It is likely that electricity storage units (for example batteries) will become more prevalent in homes and businesses in the future. Aggregators will play a role in helping consumers with storage systems to sell excess electricity

to network operators or suppliers. Again, aggregators can play a role in making sure that EV owners are paid when their vehicles connect to the networks and act as 'virtual storage' by providing additional electricity, or when EVs are charging to use up excess generation on the system.

These are some examples of how flexibility is provided. We believe that if we are to see the full benefits of increased flexibility then ELEXON, the industry, Government and Ofgem need to work together to develop exchanges where flexibility services can be openly traded.

These exchanges should also include trading of capacity that has been sold to generators and other users, but is not being fully used (defined here as 'spare capacity'). This will ensure that capacity can be better allocated to other generators that will make use of it.

What is ELEXON doing to support increased use of flexibility?

ELEXON plays a key role in the electricity system by managing the Balancing and Settlement Code (BSC) and operating the systems that deliver it. The BSC sets out the rules which make sure that payments for imbalances in wholesale electricity supply and demand are settled accurately.

We are working with the Department for Business, Energy and Industrial Strategy (BEIS) and energy regulator Ofgem to support moves to a more flexible energy system in support of the Government's 'Net Zero' ambition.

Last year we published ideas for ground-breaking reforms to the market and the BSC in particular, which will enable customers to buy from, and sell electricity to, multiple providers. This has been developed into BSC Modification Proposal P379.

Under P379, the consumer, could for example contract with one provider for all the electricity they need to charge their electric vehicle and obtain the rest of their consumption from another provider. This will make it easier for a consumer to sell back electricity that they aren't using from their EV, through a flexibility arrangement.

Through BSC Modification P344, ELEXON is also opening up the GB Balancing Mechanism (BM) so that independent aggregators can participate in the BM from December 2019. The BM is used by the electricity System Operator to balance supply and demand in each half hour trading period of the day.

Previously aggregators could only access the BM if they were affiliated with a licensed BSC Party. These changes create new opportunities for the independent aggregators to directly provide their services.



A new role for Distribution Network Operators

Britain has high voltage transmission networks to which large power stations are connected and they act as the motorways of the electricity system.

The regional electricity networks connect to the transmission networks and they are owned by six electricity distribution network operators (DNOs). Independent Distribution Network Operators (IDNOs) develop, operate and maintain separate networks which are either directly connected to the DNOs (or indirectly to the DNO via another IDNO).

The expectations that users of the electricity system have of the role the distribution networks play are

changing. Until recently the job of the distribution networks was to funnel electricity from the transmission system to consumers, because previously there was little generation actually connected to DNO networks. That has now changed as distribution networks must be more actively managed, by new entities referred to as Distribution System Operators (DSOs). They will be managing electricity flows from a wider range of low carbon generators, and storage.

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How network capacity is allocated

DNOs have sole control over capacity allocation. Network capacity for generators has generally been sold on a ‘first come, first served’ basis with a presumption that once the generator is linked to the grid it will use its connection continually.

However, as the amount of renewable generation available has increased it has become less likely that fossil-fuelled generators connected to DNO grids will produce electricity 24/7. During the day time when the sun is out, or the wind is blowing, renewable generators can produce output at a lower cost than fossil-fuelled plant (which is now more likely to operate at times of peak demand when wholesale prices are higher). To a lesser extent, renewable generators do not continually use

their connection, for example on days when there is no wind blowing, or when it is too windy for the turbines to operate safely.

Overall the current approach to capacity allocation results in network capacity being tied to a generator that does not use it all of the time. It reflects the way the electricity system was historically managed and arguably it is not best suited to the system we have today, or will have in the future. In some parts of Britain long

queues of small generators are still waiting to connect. Network companies are proactively looking at better ways to manage these queues, including giving more priority to the projects that are most ready to be connected. However, there is no system for trading capacity on the DNO networks, either between generators that are connected, or with those waiting in connection queues. We believe flexibility exchanges can provide a market place for capacity trading.



Flexibility exchanges can support trading in demand side response offers and network capacity

Currently aggregators, DSR providers, and other users of the system have limited options for buying and selling DSR between themselves, and to DNOs. At present DSR is typically secured by the DNOs through individual, long term, fixed bilateral contracts.

This could lead to DSR being under or overvalued because there is not a competitive market for the service to determine its true value. If DSR was openly traded through flexibility exchanges, then this would give both sides (the DNO and the DSR provider) the confidence that they are trading at a fair price.

We believe that one or more national flexibility exchanges should be set up so that both DSR offers and spare network capacity can be openly traded. We believe these exchanges should provide regional 'products'. For example, DSR offers to reduce or increase consumption, and spare network capacity should be offered for sale in specific geographic areas. The exchanges will allow aggregators to trade DSR offers with DNOs and IDNOs. Through the exchanges consumers and aggregators could also trade electricity between themselves.

For example, a DSR aggregator could sell unused electricity from EVs or small scale storage to a large business that needs extra electricity for its plant.

On the next page we set out the benefits of local flexibility markets, compared with the current arrangements.

We believe flexibility exchanges can also provide the platform to trade spare network capacity between generators that are already connected to the system, and also between those that are waiting to connect. DNOs could also decide to buy back unused capacity so it can be resold to generators that could use it, including those waiting in the connection queues.

Ultimately we believe that these exchanges could function in a similar way to the GB wholesale

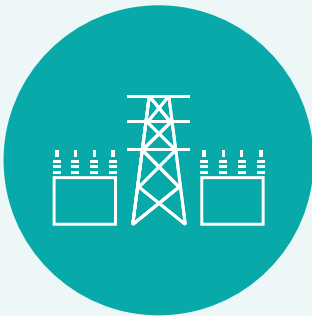
electricity market. The wholesale market has a range of products available from promptly delivered electricity to more longer-dated products.

Below we set out the benefits of local flexibility markets, compared with the current arrangements.

Drawbacks of the current arrangements:



Network companies are in sole control of the DSR purchasing process and set the price, which inhibits competition



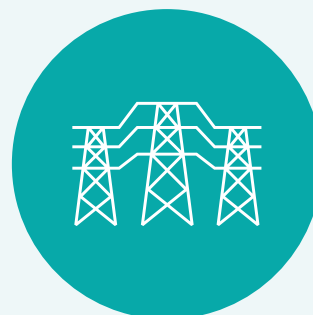
DSR providers have no choice to sell their services locally other than to DNOs



There are no options to trade unused capacity



Fixed priced (long term contracts) between the DNO and the DSR provider are unlikely to account for actual market value



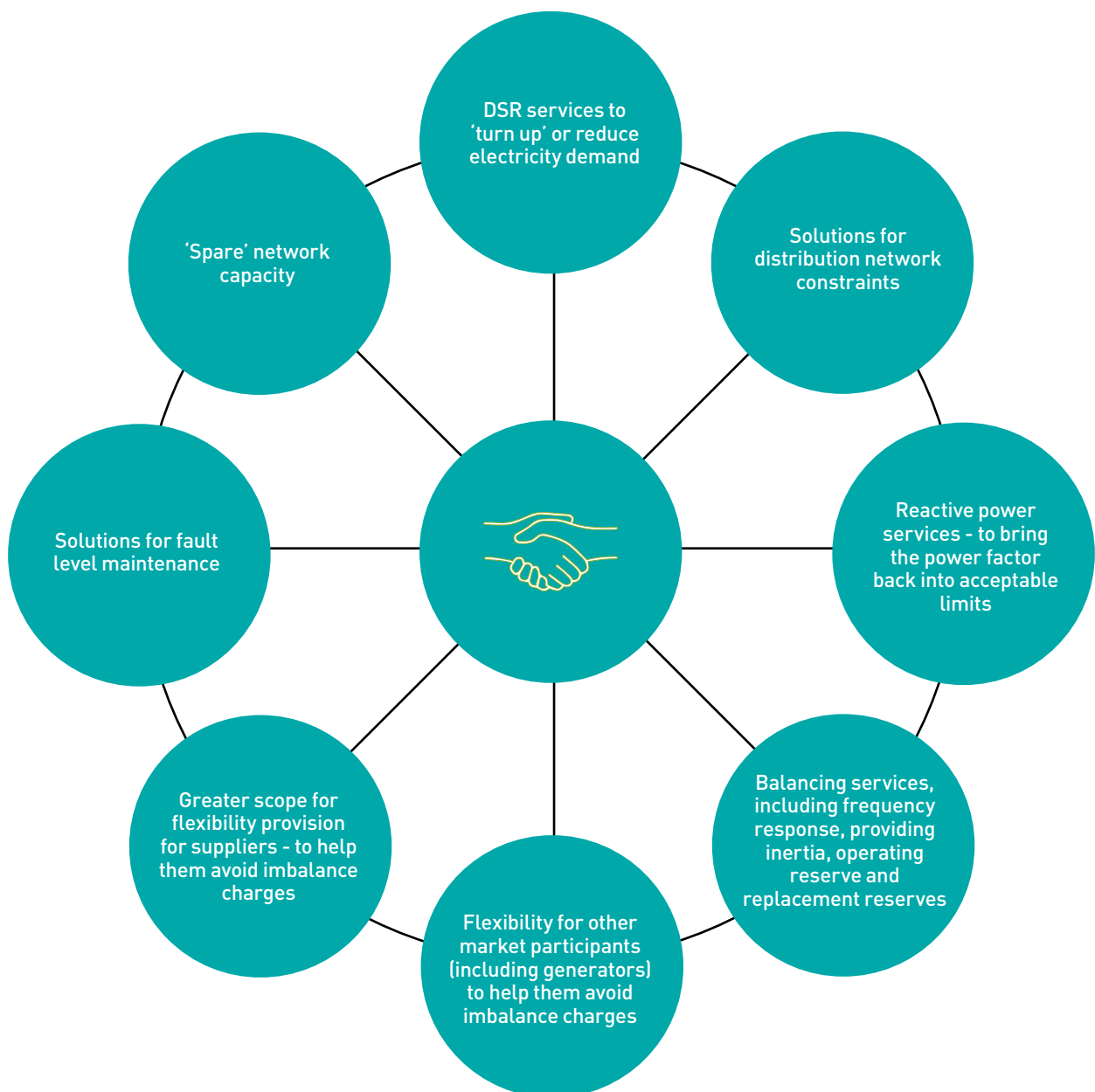
DNO contracts with its preferred bidder, therefore unsuccessful bidders have no alternatives for selling their output



Benefits of flexibility exchanges:



Services and products that provide value right across the supply chain from 'connection to the plug' can be traded on flexibility exchanges:



Who will set up local flexibility markets and how would they work?

BEIS has signalled its support for trials of flexibility exchanges through its [Flex competition](#). BEIS intends to announce the winners of funding to trial these exchanges soon, and ELEXON will be offering its expertise in managing Settlement to the winners.

ELEXON's support to the winners includes advice on:

- How the exchanges can be set up and integrated with existing electricity market arrangements**
- Changes to BSC rules that may be needed so the exchanges could become common place and introduced at scale across GB**
- How exchanges can publish transparent data on how much electricity has been bought and sold**

Trials are an important first step, however ELEXON believes that the industry needs to go further.


In its [Future Insights: Flexibility Platforms in Electricity Markets paper](#), Ofgem calls for a greater degree of planning and co-ordination by stakeholders so that flexibility exchanges can be established in a way that serves the needs of the sector while protecting consumer interests.

We fully support greater co-ordination and we believe the Government and Ofgem should further encourage and support the DNOs, aggregators and industry to work together to set up national flexibility exchanges. The exchanges should build on the trials and dovetailing with the existing electricity market arrangements and balancing services.

We believe DNOs should also collaborate with each other and bid for network price control innovation funding from Ofgem to carry out further trials of flexibility exchanges.

ELEXON is ready to work with the developers of exchanges (independent companies that provide the technology on which the platforms operate) DNOs and aggregators to set up national flexibility exchanges.

We believe that Ofgem could usefully establish a regulatory framework to determine responsibilities of DNOs and all other parties that want to use the exchanges. This framework should also set out how the exchanges should be operated and funded.



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In the longer term, ELEXON believes that Ofgem should agree relevant incentives or funding via the DNOs' price controls. This would ensure that DNOs are required and able to co-operate in the development of the exchanges and actively use them to manage both network capacity and electricity on their networks. The DNOs should work alongside developers of platforms and aggregators to ensure that the exchanges are interoperable and delivered in a co-ordinated way. Use of the exchanges can help to facilitate the new DSO role.

ELEXON proposes that once established, flexibility exchanges should operate at a national level, with regionally specific products (as explained earlier). The exchanges should operate as close to real time as possible, in a similar way to how the wholesale electricity market works. Through our role under the BSC, ELEXON would ensure that the exchanges interface smoothly with wholesale electricity Settlement and dovetail with current industry arrangements and protocols.

For the exchanges to work properly, access to data is vital, especially for the DNOs. The more data DNOs have, the easier it will be to make decisions about how and when to use flexibility services. Access to quality data also ensures that parties are exposed to the full value of their actions, including imbalance payments.

Key data to support the exchanges would include:

- **Information on the size of flexibility markets (how much flexibility is being traded in each region).**
- **Clear details of the output and capabilities of flexibility providers in each region.**
- **Transparent pricing for all products available on exchanges including bids, offers and transacted prices alongside information on whether sales occurred through an auction or continuous trading**
- **Clear information on how much spare network capacity could be offered in each region.**

Common rules for how trading should be carried out would need to be established, including:

- **Standards for displaying bid and offer prices for providing flexibility and spare capacity**
- **Clear guidance on what data should be shared by the providers, DNOs, IDNOs and other potential users of the exchanges**
- **Invoicing, payment and credit cover arrangements.**

Having common arrangements in place is important so that both flexibility providers and DNOs clearly understand the process for participating in the exchanges. The rules could leverage existing code governance arrangements and services.

The measures outlined above will be imperative to ensure the smooth integration and running of the exchanges in line with the existing electricity market.



Conclusion

There is significant potential for greater use of electricity flexibility services in Britain in the coming years. Greater flexibility clearly has benefits for the energy system as it can help DNOs to reduce the costs of managing supply and demand. It can also ensure capacity is used more efficiently.

Overall, this will lead to better outcomes for consumers as we all pay for the costs of the energy system as part of our bills. Flexibility exchanges also create more opportunities which can encourage new business models to enter the energy market. This is good for consumers as these companies can offer new products and services which benefit homes and businesses.

Creating one or more national flexibility exchanges will maximise these opportunities and formalise arrangements for trading of flexibility and spare capacity. The end result would give a kick start on the road to Net Zero and accelerate the use of existing and future generation and network assets.

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