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Date  
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Contact / Extension  
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Dear Louise,

### **Position Paper on Distribution System Operation (August 2019)**

SP Energy Networks (SPEN) owns and operates the electricity distribution networks in central and south Scotland (SP Distribution), and Merseyside and North Wales (SP Manweb). We serve 3.5million distribution customers. We also own and maintain the electricity transmission network in central and south Scotland (SP Transmission). We are the only DNO group to operate across all three GB political administrations.

We welcome Ofgem's Position Paper on Distribution System Operation (DSO), and we look forward to the opportunity to engage with Ofgem on this important issue. We see the role of the DSO as critical to the delivery of a safe, efficient, reliable and decarbonised energy system.

We, like Ofgem, want to deliver major progress to DSO now, and we agree that we cannot wait until ED2 commences in 2023. We also recognise that it's important to keep DSO institutional options open whilst there are so many unknowns. However, for work programme outputs that will affect distribution licensees, final decisions need to be made by Q4 2020 at the very latest in order for them to be included within ED2 submissions. Decisions need to be made quickly and in the best interests of customers.

The role of DSO is vital to meeting the challenges set out in the Position Paper. To that end, during ED1 we have spent significant time considering DSO, how it could work, its benefits, and potential solutions to its challenges. From this, there are three fundamental issues that the proposed DSO work programme must consider:

1. There is no clear description of the overarching purpose(s) of the DSO work programme.
2. In implementing DSO, the characteristics of the network and the laws of physics must be respected as these are an absolute.
3. We, as existing distribution licensees, are uniquely placed to implement the delivery of DSO.

These are summarised below and further detail on each is provided in our response.

#### **1. Overarching purpose of the DSO work programme**

There is no clear description of the overarching purpose(s) of the DSO transition.

- What is Ofgem ultimately trying to achieve?
- Is Ofgem's end goal to provide safe reliable network capacity for customers in the most economical manner, or is establishing markets an aim in itself?

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It is essential to have clarity on this overarching purpose as it will guide the work programme, help resolve where objectives conflict (for example, where markets don't deliver in consumers' best interests), and help avoid confusing methods / approaches (e.g. markets, reinforcement, flexibility) with end goals which benefit customers (safety, reliability, capacity for Net Zero). We strongly believe that the overarching purpose for this work must be to **deliver an outcome that ensures the safe, efficient, reliable and decarbonised operation of the distribution network and wider energy system** as this approach will best serve existing and future customers. All proposed DSO policies, methods and approaches should be judged against this purpose. This overarching purpose must be considered throughout the work programme.

The work programme must consider throughout what is in the best interests for the existing and future customers who will pay for this. The work programme must be geared towards meeting their needs over and above any other industry parties. Can you provide clarity please on how customer requirements will be represented and considered front and centre in this work programme?

## 2. Understanding the distribution network

By its very nature, Ofgem's Distribution System Operation work programme will affect how the distribution system and wider energy system operate. Our 3.5million domestic and business customers depend on safe reliable distribution system operation. This operation is dependent on multiple interacting technical factors and governed by the laws of physics. It is vital that the work programme understands the fundamental realities, engineering and operational characteristics of distribution networks. This is for two reasons:

- To effectively deliver DSO in customers' interests. It is these fundamentals that explain why the DSO experience will vary by voltage level, why we will only get shallow markets in some areas, why the transmission competition model won't universally work at distribution, where flexibility will be useful and where it won't, and what is required to deliver Net Zero.
- To ensure continued safety and reliability for customers. If Ofgem is prepared to compromise on safety and reliability, you must be upfront about it. We would strongly oppose such a move.

A work programme that will affect how the network operates cannot overlook how the network operates. We will challenge any outputs which adversely impact our networks or customers.

## 3. The role of existing distribution licensees

Existing distribution licensees are uniquely placed to implement the delivery of DSO. Our experience and knowledge in safely operating networks to maintain supply to customers will help deliver DSO. Since incentive based price control models were introduced, network companies have demonstrated positive outcomes for GB consumers with:

- a 17% real terms reduction in network prices<sup>1</sup>;
- 50% real term increase in investment<sup>2</sup>;
- 30% reduction in the number and duration of power cuts<sup>3</sup>; and
- consistent improvements in customer satisfaction scores which exceed those of John Lewis and Amazon<sup>4</sup>.

All this has been achieved whilst supporting economic growth with increased jobs and facilitating the decarbonisation of the UK.

We have the organisational capability and resource base to deliver the infrastructure enablers that will underpin DSO. Our use of flexibility tenders, independent contractors, and multiple equipment vendors means that competition will be embedded in DSO. Our regulatory framework, price control model and economies of scale mean we are a low-cost provider that can deliver where the market might not, leaving no customer behind. We have the capability, knowledge and experience to deliver a lot of DSO functions at least cost to customers.

<sup>1</sup> <https://www.ofgem.gov.uk/news-blog/our-blog/why-cost-capital-networks-likely-fall>

<sup>2</sup> Ofgem (2008), SGBI speech

<sup>3</sup> <https://www.ofgem.gov.uk/ofgem-publications/76425/rpix20-press-release-finalpdf>

<sup>4</sup> Ofgem (2017), 'RIIO ED1 Annual report 2015/16' and Ofgem (2015), 'Electricity Distribution Company 2010-2015'

## Next steps

SPEN, in October 2016, was the first DNO to publish a DSO Vision. This was developed with input from a range of external stakeholders including flexibility providers and the ESO. Since then we have:

- market tested flexibility solutions (we have an ongoing tender for 110MVA across ten sites and are the only DNO to tender for reactive power);
- our Fusion project is at the forefront of market platform design;
- we have done extensive work to promote the understanding of the financial value of flexibility (we are the only DNO to publish site-specific service rates); and
- our Dumfries and Galloway active network management scheme will be the largest ANM scheme in the UK and is a good example of a whole system solution: regulating the output of distributed generation to avoid transmission constraints.

In the attached response we have resisted the temptation to detail all our DSO activities, experience and thoughts. Instead we ask that there are regular face-to-face opportunities to input and engage with you and other industry stakeholders on this work programme. Given the complex interactions and wide-ranging nature of this work, we believe this face-to-face interaction is the most effective way to develop DSO.

We believe that the DSO transition will bring real benefits to customers and the decarbonisation agenda. We look forward to progressing DSO with you, supporting the growth of market services and delivering DSO functions to realise these benefits.

If you have any questions about any part of our response please do not hesitate to contact me. We look forward to continuing to engage with you and delivering the DSO transformation.

Yours sincerely,



**Graham Campbell**  
**Head of Distribution System Operation and Whole Systems**  
**SP Energy Networks**

## 1. Do you agree with our strategic outcomes?

We, like Ofgem, want to deliver major progress to DSO now, and we agree that we cannot wait until ED2 commences in 2023. Change is needed now if we are to ensure a safe, efficient and decarbonised energy system, and locking ourselves into a particular DSO institutional structure is not sensible whilst there are so many unknowns.

Given this, we agree with Ofgem's two philosophies which underpin this work:

1. that DSO is a set of functions which allows for a range of parties to potentially be involved; and
2. that retaining optionality around DSO institutional structures is important.

To this end, our response to the ED2 Open Letter encourages, where possible, separate costs, revenues and outputs for DSO functions.

### Overarching purpose

However across Ofgem's overall aim, two underpinning philosophies, and four strategic outcomes, there is no clear description of Ofgem's overarching purpose(s) of the DSO transformation. We ask:

- What is Ofgem ultimately trying to achieve?
- Is Ofgem's end goal to provide safe reliable network capacity for customers in the most economical manner, or is establishing markets an aim in itself?

It is essential to have clarity on this overarching purpose as it will guide the work programme, help resolve where objectives conflict (for example, where markets don't deliver in consumers' best interests), and avoid confusing methods / approaches (e.g. markets, reinforcement, flexibility) with end goals which benefit customers (safety, reliability, capacity for Net Zero).

We strongly believe that the overarching purpose must be to **deliver an outcome that ensures the safe, efficient, reliable and decarbonised operation of the distribution network and wider energy system**. Not only will this purpose best serve existing and future customers, it is aligned with the five outcomes that Ofgem aims to deliver for consumers: lower bills and environmental impacts, and better reliability, safety, quality of service and social outcomes. All proposed DSO policies, methods and approaches should be transparently judged against this purpose. This overarching purpose must be considered throughout the work programme.

## 2. Do you agree that our work programme will help to deliver the strategic outcomes?

We support the three workstreams proposed by Ofgem and we look forward to actively contributing. To ensure the work programme delivers the strategic outcomes, it must:

1. effectively engage with industry;
2. coordinate closely with ED2 and Open Networks; and
3. understand the realities of distribution system operation and engage with distribution licensees.

### 1. Effective engagement with industry

Engaging with industry is critical to the efficient and effective delivery of the work programme. The DSO Position Paper did not give much detail on how Ofgem will engage with industry to deliver this work programme. We ask that there are regular face-to-face opportunities to input and engage with you and other industry stakeholders. Given the complex interactions and wide-ranging nature of this work, we believe face-to-face interactions are far more effective in developing the detail and solving the challenges of DSO than written correspondence. We welcome the planned workshop this autumn (paragraph 3.13).

We ask that, where possible, this engagement is coordinated with Open Networks and ED2 work groups. This ensures that common issues are coordinated, and reduces the overhead for stakeholders to participate – this is particular relevant for smaller stakeholders who may have valuable input but do not have the time to engage with multiple separate working groups. The work programme must facilitate input from a range of industry parties.

### 2. Coordination with ED2 and Open Networks

The work programme must be coordinated with the development and timescales of ED2, and must consider the outputs and decisions made by ED2 working groups. DNOs must be given sufficient time to accommodate any outputs from this DSO work programme in their ED2 submissions. As DNOs' first submission to Ofgem's Consumer Challenge Group will be around April / May 2021, this means we need a decision on the key policy outputs by the sector decision date of Q4 2020 at the very latest.

The work programme must include the outputs already delivered by the Open Networks project. These have been developed after much consideration and stakeholder input.

### 3. Understanding the distribution network

By its very nature, Ofgem's Distribution System Operation work programme will affect how the distribution system operates. It is therefore vital that the work programme understands the fundamental realities, engineering and operational characteristics of distribution networks. Key amongst these are:

1. The distribution network is much more localised than the transmission network. This is due to its inherent design and the laws of physics. This means that we may only get shallow markets<sup>5</sup> in some parts of the network, even once DSO is mature. A shallow market does not typically deliver the full benefits of competition. This means we need to carefully consider how DSO will vary by voltage level and where markets will really add value greater than their overhead. We need to be wary of simply replicating transmission competition models. This localisation also means there is no operational value in having

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<sup>5</sup> Shallow markets are typically characterised by fewer participants and less liquidity.

a single GB wide system operator at distribution level (and the benefits of benchmarking between regional DSOs would be lost).

2. To achieve Net Zero, it is highly likely that the UK will have to electrify a significant proportion of heat and transport. To just consider the additional network capability required for the electrification of heat: Ofgem's Typical Domestic Consumption Values<sup>6</sup> show that, for houses with gas and electricity, **four times more energy** is provided by gas than electricity. This energy will now need to be provided by electricity networks. To achieve decarbonisation we are not talking about incremental change. We need to be realistic about the volumes of additional network capacity required, and what are feasible technical solutions.
3. Reinforcements take time to plan, consent, construct and commission. For example, at best an LV<sup>7</sup> reinforcement can take three months to complete, but usually more than six months. HV and EHV reinforcements take much longer, mainly due to the planning and consenting process. This means that if markets fail to deliver having been relied upon, it will take time to add capacity using reinforcement. This delay before capacity is added can inhibit economic growth and decarbonisation, not to mention the impact on individual customers.
4. Most existing electricity markets have a safety net. By this we mean, if suppliers are in imbalance in the wholesale market, then the Electricity System Operator (ESO) will take actions to keep the system balanced; if a service provider fails to deliver in the ancillary service market, then the ESO can call upon another provider in the Balancing Mechanism. In these markets, in the event of failure of a market participant there are either deep markets or safety nets. For DSO, especially HV and below, failure of a market participant is more serious: shallow markets mean there are unlikely to always be other providers to call upon, and as market services will be used to defer reinforcement there may not be network capacity to fall back on. This creates a higher loss-of-supply risk to customers than in other markets.
5. Supply failure has a real tangible impact on our customers lives. This will be compounded as decarbonisation makes customers more reliant on electricity – in the future customers will be reliant on electricity for heat, light, cooking, communications and transport. Given this total reliance, any loss-of-supply would likely have a significant impact on customers, especially rural ones. We must therefore carefully consider the impact on network reliability of any DSO changes. We oppose moving away from a deterministic planning standard.
6. Flexibility is a tool to make capacity available, just like reinforcement and network reconfiguration. We see these as complimentary sequential measures, the order of intervention being determined by their cost and ability to solve the constraint. For example, for a typical town with rising demand: when power flows initially exceed network capacity by a small margin, reconfiguration is likely to be least cost intervention. When more capacity is required we may use flexibility providers, before finally reinforcing the network if even more capacity is needed.

We do not raise these points to create a barrier to certain DSO institutional structures, markets, or competition. We support flexibility services and other market interventions as experience shows they can bring material benefits and operational advantages to our networks and customers. However if these fundamentals aren't considered, we will fail to deliver an outcome

<sup>6</sup> <https://www.ofgem.gov.uk/gas/retail-market/monitoring-data-and-statistics/typical-domestic-consumption-values>

<sup>7</sup> LV (low voltage) is all voltage levels up to and including 1kV; HV (high voltage) is all voltage levels above 1kV up to and including 22kV; EHV (extra high voltage) is all distribution voltages great than 22kV.

that ensures the safe, efficient, reliable and decarbonised operation of the distribution network for existing and future customers.

It is essential that distribution licensees are engaged throughout this process to share our knowledge and understanding of distribution networks. Our 3.5million domestic and business customers depend on safe reliable distribution system operation. We will challenge any significant outputs which materially adversely impact our networks or business.



### **3. Do you have anything to add to the thinking and analysis that informs how we propose to deliver our programme of work?**

In this response we have resisted the temptation to provide commentary and supporting detail on every point, or potential solutions to every challenge. Instead we provide a summary of the key points we believe the work programme should consider, and leave the detail to be discussed with you and industry over the course of the work programme.

#### **The Future Charging and Access Programme**

We welcome that this work programme will be coordinated with the Future Charging and Access Programme. Flexibility must be considered alongside this work, as both flexibility and network charging seek to do the same thing: send price signals to users to operate in ways that benefit the network / system. Without coordination, we risk sending conflicting signals to users, or not properly valuing their benefit to the network. Clear, visible signals will be essential for efficiently and economically operating the network. This work must consider behavioural economics to confirm that customer behaviours will respond to the pricing signals under development. Without this work we risk customers responding in unforeseen ways which compound network issues, or not responding to the extent that delivers meaningful benefit.

In order for outputs to be accommodated within ED2 submissions, they must be made by Q4 2020 at the very latest.

#### **Vulnerable and fuel poor customers**

We support that a DSO world will likely reward customers who actively participate to minimise their impact and benefit the network. However, the corollary of this is that customers who don't participate will bear higher costs. We must consider the learning from the retail market that UK consumers will have varying levels of engagement. This is particularly important for vulnerable and fuel poor customers who are less likely or less able to engage.

The work programme should consider how we can encourage the best parts of the DSO transition without penalising or leaving behind vulnerable and fuel poor customers. We would welcome clarity on how customer requirements will be represented and considered front and centre in this work programme.

#### **Understanding the realities of distribution system operation**

As Ofgem's Distribution System Operation work programme will affect how the distribution system operates, it is vital that the work programme understands the fundamental realities, engineering and operational characteristics of distribution networks. It is these fundamentals that will explain why the DSO experience will vary by voltage level, why we will only get shallow markets in some areas, why customer reliability might be adversely impacted, why the transmission competition model won't universally work at distribution, why there's no operational benefit in having a single ESO at distribution level, where flexibility will be useful and where it won't, and what is required to deliver Net Zero.

We have provided a summary of these in response to question 2, but their detail and impact warrants further engagement and discussion. The work programme must consider these realities, and the impact they will have on DSO and customers. Any increased loss-of-supply risk to customers must be very carefully considered.



### **Distribution licensee as provider of first resort**

Existing distribution licensees are uniquely placed to implement the delivery of DSO. Our experience and knowledge in safely operating networks to maintain supply to customers will help deliver DSO. Since incentive based price control models were introduced, network companies have demonstrated positive outcomes for GB consumers with:

- a 17% real terms reduction in network prices;
- 50% real term increase in investment;
- 30% reduction in the number and duration of power cuts; and
- consistent improvements in customer satisfaction scores which exceed those of John Lewis and Amazon.

All this has been achieved whilst supporting economic growth with increased jobs and facilitating the decarbonisation of the UK.

We have the organisational capability and resource base to deliver the infrastructure enablers that will underpin DSO. Our use of flexibility tenders, independent contractors, and multiple equipment vendors means that competition will be embedded in DSO. Our regulatory framework, price control model and economies of scale mean we are a low-cost provider that can deliver where the market might not, leaving no customer behind. We have the capability, knowledge and experience to deliver a lot of DSO functions at least cost to customers.

The work programme should give weight to the benefits of the distribution licensees delivering certain DSO functions. The work programme should consider models which have the advantages of both DNO involvement and competition – for example, the DNO delivering the infrastructure before its operation moves to a commercial basis.

### **Distribution licensee as provider of last resort in market activities**

One consideration which isn't mentioned in the DSO Position Paper is whether the Distribution licensee should ever play the role of 'provider of last resort' for functions/activities which are left to the market, but where the market has failed to deliver a solution. One example is EV charge points: in order to achieve Net Zero and UK government policy of no new fossil fuel cars by 2040 (2032 in Scotland) there will need to be a comprehensive network of EV charging points. Yet in some rural and remote locations, the market might not naturally provide these due to higher installation costs and lower utilisation revenue. The DNO has the trained workforce, equipment and ability to deliver these, and their delivery will be to benefit of consumers and the decarbonisation policy. Once the distribution licensee has delivered the EV charging point infrastructure, their ownership and operation could move to a commercial basis. This approach was used in Ireland, as ESB recognised it would serve consumers best.

The work programme should consider the potential of the Distribution licensee to be a 'provider of last resort' in contestable activities where markets have failed, and where doing this would be valuable to customers. We would welcome clarity on how Ofgem will consider customers in this work programme.

### **Transparency and neutral market facilitation**

A common theme across the DSO Position Paper is how to ensure fair competition, given the potential advantage a distribution licensee may have. We consider that transparency around the value, and valuation, of activities, and subsequent procurement decisions, is key. The creation

of a common methodology to value flexibility and optionality would bring transparency to the value, and valuation of, different network interventions. This, combined with transparency on reinforcement versus flexibility procurement decisions, would give market participants and Ofgem confidence that the true least-cost solutions are being correctly identified and used.

More broadly, this transparency underpins and gives credibility to the distribution licensee as a neutral market facilitator, which will give potential participants confidence in the market, and sends price signals to market participants. This is beneficial for market stimulation.

### **Whole system coordination**

We support measures to coordinate markets. There is a clear system need for the ESO to be able to utilise, via the DSO, services from providers connected to the distribution network, and coordination enables service providers to sell to multiple markets and stack value. A stable system, and service costs being shared across multiple parties rather than just ourselves, are in our and our customer's interest.

However, the work to coordinate markets must consider what happens when the needs of the market buyers are opposed with each other. For example, the DNO may want to procure demand reduction to avoid a network constraint at the same time that the ESO wants to procure demand increase to manage frequency. In a pure market, an auction could reveal to which buyer the service had the most value, but it is not efficient for the DNO and ESO entering into a bidding war using customer money.

The work programme should consider how we can encourage whole system and coordinated markets, whilst recognising that the DNO and ESO's operational requirements will be different at certain times.

### **Funding**

The DSO Position Paper does not cover how any outputs from the work programme will be funded (as one example, the capability to collect, manage, analyse and share data will require investment). In addition, across distribution licensee and market activities, it is vital that investors have a clear understanding of how they will make returns. Without these, we risk a lack of investment and higher financing costs. These will increase overall costs for consumers and inhibit the required pace of change.

The work programme must consider the sources of any required investment and funding models. In order for outputs to be accommodated within ED2 submissions, they must be made by Q4 2020 at the very latest.

### **Data and security**

We welcome the recognition of the importance of data, and of that data being visible, accessible and interoperable. We agree that this is key for efficient markets and transparent decision making. However, electricity networks are nationally significant infrastructure. The current threat level to the UK is Severe, meaning an attack is highly likely. Cyber-attacks against infrastructure, from both state and non-state actors, are on the rise. Publishing all data about networks can only increase their vulnerability.

The work programme should consider how we can get the advantages that an open data policy brings, without opening up the electricity networks to materially increased risk. This will likely require engaging with expertise outside the energy industry.