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Consultation

Key enablers for DSO programme of work and the Long Term Development Statement

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We are consulting on our key enablers for distribution system operation work programme, including questions on one specific enabler – reform to the Long Term Development Statement (LTDS). We would welcome views from a wide range of stakeholders, including those with an interest in energy networks, energy flexibility, whole systems approaches to energy management, digital data and technology (DDaT), cyber security, and telecoms.

A supplementary document is published alongside this consultation. This details ongoing industry initiatives that provide an evidence base for this consultation, and explains how key enablers for distribution system operation (DSO) and the LTDS are coordinated with ongoing industry and regulatory initiatives.

This document outlines the scope, purpose and questions of the consultation and how you can get involved. In addition to receiving consultation responses by email, we are piloting an online portal for consultation responses to streamline the consultation process. The online portal for responses is linked here.

Once the consultation is closed, we will consider all responses. We want to be transparent in our consultations. We will publish the non-confidential responses we receive alongside a decision on next steps on our website at

Ofgem.gov.uk/consultations. If you want your response – in whole or in part – to be considered confidential, please tell us in your response and explain why. Please clearly mark the parts of your response that you consider to be confidential, and if possible, put the confidential material in separate appendices to your response.

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Executive summary

We are committed to regulating energy networks to ensure that they are cost efficient and provide value for consumers while meeting government decarbonisation and net zero emissions targets. Our strategic narrative sets out our core priorities to enable competition and innovation, drive decarbonisation at the lowest cost, and protect consumers.[1] Our system operator reforms at distribution level contribute across these strategic priorities. This consultation considers the data, technology and engineering capabilities to enable smart, flexible, low carbon networks in the interests of consumers.

Distribution system operation (DSO) is the effective execution of a set of functions and services that need to happen to run a smart electricity distribution network in the interests of energy consumers. This does not focus on a single party as an operator, but rather recognises that there are roles for a range of parties to deliver DSO.

For these functions to be realised, there are 'key enablers for DSO': material improvements to the foundational building blocks on which smart, flexible networks and DSO function delivery will rely. These step-change enhancements will meet users' needs, and are built on a number of incremental individual technology, data and engineering improvements. The key enablers for the DSO work programme require actions from network and system operators, Ofgem, and wider stakeholders alike. We will actively engage with industry to ensure progress on key enablers is taken now, ahead of the next price control.

The first key enabler for DSO in our work programme is reform to the Long Term Development Statement (LTDS). This is a core improvement to network forecasting and planning data, modernising the data to meet users' needs. This will underpin the delivery of a number of DSO functions. Specifically, enhanced planning and forecasting data will stimulate growth in flexibility markets.

Reform to the LTDS will be the first licence condition explicitly addressing the interoperability of network data, part of the modernisation of energy data. We expect that implementing better data practices into the LTDS will improve the value ultimately realised by consumers delivered by network forecasting and planning data. As the energy system continues to

[1] https://www.ofgem.gov.uk/publications-and-updates/ofgem-strategic-narrative-2019-23

digitalise, we expect to take further regulatory actions to ensure key enablers for DSO are put in place, and that DSO functions effectively make their contribution to modernising energy data.

In this consultation, we seek feedback on our proposed reform to the LTDS. Responses will inform the specification and delivery of the LTDS and its associated form of statement (FoS). We anticipate that this will be delivered with the input and assistance from a broad range of expert stakeholders, and seek expressions of interest to contribute to an Ofgem-chaired working group to deliver this work.

Further, we seek views and input to inform our ongoing work programme, key enablers for DSO. Responses to this consultation will help drive the next regulatory policy development steps to enhance technology, data and engineering competencies to develop DSO.

1. Introduction

What are we consulting on?

1.1. This informal consultation is formed of two sections: the first section focuses on the first key enabler for DSO in our work programme – reform to the long term development statement (LTDS) – which will be reformed for implementation in the next price control. We seek views on:

- Scope of the form of statement
- Format of the form of statement
- Heatmaps, direct needs identification and hosting capacity
- Forecasting of network needs
- IDNOs and the LTDS
- Delivery governance of the form of statement

1.2. We are inviting interested parties to put themselves forward to join the LTDS update working group that Ofgem will convene and chair. More information on this working group is presented in the LTDS section. Please make it clear on your response to this consultation if you wish to contribute to the working group to develop LTDS FoS.

1.3. The second section seeks views on our wider programme of work on key enablers for DSO – the output improvements made to energy networks that facilitate DSO function delivery in the interests of consumers and meet users' needs based on technology, data and engineering competencies – to inform policy priorities. We seek views on:

- Where we should focus regulatory reforms for future key enablers for DSO
- What reforms we should prioritise

Our strategic approach to DSO

1.4. We consider DSO to be a set of functions and services that need to be executed to run a smart electricity distribution network. This definition does not imply a single party as an operator, but recognises roles for a range of parties in delivering DSO.[2]

1.5. Action is needed now to unlock the value of data for market participants and to improve the quality of data that is available to meet the needs of its users. This will enable flexibility markets to develop and provide near term value for consumers. At the same time, we must ensure that we do not allow information imbalances or unnecessary path dependent lock-in to develop, to mitigate poor consumer outcomes and unintended consequences. We will assess the case for regulatory steps to ensure good consumer outcomes.

1.6. We recognise the importance of the price control to implement some DSO functions. The next electricity distribution price control, RIIO-ED2, will start in 2023, and will last for five years. It will set controls on DNOs to ensure private companies running network monopolies continue to act in the interests of energy consumers.[3] Our policy work on DSO will help set the roles and functions for DNOs to deliver through network price controls. We are seeking views now to drive change in the current price control, RIIO-ED1, where we believe improvements can be made under the existing network price control. We also welcome views on where we should prioritise technology, data and engineering changes for delivery in the next price control.

1.7. A supplementary document published alongside this consultation. This details relevant industry initiatives providing an evidence base for this consultation, and explains how this work is coordinated with industry and regulatory initiatives.

Our definition of key enablers for DSO

1.8. Key enablers for DSO are deliverable marked improvements in the technology, data and engineering that underpin DSO functions. These outputs are likely to be formed of a number of smaller improvements; they will meet network users' needs; and

[2] https://www.ofgem.gov.uk/publications-and-updates/ofgem-position-paper-distribution-system-operation-our-approach-and-regulatory-priorities
[3] https://www.ofgem.gov.uk/publications-and-updates/open-letter-consultation-riio-ed2-price-control

contribute towards our strategic outcomes. We expect that these key enablers will result from actions by stakeholders, Ofgem and the government.

Why the LTDS, how is it a key enabler, and how will it contribute to enabling DSO functions?

1.9. The LTDS is provided for in electricity distribution standard licence condition 25 (SLC25),[4] including the associated form of statement (FoS),[5] which describes the detailed scope and content format of network data that each DNO is required to publish on an annual basis.

1.10. Reform to the LTDS is the first key enabler in our work programme. The update of the LTDS will underpin a number of DSO functions by modernising energy data, including its availability, handling and quality for network planning and forecasting data.

1.11. Network planning and forecasting enablers are foundational to improving DSO as they provide the information needed to inform coordinated actions by the system and network operators, investment decisions of stakeholders and facilitate the development of efficient flexibility markets. Major projects, including the ENA Open Networks project[6] and the Future Power Systems Architecture project,[7] as well as responses to our DSO position paper,[8] have provided evidence that for smart and active networks to develop, greater knowledge and visibility on network data, including network visibility at lower voltage levels, embedded generation and network loading, must be made available.

1.12. LTDS data can inform the following DSO functions:

- Forecasting demand and generation and distributed energy resources (DER)

[4] https://www.ofgem.gov.uk/licences-industry-codes-and-standards/licences/licence-conditions
[5] https://www.ofgem.gov.uk/publications-and-updates/form-long-term-development-statement?docid=5&refer=Networks/Techn/NetwrkSupp/LongTermDS
[6] http://www.energynetworks.org/electricity/futures/open-networks-project/
[7] https://es.catapult.org.uk/capabilities/systems-integration/future-power-systems-architecture/
[8] https://www.ofgem.gov.uk/publications-and-updates/ofgem-position-paper-distribution-system-operation-our-approach-and-regulatory-priorities

- Connection studies and operation procedures
- Integrated transmission-distribution planning
- DER hosting capacity analysis
- DER net local value analysis
- Data management and sharing
- Coordination between transmission-distribution interfaces

1.13. Reform to the LTDS will require action from networks, stakeholders and Ofgem. Figure 1 outlines the inputs, processes and outputs in reform to the LTDS, leading to it making a marked improvement in the technology, data and engineering that underpin a number of DSO functions. To reform the LTDS:

- We will convene a working group to write the FoS specification and manage the delivery of the final FoS pro-forma, for example through a delivery body. The distribution network operators (DNOs) will need to improve their data availability, feed into the working group, advise on what information they hold and how they will meet the new FoS.
- Wider stakeholders will also need to be proactive in advising on the information and data that is imperative to meeting user needs and take a step-change in information provision. This means being specific about which data and in what priority order it should be made open, associated data quality requirements and any other related needs, such as the availability of data processing protocols.

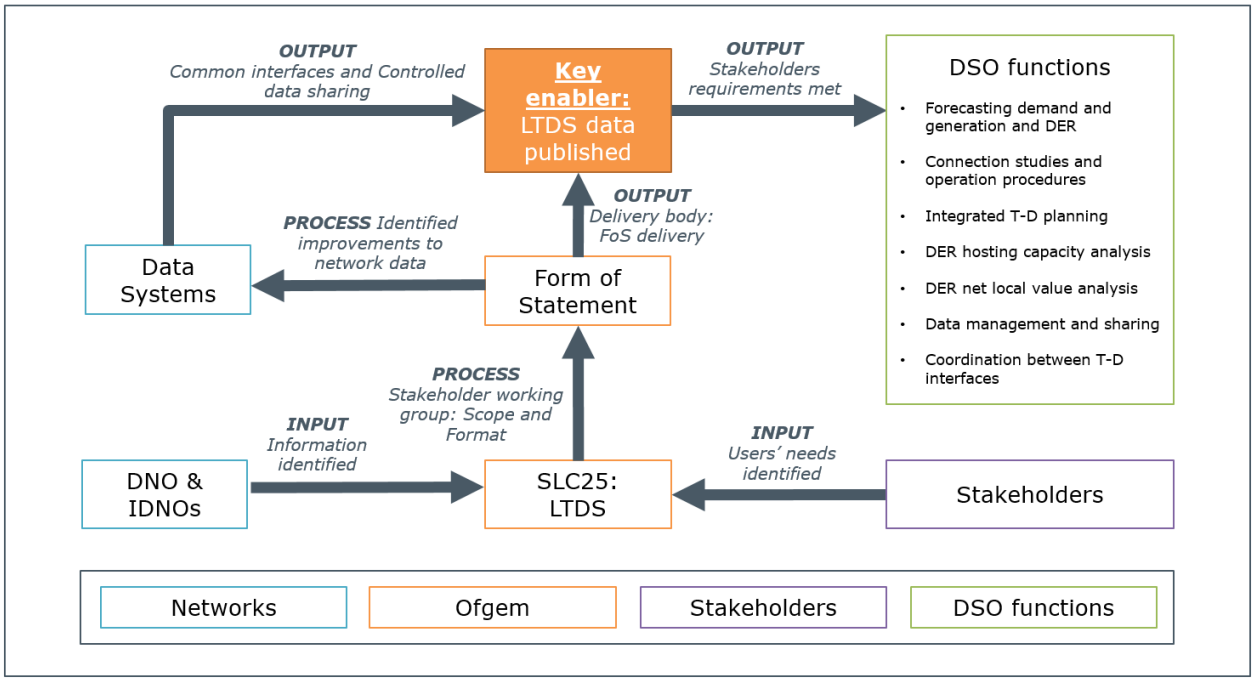

Figure 1. Process diagram of reform to the LTDS as a key enabler for DSO. Actions in italic text show steps that contribute to the LTDS enabling DSO functions.

Modernising Energy Data and Data best practice

1.14. This work is coordinated and aligned with our wider strategic initiatives. We are collaborating with the Department for Business, Energy and Industrial Strategy (BEIS) and Innovate UK to facilitate Modernising Energy Data (MED), an ongoing data improvement programme.[9] MED work started with the Energy Data Taskforce (EDTF), which undertook a wide reaching investigation that created a set of high-level principles for how energy system data should be used to best meet the needs of consumers. This culminated in the publication of findings and recommendations that have been endorsed in principle by Ofgem and the government, subject to coordination with existing legal and regulatory frameworks.[10]

[9] https://www.ofgem.gov.uk/publications-and-updates/modernising-energy-data-update
[10] https://es.catapult.org.uk/news/energy-data-taskforce-report/

1.15. We are continuing MED to work with BEIS and Innovate UK, using the EDTF findings as a basis. Work is now underway to define 'Data Best Practice' guidance to support the use of energy data.[11] This guidance is expected to emphasise the importance of data visibility, openness, interoperability and ensuring data quality meets the use cases for the data. These concepts and others in the emerging Data Best Practice guidance are aligned with our reform of the LTDS and our wider key enablers for DSO work programme.

[11] The Energy Systems Catapult are the delivery partner for the creation of the "Data Best Practice" guidance. https://www.ofgem.gov.uk/publications-and-updates/we-are-creating-data-best-practice-guidance

2. The Long Term Development Statement

Section summary

This sections covers changes to the LTDS. This consultation covers:

- Scope of the form of statement
- Format of the form of statement
- Heat Maps, Direct Needs Identification and Hosting Capacity
- Forecasting of Network needs
- IDNOs and the LTDS
- Delivery governance of the form of statement

2.1. The stated purpose of the LTDS, as set out under standard licence condition 25 (SLC25) of the Electricity Distribution Licence is to ensure that the licensee:[12]

1. *Provides information that will assist any person who might wish to enter into arrangements with the licensee that relate to Use of System or connections to identify and evaluate the opportunities for doing so.*

2. *Makes such information generally available in the public domain.*

[12] https://www.ofgem.gov.uk/licences-LV-codes-and-standards/licences/licence-conditions

2.2. The LTDS is published annually and provides data for a rolling five year period commencing on the 1st April of the year of initial publication. The LTDSs were first published in November 2002.

2.3. Ahead of RIIO-ED2 we consider that it is appropriate to review and assess how well the LTDSs are meeting the needs of existing and potential network users, and consider any changes that may be required to support DSO.

Background

2.4. In August 2002, the Authority issued a formal direction to DNOs, requiring them to each prepare an LTDS on an annual basis. The direction requires the structure and content of the LTDS to be in accordance with a defined FoS published by Ofgem,[13] and SLC 25 of the Electricity Distribution Licence.[14,15]

2.5. In order to ensure that the LTDS and associated FoS are meeting the needs of users, we have consulted ahead of price control periods. In 2005[16] and 2010[17] we consulted on the LTDS. In 2010, the key change was a requirement to provide details of connected generators in the LTDS with a de-minimis size for the generators to be listed.[18] A direction was issued in September 2011 that defined 1MVA generator capacity as the minimum installed capacity for inclusion in the LTDS.[19]

Scope of form of statement

2.6. As per the 2010 consultation, we consider that there is a growing need for increased observability of distributed generation (DG) and other low carbon technologies (LCTs) connected to the distribution network. This is important for understanding the contribution of DG to the security of supply of the GB system; informing coordinated

[13] https://www.ofgem.gov.uk/publications-and-updates/form-long-term-development-statement?docid=5&refer=Networks/Techn/NetwrkSupp/LongTermDS
[14] https://www.ofgem.gov.uk/licences-industry-codes-and-standards/licences/licence-conditions
[15] https://www.ofgem.gov.uk/ofgem-publications/52325/proforma-direction-letter-headed-2-september-2011.pdf
[16] https://www.ofgem.gov.uk/ofgem-publications/52303/decision-letterpdf
[17] https://www.ofgem.gov.uk/ofgem-publications/52306/fos-consultation-letter-finalpdf
[18] https://www.ofgem.gov.uk/sites/default/files/docs/2010/09/fos-decision-letter---final-%285%29.pdf
[19] https://www.ofgem.gov.uk/ofgem-publications/52325/proforma-direction-letter-headed-2-september-2011.pdf

actions by network and system operations across transmission and distribution planning; informing investment decisions; and facilitating efficient flexibility markets.

2.7. In previous consultations, we decided that the LTDS should remain limited in scope to the extra high voltage (EHV) network.[20] We were not convinced that it would be appropriate to mandate the extension of the LTDS to the 11kV network. This decision was based on the scale and complexity of the 11kV networks and the cost of collating and sharing the data.

2.8. From the work completed by the EDTF and others, the expectation is for energy system data to be presumed open, including 11kV data and for this to be opened up progressively as DNOs identify areas where they expect needs to emerge and lower voltage telemetry expands. As part of this consultation, we are seeking views on the need to collate and share 11kV data and the value in creating a framework and format for data sharing in advance of full data availability for 11kV data, including DG and demand-side response (DSR).

Content format of form of statement

2.9. The current EHV network data in the LTDS FoS is presented in a Microsoft Excel spreadsheet by network node, transformer and circuit. Work completed by the EDTF, conclusions from the Open Networks Project, innovation projects and Horizon 2020 projects regarding the collation and sharing of technical information suggests that technologies available to distribution network operators to collate and share network information have moved on significantly since the 2011 consultation. A review of these findings is offered in the supplementary document published alongside this consultation.

2.10. As part of this consultation we seek feedback on both the collation and presentation of static network data in a portable format and the benefits and costs of developing and sharing of underlying standardised or common network models to allow user to model local grid areas. The EDTF has examined a number of mechanisms for the sharing of

[20] Extra high voltage is Electricity supplied at 33,000 volts.

data and identified the Common Information Model (CIM) for Electricity as a potentially foundational standard that could allow the sharing of network data and models.[21]

2.11. CIM for Electricity is an International Electrotechnical Commission (IEC) recognised interoperable standard for energy data, allowing all actors to access and use data.[22] CIM does not restrict individual parties using bespoke systems in-house, but allows external data to be interoperable. CIM is available from major vendors, and is used by Transmission System Operators across Europe.[23] However, is not yet rolled-out at distribution level. As noted in the EDTF report, other than internally set standards or those aligned to a specific vendors' solutions, there are few alternatives.

2.12. Given its use already in the wider industry, CIM has the potential to be a foundational technology with regards to DSO. We also recognise that there is a legacy of poor data quality and high variability in the structure of the disparate DNO data sources. Improvements are needed to address data issues to fulfil a robust CIM-based model. We note the progress and learning that WPD's Network Innovation Allowance project 'Common Information Model' has provided.[24,25] We are seeking views on potential technologies for collating and sharing network data, in support of the objectives of the LTDS and associated FoS.

[21] https://es.catapult.org.uk/wp-content/uploads/2019/06/EDTF-Report-Appendix-6-Standards.pdf
[22] https://www.iec.ch/smartgrid/standards/
[23] https://www.entsoe.eu/digital/cim/
[24] https://www.westernpower.co.uk/innovation/projects/common-information-model
[25] https://www.smarternetworks.org/project/nia_wpd_016

Question 1: We consider that improvement is required in the visibility of DG and LCTs connected to the distribution network. It addition to DG and LCT connections, can you identify areas for improvement in the current data that is shared in the LTDS?
Question 2: Can you identify areas for improvement in the presentation of network information in the current FoS?
Question 3: The EDTF and others have identified the need to collate and share 11kV and lower voltage network data. Is there value in creating a sharing mechanism for 11kV and LV network data ahead of the expected roll out of network monitoring and telemetry in RIIO-ED2 and the limited data availability in RIIO-ED1?
Question 4: Given the complexity of future distribution networks, static data alone may not satisfy user needs. Should the FoS be enhanced to mandate the development of a common network model to allow power system simulation that each licensee must make available for exchange to users and interested parties? If so, what do you consider to be an appropriate standard?
Question 5: From a review of industry publications we consider that interoperable standards will underpin future DSO activities. Should the FoS mandate the adoption of a IEC 61970 CIM and IEC 61968 CIM for Distribution Management, such that data is collated and constructed in a manner similar to WPDs CIM innovation project model? Are these standards mature and what are the likely benefits and costs?
Question 6: Should the FoS also be retained in its current Microsoft Excel form? Is there value in this format?

Heatmaps, direct needs identification and hosting capacity

2.13. The original intent of the LTDS was to provide technical information to allow developers to assess opportunities for making new or additional use of the networks. Since the latest iteration of the LTDS and FoS, there has been significant growth in the range of developers and their technical capabilities. Presentation of network data in an updated FoS alone may not meet all users' needs.

2.14. In order to improve accessibility of information about connection opportunities, DNOs have developed a range of mapping tools, or 'heatmaps', which express technical information about their networks. As part of this consultation we are seeking views on the content and format of heatmaps provided by DNOs and whether these should be standardised as part of the LTDS. We consider technical information (network capacity, headroom, etc.) and cost information (cost of connection, connection queue information) to be relevant to include in DNO heatmaps.

2.15. DNO heatmaps vary in complexity and detail; however, the information contained in the mapping tools is generally based on the LTDS content, with the addition of visualisation aids. A short objective summary of what DNOs provide is listed below:[26]

- Electricity North West (ENW):[27] An interactive Excel workbook that shows capacity at bulk supply points and primary substations. Network maps, in pdf format, show the geographical location of primary and bulk supply point substations. An interactive map is planned for the new year.

- Northern Powergrid (NPg):[28] Interactive mapping tool that shows available capacity at grid supply, bulk supply and primary substation level down to 11kV. Raw data available to download.

- SP Energy Networks (SPEN):[29] Interactive mapping tool showing available capacity at grid supply point, bulk supply and primary substation level down to 11kV. Also shows EHV and HV circuits and displays flexibility tender locations.

- Scottish and Southern Energy Networks (SSEN):[30] Interactive mapping tool that shows available capacity at grid supply point, bulk supply and primary substation level down to 11kV. Raw data available to download.

- UK Power Networks (UKPN):[31] Interactive mapping tool that shows available capacity at grid supply point, bulk supply and primary substation level down to 11kV. Also shows Active Network Management zones. Raw data available to download. Registration is required to access the heatmap.

- Western Power Distribution (WPD):[32] Interactive mapping tool that shows available capacity at grid supply, bulk supply and primary substation level down to 11kV. Also shows Active Network Management zones. Raw data available to download via

[26] We are aware that there are varying levels of accuracy and precision on heatmaps. We acknowledge these variations and do not provide further comment here.
[27] https://www.enwl.co.uk/get-connected/network-information/heatmap-tool/
[28] https://www.northernpowergrid.com/generation-availability-map
[29] https://www.spenergynetworks.co.uk/pages/sp_distribution_heat_maps.aspx
[30] https://www.ssen.co.uk/generationavailability/
[31] https://www.ukpowernetworks.co.uk/electricity/distribution-energy-resources
[32] https://www.westernpower.co.uk/our-network/energy-data-hub

registration and request. WPD have also published an EV map, showing capacity available for electric vehicle (EV) connections.[33]

Question 7: Ensuring network information remains accessible is a priority. At present there is no formal requirement for the production of heatmaps. In order to ensure future customer can access the required data, should the scope of the LTDS and FoS be extended to mandate the production of heatmaps?

Question 8: Would there be benefit to adopting common guidance or formats on information presentation within heatmaps, including the presentation of technical information and cost information? What are the barriers to its adoption?

Question 9: The core focus of the LTDS is to assist users to enter into arrangements with the licensee and evaluate the opportunities for doing so. Should the scope of the heatmaps include other network needs, such as flexibility requirements? What is the best mechanism to notify network users of opportunities to enter arrangements with the licensees?

Question 10: On what frequency should these maps be updated? Should they be updated as there are changes to the underlying data or periodically?

Forecasting of network needs

2.16. Forecasting of load is a direct part of the LTDS, and the FoS mandates that estimated values should be clearly identified within the table and forecasts for five years should be provided. Where this applies to a single consumer, the Distribution Code submission (or equivalent) from the consumer should be used. The expected growth of LCTs uptake will drive where and when network requirements are needed, making forecasting load significantly more important than when the LTDS was originally conceived.

2.17. This forecasting is more deterministic than the Distribution Future Energy Scenarios (D-FES), which most DNOs have started to produce. These outline a range of potential futures for the growth of the distribution network. They cover high level scenarios for

[33] https://www.westernpower.co.uk/smarter-networks/electric-vehicles/ev-capacity-map

demand growth, storage and distributed generation, as well as LCTs such as EVs and heat pumps. There is no defined consistent methodology to producing D-FESs and they are not subject to data assurance governance. The forecasts in the LTDS are used to evaluate costs relating to use of system or connection charges for third parties connecting at EHV level.[34,35] Using network planners judgements on local load growth and known developments, the LTDS produces a single forecast for the next five years. There is currently no formal link defined between the D-FES and the LTDS.

2.18. No guidance is given to the preparation of load forecasts and a variety of techniques are used by the DNOs to estimate load scenarios. As a comparison, the Electricity Ten Year Statement (ETYS)[36] is produced annually by NG ESO as part of the annual electricity transmission planning cycle, and shows the likely future transmission system requirements. This adopts a scenario based approach using the National Grid Future Energy Scenarios (FES) as inputs, which allow NG ESO to capture a wide range of future network requirements. We wish to seek views on how the D-FES can inform the LTDS.

2.19. Initial development work from the ENA Open Networks Project 2019, workstream 1A, product 3 – Dispatch and Settlement Processes[37] – which seeks to assess and define best practice across DNOs, states that all DNOs forecast network requirements considering the following criteria:

- "Historic demand
- Load growth
- Asset load index
- Planned outages"

[34] Schedule 17 of the DCUSA – EHV charging methodology (FCP model) https://www.dcusa.co.uk/wp-content/uploads/2019/08/Schedule-17-v11.2.pdf
[35] Schedule 18 of the DCUSA – EHV charging methodology (LRIC model) https://www.dcusa.co.uk/wp-content/uploads/2019/08/Schedule-18-v11.2.pdf
[36] https://www.nationalgrideso.com/publications/electricity-ten-year-statement-etys
[37] This ONP product will be published by the end of 2019, and will be made available here: http://www.energynetworks.org/electricity/futures/open-networks-project/workstream-products/ws1a-flexibility-services.html

2.20. Given the current uncertainties associated with the uptake on LCTs, we think it would be useful to state the key assumptions on load forecasting in section one of the LTDS and reference the supporting document where available. Consumers should be able to understand the forecast growth rates and key drivers.

Question 11: Is there a need for a common methodology or principles for estimating load growth? What potential role could the D-FES play in informing the load growth forecasts on the LTDS?
Question 12: Are there any lessons that can be learned from other industry documents such as the ETYS and the NG FES?
Question 13: Do you agree that the LTDS should be enhanced to present the key assumptions for network requirements forecasting and the uptake in LCTs, or is this a role better served by the D-FES or other documents?
Question 14: Forecasting tools have been a focus of a number of innovation projects. Are there any mature tools or techniques that could be adopted to enhance the transparency or robustness of the load growth forecasts?

IDNOs and the LTDS

2.21. When the original direction for the LTDS was issued there were no Independent Distribution Network Operators (IDNOs). The IDNOs have therefore never been directed to produce LTDSs. IDNO networks interface with the DNO networks to connect new housing and commercial developments. IDNOs own and operate 2% of all network connections, but account for 49% of all new connections.[38]

2.22. Given the growth in number of IDNOs and number of consumers served by IDNOs, we believe that it is appropriate to revisit this decision. We wish to seek views if there are credible reasons why IDNOs could not provide the summary information mandated in section one of the LTDS FoS and some, though not all, of the network data mandated in section two.

2.23. We expect IDNOs and boundary DNOs to effectively communicate and exchange information in order to ensure that there is coherence in their network planning

[38] Figures from 2017.

expectations and forecasts. Any data publications, such as the LTDS or heatmaps therein, should use the same relevant data formats and give consistent values related to IDNOs and DNO boundaries.

Question 15: Do you agree that IDNOs should be issued with a direction to produce a LTDS?
Question 16: What summary information should IDNOs publish? This is currently found in section one of the LTDS FoS, such as information relating to the design and operation of all voltage levels of the distribution network. Please explain your reasoning.
Question 17: What information on network data should IDNOs publish? This is currently found in section two of the LTDS FoS. Please explain your reasoning.

Delivery governance of the form of statement

2.24. Ofgem are responsible for the LTDS licence condition update. The development of the LTDS and the associated FoS will require engagement from across industry to ensure that the new FoS is appropriately developed and meets users' needs.

2.25. We envisage delivery governance based on the following:

- Ofgem to independently chair an industry working group. We believe our independence and ability to balance views in a fair and transparent manner will be critical.

- An industry working group providing representations from a broad cross-section of stakeholders tasked with developing a functional specification for the new FoS. This will involve engagement with DNOs to assess the effective use and availability of their data, and with data users to ensure the specification meets their needs.

- A sufficiently independent and capable delivery body tasked with undertaking the development, testing and finalisation of the new FoS. The delivery body will sit on, and report to, the working group. If any public procurement is required we will adhere to our procurement policies and obligations.

The working group will be drawn from a broad range of industry experts. We seek nominations from stakeholders willing to give time and expertise to the development of the new LTDS FoS. We will consider nominations based on evidence of knowledge and experience to provide effective contribution, resource availability, and creating a representative group of stakeholders.

Question 18: Do you agree with our proposal on how the LTDS delivery body should be convened and governed?

Question 19: Would you like to nominate an individual to take part in the LTDS working group? Please set out reasons for their inclusion and any qualifying experience the nominated person has to function as a strong contributor to the group.

3. Key enablers for DSO

Section summary

This section of the consultation seeks views on:

- Where we should focus regulatory reforms for future key enablers for DSO.
- What reforms we should prioritise.

3.1. We are focussing on updating the LTDS, as set out in section 2. In this section, we set out the areas that we may develop as part of our ongoing work programme. We seek input from stakeholders about what areas we should focus on next.

Network monitoring & visibility enablers

3.2. Visibility of energy flows across the networks has historically been poor at 11kV and LV networks. This is in part due to an historical lack of necessity to monitor these networks, and so the limited value in doing so. However, the expected growth of peak demand from the electrification of other sectors and the decentralisation of the energy networks now demands greater network visibility, particularly on the 11kV and LV network. Enhancements will drive efficient operational decisions on network management across voltage levels, and allow and inform the activation of flexible services.

3.3. Whilst we consider enhanced visibility important, we wish to ensure that this is achieved in the most efficient manner possible. For example, consideration should be given to the smart meter data that DNOs are able to access through data privacy plans under standard licence condition 10A of the Electricity Distribution Licence. Deployment of network monitoring should be prioritised on a needs basis where there are areas of the network that are known to be constrained and could host a flexibility market.

3.4. Network monitoring and visibility requires multiple activities, including capturing data, transporting and sharing network visibility data, as shown in Figure 2.

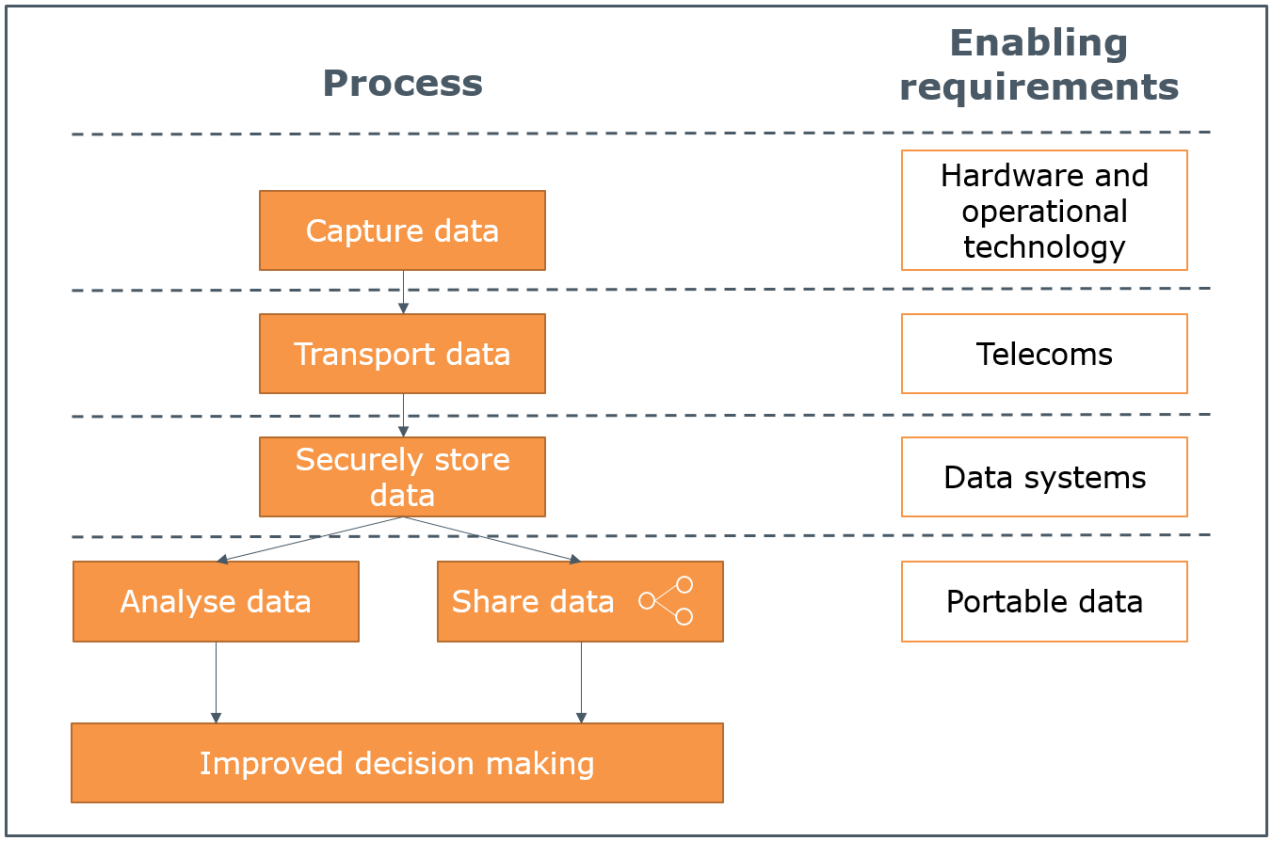

Figure 2. Process and requirements for network visibility and monitoring.

3.5. Capturing data across multiple voltage levels is a challenge to current data system and architectures. We seek to understand what data is valuable for network operators, flexible service providers and consumers to have access to.[39]

3.6. Currently, there are no data sharing protocols or mechanisms for network monitoring data. The EDTF recommend that all energy system data should be interoperable and meet users' needs. We recognise there is a need to work with existing and future data privacy regulations and consumer protections.

[39] We acknowledge that there may be relevant interactions with telecoms systems required to transport network data. Whilst this consultation does not explicitly focus on these limitations, we welcome stakeholders to raise any wider views in the context of DSO.

Question 20: What network monitoring parameters would you like to have access to? At what frequency?

Question 21: What would enhanced 33kV network monitoring enable that cannot be undertaken today?

Question 22: What would enhanced 11kV network monitoring enable that cannot be undertaken today?

Question 23: What would enhanced LV network monitoring enable that cannot be undertaken today?

Question 24: What constraints in data systems architecture do you perceive are limiting network monitoring and visibility?

Flexibility trading enablers

Operational data

3.7. Operational data can generally be understood as data that describes network processes and activities on days to months ahead timescales. This data is core to well-functioning flexibility markets, and provide value to flexibility providers, aggregators and platforms. This data informs market positions, the value of flexibility for near-term competitions, and the ability to stack value across markets. Similarly, this data will inform network and system operators about operations taking place on networks that may benefit from co-optimisation and conflict avoidance.

3.8. Operational data includes:

- Network outage plans
- Network configurations
- Working/dynamic network topology
- Resource availability under supervisory control and data acquisition (SCADA) (generation, demand, resources contracted for operations)
- Constraints and conflicts

3.9. There are currently no obligations on DNOs to publish this data. We are considering appropriate mechanisms to facilitate this in coordination with MED, and are reviewing a range of options. Notwithstanding the differences in balancing to constraint management markets, and the level of Electricity System Operator (ESO) market maturity, we note that the ESO is licenced under standard licence condition C-16 of the Electricity Transmission Licence to:

- Publish information which the licensee holds to enable electricity market participants to make efficient operational and investment decisions
- Produce and publish accurate and unbiased forecasts, including demand
- Ensure the procurement of balancing services is transparent

Question 25: What operational data is most important to prioritise opening up first and why?
Question 26: How does a lack of access to this data impact the delivery of flexibility to the system?

Flexibility dispatch and control enablers

3.10. The dispatch and control of flexibility services for distribution network management has been defined in multiple ways. Differing approaches have made it unclear what the remit of the DNOs is relative to a flexibility provider or aggregator. As active network management (ANM) schemes proliferate, we are aware that all control and management of such schemes is wholly owned by DNOs.

3.11. ANM systems are sold with the ability to scale to multiple LCTs and can be interfaced to markets to facilitate flexibility markets. This means there is a potential for ANM systems to control and manage capabilities to dispatch procured flexibility.

3.12. To protect consumer interests, we have set out our strategy of maintaining policy optionality and avoiding path dependent institutional lock-in. If DNOs own and operate the link between generators and markets, there is a potential for conflicts of interest.

How have different projects defined dispatch and control?

The ENA Open Network project workstream 1A product 3 considers dispatch of flexibility services to be the '*Process through which the DNO informs a flexibility provider of the required level of service within operational timescales'.*[40] This process of informing an asset is left open as to whether this constitutes the sending of a signal or physical (automated or manual) control over an asset to modulate its generation or consumption of energy.

Regarding procured flexibility, we have seen different approaches taken by DNOs to dispatch. Several DNOs have taken an approach where they send a signal to an aggregator or flexibility provider to instruct they modulate generation or load.

WPD's Flexible Power initially sought to allow the DNO to install and manage despatch equipment at a participant's site.[41] This has subsequently been withdrawn, and the terms and conditions of participation will be updated in 2020 to reflect only electronic dispatch.

All DNOs operate ANM schemes. These schemes vary in complexity, from DNOs manually telephoning a generator requesting a modulation, to automated systems where the DNO can control an asset to curtail generation. In the latter instances, the DNO manages, owns, and operates the means to dispatch and control flexible assets on their network. We are aware that some DNOs are seeking to develop existing ANM equipment to dispatch procured flexibility as well as ANM curtailment.

For the purposes of discussion here, we will assume that flexibility dispatch and control includes all management of an asset's energy consumption or generation, including the sending of a signal and the enactment of a modulation of energy use.

[40] This ONP product will be published by the end of 2019, and will be made available here: http://www.energynetworks.org/electricity/futures/open-networks-project/workstream-products/ws1a-flexibility-services.html

[41] Item 7.2 (a) of Schedule 3, Terms and Conditions, Constraint Management Zone (CMZ) Services Agreement, available here https://www.flexiblepower.co.uk/downloads/130

3.13. Wider policy questions are presented here on the role of the DNO relative to contested service providers. Our focus here is to establish the technical means of ensuring that the dispatch and control of flexibility services can be contested.

Question 27: Are there any real or perceived conflicts of interest with DNOs owning and operating ANM platforms at scale? What additional protections could be required for ANM customers?

Question 28: In order to preserve optionality over ANM scheme operations, what technical and commercial protections, such as technical ring-fencing, may be required?

Question 29: Please provide real world examples where lacking timely access to usable network data, or regulatory barriers, have limited your ability to provide a DSO function or support service. Please submit any relevant evidence and documentation of examples cited.

Question 30: Are there any other issues related to enabling DSO that have not been considered that you think are important? Please provide details of your considerations.

4. Next steps

4.1. Responses to section one of this consultation will be used to inform updates to the LTDS FoS. We will convene a working group in 2020 from across industry to define the specification of the reformed FoS based on the responses to this consultation. The New FoS will be in place by 2023.

4.2. Responses to section two of this consultation will feed into our policy development on DSO. Information will inform where, when and how we take regulatory steps to facilitate DSO through improvements to technology, data and engineering practices. We expect to harness this information to help define our forward work programme on key enablers for DSO and associated regulatory actions, and will continue to coordinate this with wider data strategies as outlines here and in the supplementary consultation document.

Appendices

Appendix 1 – List of consultation questions

Part 1 – The Long Term Development Statement

Question 1: We consider that improvement is required in the visibility of DG and LCTs connected to the distribution network. It addition to DG and LCT connections, can you identify areas for improvement in the current data that is shared in the LTDS?

Question 2: Can you identify areas for improvement in the presentation of network information in the current FoS?

Question 3: The EDTF and others have identified the need to collate and share 11kV and lower voltage network data. Is there value in creating a sharing mechanism for 11kV and LV network data ahead of the expected roll out of network monitoring and telemetry in RIIO-ED2 and the limited data availability in RIIO-ED1?

Question 4: Given the complexity of future distribution networks, static data alone may not satisfy user needs. Should the FoS be enhanced to mandate the development of a common network model to allow power system simulation that each licensee must make available for exchange to users and interested parties? If so, what do you consider to be an appropriate standard?

Question 5: From a review of industry publications we consider that interoperable standards will underpin future DSO activities. Should the FoS mandate the adoption of a IEC 61970 CIM and IEC 61968 CIM for Distribution Management, such that data is collated and constructed in a manner similar to WPDs CIM innovation project model? Are these standards mature and what are the likely benefits and costs?

Question 6: Should the FoS also be retained in its current Microsoft Excel form? Is there value in this format?

Question 7: Ensuring network information remains accessible is a priority. At present there is no formal requirement for the production of heatmaps. In order to ensure future customer can access the required data, should the scope of the LTDS and FoS be extended to mandate the production of heatmaps?

Question 8: Would there be benefit to adopting common guidance or formats on information presentation within heatmaps, including the presentation of technical information and cost information? What are the barriers to its adoption?

Question 9: The core focus of the LTDS is to assist users to enter into arrangements with the licensee and evaluate the opportunities for doing so. Should the scope of the heatmaps include other network needs, such as flexibility requirements? What is the best mechanism to notify network users of opportunities to enter arrangements with the licensees?

Question 10: On what frequency should these maps be updated? Should they be updated as there are changes to the underlying data or periodically?

Question 11: Is there a need for a common methodology or principles for estimating load growth? What potential role could the D-FES play in informing the load growth forecasts on the LTDS?

Question 12: Are there any lessons that can be learned from other industry documents such as the ETYS and the NG FES?

Question 13: Do you agree that the LTDS should be enhanced to present the key assumptions for network requirements forecasting and the uptake in LCTs, or is this a role better served by the D-FES or other documents?

Question 14: Forecasting tools have been a focus of a number of innovation projects. Are there any mature tools or techniques that could be adopted to enhance the transparency or robustness of the load growth forecasts?

Question 15: Do you agree that IDNOs should be issued with a direction to produce a LTDS?

Question 16: What summary information should IDNOs publish? This is currently found in section one of the LTDS FoS, such as information relating to the design and operation of all voltage levels of the distribution network. Please explain your reasoning.

Question 17: What information on network data should IDNOs publish? This is currently found in section two of the LTDS FoS. Please explain your reasoning.

Question 18: Do you agree with our proposal on how the LTDS delivery body should be convened and governed?

Question 19: Would you like to nominate an individual to take part in the LTDS working group? Please set out reasons for their inclusion and any qualifying experience the nominated person has to function as a strong contributor to the group.

Part 2 – Key enablers for DSO

Question 20: What network monitoring parameters would you like to have access to? At what frequency?

Question 21: What would enhanced 33kV network monitoring enable that cannot be undertaken today?

Question 22: What would enhanced 11kV network monitoring enable that cannot be undertaken today?

Question 23: What would enhanced LV network monitoring enable that cannot be undertaken today?

Question 24: What constraints in data systems architecture do you perceive are limiting network monitoring and visibility?

Question 25: What operational data is most important to prioritise opening up first and why?

Question 26: How does a lack of access to this data impact the delivery of flexibility to the system?

Question 27: Are there any real or perceived conflicts of interest with DNOs owning and operating ANM platforms at scale? What additional protections could be required for ANM customers?

Question 28: In order to preserve optionality over ANM scheme operations, what technical and commercial protections, such as technical ring-fencing, may be required?

Question 29: Please provide real world examples where lacking timely access to usable network data, or regulatory barriers, have limited your ability to provide a DSO function or support service. Please submit any relevant evidence and documentation of examples cited.

Question 30: Are there any other issues related to enabling DSO that have not been considered that you think are important? Please provide details of your considerations.

Appendix 2 – Privacy notice on consultations

Personal data

The following explains your rights and gives you the information you are entitled to under the General Data Protection Regulation (GDPR).

Note that this section only refers to your personal data (your name address and anything that could be used to identify you personally) not the content of your response to the consultation.

1. The identity of the controller and contact details of our Data Protection Officer

The Gas and Electricity Markets Authority is the controller, (for ease of reference, Ofgem). The Data Protection Officer can be contacted at dpo@ofgem.gov.uk

2. Why we are collecting your personal data

Your personal data is being collected as an essential part of the consultation process, so that we can contact you regarding your response and for statistical purposes. We may also use it to contact you about related matters.

3. Our legal basis for processing your personal data

As a public authority, the GDPR makes provision for Ofgem to process personal data as necessary for the effective performance of a task carried out in the public interest. i.e. a consultation.

4. With whom we will be sharing your personal data

None

5. For how long we will keep your personal data, or criteria used to determine the retention period.

Your personal data will be held for an appropriate duration.

6. Your rights

The data we are collecting is your personal data, and you have considerable say over what happens to it. You have the right to:

- know how we use your personal data
- access your personal data
- have personal data corrected if it is inaccurate or incomplete
- ask us to delete personal data when we no longer need it
- ask us to restrict how we process your data
- get your data from us and re-use it across other services
- object to certain ways we use your data
- be safeguarded against risks where decisions based on your data are taken entirely automatically
- tell us if we can share your information with 3rd parties
- tell us your preferred frequency, content and format of our communications with you

- to lodge a complaint with the independent Information Commissioner (ICO) if you think we are not handling your data fairly or in accordance with the law. You can contact the ICO at https://ico.org.uk/, or telephone 0303 123 1113.

7. Your personal data will not be sent overseas (Note that this cannot be claimed if using Survey Monkey for the consultation as their servers are in the US. In that case use the Data you provide directly will be stored by Survey Monkey on their servers in the United States. We have taken all necessary precautions to ensure that your rights in term of data protection will not be compromised by this.

8. Your personal data will not be used for any automated decision making.

9. Your personal data will be stored in a secure government IT system. (If using a third party system such as Survey Monkey to gather the data, you will need to state clearly at which point the data will be moved from there to our internal systems.)

10. More information For more information on how Ofgem processes your data, click on the link to our Ofgem privacy promise.