Energy Systems Catapult: Consultation Response

Ofgem Key enablers for DSO and the long term development statement (LTDS) – evidence and coordination with existing initiatives[1]

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Energy Systems Catapult (ESC) was set up to accelerate the transformation of the UK's energy system and ensure UK businesses and consumers capture the opportunities of clean growth. The Catapult is an independent, not-for-profit centre of excellence that bridges the gap between industry, government, academia and research. We take a whole systems view of the energy sector, helping us to identify and address innovation priorities and market barriers, in order to decarbonise the energy system at the lowest cost.

We warmly welcome Ofgem's timely consultation on updating the LTDS as it presents the first regulatory opportunity to implement the findings of the Energy Data Task Force (EDTF), led by the Energy Systems Catapult (ESC) and chaired by Laura Sandys. The LTDS review presents an opportunity to embed EDTF's recommended overarching approach to data of *Filling in the Gaps* and *Maximising the Value* based in on the two key principles of *Digitalising the Energy System* (new data needs; continuous improvement; digitalisation strategies) and *Presumed Open* (discoverable, searchable and understandable; structures, interfaces and standards; secure and resilient). The approach and principles are detailed in EDTF's recently published report[2].

The LTDS is a key enabler for DSO that should deliver core improvement to network forecasting and planning data that in turn can provide the necessary underpinning for delivery of other DSO functions. The LTDS review can develop common standards that start to enable data interoperability across organisations and create a requirement for data that underpins network modelling in machine-readable format.

We agree with Ofgem that the time is right to regulate. The current body of evidence is more than sufficient to justify intervention. Innovation and high potential consumer benefits are being significantly constrained due to inadequate exchange, transparency and interoperability of data. The rapid and wholescale change needed in this domain is dependent on timely and effective regulation.

The ESC also supports Ofgem's intended approach to make progress on DSO now, without delay, where data, technology and engineering practices are sufficiently mature. Evidence regarding the latter, however, must be collected from a wide range of sources and stakeholders, including those outside of the UK, in order to support an ambitious approach, avoiding an overly cautious approach.

ESC recently published best practice principles for energy data (EDBP) and we recommend they be taken into account for the update of the LTDS[3].

ESC detailed responses to the consultation questions:

[1] Consultation documentation available at: https://www.ofgem.gov.uk/publications-and-updates/key-enablers-dso-programme-work-and-long-term-development-statement

[2] ESC 2019, *A Strategy for a Modern Digitalised Energy System – Energy Data Task Force report,* chaired by Laura Sandys, sponsored by BEIS, Ofgem, Innovate UK, available at: https://es.catapult.org.uk/impact/specialisms/energy-data-taskforce/

[3] https://modernisingenergydata.atlassian.net/wiki/spaces/MED/pages/69042178/MED+Data+Best+Practice

Question 1: *We consider that improvement is required in the visibility of DG and LCTs connected to the distribution network. In addition to DG and LCT connections, can you identify areas for improvement in the current data that is shared in the LTDS?*
Asset registration was a key recommendation of the EDTF. ESC takes the view that improving the visibility of infrastructure and assets is urgently needed. The lack of a coherent approach to data sharing/management and poor visibility of energy assets creates many problems across the sector. The repeated, manual registration of data and the resulting multiple, incomplete datasets increase the cost of operation for many organisations across the sector.

Data required includes available network capacity and system requirements. Data relating to the status and capabilities of assets (e.g. flexibility, duration, volume, location (consider EVs are mobile)) is needed and must be compatible with the data needs of innovators and system operators. Data is also needed by system operators in order to be able to assess options to achieve certain outcomes, such as system security standards.

It would be useful if static data could be made available at lower voltages than is currently provided in the LTDS. Provision of substation locations and capacities at all voltages would be valuable for Local Area Energy Planning (LAEP) purposes. Ideally, this would also include information on the numbers of connected customers and, where possible, connection data. Whilst customer connection data might be considered sensitive, being able to identify the feeder connections between substations would be valuable. Provision of this data in a format common to all network operators would help significantly in terms of developing energy system models that can be easily applied to all network operators. Data should be made available in file formats that are easily readable in order to enable innovative and efficient uses of the data. Network data should not only be provided in a proprietary format appropriate for a particular simulation tool.

Data that could be useful also includes load curves and capacity curves (e.g. higher ratings in winter) so third parties can identify headroom.

Static asset registration is the first step though ultimately we know that a more dynamic system is required. To realise the benefits of smart energy systems, all necessary investment and operational planning data must be available and development of data strategies and the LTDS must take account of that. As useful as it is to have 'installed' data, it is not enough to enable the active system management envisaged for decentralised, digitalised, decarbonised and democratised energy systems that must also be Net Zero compliant. It must be considered that a lot of such data will be personal and would be generated and shared by non-energy related systems, so confining scope to energy data only could be unhelpful.

Question 2: *Can you identify areas for improvement in the presentation of network information in the current FoS?*
Guidance about methods to enable data access can be found in the Energy Data Best Practice Guidance[4].

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?*
The need to collate and share 11kV and lower voltage network data is urgent and actions need to be accelerated if innovation is to unlock consumer benefits. ESC provides some guidance for data

sharing, relevant to this question, in the EDBP guidance. Considering that the RIIO-ED2 price control will not take effect until 2023, actions that can be usefully implemented before this date should not be delayed.

Any learning relating to sharing of data will prepare the ground and provide valuable input to the design of the RIIO-ED2 mechanisms. Any progress with sharing data ahead of RIIO-ED2 implementation will also support innovation; many businesses patiently wait for the data they need to realise their innovations. While RIIO-ED2 is the mechanism that will incentivise DNOs to transform and play their full role in future DSO, early mover DNOs should not be prevented from advancing ahead of RIIO-ED2.

RIIO-ED2 can be designed to encompass multiple mechanisms that embed the core principles relating to digitalisation of the energy system; EDTF recommends the following mechanisms:

- Requirement for the network operator to submit a data strategy within their RIIO2 business plans which adopt the principles proposed by the Taskforce
- Business as usual to be set at a new level of transparency
- Requirements for more data relating to the networks.
- Investment evidence to require appropriate data analysis
- Disclosure of raw data that underpins network modelling
- Companies recognised for innovative mechanisms for using data to provide greater infrastructure visibility and support productive collaboration

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?*

We agree that static data may not satisfy users' needs – as mentioned above, investment and operational planning data must be available if the benefits of smart energy systems are to be realised. That said, there should be an understanding of a) what the data is to be used for as this will determine the standard/quality required b) the vision for the direction and pace of the data improvement journey and end point or goals. In relation to a), for example, if the objective is to provide virtual inertia then the data standards need to be the very highest while, in comparison, a much simpler data strategy would be needed to enable trading of, for example, peer2peer applications. In relation to b) it may be necessary to choose between starting with a relatively simple data strategy that can be evolved (but may mean stranding/redundancy of some investment, though benefits could exceed costs), or adopting a more comprehensive data strategy knowing that it will take longer to get right before it can be used.

Real time data may need a sensible strategy to infer from what is available rather than having to mandate monitoring on every node of the system.

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- There is a need for a more coordinated approach for the sharing of real time / operational data to enable the deployment of more dynamic market arrangements.

It will be necessary to consider the cost and benefits using a transparent CBA methodology.

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?*

The EDTF considered the common information model (CIM) as a case study and as part of its analysis of standards[5]. The EDTF concluded that as CIM offers value to the network operators, system operators, innovators and the regulator alike that the government and regulator should take actions to embed CIM into regulatory processes and new markets to clarify the value statement and ensure that CIM creates maximum value for the Energy System. In the UK, many of the operators have started to transition to a consolidated CIM representation of their network, with some having reached a very good level of maturity. However, there are some networks which have not yet been able to identify sufficient value to make the investment required; this could benefit from Ofgem's closer scrutiny.

Defining DSO and providing greater clarity on roles and responsibilities of various actors involved in delivering DSO is crucial input as then actors can more readily understand if/how certain standards will meet their needs.

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

An advantage of Microsoft Excel is that it is easy to download and manipulate if the file is small and the same format is used by all network operators. However, a csv file would be better as it is open and not tied to Microsoft.

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?*

Heat maps can be rather simplistic but could be helpful in presenting certain non-dynamic data for planning purposes. What is key is that the required information is clearly specified. Heatmaps could be useful for local area energy planning (LAEP) purposes but this would be subsidiary to the requirement for good quality network data (question 4). The precise methodology used to produce any heat maps would need to be clearly defined and applicable to all network operators (e.g. standardisation) for them to have any real value.

A mandate can helpfully ensure data access and provision, but mandating the format for presentation of data may not be so helpful if better alternatives exist.

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?*

Common guidance and formats could be highly complementary to mandates (Q7); they could incorporate best practices and give clear indication of Ofgem's expectations.

[5] See Appendix 6 of the EDTF report, available at: https://es.catapult.org.uk/wp-content/uploads/2019/06/EDTF-Report-Appendix-6-Standards.pdf

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?*

The scope of heatmaps or other such tools should indicate network needs, including flexibility requirements. For example, heatmaps could communicate constraint zones and include postcode detail.

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

- Need to take into account network company processes but in the region of 10 days should be sufficient for most.
- The updates should be accessible online.
- There would be some consideration around the RACI for updating these maps across DNOs and at DNO-TOs interfaces. Also, any interim updates should be limited to a narrative explaining the network changes.

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?*

- Standardisation is necessary to avoid anomalies between data produced by different DSOs. However, the methodology should be kept under review – standardisation should not be used as an excuse for not updating the methodology.
- Furthermore, there should be coordination between ESO FES (which is a top-down approach) and D-FES (which is a bottom-up approach) with a view to finding the equilibrium point in between.
- Care should be taken to ensure that any methodology used to estimate load growth reflects the unique nature of local energy systems. A methodology that assumes a 'one size fits all' approach where differences between local areas are not considered would be of limited value and could be highly misleading.
- Estimating load growth for planning purposes should take full account of the ongoing data improvements relating to energy resources, including storage and load, in both investment and operational timescales, which along with market design reforms are expected to unlock the flexibility value of energy demand/storage.

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

- Importance of getting feedback on the assumptions made to support acceptance of the outputs.
- Seeking and responding to feedback to improve the next version of the document,
- Not only focus on peak ACS demand to identify the requirements.
- Identify the requirements based on year-around assessment considering whole system approach (not just about gas and electricity networks – include interaction with transport, heat, hydrogen, buildings, cities and regions, industrial sectors etc.)
- Consider establishing a level playing field between regulated asset-based solutions (considering DNO's allowance and also their detailed knowledge of the network) and non-asset-based solutions and market solutions provided by third parties for provision of services,

such as flexibility. Incorporate this consideration within CBAs. This would enable competition between and across technologies, so reducing costs and realising benefits for consumers.
- Keep updating any *possible* future security and quality of supply standards. These standards could technically be the backbone of any long-term development strategy.
- Cost effective and efficient end-of-life asset replacement decisions.

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?*
What is important is a standard approach across DNOs that reflects differences between local areas.

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?*
IDNOs represent a significant challenge for data access so it is key that they are expected to contribute via the LTDS at least. IDNOs should provide a similar service to customers as a DNO.

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?*
Yes, the proposal should be relatively straight-forward to implement and could be made more formal if needed in the future.

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.*

The Energy Systems Catapult proposes to be represented in this working group. ESC has accumulated considerable knowledge on data, digitalisation and modernising power systems through its leadership of the EDTF and other relevant initiatives. We propose that ESC be represented by Amir Alikhanzadeh, ESC's Practice Manager for Power Systems. Previously with National Grid, Amir's expertise lies in economic long-term network development planning. His experience includes leading NG ESO's Network Options Assessments (NOA), Electricity Ten Year Statement (ETYS), and Constraint Management Pathfinder. Amir also has expertise in Future Energy Scenarios (FES) development relating to achieving Net-Zero 2050 as well as energy storage systems. Amir will bring to the working group the collective expertise of ESC from different teams: policy and regulation; integrated energy systems; Local Area Energy Planning; innovation and digital. Amir is also representing ESC in Ofgem's Forward Looking SCR Challenge Group.

Question 20: *What network monitoring parameters would you like to have access to? At what frequency?*
The necessary network monitoring parameters are those that DSO will need access to if it is to move away from a "fit and forget" philosophy.

For local area energy planning purposes (LAEP), annual and peak demand on different assets should be provided where available. Ideally more detailed, half-hourly demand data should be made available where possible. More detailed information on voltages and currents is likely to be valuable for other activities.

The dynamism of parameters are particularly important and it's necessary to consider how parameters will change and/or which new parameters might emerge.

At all voltage levels, commercial data like the cost of reinforcement in specific areas would help to model "reinforce vs flexibility" choices.

Question 21: *What would enhanced 33kV network monitoring enable that cannot be undertaken today?*
The 33kV network is generally well monitored already but its value would be much enhanced if lower voltage network monitoring would be improved.

Question 22: *What would enhanced 11kV network monitoring enable that cannot be undertaken today?*
Enhanced 11kV network monitoring is key to unlocking the value of energy resource flexibility and system services at the distribution level.

Where a circuit could credibly be overloaded, the DNO either needs to reinforce the network or have the facilities to:

- Detect the overload
- Identify the required mitigating action
- Communicate the required action (usually to an end customer)
- Have the contractual right to instruct the customer to change load
- The customer needs the ability to receive and implement the instruction
- The settlement system needs to record the instruction and verify whether it was implemented

Question 23: *What would enhanced LV network monitoring enable that cannot be undertaken today?*
See Q22

Question 24: *What constraints in data systems architecture do you perceive are limiting network monitoring and visibility?*
Data systems architecture must be based on clarity regarding how data supports achievement of objectives or fulfilment of functions. So, for example, more clarity on the definition of DSO would be helpful as this would provide a key input to the functional architecture and its data needs.

- Installing sensors to monitor
- Communicating the data to the point of decision
- Communicating the required actions to those required to respond
- Establishing contractual rights and settlements to support the above
- Inconsistencies between network operators – file formats and structures, underlying assumptions

Question 25: *What operational data is most important to prioritise opening up first and why?*
It should be a priority to open up data on network constraints at the DNO level given that some distributed systems are already constrained and as value can be immediately unlocked. Relevant data should include the magnitude, duration and time of the constraints and the network asset(s) involved. The network constraints can include voltage, thermal, and system security (e.g. black start, etc.) limitations. Particularly important is information regarding the cost and time of reinforcing the network to relieve a constraint and identification of the real value of flexibility options. Estimates of local load growth are also a priority.

Question 26: *How does a lack of access to this data impact the delivery of flexibility to the system?*
Flexibility users and providers have a very limited view of where, when or to what extent flexibility is important/required. Data relating to potential sources of flexibility, their capability and availability, are also needed. Without the right data at the right level of granularity (time/location) that can be accessed by all flexibility users and providers (including third parties), flexibility cannot be accurately delivered by system operators and nor can it be appropriately rewarded through markets or market-based mechanisms.

Flexibility users and providers should also have access to any information regarding planned changes that might impact how long the particular form of flexibility will be needed for e.g. the DSO may be planning to install a larger transformer at some point to alleviate a constraint; expected date that an interconnector will become operational.

High visibility of data must also be accompanied with high visibility of participants' behaviour in response to this data, to ensure quality system/market performance based on appropriate use of data and to prevent abuse of data.

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?*
Indeed there are potential conflicts of interest and there exists a body of literature, including Ofgem's own analyses/contributions[6], which discusses this question. Some functions of DSO are contestable and competition should be encouraged, including competition for holding licences, while for other functions, it may be in the consumers' best interests that they be delivered by regulated monopolies. How monopolies are regulated is crucial to enabling innovation and achieving value for consumers and further evolution of performance-based/incentive-based regulation (i.e. RIIO) is necessary. Nevertheless, delivery of all DSO functions (including ANM) requires effective/quality monitoring, whether or not they are delivered by a monopoly or through third party (competition). Insights from monitoring should provide the evidence and justification for further regulatory intervention to ensure sufficient consumer empowerment and protection.

A particularly important consideration relates to the possibility of these platforms becoming mission critical (i.e. their failure will lead to black outs). If it might not be economic for non-DNO providers to give the required level of system resilience/security or if the latter might be compromised due to pursuit of commercial interests, the case can be made for making the DSO responsible for achieving defined system security standards.

[6] For example, Ofgem's Future Insights Papers: Flexibility Platforms in Electricity Markets: https://www.ofgem.gov.uk/ofgem-publications/155489

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.*
ESC is conducting extensive modelling work to assist local authorities in developing Local Area Energy Plans (LAEP[7]). The modelling can inform decision-makers on cost-optimal energy infrastructure development. Using the EnergyPath® Networks (EPN) tool, ESC takes a whole systems approach to understanding the unique characteristics of the local area including the type of building stock, heating technologies, existing energy networks, electrification of cars, as well as local spatial constraints and opportunities. This modelling, however, has been severely hampered by the inadequate data provision relating to distribution energy networks. The evidence is presented in the Annex to this paper.

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.*

- The pace and direction of travel for enabling DSO could be more clearly articulated.
- Attention needs to be given to the interaction between DSO and ESO and interoperability across different voltage levels. How to identify the requirements, and by whom? How to procure it to avoid any conflicts between DSO and ESO?
- Local power system needs and DNO interventions might not always align with power system needs at national level. If the DSO is only making decisions on the implications for their own assets, then there is a risk that we do not get the best solution for the power system as a whole.

[7] Local Area Energy Planning (LAEP) is a means, involving area-specific energy system modelling and stakeholder-government engagement process, of exploring a range of different future local energy scenarios and for developing policy and investment strategies regarding deep decarbonisation. LAEP takes a whole systems view, accounting for building energy performance, heating technologies, electrification of transport, the capacity of and potential for gas, power and heat networks, local spatial constraints and opportunities.

ANNEX:

ESC experience of DNOs' data limitations through local energy system modelling for LAEP

Improving access to data will improve the Local Area Planning process. For example, the provision of up to date network data will help to increase confidence in the LAEP outputs; where the ESC has experienced several challenges with obtaining and using network operator data:

1) All network operators have different data licence agreements. These are often not suitable for use unless they can be varied. Examples include:
    a. An assumption that data will only be used by contractors who wish to understand where network assets are located before starting road works
    b. Clauses that states that all outputs from use of the data belong to the network operator and data users have no rights of ownership or publication of derived data
2) All network operators share data in different formats, with different fields and units used, such that resource intensive data processing is required to allow the data to be used effectively
3) Data provided is often incomplete (e.g. asset locations but no asset capacity)
4) Data is often provided across several files which do not cross reference properly (e.g. asset names vary across different files/sources).
5) Network operators will not generally provide customer connection data due to concerns over data privacy issues. Where data is provided it generally maps to MPAN numbers rather than addresses, introducing additional challenges of identifying which buildings are associated with each meter. This means that customer connection data will generally have to be synthesised; however, there are likely to be solutions to ensure that data privacy is maintained.
6) If network data is provided in GIS formats, generally assets are not represented by single item in the data set. For example, single pipes or wires are represented as a number of individual lengths of pipe or wire, making it difficult to use and requiring intensive processing; resulting in an inferior representation of the actual network.
7) The ESC has been provided with information where there have been significant cost differences between network operators in cost data for building new networks or reinforcing existing networks; providing consistency of approach challenges. This is often due to different assumptions, examples include:
    a. Cost data for a new substation either: including all components and work required to install; or the transformer cost only.
    b. Assumptions made around pole spacing for overhead lines.

The Energy Data Taskforce report: A Strategy for a Modern Digitalised Energy System, contains a number of recommendations that, where progressed, could alleviate the challenges described above and feed into the LAEP Methodology and Framework, supporting a more open data driven approach, key aspects are summarised below:

1.1. Approach/principles*

1. **Digitalisation of the Energy System** – There are many aspects of the energy system where data gaps exist that will have to be addressed through the identification of new data needs,

continuous improvement of data quality, granularity and skills, and the development of digitalisation strategies by organisations and the sector as a whole.

This could support LAEP through the development of accurate low voltage network data and access to more timely network capacity information; helping to improve the representation of an areas existing energy system.

2. **Maximising the Value of Data** – There are many cases where data exists, but its value is limited by a lack of openness or sharing. To address this, the EDTF recommended the adoption of a Presumed Open principle where organisations have an obligation to prove why data cannot be open rather than assuming all data is closed by default. To support this, data should be 'discoverable, searchable and understandable', it should be based on standards where practical and contribute to increasing system security and resilience.

   This would improve the LAEP process by reducing the barriers to accessing data relating to the energy system, including network data. For example, this could help to resolve the data licencing issues highlighted in item 1 above.

* Note that the EDTF promotes an overarching approach of 'Filling in the Gaps' and 'Maximising the Value' that is based on two key principles: Digitalising the Energy System (new data needs; continuous improvement; digitalisation strategies); and Presumed Open (discoverable, searchable and understandable; structures, interfaces and standards; secure and resilient).

1.2. Building Block Projects

3. **Data Catalogue** – Improving visibility of data across the system through the commissioning of a standardised metadata catalogue of all energy system data.

   This would improve the LAEP process through easier identification of data sources. For example, it is unclear what data sets different network operators have and what data is within them; this could help to resolve the asset identification and cross-referencing issues highlighted in item 4 above.

4. **Asset Registration Strategy** – Providing a coherent, coordinated approach to energy asset registration in order to simplify the process for asset owners, provide a trustworthy data source containing all system connected energy assets and drive efficiency through the sector.

   This would improve the LAEP process by providing a high-quality data source of distributed energy assets; helping to maximise the number of existing assets captured in the representation of an areas existing energy system e.g. domestic PV systems

5. **Digital System Map** – Developing an energy system map which brings together data from across the sector including network data (electricity and gas), asset information and system metrics. The map also enables other complementary datasets to be viewed in combination with energy system data to derive greater value and works towards the vision of a digital twin.

   This would help by providing a consistent visual representation of existing energy systems, incentivises the network companies to open and standardise their data and providing a possible route for dissemination and visualisation of LAEPs.