

Energy Data Taskforce: Two Years On

Part of the Energy Digitalisation Taskforce

Laura Sandys CBE	Jake Verma
Dr Richard Dobson	Dr Stephen Haben
Emily Ainsworth	Ben Leland

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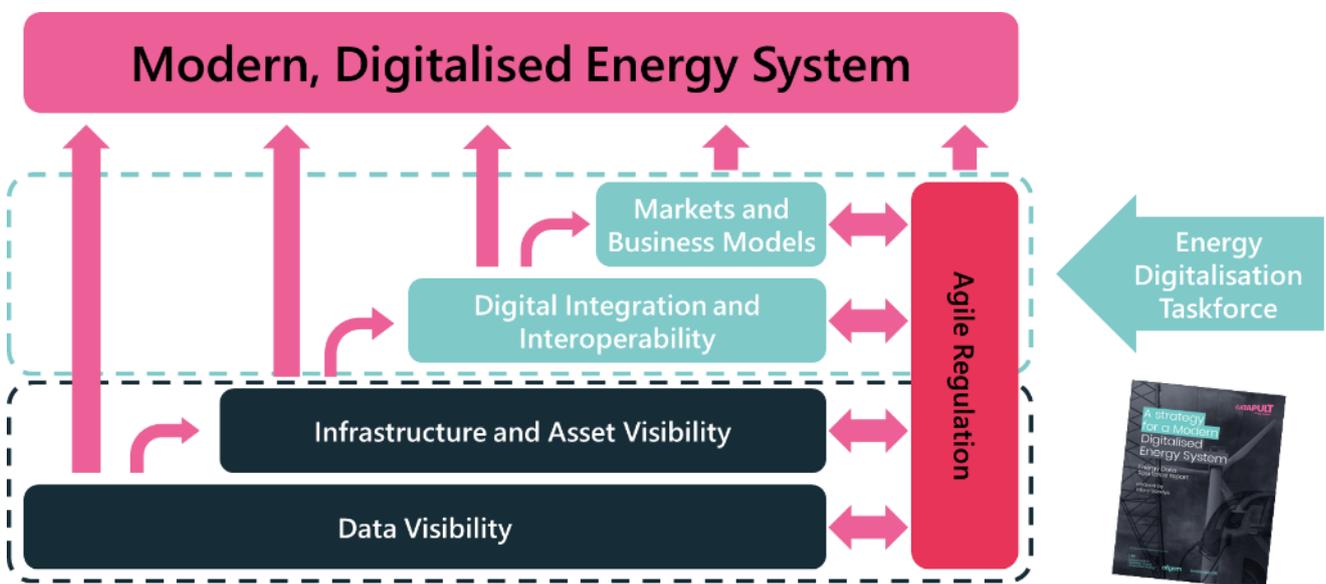
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Introduction

The Energy Data Taskforce (EDTF) was commissioned by the UK Government, Ofgem and Innovate UK to develop an integrated data and digital strategy that helps unlock the opportunities of a modern, decarbonised, and decentralised Energy System for the benefit of consumers. Chaired by Laura Sandys CBE and implemented by Energy Systems Catapult, the EDTF delivered a strategy for a 'Modern, Digitalised Energy System' centred around a set of key principles.

The EDTF team engaged with over 300 individuals throughout the energy sector and beyond to understand existing challenges, develop hypotheses and test recommendations. EDTF presented five key recommendations to achieve a Modern, Digitalised Energy System based around the need to fill the data gaps and maximise the value of data, providing a strong foundation for the Digitalisation of the Energy System.



The Energy System Digitalisation Taskforce (EDiT) will continue by identifying the challenges and opportunities of digitalisation and provide clear direction and leadership to accelerate digital transformation of the sector. The Taskforce will deliver a set of actionable recommendations that sit at the intersection between policy, regulation, and innovation that span market design, digital architecture, and governance. The recommendations will draw on best practice from other sectors and countries to challenge the status quo and deliver the energy system transformation that we need to reach Net Zero.

To set the direction of travel for the EDiT, we have conducted a review of the EDTF recommendations to assess the progress made by the sector since they were launched in summer 2019. The original recommendations can be found [here](#).

Methodology

This document is a review of the EDTF recommendations, conducted through semi-structured interviews with members of the energy industry who are at the forefront of delivering the recommendations of EDTF. This includes network operators, consultancies, SMEs, members of academia, government departments and trade bodies. The responses from the interviews were analysed and categorised into common themes. Generally, the most common points raised across multiple stakeholder interviews have been highlighted in each section, however we have also included more niche points where a stakeholder made a particularly insightful point.

As part of the review, we also identified and assessed activities that have taken place since the launch of the taskforce recommendations. The list of projects has been compiled and is available [here](#).

The review is presented by recommendation. Each recommendation has been allocated a red-amber-green rating which is based on rate of progress rather than outcome. This is accompanied by an overview of progress since the EDTF launched, a case study of a noteworthy activity and a set of recommendation updates which can maximise impact.

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Overarching Outcomes

Since the publication of the EDTF report there has been significant change across the sector. While the EDTF stimulated debate, created engagement, and galvanised action, these overarching outcomes were achieved thanks to the actions of many organisations and individuals across the sector. In this section, we have highlighted some of the overarching outcomes that cannot be constrained to a single recommendation, but which have helped to fundamentally change the sector for the better.

Energy data is a key focus across the sector. The EDTF principles resonate with the industry and have promoted better conversations about the value of data and data access to take place. The work to deliver the recommendations across the sector has created commercial opportunities for a diverse range of organisations and highlighted multiple areas that still require work.

Cross government collaboration is supporting innovation. The Modernising Energy Data (MED) group, created by the Department for Business, Energy and Industrial Strategy (BEIS), Ofgem and Innovate UK, has worked tirelessly to drive the sector forward towards the vision of a modern digitalised energy system. The MED group have been responsible for developing and funding many impactful projects including Energy Data Best Practice, Local Energy Data Innovation, Modernising Energy Data Access, and Modernising Energy Data Applications which have together provided approximately £5m of funding to energy data innovators.

Government and the regulator are implementing the EDTF recommendations within policy and regulation. The MED group have developed both policy and licence conditions which promote the principles of the EDTF. Ofgem have acted incredibly quickly to implement meaningful conditions into the upcoming RII0 2 Licence. These will have a substantial impact on data practice across the sector. BEIS has also made substantial strides, by recognising the value of energy data and digitalisation in the Energy White Paper and announcing the publication of the joint BEIS and Ofgem Energy Data Strategy this year.

Increasing Skills and Data Literacy. Many organisations across the sector, including the regulator and policy makers, increasingly appreciate the growing importance of digital and data skills. This has created opportunities for third parties to upskill the sector. Although the work to embed skills in the sector is still ongoing, there was general feedback that many organisations now have a much better idea of what capabilities they need to deliver on their digitalisation plans. However, organisations would appreciate more guidance on the next stages of digitalisation so they can ensure their development plans cover the range of skills they will need in the future.

Increased demand for data and digitalisation solutions. There is a huge amount of support for the EDTF and the wider digitalisation and data work that is happening across the sector, so much so that many of the stakeholders we interviewed expressed a desire for things to move faster. Stakeholders want access to more data, better digital systems, and practical tools to help them navigate the complex landscape. There was a strong demand for the building block projects (Recommendations 3-5) to quickly deliver public tools.

Overall, the digital and data landscape has changed dramatically since the inception of the Energy Data Taskforce. We have seen new digital and data jobs created, collaborative industry groups emerge, numerous data projects receive significant funding and new data centric products and services launched. This is just the start of the transformation, but it is a fantastic start.

Recommendation 1: Digitalisation of the Energy System

RAG rating: Amber

Digitalisation Strategies and Action Plans demonstrate ambition. Ofgem requested that the networks develop and publish a Digitalisation Strategy almost immediately following the publication of the EDTF report and is commended for its very timely response. All network companies responded and have now published two iterations of their Digitalisation Strategy which is now accompanied by an Action Plan. Ofgem have now moved to mandate the ongoing publication of the network Digitalisation Strategy and Action Plan via the RIIO 2 Licence.

In addition to the Digitalisation Strategy and Action Plan publications we have seen a wealth of digitalisation initiatives ranging from fundamental research and development work through to large scale innovation trials and business as usual technology deployments. Of particular note is the EA Technology led substation monitoring trial which has deployed granular monitoring at many substations within the Cheshire area. This will create a really valuable data resource which can be used to validate many Net Zero pathways.

However, this great progress is just the start of the digitalisation journey and we have highlighted some key points that need to be considered below.

Leadership driven by a clear, shared vision. There is a need for greater digitalisation coordination across the sector and we believe that a shared vision for the digital system architecture of the future will help. Interviewees highlighted that while the individual digitalisation strategies were often good; they took different approaches and will not necessarily create a coherent system without intervention to bring them together.

Innovators need more from networks. Many of the networks have made great progress with digitalisation, especially with operational systems and processes. However, initiatives are often invisible to external stakeholder and do not necessarily create opportunities for innovators. The network Digitalisation Strategies have created a better view of priorities and activities, but they have also reinforced the view that agile development practices, data driven problem solving and transfer of innovation solutions to business-as-usual were still challenges. This all limits the ability for innovators to create impact and help deliver Net Zero. Interviewees suggested that there was also a need for more digital and data skills (including at a management and senior leadership level) as well as proper regulatory incentives to drive change.

Less clear outcomes for Gas Networks. Decarbonisation of heat is a hot topic, with many options being considered from heat pumps through to the use of hydrogen. In addition, the operational model for gas networks is less dynamic due to the inherent flexibility of the system. The combination of uncertainty around the future of the gas network and operational model means that digitalisation is being approached more cautiously. However, the lack of information about the gas network and its features will make it more difficult to understand the value of assets and how they can be productively used in a Net Zero world.

Promoting digital leadership and literacy presents opportunities. Some organisations have appointed a senior leader for digital and data, this has helped to ensure digital and data are a focus and break down organisational siloes to promote skills across the organisation. However, this is not ubiquitous across the sector, more direction from the regulator could help to resolve this.

Effective collaboration and recognition of inter-relationships. Many digitalisation challenges in the energy sector are whole system problems that require collaboration between regulated entities and cannot be solved by organisations acting independently. The digitalisation strategies provide

an insight into each network organisation but do not demonstrate a holistic whole system solution. This is highlighted by the fact that there are areas of significant overlap and gaps between strategies which are a risk. The existing strategies need to be rationalised and a more collaborative approach should be encouraged.

Recommendations Update

There is a clear need for leadership and digital system vision. While there are many good digitalisation initiatives underway there is no clear vision for the energy system digital architecture, this creates the risk of there being overlaps or gaps between systems which is likely to create confusion and increase integration complexity. In addition, there is significant uncertainty about the governance of new digital system functions which needs to be addressed before monopoly positions are embedded unconsciously. Finally, while there are good steps being made to improve digital and data skills in the sector it is essential that these become embedded throughout organisations (from directors to entry level) and new skill requirements are identified early so development pipelines can be put in place.

By commissioning the Energy Digitalisation Taskforce, BEIS, Ofgem and Innovate UK have provided the environment for these big issues to be discussed and for a coherent vision to emerge.

Network digitalisation strategies and action plans need to be rationalised. Our analysis shows that there are many common needs across network organisations and there is risk of duplication of effort if these are developed independently. This means that there is significant potential for efficiencies if the networks collaborate effectively on the common elements. Embracing open source approaches where possible will crowd in expertise and drive innovation.

Case Study – Digitalisation Strategies

Following Ofgem's request, the network operators developed and published their digitalisation strategies in line with recommendation 1. There has been a very positive progress with alignment and coherence increasing across the sector. Although there is much still to do, the reports have demonstrated the network operators' strong commitments to digitalisation and the tangible benefits and value to embedding digital and data best practice within the organisation. A stakeholder-driven digitalisation approach is promoted by most of the network operators. User personas have also been included as a core methodology for understanding which use cases to prioritise and thus which datasets to release.

The strategies highlight several emerging areas of interest including more advanced network monitoring, smart meter integration, and increased utilisation of machine learning and AI for use in asset health prediction, fault detection among other applications. Further there has been an increased emphasis on data skills and training, recognising the potential shortage of the right personnel and talent required to implement and maintain their future systems.

Recommendation 2: Maximising the Value of Data

RAG rating: Green

There has been very positive progress on recommendation 2, with a huge proliferation of open data being made available across the energy sector with a noticeable increase in the availability, accessibility, and discoverability of data. Cited for particular praise were the electricity networks, Electralink, Elexon and the Low Carbon Contracts Company, who have effectively triaged 100s of datasets between them for general access. Unnecessary barriers to entry by have also been reduced by collating datasets into data portals and setting common licence terms. The open data triage was considered a robust methodology by those interviewed but there was still some lingering concern that it still leaves a little too much flexibility to move data to “shared” instead of “public” or “open”.

The Presumed Open principle has driven much of the excellent progress on maximising the value of data. Although initially regarded with suspicion because of the word “open”, the presumed open principle has rapidly given multiple organisations across the industry the tools needed to robustly understand what steps needed to be taken to make data more open. The freedom for each organisation to determine what steps they needed to take to make data open was a benefit and most interviewees agreed that there is significant support from across industry for the principle.

It is complicated to assess the value of network data. This has made it difficult to know what they should prioritise for release; this continues to hinder progress. User personas are a common approach, but these only go so far in assessing value for specific stakeholders. Demonstrating the value of data was considered very important as it gives a solid business justification for making data open, which often addresses the cost-benefit analysis of preparing data for release. Some stakeholders expressed a hesitancy to publish on the basis that the quality of the data may not be as high as expected. However, data users expressed they would rather have lower quality data as opposed to nothing at all.

Open data triage is vital for sharing data safely and good progress has been made but not all organisations have implemented this yet. The WPDs Presumed Open Data project has developed an open data triage tool which is complemented by the ENA led data request process. There was interest expressed in the interviews for more guidance on the open data triage process and even for more guided sessions to add confidence to the triage results for open and public

Case Study – Presumed Open Data

Open data hubs are becoming ubiquitous across the sector, almost all network and transmission operators have released some data online, but the level of granularity and accessibility of the data varies. However, within both transmission and distribution networks there is a wide discrepancy between the most open organisations who have shared a lot of data and the least open where the data portals are not available or easy to find.

Western Power Distribution fully embraced the presumed open principle with the Presumed Open Data (POD) NIA project. The main outputs consisted of a triage process for assessing the risks associated with opening various datasets, investigation of data modification techniques, and increased visibility of datasets across the organisation and externally. The project also demonstrated the value of releasing data through a highly successful data science challenge, encouraging engagement from hundreds of individuals across academia, industry, and consultancy not just in the UK.

data. Consistent licence conditions across open and public categories are necessary, even small clause changes can cause problems in examining data from a GB-wide perspective. This has now been taken into MEDA phase 3 and progress is being made on aligning the mechanisms and assumptions made on licencing.

Open data access and publication needs to be implemented consistently across the sector.

Western Power Distribution and UK Power Networks lead the pack among the network operators in terms of data access. Other regulated entities removed cost barriers associated with APIs for access, while other grouped their data into single webpages for ease of access. Interviewees responded very positively to these data portals and noted that excellent progress had been made. There is still some difficulty accessing data required and data users still rely on knowledge from certain individuals in an organisation or word of mouth to locate where a particular dataset may be. In many cases there may be valuable data sets which have not been made visible outside of an organisation, therefore publishing all possible metadata is vital. There are a relatively small number of key datasets (see recommendations below) that are required for several important applications and releasing these consistently would go a long way to fulfilling user needs.

Recommendations Update

Continue to deliver Presumed Open. The Presumed Open approach has been adopted by many organisations across the energy sector and is delivering value to energy data innovators today. Ofgem’s proposals to integrate Presumed Open into the RIIO 2 network licence condition is a brilliant step forward and we hope to see this replicated in other licence areas. Code organisations have also started to integrate Presumed Open into their codes, this is a positive approach that we hope more code administrators and parties will support.

Publish key datasets as soon as possible. Many trailblazer organisations have triaged and safely published these datasets. We recommend that organisations who hold these datasets publish them as soon as possible, this will unlock value for many data users. The key datasets are:

- Energy asset locations - spatially aggregated where sensitivities exist
- Granular Energy demand - half hourly where possible spatially aggregated to address privacy issues (e.g. for smart meter data)
- Low voltage substation capacities
- Estimated price of network connection by location - with disclaimer to mitigate commercial risk

Promote the use of Open Data Triage. Open Data Triage is a powerful tool that can be used to safely publish data in a way that creates the maximum benefit for the sector. However, there are some organisations who have yet to embrace the principle or the triage process and have therefore published very limited amounts of data. By providing additional examples and more guidance to the sector we can give stakeholders the confidence to publish more data, more openly and therefore unlock more innovation. In addition, data custodians should seek to understand the value of data (financial and intangible) and what it can contribute to the net-zero journey, this will help to ensure that data is triaged and published in the most useful way possible.

Finalise consumer data governance model. Consumer data is often highlighted as the most valuable data but poses a real challenge for data users in terms of data access and data governance. Building on the work of the Smart Meter Public Interest Advisory Group (PIAG) a consumer data governance model should be established that enables data users to safely realise the value of consumer data. EDiT will be working with PIAG and others to address this issue.

Recommendation 3: Visibility of Data

RAG rating: Amber

Significant progress has been made in the development of a central catalogue. An excellent discovery project has been delivered by Hippo Digital and Office for National Statistics (ONS), which clearly details the requirements of a data catalogue. However, the Alpha project was unable to proceed as planned which delayed progress. Nevertheless, the Energy Data Visibility Project is set to deliver the data catalogue under a respectable timescale to get the recommendation back on track.

The aim of this recommendation was to create a common data catalogue which collates the energy system metadata that organisations hold so that it can be easily located. For open data this also means providing direct links, but for other datasets the catalogue can be used to make data access requests. The catalogue has several other advantages including supporting common standards and data management practices, identifying the value of data through request frequencies, identifying data gaps and quality issues, and evaluating an organisation's overall data openness.

Quickly locating and accessing data is still too arduous. Current approaches are reliant on word-of-mouth, industry knowledge or via long and complicated negotiations with data owners. Despite the significant progress that has been made with this recommendation there is still some frustration that not much new data has been made available, rather datasets that have been released are those that are already available and/or easy to release.

Evidence for active participation or preparation by network operators is low. Many are waiting for development and other network operators have mentioned they will share data when required. Internal catalogues are common, and the Common Information Model (CIM) standards are the likely approach for the exchange of network data. Network operators should take a proactive approach and begin preparing their metadata rather than waiting for the final catalogue to arrive.

Data quality is a major source of concern. Any published data is unlikely to be perfect; in particular, sensor and monitor data are likely to have many areas of missing and anomalous data due to outages and communications issues. As previously discussed, releasing poor quality data is seen as a reputational risk and therefore large amounts of time are invested to check and pre-process the data. Assurances from government or the regulator that poor data quality will not be unduly penalised could increase the tendency for data release.

Organisations should not hesitate to make data available. Prioritising which data to release, e.g. thoroughly understanding possible use cases or appraising their value, is important but it should not limit making data available. Similarly, although developing standard formats is useful it should not be a hindrance to releasing data. If the data can drive innovation, then users of the data will take the time to transform and pre-process the data as needed and would rather not wait in order for some formatting criteria to be met.

There should be opportunities for the community to provide feedback on both the catalogue and individual datasets. This will drive continuous improvement and address evolving user needs, which will in turn reduce the need for direct regulation of which datasets should be published.

Recommendations Update

Focus on delivering visibility of all energy data regardless of access and usage rights. It is essential to reduce information asymmetry between data custodians and data users by providing visibility of all datasets rather than just the published ones. This improves transparency, enables better reporting, and more productive conversations about data access.

Define reporting and governance requirements for the Energy Data Visibility Solution. The EDTF envisioned that the data visibility solution would provide a range of oversight and governance functions for Presumed Open including reporting the openness of data, transparency of Open Data Triage outcomes, and Challenge Open Data Triage assessments including escalation to arbitrator. The Energy Data Visibility Project should address this as part of the governance requirements.

Reporting makes it possible to meaningfully track progress towards Presumed Open. Visibility of metadata for all datasets (open, shared and closed) encourages 'crowd regulation' – enabling anyone to make a data request, compare triage results and challenge data access choices. This reduces the need for regulatory intervention and enables regulatory processes to be largely automated.

Case study – Open Energy

Of the three building block recommendations this one has made the most progress.

Icebreaker One have developed the Open Energy 'Energy Data Search' as part of the Modernising Energy Data Access (MEDA) competition. This is a core technical component of the central catalogue, making data easier to find through search functionality, and facilitating direct access to open datasets and additional options with further licensing for non-open but shared datasets.

Icebreaker One have now partnered with Arup and Hippo Digital to deliver the Energy Data Visibility Project Alpha project. The team aim to build on the Energy Data Search to develop a central metadata catalogue, a mechanism for requesting additional data and key reporting functions.

Recommendation 4: Coordination of Asset Registration

RAG rating: Red

Research has not yet led to a solution. BEIS has conducted extensive research with industry on this recommendation which has helped to better understand the need and range of solutions. It is now time to implement a pragmatic solution which delivers asset visibility.

There is strong support for an energy asset register. Interviewees were supportive of this recommendation and highlighted the many ways it would be beneficial. The multiple industry led attempts to address this challenge including RecorDER, Flexr, System Wide Resource Register and National Underground Asset Register, this demonstrates sector need.

Despite the range of prior work, a common asset registration solution has not emerged. None of the industry projects have the mandate to develop a whole of market solution for asset registration, this needs to be led by government. BEIS has undertaken a lot of good research but a solution has not yet been implemented. This is not a technically complex recommendation and there are a variety of solutions which could be easily implemented today.

Energy Assets need to be precisely defined. Interviewees wanted to know exactly what would be included in the register. Near term value is linked to established storage and generation assets with export capabilities as well as large scale flexibility however, smaller flexibility assets will become increasingly important and should be included within the long-term vision.

Recommendations Update

The original EDTF recommendation was not specific enough, this has made it difficult for a solution to be implemented. In addition, sector needs have changed, therefore this recommendation update focuses on creating near term benefit and then establishing an enduring, future fit solution.

Deploy an Energy Asset Register prototype by December 2021. Rapid progress can be achieved by implementing a prototype Energy Asset Register which collects existing asset data in a common format and establishes a simple process for new data to be added. We recommend a deadline for delivery of December 2021 for a public version of the Energy Asset Register prototype. A prototype will enable industry to provide useful feedback that can be used to improve the solution over time.

Specify an auto-registration solution which enables assets to securely register with the EAR. Similar to the way in which many internet-connected devices auto-register with a service provider, energy assets should provide the same auto-registration. It will be necessary to specify new standards or protocols which describe the auto-registration process and allow device manufacturers to build the solution into energy assets. However, this should be simple and build on existing work such as Open Energy for data sharing.

Mandate all new energy assets to auto-register. Use policy and regulatory measures to implement auto-registration of new energy assets. Interventions such as product standards or legislation could be used to execute this and ensure asset visibility is maximised.

Case Study - Embedded Capacity Register

The Embedded Capacity Register (ECR) is a public register of all sites that use electricity distribution networks and are able to influence the operation of the power market (> 1MW export). Each DNO publishes their part of the register on their own website, an approach trialled by the System Wide Resource Register. The ECR has been mandated via DCUSA (DCP350).

Recommendation 5: Visibility of Infrastructure and Assets

RAG rating: Amber

There has been significant progress towards the digital system map led by the ENA. It now remains for this work to be put into the public domain to start delivering value and drive engagement. Significant emphasis has been placed on the interoperability of data, which is aligned with the broader national digital twin strategy as described by the Centre for Digital Built Britain. The digital system map supports increased visibility, improved planning, and a wide range of whole systems applications.

Digital System Map has wide support. The ENA has ensured there is good support across the networks who prominently advertise their work on the ENA National Energy System Map subgroup. In addition, potential users are still enthusiastic about getting access to the solution. However, there are some reservations regarding its usefulness, it is viewed as having fewer applications than the catalogue or the asset visibility recommendations.

Stakeholders are unaware of how much progress has been made. While early communication was good, this has tailed off. Unless interviewees were members of the ENA group they were often unaware of the progress which has been made. Much focus has been placed on developing the interoperability of the solution and ensuring that the solution is useful, but this needs to be communicated to stakeholders.

Networks are keen to work towards digital twins. Almost all distribution and transmission operators are exploring digital twin solutions. Many report to be using the Gemini Principles as a fundamental design framework and several are members of the Digital Twin Hub set up by the Centre for Digital Built Britain.

Security remains a sensitive issue. Stakeholders questioned if the map could leave sensitive information open to misuse. It is vital to communication how Open Data Triage will be used to address these concerns.

Recommendations Update

Deploy a public solution as soon as possible. To increase visibility of the work and deliver value to stakeholders, a public version should be made available as soon as possible within 2021.

Tell stakeholders about progress. There has been little high-profile communication on the digital system map, despite significant work into interoperability having been conducted. It is important to keep the industry informed to keep momentum and interest, but also to communicate what the rest of the sector can expect to be able to use and access in the medium to long term.

Learn from other mapping exercises. Many other energy system maps have already been implemented such as the Australian Renewable Energy Mapping Infrastructure (AREMI), and the Northern Ireland Demand Flexibility Map. In some cases, source code has been made available which provides multiple opportunities to get a quick start to the full tool.

Case Study – ENA system map

Working with Ordnance Survey, and 1Spatial, ENA are developing a proof-of-concept Digital System Map. This builds on mapping solution demonstrations last year and work to create interoperability between network data by ENA members.

Summary

There has been excellent progress towards realising the original EDTF recommendations from many different organisations across energy, including from regulated organisations, regulators, innovation, academia, and government. It must be noted that Ofgem has played a key part in the progress through strong signals to the energy industry and should be commended for the fast move to embed Energy Data Best Practice into regulation.

Enthusiasm remains high

Although the recommendations have been greeted with enthusiasm some of the progress has been perceived as slow, which highlights that there is more excitement than trepidation about digitalisation and data. Organisations are anxious to get started and iterate rather than deliver perfection in the first instance, promoting continuous improvement.

Promote collaboration rather than competition

There were multiple organisations that advocated for more prescriptive measures, however on balance this perhaps was more about the time taken to achieve certain outcomes than about desiring total oversight and direction. While there was a clear message that a roadmap needs to be established for digitalisation, this supports the view that more collaborative work needs to take place to prevent new siloes from emerging. This approach would make it clearer where there is underlap and overlap in funding mechanisms which gives better value for public investment. Selectively working collaboratively instead of competitively, particularly on digitalisation strategies, could go some way to addressing the knock-on impacts across the whole sector.

A journey of continuous improvement

Finally, it was highlighted on multiple occasions by many different participants that deploying state-of-the-art or perfect systems should not be the intention of these projects. By adopting agile development principles, continuous improvement and iterative development (in line with digitalisation best practice) is the best way to achieve the full impact of the recommendations and adapt to changes and challenges in the future.

Energy Systems Catapult supports innovators in unleashing opportunities from the transition to a clean, intelligent energy system.

Energy Systems Catapult

7th Floor, Cannon House
18 Priory Queensway
Birmingham
B4 6BS

es.catapult.org.uk
info@es.catapult.org.uk
+44 (0)121 203 3700