UtilityWeek™

Paving the way to net zero

Data and digitalisation requirements
for the energy transition:
insights from an industry working group

CGI

In this report

Introduction

The UK government's bold action in 2019 to commit to a legally binding net zero emissions target for 2050 has had wide ranging ramifications. Not least, it has proved a catalyst for realisations within the energy sector that rapid decarbonisation will require very different methods of system operation, regulation and consumer participation to be brought forward at pace – as well as the application of new incentives to drive strong cohesion between these areas.

To achieve this transformation, it is now acknowledged that utilities need to profoundly change their relationship with data and digitalisation. However, while the will to innovate is strong and some companies have reaped rewards from the application of technology to make efficiency gains, plan investments and interpret shifting consumer needs, progress on accessing the potential presented by digital innovation remains patchy across the sector.

As many industry commentators have observed, a lack of focus, coordination and strategic purpose in digital transformation, as well as inadequate regulatory incentives for digital investment, have left the sector in what one leader recently described to Utility Week as a position of "digital deficit".

The sector now needs to respond vigorously to a collective imperative to correct this investment lag, to innovate and to maximise the potential of data to deliver the net zero transition in a cost effective and equitable way.

The sector now needs to respond vigorously to a collective imperative to correct this investment lag, to innovate and to maximise the potential of data to deliver the net zero transition in a cost effective and equitable way. Across an array of energy value chains, data must be applied to create optimised, flexible and intelligent infrastructure that meets the needs of the environment. Meanwhile, access to system data is also seen as key to the emergence of agile markets for services that can engage energy users, reward demand side participation in the system and empower consumers to make decisions or behaviour changes which will positively contribute to the net zero agenda.

This need to put data at the heart of the UK's energy transition strategy has been recognised in the last three years in a range of significant publications and industry workstreams, including in the pivotal Energy Data Taskforce publication: A Strategy for a Modern, Digitalised Energy System.

This landmark report set in tow a range of important work in the industry to align data and digitalisation strategies and encourage progress towards a principle of "presumed open" data so that diverse innovation in operations, products and services can flourish. Much progress has been made, with initiatives like the Energy Networks Association's Open Networks project and its Data and Digitalisation Steering Group convening technical experts from across the gas and power infrastructure base to tackle challenges around data availability, accessibility, and interoperability.

Meanwhile, steady progress from suppliers on the GB smart meter rollout is extending visibility of consumer energy usage data and the Data Transfer Service operator ElectraLink has made available a Distributed Energy Resources Register to help improve visibility of distributed generation and devices. These are just a few examples of the positive developments which have taken place.

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Paving the way to net zero working group structure

To ensure Utility Week and CGI's independent working group on data strategies for net zero focussed on relevant issues which resonated with our participants, an attendees survey was used to identify views on:

- **The perceived maturity of organisational data strategies;**

- **Key barriers to maximising the value of data;**

- **Beneficial changes which could be made to regulation, technology, organisational processes or culture to support execution of strategies and more.**

Insight into the results of this survey, which was completed by 12 of the 14 working group participants, are outlined on pages 6-7. However, responses were also used to hone the working group agenda and select germane challenge statements for two breakout groups to tackle during the event. These groups were broadly divided by subsector, with one dominated by infrastructure owning companies and the other by energy service providers (central markets representatives were present in both groups).

Working group challenge statements

Infrastructure: "How might we promote easy and efficient interoperability of data within new and emerging energy value chains"?

Service provision: "How might we help create an environment in which customers have confidence and willingness to authorise access to their data"?

It is notable that these challenge statements, selected on the basis of independent working group attendee inputs, relate closely to the key focus areas selected for the upcoming work of the Energy Digitalisation Taskforce. This is reassuring and endorses the timeliness and significance of the Taskforce's agenda.

However, despite these strides, the pressures of delivering on business as usual, which include resource-hungry price controls, continue to be challenging. Coordinating multiple stakeholders and a variety of other factors, mean that some major shortfalls against the Energy Data Taskforce's recommendations remain. For example, progress on asset registration and the creation of a digital system map has been slower than many might have liked.

These issues must be urgently addressed to keep the UK on track with its net zero ambitions and to ensure the British energy system sustains its record on reliability and resilience notwithstanding radically changing system dynamics.

In recognition of the need for a fresh spur for the energy data and digitalisation agenda, the Department for Business Energy and Industrial Strategy, in tandem with Ofgem, has commissioned the Energy Digitalisation Taskforce to build on the foundations of the Energy Data Taskforce, establish a shared vision for the future digital architecture of the sector and make recommendations about the necessary governance arrangements it will need.

Once again, the initiative will be led by prominent energy policy influencer Laura Sandys (see p5). In a launch event in mid-May she, alongside other taskforce members, called for collaborative and open input from the sector to help ensure they can carry out a rigorous review of previous data strategy recommendations, honestly critique progress against these and bring a new level of clarity to critical issues surrounding the interoperability of data and data governance. She said this will include scrutiny of issues around consumer consents for data use.

To help support the work of the new taskforce and enable industry players to make good on their undoubted ambitions to maximise the potential of data in the interests of people and planet, Utility Week and CGI – a global IT and business consulting services firm – partnered to host an independent industry working group on the data and digitalisation strategies needed for our net zero energy transition.

Taking place just ahead of the official launch of the new taskforce, the virtual event saw participations from strategic leaders and data specialists representing a range of energy infrastructure companies, energy service providers (including energy suppliers and aggregators) and market operators.

The forum provided a timely opportunity for unbiased reflection on the key challenges and priority actions which should be implemented to accelerate and improve the sector's approach to harnessing the value of data and digitalisation in the energy transition. This report provides a summary of the discussion which took place during the working group, with reflections on the significance of key themes in the wider industry context.

VIEWPOINT

Laura Sandys
chair, **Energy Digitalisation Taskforce**

I truly recognise the barriers that the group has identified and they are valid and need to be tackled. We will aim to address many of these through the Taskforce not least interoperability, the system wide stability issues that we will all have to address and of course the governance gap that currently exists including in relation to consumers and their consent.

We do need to learn from other sectors in terms of common standards that unlock everyone's business models – from GSM through to HTML – driving forward innovation by having a very few but crucial common rules of engagement.

We have started the journey with open data but as we embark on deep digitalisation we need to adopt the same approach as we did for data. Let's not get caught up with use cases as it will likely be people not yet in the room who will design business models that we cannot even think of today – so our job with the taskforce is to create the operating environment into which the potentially unthinkable can happen.

This is not to say that there aren't some very mundane – but highly important - issues that do need to be addressed. Governance around the interoperability and stability of the system, the cyber security of a critical infrastructure and consumer protection. Governance of standards, consumer protection and algorithm oversight are all important. As digitalisation in other sectors has shown us, there can be winners and losers – and as we are following other sectors let's learn the great lessons and avoid their mistakes.

To support open and honest sharing of opinions, experiences and recommendations, the working group was hosted under the Chatham House Rule, meaning participants will not be identified in this report or elsewhere.

In brief, the working group identified a shared ambition across industry actors to push organisational and sector strategies for data and digitalisation to the next level to create consumer value, environmental benefit, and economic opportunity.

However, it also highlighted some significant perceived barriers to delivering on this shared ambition. These included:

- A perceived inability to generate sufficient pace of change in the industry with regards to data sharing standards and data governance – in part due to business as usual pressures and mis-aligned incentives.

- A persistent lack of system intelligence, especially at low voltage levels on the power system, which is hampering the pace of innovation in flexible network operations and consumer propositions.

- A lack of common understanding and agreement around the intended use cases for different types of data between industry actors. This means work to improve data quality and accessibility is often not prioritised effectively.

- Cultural challenges and a lack of understanding across organisations, including in critical operational roles, of the ways in which data can drive value. This means data governance protocols are often not followed effectively.

- A lack of any clear method or framework for understanding potential risks – for assets, consumers and companies – which might arise as a consequence of system digitalisation, and

- A low level of understanding among consumers of the potential value available to them, to society and to the net zero agenda through allowing access to their data. This was coupled with the lack of a consistent, user-friendly processes for managing consent.
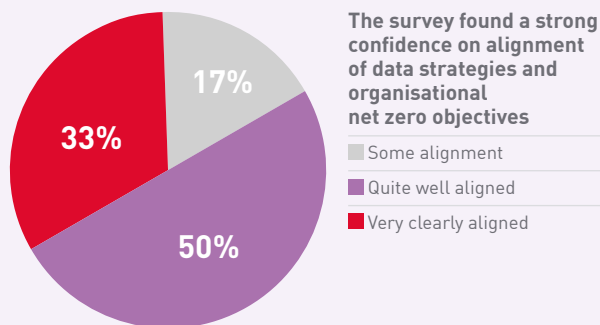
More detail on the reflections which were shared in relation to these issues are set out in the subsequent pages of this report.

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Working group survey insights

Prior to taking part in the above outlined working group, participants completed an online survey to capture perceptions of organisational maturity on key data matters and views on the most important challenges that need to be overcome to realise the full potential of data in delivering a cost-effective response to climate crisis.

The results painted a picture of a sector mid-flight in its development of clear digitalisation strategies to support the energy transition, with an average maturity rating of 3.2 out of 5 being allocated by respondents.

Importantly however, working group participants were also broadly confident that these developing data strategies are well aligned to broader organisational objectives for creating value in a net zero future. Just over 80% of participants said their data strategies are either quite well aligned or very clearly aligned to broader organisational goals with actors in central markets and flexibility provision being most confident. None of our participants felt there was no alignment between organisational ambitions for the net zero future and their data strategies.

The survey found a strong confidence on alignment of data strategies and organisational net zero objectives

- Some alignment
- Quite well aligned
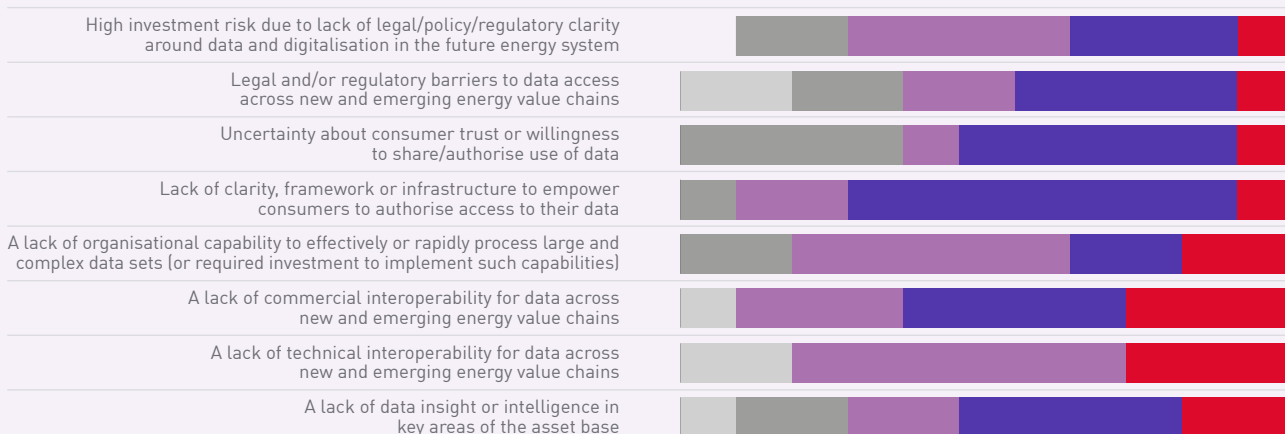- Very clearly aligned

17%

33%

50%

When it came to the biggest perceived barriers to executing net zero data strategies, there were two stand out areas of concern, which were leveraged as focussed discussion topics during the working group event itself. Broadly speaking, these manifested as:

- Worry about the substantial challenge of achieving technical and commercial interoperability of data across new and emerging energy value chains.

- Doubt around consumer willingness to authorise access to data and the lack of suitable frameworks for helping them do so in an easy and transparent way.

While these issues were identified as middling to significant barriers across the board by our participants, it is notable that those whose businesses are founded on the provision of energy services – including energy supply – were more likely to be concerned by the issue of consent, while infrastructure owners were more likely to be concerned by interoperability.

Some of the detail around participants' feelings on these matters is captured in the body of this report, however it is also worth noting that both are set to be priority topics for the newly formed Energy Digitalisation Taskforce.

Data strategy maturity **3.2/5**

Barriers to data ambitions...

High investment risk due to lack of legal/policy/regulatory clarity around data and digitalisation in the future energy system

Legal and/or regulatory barriers to data access across new and emerging energy value chains

Uncertainty about consumer trust or willingness to share/authorise use of data

Lack of clarity, framework or infrastructure to empower consumers to authorise access to their data

A lack of organisational capability to effectively or rapidly process large and complex data sets (or required investment to implement such capabilities)

A lack of commercial interoperability for data across new and emerging energy value chains

A lack of technical interoperability for data across new and emerging energy value chains

A lack of data insight or intelligence in key areas of the asset base

1 = not a barrier at all... **2 3 4 5** = a significant barrier.

Priority changes...

Regulatory

- "Incentives for data driven operation"
- "A 'markets everywhere' approach to distribution system operation"
- "Align energy markets and network price signals to data"
- "Alignment of data privacy restrictions across licenses and codes"
- "Clear framework for sharing data along with an industry standard data ontology"

Technology

- "Development of a centralised digital twin of the energy model"
- "Organisational analytical platform allowing for single source of truth analytics"
- "Master Data Management to drive data culture and data driven decision making"
- "Access to reliable smart meter data"
- "Completion of smart meter rollout"

Organsiational

- "Build a data and digitalisation culture"
- "Data governance embedded into the entire organisation"
- "IT system upgrades"
- "Greater understanding of the value of data"
- "Skills and capabilities to derive insights from data effectively and using these for decision making"

Notable tertiary areas of concern centred around the level of current intelligence in the energy asset base to underpin data-driven transition aspirations, as well as a lack of confidence in the readiness of organisational IT systems to be able to process large and complex data sets.

In addition to identifying key barriers to the execution of their data strategies, the survey asked respondents to identify the changes to regulation, technology and organisational process or culture which would have the greatest positive impact on their ability to deliver.

Respondents gave a wide range of thoughtful responses, some of which are displayed left. Broadly speaking however, it can be said that the most desired adaptation to regulation related to better incentives and to establishing frameworks for data sharing.
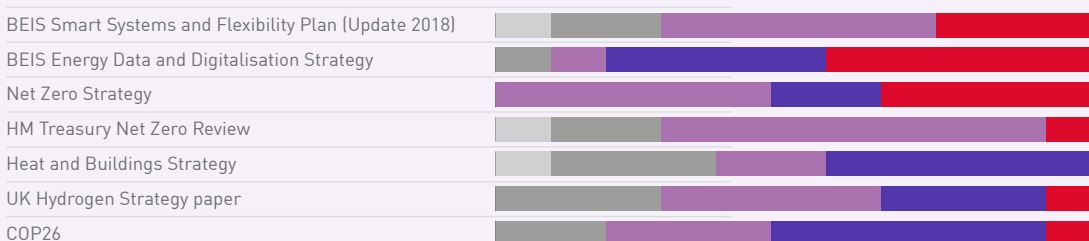
In the case of technology change, the most keenly anticipated advances were unsurprisingly around advanced analytics and other developments which would support faster and more intelligent processing of data – though there were also some more foundational hopes for delivery of ubiquitous smart metering.

When asked about the most beneficial internal changes which could manifest in their organisations, it was very clear that participants were keen for significant changes in cultural attitudes towards data capture, care and governance. Though some also hankered for substantial investment in IT systems.

Finally, as the survey drew to a close, respondents were also asked to share their views on the significance and usefulness of a variety of recent or upcoming papers and workstreams designed to advance understanding about the energy transition and/or the role of data in supporting this.

It was striking that the whole group placed a heavy emphasis on the recommendations of the Energy Data Taskforce, which published it Modernising Energy Data report in June 2019. Likewise the group expects the work and outputs of the new Energy Digitalisation Taskforce to be similarly influential and progressive – the taskforce is currently calling for collaborative participation from multiple industry stakeholders in its review of the sector's data strategy needs and is due to report in December.

Re forthcoming programmes/papers etc

	1	2	3	4	5
BEIS Smart Systems and Flexibility Plan (Update 2018)					
BEIS Energy Data and Digitalisation Strategy					
Net Zero Strategy					
HM Treasury Net Zero Review					
Heat and Buildings Strategy					
UK Hydrogen Strategy paper					
COP26					

1 = insignificant/not aware of it... 2 3 4 5 = highly significant and influential.

Summary of common working group beliefs

As outlined in the introduction to this report, discussion at Utility Week and CGI's May working group prompted some frank sharing of opinion, sentiment and experience from participants on the challenges they are facing as they try and bring to life ambitions to leverage data in support of a cost effective and equitable energy transition.

In this report section we have used these insights to frame a series of requirement statements which reflect the beliefs of the group that the industry needs to go further and faster on coordinated energy system digitalisation and to maximise the value of data in the energy transition.

We need common standards for data interoperability

It was by no means a novel or surprising conclusion of the group that there is a foundational requirement for common standards to support interoperability of energy system data across existing and emerging system participants.

This requirement was also clearly identified by the Energy Data Taskforce and it has received some significant industry attention in the intervening years, especially within the regulated energy networks industry.

However, our working group participants – most notably those representing energy networks – also expressed some frustration with the pace of progress on essential interoperability building blocks like the creation of a Common Information Model (CIM) and the designation of agreed terminology for different assets, devices, commercial arrangements, and processes in the energy system.

While these building blocks were agreed to be well progressed at higher voltage levels on the power system where there is generally high visibility of a relatively low volume of different asset types and technologies, they were felt to be a long way off delivery for low voltage (LV) levels.

The prospect of extending common information taxonomies and information models to embrace LV areas of the networks seemed daunting to most given the generally low level of system visibility currently available in this space (see next segment on gaps in system intelligence) and because of the significant range of technology solutions which have been applied to low voltage networks over time.

However, it was also agreed that enabling interoperability of LV network data should be a priority since this data will be critical to unlocking innovation in demand-side energy flexibility – a potential game changer for cost effective decarbonisation.

Despite the expressions of frustration and a little trepidation around achieving interoperability of data at lower voltage levels, several participants suggested the UK is ahead of the international curve in terms of its willingness and ambition to tackle this large and complex issue. As a consequence, these representatives agreed it is incumbent on relevant UK industry representatives to ensure they work to influence the shape of emerging international standards for energy data interoperability, such as those being developed by the International Electrotechnical Commission.

Another briefly made but critical point in discussion of data interoperability requirements is that any CIM must be created with whole system needs in mind. It is true to say that data and digitalisation on the power system is generally viewed as a priority for a variety of reasons, including the scope for dynamic flexibility and converging dependencies on electricity for transport and, to an unknown degree, heat. Nonetheless, it is essential if we are to forestall future inefficiencies, said our attendees, that standards for data interoperability also embrace the gas industry. As one participant put it: "Interoperability loses its meaning and dilutes itself if not everybody - across the whole system - subscribes to the same model."

Notwithstanding this need for inclusiveness in developing interoperability models, participants across both the infrastructure and service sectors agreed that it is critical not to wait for a perfect solution to data exchange before starting to open data up. One attendee suggested that while data glossaries and common catalogues to support standardisation are worked on, we can apply existing technology to strip out inconsistencies in data and facilitate innovation. This participant stated that as an interim and, they admitted, imperfect solution for the long term, the industry might want to create a centralised "data monopoly" to bring together multiple sources of important data – for example settlement and smart metering information as well as asset and balancing data.

> Interoperability loses its meaning and dilutes itself if not everybody - across the whole system - subscribes to the same model."
> Working group participant

Other participants were less positive about the idea of creating a new data monopoly, even as an interim measure. However, they all agreed that progress cannot wait for perfection. In the spirit of iterative progress (see report segment on culture change) they suggested there could be significant value in applying a model like that used for Open Banking to create a platform for open exchange of data in the energy system, and as a means to improving our baseline understanding of what data is held by different actors.(See opposite for views from Gavin Starks, founder and CEO of Icebreaker One for more on the lessons Open Banking has to offer the energy system.)

VIEWPOINT

Learning from Open Banking

During our working group event there were multiple references to Open Banking as a potential model for facilitating data interoperability and empowering consumers to manage their data access consents with confidence, supporting the move towards a smart, low carbon energy system in the UK. To uncover more detail about the value lessons the energy industry could learn from Open Banking, Utility Week subsequently spoke to Gavin Starks, CEO, Icebreaker One and co-chair of the original Open Banking Standard.

How would you describe the Open Banking model and what it does?
"It's an application of the web of data. It's not a consumer standard. It's a way of creating cohesion and interoperability that generates an open marketplace.

Can the Open Banking blueprint be replicated in the energy sector?
Absolutely. For me, the repeatability or the blueprint that Open Banking holds isn't necessarily to do with the detail of things it does in financial services - like accessing current accounts and moving consumer data from A to B.

The important thing to think about is the overall market it unlocks. Imagine we've got some data with party A – which could be a company, a person, or any kind of entity – and they want to share that with party B with minimal friction. What open banking enables is getting all friction out of the way.

Open Banking should be completely invisible if it's working well. In the same way that when you click from web page to web page on the internet, the technology and the rows of code behind that are completely invisible. What we are trying to get to here is a web of data, where the ability to share data is as easy as clicking between web pages.

What would the first steps be for the energy industry towards adopting an Open Banking blueprint for data interoperability and sharing across the system?
My number one call to action – which everybody can do, it just requires the will – is to publish openly licensed meta data of the data that you have. The underlying data can be open or closed or shared or any flavour of license. But if we don't know it's there, it might as well not exist.

To get started, you need to establish that data inventory. Every organisation's data strategy should start by asking the questions: What have we got? What have we not got? What do we need?

Once you know these things you can start to prioritise in a business context. And what a neutral facilitator like us can begin to ask is, what does everybody need?

My second call to action would be the selection of a use case around which to have a conversation. Far too many initiatives spin up with a tech focus and the idea that, if only some technical issue can be solved then the enabling infrastructure for everything will be there. But then nothing happens because there are no users involved.

Gavin Starks will speak at Utility Week's **Network Asset Performance Conference** in September 2021. For further details see **utilityweek.co.uk**

We need to address gaps
in system intelligence

Participants from all market segments represented at our event agreed that a lack of intelligence at the low voltage level of the power system is a significant barrier to digital innovation.

This issue has been widely recognised elsewhere and is the product of legacy modes of network operation which meant there was no real need for Distribution Network Operators to have visibility of activity at the low voltage level and consequently no incentive to invest in monitoring and control technologies.

Today however, our participants said that a lack of LV intelligence makes it very difficult for network operators to identify and locate Distributed Energy Resources connected to their infrastructure, constraining their ability to bring forward accurate local balancing and forecasting tools, but also limiting their ability to make available to existing or emerging service providers data which might help them bring forward novel consumer propositions. One energy retail representative said: "Visibility at the low voltage level is one of the major, if not the biggest blocker, to a whole bunch of things we want to do as an industry." The same participant warned that releasing a swathe of investment to inject intelligence into the LV network should

not be postponed until the beginning of the next price control period (RIIO2) when power distribution companies might be allocated baseline funding for such infrastructure upgrades. "We can't wait until 2023 for that chunk of cash. Everyone in this industry can agree it would be money well spent today…If we'd spent the last 10 years of innovation budget across the industry just instrumenting our networks we would likely be in a far better place as an industry. Concerted spend now on LV visibility would be extremely valuable."

This said, the resolution of issues relating to gaps in system intelligence do not solely hang on investment in LV network visibility. As discussed extensively by representatives of energy service providers at our event – and reflected in contributions to the pre-event research – completion of the GB smart meter rollout is also essential.

While suppliers have made significant strides in pushing forward with the rollout – there are approximately 24 million smart meters now installed – there is still a long way to go before smart meters are ubiquitous in consumer properties. Until this is the case suppliers will not have the necessary foundations to bring forward the mass-market propositions based on dynamic half

hourly settlement which are eyed as an important means of introducing the price signals consumers need to helpfully shift their demand on the system in the future, to optimise the use of renewable generation and to control their own costs.

Following on from this point, our service representatives noted that the challenge of delivering and capitalising on the value of smart metering goes far beyond the challenge of getting meters on walls. With the collection of half hourly meter reads currently being an optional opt-in decision for consumers, participants warned that there is a major challenge to be tackled in communicating the importance and value – for consumers and the net zero agenda – of authorising half hourly settlement (see final segment on making it easy for consumers to participate in net zero).

Some suggested that the optionality around half hourly meter reads should be removed in the interests of ensuring we have "the base level of data we need for operating a smart energy system." Meanwhile, others voiced the opinion that half hourly data collection should be viewed merely as a steppingstone to a more ambitious goal for the collection of meter reads at 10 second intervals, a frequency which allows for device consumption signatures to be clearly recognised.

It was noted that while the capability for 10 second data reads was embedded early into the GB smart metering architecture through Consumer Access Devices, it is not commonly being exploited today. This was, at least in part, felt to be due to consumer reticence to authorise this level of data access and the lack of compelling value cases from the market to incentivise them to do so.

> **If we'd spent the last 10 years of innovation budget across the industry just instrumenting our networks we would likely be in a far better place as an industry. Concerted spend now on LV visibility would be extremely valuable."**
> Working group participant

We need a system of clear prioritisation for digitalisation activity

One of the major challenges in achieving a rapid pace of change around the way data and digitalisation are leveraged in the energy system was agreed to be the sheer scale of work to be done, and the lack of a clear priority framework to coordinate efforts behind tackling the most important areas of opportunity first.

One energy network representative explained how a lack of clarity about the potential use cases for data in service delivery and market stimulation has made it harder to justify putting investment and resource into standardising data and extending system intelligence – for example at LV level – in the past. They said: "For the effort involved [in projects like these], we need to understand - and have a good understanding of what the use cases for that data are. I think we have a rough idea but I'm always taken aback by how little I know about the customer side of things and what they would use it for." They added that clarity on these use cases would be "incredibly helpful" in justifying investments to senior management and prioritising which projects to work on first.

Other participants agreed that building a shared idea of the priority use cases for data would help create greater direction and pace in digitalisation of the system. To do this, there was an acknowledgment that communication with stakeholders in the service sector needed to improve – and to be coordinated to avoid inconsistent interpretation of priorities or drain on time and willingness to engage.

In a linked but separate discussion among service-focussed participants in the working group, one representative suggested there is a need for energy service providers to be clearer in their own thinking about the underlying purpose for and value of different data use cases. "There is data we want for products and services," they said. "And there is data that we all need for the system. We need to separate those things." They added that it would be helpful to agree what constitutes an appropriate "baseline" of data for operating a smart system and that this baseline should be "non-negotiable". This though sparked some interesting exchanges on the necessary level of consumer endorsement and buy-in to system digitalisation.

From another perspective, one gas industry participant argued strongly that there is a need to address inconsistent priorities across networks with regards to which processes and operational activities they are focussing on digitalising and automating. They argued that process digitalisation in the industry is a critical accompaniment to asset digitalisation in order to achieve the high levels of data quality and consistency needed for interoperability. However, they added that a lack of clear incentives or common outcome goals for the industry on digitalisation has left process automation patchy. Some

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>
> Working group participant

networks still operate with "hundreds" of paper-based processes they stated.

This individual believed there was a big role for Ofgem to play in spurring the creation of a coordinated set of priorities for operational digitalisation in the industry. Others however, while agreeing with the point in principle, felt that collaboration could achieve the same results and indeed it was pointed out that the ENA Data and Digitalisation Steering Group is trying to coordinate and prioritise industry digitalisation efforts so that return on collective investment is maximised.

We need culture change and new attitudes to risk

A topic which stirred strong emotions among the infrastructure group at our event was the need for a substantial culture change and raising of awareness about good data practices in the energy industry before meaningful digital transformation can take hold.

This issue of culture change had two main dynamics. Firstly, there was a common belief that the industry needs to move away from a strategic predilection for "big bang" solution releases in response to problems like data interoperability. Instead, they said the industry must get comfortable with the idea of "iterative" releases of solutions which are recognised to be imperfect, but which would help support continuous progress and learning.

To do this, participants said there was a need to educate key stakeholders throughout organisations on the principles of Agile working methodologies (a particular approach to technology development and deployment which emerged in the early 2000s) which they said are widely misunderstood.

One participant said that Agile education is something they are proactively addressing in their organisation at the moment. "It's one of the big things we're looking at internally," they said. "How do we start instilling these different ways of working into the broad change across the organisation? It's always quite painful, especially if you've got quite traditional 'Waterfall' type organisations [as we still mostly do in the energy sector]."

Beyond education on Agile methodologies and principles however, the second dynamic to culture change identified by the group was a broader need to improve understanding in key roles of the importance of key data governance principles and the fundamental value of clean and consistent data.

Multiple participants complained that their efforts to improve data quality and support the standardisation which in turn will underpin interoperability is constantly undermined by sloppy data capture and input processes. One participant said that very basic things like "putting the postcode in the post code field – not just chucking anything in there"

> " Our regulation is set up for companies with assets that last 40 years or more...I think there needs to be a change to have a regulatory framework which is aimed at data as an asset which last maybe just weeks or month – a year at the maximum. "
> Working group participant

were still common bugbears which leave data and digitalisation strategies hamstrung.

While process automation is one route to resolving these manual inconsistencies, there was agreement that strong messaging on the opportunity cost of poor data to organisations with a central role to play in the energy transition should also be delivered in a concerted way.

A further evolution of the discussion around the cultural foundations needed for energy system digitalisation also surfaced some significant concerns about the ways in which digitalisation will require different thinking about organisational and system risks and the attitudes or approaches which need to be in place to respond to them appropriately.

Again, this broad issue included a number of different dynamics and perspectives. There was the challenge of creating the conditions in which "fail fast" and iterative innovation can be conducted with confidence. But there were also wider concerns that while the sector has an excellent track record and culture for managing risks associated with physical assets, these will not be fit for a future in which a complex web of interacting digital and automated processes are running simultaneously with data being exchanged between myriad actors.

This lack of understanding could pose cyber and physical risks to the system. For example, one contributor said overzealous demand turn-up or smart charging services might push unmanageable load through devices and cause the outbreak of electrical fires if appropriate ways of quantifying risk and implementing controls are not developed.

Another interesting view on the new risk considerations that need to be taken into account in a digitalised system related to the management of data as an asset and the potential need for the network regulatory framework, including practices for asset base valuation and setting returns, to flex in response to the very different lifecycle and value depreciation timescales for data. One participant commented: "Our regulation is set up for companies with assets that last 40 years or more...I think there needs to be a change to have a regulatory framework which is aimed at data as an asset which last maybe just weeks or months – a year at the maximum."

We need to make it easy for consumers to participate

Perhaps the most prominent discussion theme for the service provision group at our event was the challenge of unlocking the potential of consumers to play their role in the energy transition and, at the same time, opening up important new commercial opportunities.

A critical point which was made here, and broadly embraced by the group, was that industry, along with policy makers and regulators, would do better to focus on enabling consumer participation in the future system than chasing after engagement. Several attendees argued that there is an important difference between the two words (participation and engagement) which drive towards very different expectations of the consumer – particularly in relation to how active they need to be in managing their data or authorising access to it.

One participant observed: "I'm a sceptic around huge engagement in the future energy system. But I think what we want in a big way is participation." Whether or not people commit to huge amounts of 'mindshare'...what they need to trust is that their data is there and allowing them to achieve what they want to achieve – which is participation in the right kinds of benefits or solutions or offerings."

> I'm a sceptic around huge engagement in the future energy system. But I think what we want in a big way is participation."
> Working group participant

> All we need is a standardised API definition scheme in essence for transferring the data. It's not beyond the wit of man...Open Banking took a long time to get there. But provides a great model."
> Working group participant

Others agreed that while a minority of engaged consumers, including first adopter electrical vehicle owners, might be actively interested in leveraging their data to secure better tariffs and track other benefits such as reductions to their carbon footprint, most consumers will be much more passive.

To incentivise this majority to grant the access to their data and enable innovation to flourish in mass market products and services for the energy transition, attendees said two essential conditions must be in place.

Firstly, there must be strong price signals to incentivise consumers to participate. And secondly, there must be a very simple, and ideally common, framework through which consumers can easily manage data consent with confidence.

With regards to the first condition, there was a feeling that product and service innovations which will be taken up en masse hang heavily on achieving ubiquitous opt-in to half hourly settlement. And, as previously mentioned, there was some discussion as to whether requiring opt-in to this key enabler of system digitalisation is counter intuitive, and ultimately not in consumer best interests.

Having said which, it was acknowledged that half hourly settlement might be something of a distraction for the industry from the greater service innovations available

if the full potential of Consumer Access Devices can be liberated by incentivising consumers to share data even more frequently.

Either way, making it "frictionless" for consumers to authorise access to their data and – knowingly or not – begin to participate in system decarbonisation while receiving rewards for doing so, is imperative said our group. Currently, they agreed, this is far from the case.

Looking to other geographies and sectors for examples of good and robust approaches to managing consumer consents for energy data, the group eyed the systems implemented in Estonia and the Netherlands with some envy. However, some pointed out that these models are not directly replicable within the UK market structure.

Also, in a second event reference to Open Banking, the group agreed that this platform-based approach to facilitating consumer consent, protection and data exchange could provide an easily repeatable model for mass-market participation in the energy system. One advocate of the Open Banking model observed: "All we need is a standardised API definition scheme in essence for transferring the data. It's not beyond the wit of man... Open Banking took a long time to get there. But provides a great model. It's user opt-in, it largely works very well, is very secure and it provides inherent protection against bad actors."

Conclusions

Rich Hampshire
VP digital utilities, **CGI**

Awareness of the role of data and digitalisation in delivery of the energy transition is unquestionably growing. And, as other sectors look to accelerate their own journeys towards net zero by decarbonising their energy use, the energy sector is also increasingly recognised to be at the vanguard of the battle to limit climate change.

In the countdown to COP26, it was therefore timely for CGI to collaborate once again with Utility Week to surface the sector's thinking about this crucial area. Our thanks go to all the industry leaders who invested their time and shared their views. I believe that they have provided some powerful insights that could help us collectively accelerate towards net zero, whilst ensuring that the energy and climate transitions are just.

As we canvassed views on the key requirements for a digitally enabled transition, it became clear at an early stage that our group placed significant stock in the 2019 recommendations of the Energy Data Taskforce, which ranked top in a set of potentially influential publications in our pre-event survey. It was no surprise, therefore, that the members of this working group placed similar importance on the forthcoming Energy Data & Digitalisation Strategy as well as the much anticipated Net Zero Strategy.

In terms of key themes arising from the working group session itself, these became clearly grouped into the five themes covered in the previous section of this report. However, on reflection and consideration of the comments made during the session, it would be reasonable to also identify a sixth cross cutting theme which underpinned much of the discussion. This is the need for a better set of incentives to drive investment, standardisation and collaboration in the interests of digitalisation.
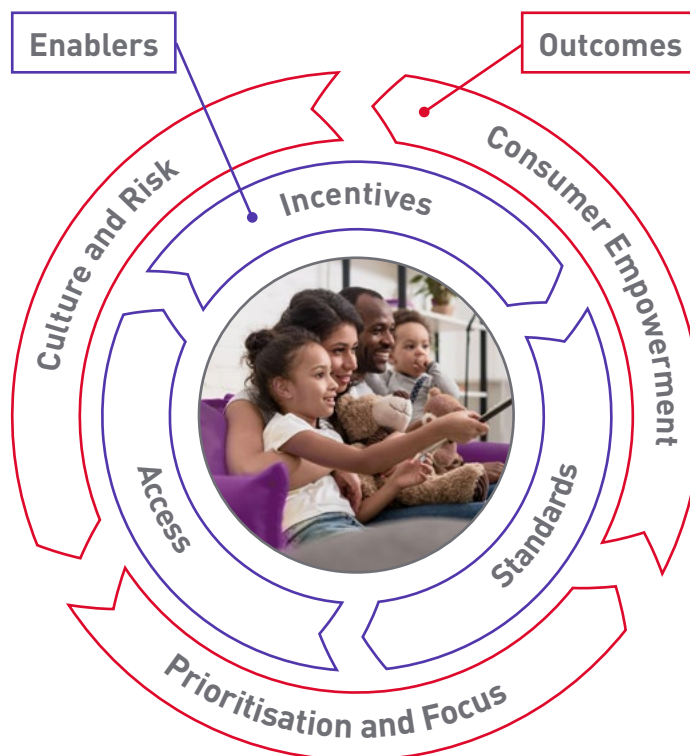
Taking this sixth theme into the fold, I would observe that the common beliefs held by our group around the use of data and digitalisation in the fight against climate change can be organised into two groups made up in each case three desired outcomes and three key enablers needed to achieve these.

The three outcomes identified where:

1. A shared system of prioritisation, based on a set of agreed use cases around which the sector can collaborate to generate solutions,

2 A cultural shift, especially in attitudes to risk, and

3. Ease of participation for consumers (or their intelligent energy technologies) in the future energy system.

And what's needed to deliver these outcomes?

1. Gaps in intelligence need to be addressed across the system

2. Standards that enable data interoperability need to be brought forward at pace, and

3. Incentives to encourage investment by some energy system actors so that value can be created by others.

The level of consensus and clarity from the working group on these outcomes and how to deliver them was striking; as was the passion and desire to make progress.

Ofgem was seen as having a pivotal role to play by leading the prioritisation of use cases and working with the industry to establish appropriate incentives that unite the sector behind solving prioritised use cases. This included addressing the gaps in system intelligence by providing appropriate incentives to those best positioned to invest in generating data that doesn't exist today (such as LV network data) in order to create value elsewhere in the energy system, ultimately, to the benefit of the consumer.

One way to achieve this desired consensus on prioritisation and justify incentives would be to determine the 'whole system' value of, and the inter-dependencies between, use cases. But, of course, that would also require agreement on the definition of 'whole system', which is lacking in the industry today.

With the new dynamics of the energy system, the group's thoughts around the changing nature of risk are, I believe, of particular importance. It was commented that we know how to regulate for physical assets with 40-50 year lives, but regulation needs to recognise and value data as an asset; an asset whose value is measured in weeks or months, not decades. The sector's demonstrable expertise in managing physical assets should be applicable to managing data as an asset, when supported by appropriate regulation.

As our group recognised, embedding such a significant cultural shift won't be without pain and we must think carefully about how to take people with us – both those working within the sector, and of course consumers who need easy ways to participate in, and benefit from, the energy transition.

> **The need for access to data must be justified to those whose data it is. "Value" isn't solely monetary. People are willing to share their data for societal good."**
> Rich Hampshire,
> VP digital utilities, **CGI**

With this in minds there were inevitably calls from some to address consent head on and increase the data sets that are shared. These calls are valid, but it is vital that the work entailed in responding to them doesn't put the brakes on the journey to net zero. There is an inherent conflict between the idea of "give us the data and the value will come" and privacy. Similar debates occurred in the GB smart metering programme and, more recently, in the Public Interest Advisory Group on access to data for societal good.

The need for access to data must be justified to those whose data it is. "Value" isn't solely monetary. People are willing to share their data for societal good. And addressing climate change would certainly qualify as a societal benefit in many people's minds. Securing people's trust to share their data is about offering them meaningful choices, providing them with mechanisms for control of access to their data and confidence that, once shared, their data will be secure.

There was consensus on the need for common data standards to enable data interoperability. The lack of agreed data standards was noted as an issue, but wasn't considered to be an excuse for not making progress; technological solutions that can deal with the lack of standardisation were cited. And whilst there was much talk of the need to adopt a "fail fast" approach to innovation, there was also acknowledgement that innovations which show promise need to "scale fast" too.

My overall takeaway from this virtual roundtable was a picture of a sector with a clear purpose and a desire to make progress. Hopefully the consensus on the required outcomes and actions needed to deliver them identified by this report will contribute to accelerating the pace of the race to net zero.

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