

Data for good

March 2021





## Foreword

Decisions taken over the next few years will determine the future of society as we know it. With concerted and widespread action, climate change can be tackled; air pollution can be improved, and millions will eventually lead improved, healthier lives.

At the Data Communications Company (DCC), we're passionate believers that while humanity created climate change, technology will help solve it. Making better use of data offers the greatest potential to help us tackle this challenge because it creates the insight that drives innovation and the evidence to direct action.

The speed at which we can harness innovation and technology to combat climate change is key and here the Data Communications Company's strategy of maximising access to data is vitally important.

Today, the volume of data at our fingertips is hard to comprehend; 90% of global data has been produced in the last two years alone. Through rapid technological advance, the capacity to capture, analyse and use it to our advantage has never been greater.

In Great Britain, smart meters and the digitisation of the energy system present an unrivalled source of data. As the company that manages the smart meter network we are uniquely placed as a single source for our platform's system data and, as such, we have a critical role to play in making it work harder for everyone. Our data strategy today is about giving the best possible access to that system data, with the correct permissions and bound by industry leading security to facilitate innovation on an immense scale – accelerating climate change solutions and ensuring that as much public benefit as possible is realised.

To do this the DCC also believes that data access via our systems must be at cost and not for profit. The big prize is social good and decarbonisation. Due to our unique position in the energy sector, we have an unrivalled capability and it is our duty to ensure we maximise the benefits it can bring for society.

During the lockdown alone, data from smart meters is estimated to have saved households £270m<sup>1</sup> just by showing them how much energy they consume.

Tomorrow, this data can help to eradicate fuel poverty and enable an ageing population to lead a fulfilled and independent life at home. In the future, data from the smart meter system will underpin the heat and transport revolution – putting us well on the way to net zero.

We know that increasing data access isn't easy. It's of critical importance we go about it in the right way.

With this paper we seek to start a dialogue about our plans for a *system data exchange*. We believe that this approach – combined with innovative licensing models – can maximise access to data securely, free of charge or at cost, but not for profit wherever possible. This contemporary approach would enable diverse innovation, allowing new ideas to grow from everywhere, not just companies that can afford to access it.

We want consumer-centric thinking at the heart of this, alongside robust governance: this is an extension to the DCC's role as an exemplar for data standards and security.

We want this to work for everyone, supporting decarbonisation for the benefit of society – and for that, we'll need your help.

**Angus Flett,**  
CEO

<sup>1</sup> A report by SWNS Digital has revealed that UK smart meter owners have managed to save a combined total of almost £270 million on energy consumption alone since 23 March.





## Executive Summary

DCC's smart, secure communications platform is a public asset. Today there are well over 10 million smart meters connected to it.

The creation and operation of the smart meter platform has been funded by energy suppliers on behalf of consumers. The data carried across it, the rich information about energy use across Great Britain, is safeguarded through National Cyber Security Centre (NCSC)-endorsed security measures that are managed and monitored by the DCC.

Britain and the world are facing huge challenges. Covid-19 and the resulting economic damage cannot mask the urgency with which climate change has to be tackled. Data is essential if we are to inform decision making and direct activity.

The DCC believes that universal, free data access and sharing will accelerate the nation's efforts to reach Net Zero. This echoes the principles within the Government's National Data Strategy.

Our plan is to start by opening up smart meter system data in a secure, fair and equitable way to allow organisations to analyse it and combine it with other data for the purposes of public good.

That analysis could eradicate the need for dirty, carbon-intensive, fossil fuel power stations. In the future it could pave the way to support major improvements to public services, such as a move to remote healthcare where treatments or monitoring do not necessitate visiting a hospital or GP surgery.

It is essential, therefore, that data should not be made available within "data lakes" and restricted by high access costs.

To maximise innovation and impact, we need a more inclusive approach. By operating as a *system data exchange*, we can deliver greater access to a broader spectrum of data to the most diverse range of users. This is the best approach to using data to take on society's big challenges.

To achieve this, we know there is some big thinking to do. There are critical issues to resolve: data privacy, and access and licensing models – the implications for our regulatory framework.

This is not an activity the DCC can, or should, undertake in isolation. We want to work with you, our customers, partners, and stakeholders, to deliver wider benefits for everyone from the data we carry and safeguard. To achieve this, over the forthcoming weeks, we will outline a series of activities to capture inputs and expertise. We would very much welcome your participation.





# 1. Introduction

Within the next 30 years we need a complete overhaul of our energy supply, for a widespread transition to low carbon heating and transport. A total shift to decentralised and flexible energy.

We need to do this fairly, at the lowest possible cost to the end consumer – creating jobs, improving lives, and reducing inequality along the way.

These are some of society’s greatest challenges: smart meter system data can, and should, be used better to help tackle them.

There are now more than 10 million smart meters installed and enrolled onto the DCC's nationwide secure network. Up to 270 million messages are securely encrypted and sent to and from homes and small businesses every month.

As the organisation at the heart of a rapidly digitising energy sector, we understand first-hand the potential this holds to bring further benefits to consumers and society at large.

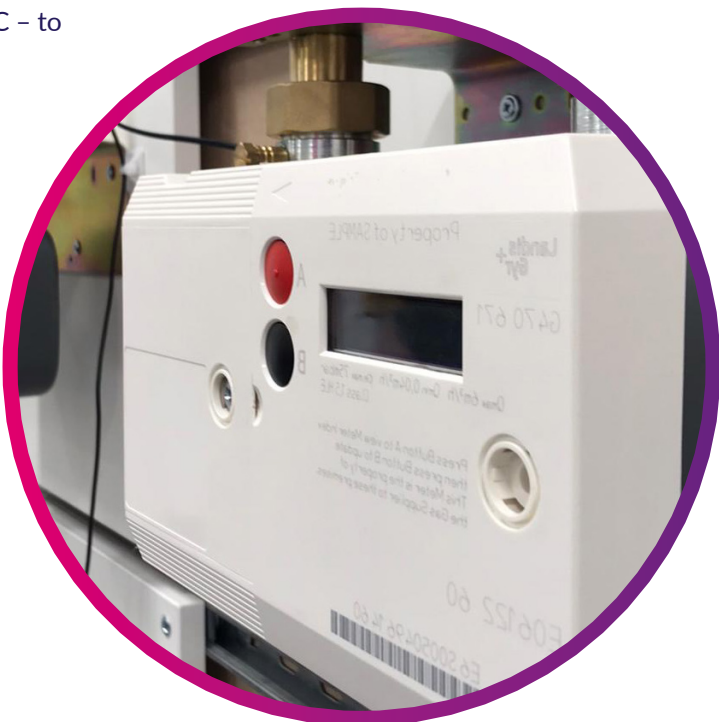
The need to enable positive change through better data use is rapidly gathering momentum. We see it as critical to our role – and our remit under licence as the DCC – to do everything we can to contribute.

In this paper we share our ambition to make this happen; our thoughts on the benefits that securely enabling appropriate and permissive access to anonymised and aggregated smart meter data can deliver; the barriers we need to overcome, and our thinking on how this can be achieved.

With collaboration and support from the nation's eco-system, our industry and stakeholders, we’re sure we can make this work.

“It is clear there is huge potential for DCC to facilitate innovation from its position at the heart of all smart meter data flows”

*Louise Fildes, Director of Applied Data and Technology, Connected Places Catapult.*





## 2. The backdrop to better data use

Rapid technological advances have led to an explosive growth in data in virtually every business and industry. It's no surprise that the six most valuable companies globally are data-driven businesses.

But the opportunity, for the DCC, is not driven by commercial interests. Better data use is critical to building a better future for everyone, and organisations around the world are responding to the challenge.

In the UK, the Government has a clearly stated objective to “put the UK at the forefront of the AI and data revolution” and “make the UK a global centre for AI and data-driven innovation.” This goal is one of the four Grand Challenges of the UK Industrial Strategy, and underpins the Government's approach to data, as found in the AI Sector Deal.

The National Data Strategy seeks to drive a collective vision that will help unlock the power of data in the UK economy and government, building public confidence in its use – whilst being sufficiently “adaptive and malleable to keep pace with the ever changing data landscape” (*Gaia Marcus, Head of National Data Strategy*).

Such a supportive political climate has enabled numerous world class organisations to thrive in the UK. Many research and innovation agencies – the Open Data Institute, Alan Turing Institute, the Catapults, academia and many more – are continuing to help organisations deliver societal benefits from data, whilst developing appropriate models to protect consumer interests. We're delighted to be working ever more closely with these organisations and benefiting from their expertise.

### 2.1 Data in the energy sector

Nowhere is the imperative greater to use data more effectively than in the energy sector. Energy ultimately underpins everything.

Recommendations from the Government-led Energy Data Taskforce have created a springboard to facilitate greater competition and innovation – steering the industry toward improved data availability, quality and transparency. Cost reduction and decarbonisation of the energy system are the ultimate aims.

The energy regulator, Ofgem, is also driving this agenda. Its Decarbonisation Action Plan describes good data use and availability as “crucial to provide better visibility of system usage, spare capacity and constraints, to inform investment needs, and to facilitate opportunities for strategic coordination.”

The launch of the £1.9m Modernising Energy Data Access competition, a joint initiative between Ofgem, BEIS and Innovate UK, is showing excellent promise as the initial funding recipients (Siemens and IceBreaker One) develop prototypes that can resolve the challenges of data interoperability and integration.

The DCC's system data forms a critical strand of the sector transition. Over the past two years, the Smart Meter Energy Data Public Interest Advisory Group has developed a substantial body of work and garnered support from some 40-plus stakeholders who recognise the significance of improved access to smart meter data for public interest purposes.

In parallel, significant academic initiatives – not least the Engineering and Physical Sciences Research Council (EPSRC)-funded Smart Energy Research Lab led by University College London – are securing access to a fully representative sample of household smart meter data. Through integration with the DCC, the lab will secure access to around 10,000 households who have granted access to their data through opt-in consent, for research purposes and with an accompanying ethical and data security framework.

The recent Energy Systems Catapult report ‘Enabling Smart Local Energy Systems : The value of digitalisation and data best practice’ emphasises the need for effective digital, data and information management as a fundamental means of ensuring successful local energy systems projects. Specifically, the report recommends that organisations seek to access smart meter data via on-boarding to the DCC or via Consumer Access Devices.

These and many other interventions and initiatives<sup>2</sup> across the sector are undeniably timely. The next waves of the energy system transition loom large.

Distributed generation assets, solar PV, batteries and electric vehicle charge-points are proliferating rapidly. New industry programmes are emerging, bringing time-of-use tariffs driven by Half-Hourly Settlement, and the ability to change energy supplier next working day through Faster Switching. Combined, these activities will lead to another step-change in industry data volumes.

With the right data access models and standards allowing integration both within and across sectors, the scale of innovation, new opportunities and potential for better consumer experience is not only staggering but also essential.

### 2.2 Consumer interests at the forefront

The trajectory for better data use is championed by Government and consumer interests and protection remain a critical component. Consumers recognise – and increasingly demand – better experience afforded by digitisation but are tiring of the enforced trade-off that diminishes the control and visibility of their data.

Research by the Open Data Institute and the Royal Society for the encouragement of Arts Manufacturers and Commerce, *About Data About Us*, identified that people generally feel positive about the benefits brought by being more connected, but want greater honesty and transparency, agency and control, rights and responsibility, context and fairness, and compliance and enforceability over how data about them is used.

In the energy sector, much research has unearthed similar results. A recent report, *Clear and in Control*, produced by Citizens Advice, identified that the purposes for data sharing are critical to consumer appetite to do so. Sharing data for targeted marketing was the least acceptable purpose. Consumers are most comfortable sharing data for public goals, like helping vulnerable customers and tackling crime.

Importantly, perspectives vary across different segments, suggesting that a one-size-fits-all model may not result in the best outcomes for all. Indeed, the status of smart meter system data – the focus of our plans – needs careful consideration from a consumer perspective.

As a leading model for data privacy we want consumers to retain complete control and transparency without diminishing choice and opportunity for use of their data. We have a duty to remain at the forefront of this issue.



<sup>[1]</sup> Smart Metering Implementation Programme Privacy Impact Assessment



3. Data and the DCC

At the completion of the smart meter roll-out we expect to be transporting more than a billion messages per month to and from 100 million devices in homes and small businesses throughout Great Britain. This represents one of the largest, always-on, device networks in the world.

The end-to-end technology system combines communication networks that offer 99.5% coverage of premises across Britain. Comprehensive data message handling and in-home ‘communication hubs’ create the ability for smart meters and a growing estate of devices – including consumption displays, smart appliances and EV chargepoints – to be connected without interruption, securely accessed and controlled.

3.1 The smart platform of things

As an organisation, the DCC was conceived to ensure this flow of data could take place protected by the highest levels of cybersecurity. At the core is a military-grade encryption model. Multiple controls and extensive verification of users ensures there is no single point of risk to the network. Our technical and security operations centres provide 24/7 cover: highly sophisticated data analytics identify unusual patterns of behaviour which might represent a threat, both on and off the network, including monitoring activity in some of the darkest places on the internet.

The smart metering security architecture has been developed from the outset in close coordination with industry security experts, the National Cyber Security Centre and the Government to ensure that robust security controls are in place across the system.

In addition to the cyber security model, transparency and consumer privacy are maintained through compliance with the data protection legislation, and the smart meter-specific Data Access and Privacy Framework (DAPF). This ensures that consumers’ rights over their personal

data are maintained in line with the requirements of the legislation.

Robust governance and clear accountability form the final piece of the jigsaw. The DCC operates under Government Licence, is regulated by Ofgem and adheres to industry codes<sup>2</sup> which are overseen by expert industry panels. The DCC is also subject to regulation by Ofcom.

The breadth, scale and sophistication of the technology system, the messaging platform, combined with the robustness of our security, data privacy and governance enable us to support multiple industry-wide applications at national scale. We process data systemically to industry standards – enabling a unique model of interoperability that enhances competition and drives better consumer experience.

3.2 The data distinction

The security model creates an important distinction between the types of data generated within the smart meter system.

At the most simplistic level, two categories exist: **message contents** and **system data**.

Physical postal letters provide a useful analogy:

- the letter – the **message content** sent to or from devices connected to the system within a premise e.g. amount of energy consumed or amount added to a pre-payment meter. This data is encrypted and accessible to energy companies or third party users consumers have given their consent to.

“DCC is a secure critical national infrastructure exemplar”

Ciaran Martin, former CEO, National Cyber Security Centre

- the envelope – the **system data** – information about the message, for example – where it was sent and which device, what time and whether it arrived safely. This data is retained within DCC’s system; currently no mechanism for external access exists (except in limited circumstances where the Government can request access).

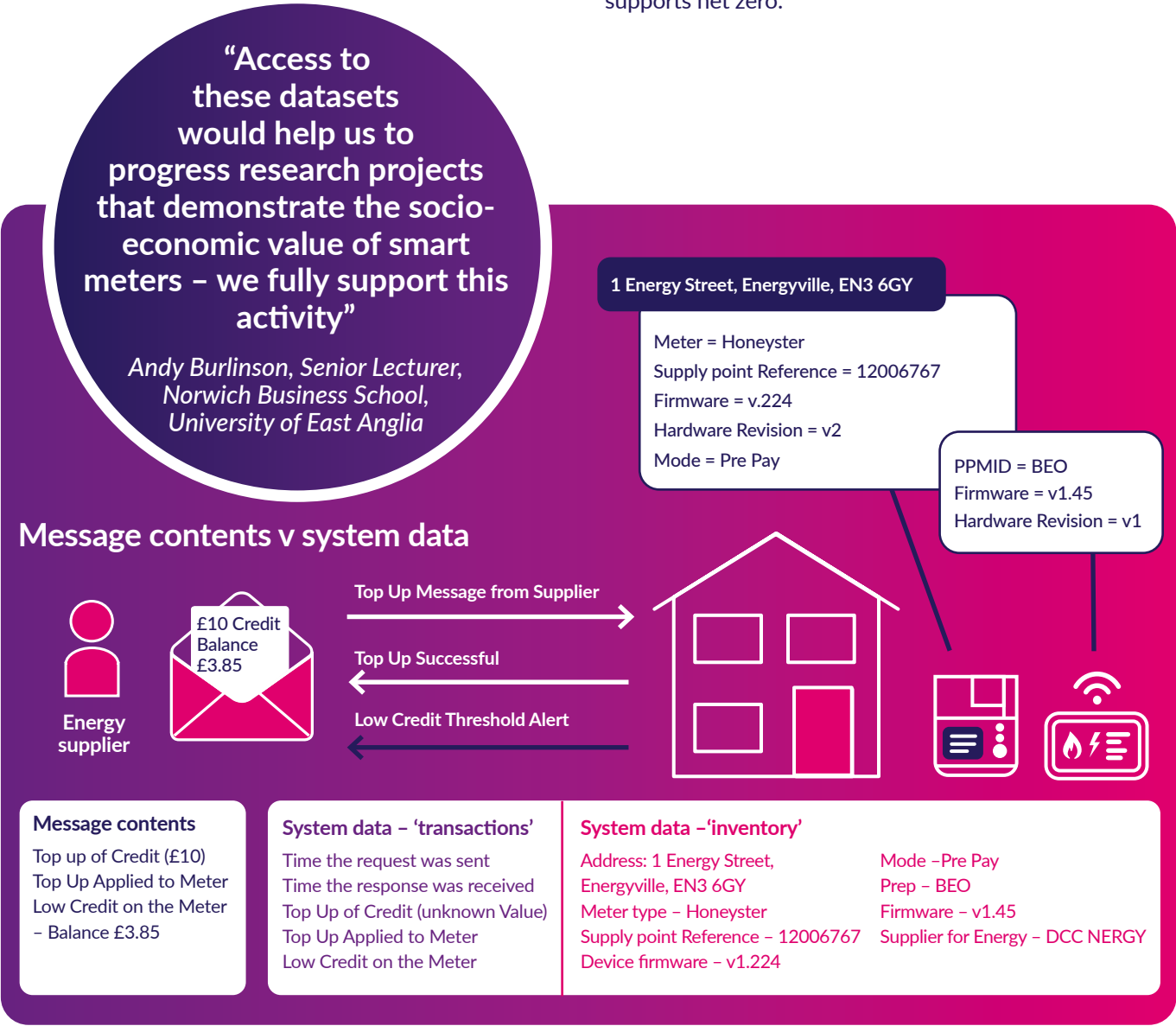
With more than 140 different types of message available through the smart meter system, improved access specifically to system data represents a massive opportunity to facilitate research, innovation and enable better outcomes – for industry, consumers and society.

3.3 Reach

When the roll-out of smart meters concludes, there will be around 53 million homes and small businesses connected to the DCC network. This will make it the single, biggest communications platform in Britain, overtaking broadband and digital TV by a considerable margin.

It’s a platform that is two-way, designed for ‘smart devices’ and with military grade security all separated from the internet. The controlled devices it links to can be instructed to do other things – including communicating with other smart devices and collecting different datasets.

That means billions of data rich messages being produced every month that could be analysed and acted upon to improve the way we generate, store and use energy in a way that reduces our impact on the environment and supports net zero.



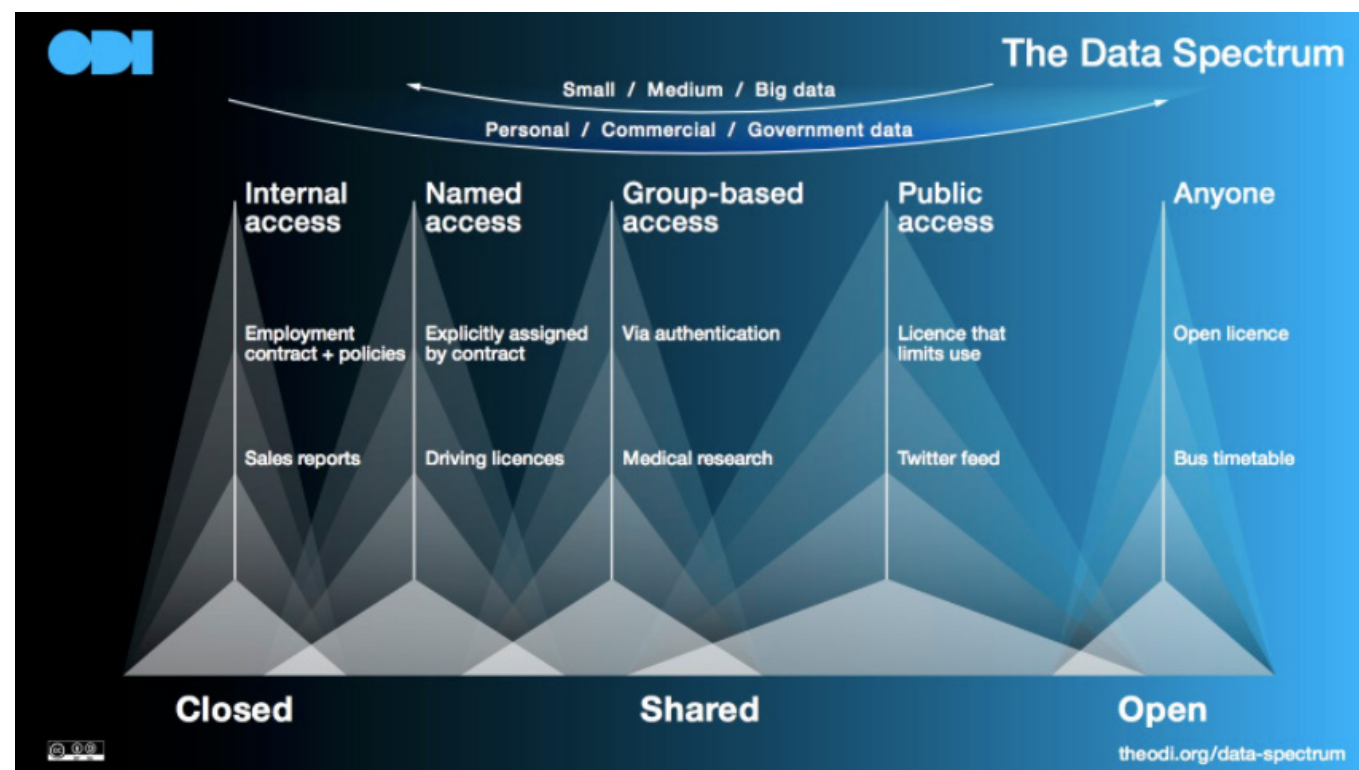
<sup>2</sup> Smart Energy Code & Retail Energy Code



## 4. Data access for all

Our ultimate ambition is to support a smart meter data access regime that maximises innovation and public benefit at the lowest possible cost.

Building upon best practice such as the Energy Data Taskforce recommendations, we will undertake a comprehensive triage process to give open access to appropriate, aggregated data sets.



### 4.1 Data access today

It is primarily energy industry parties, mandated to use the system, that have been accessing **message contents** from every home and small business in Britain with a smart meter. Access by non-energy suppliers or 'Other Users' as (described in the Smart Energy Code) is possible but is recognised to be challenging and resource intensive.

Even with this existing access regime, the benefits of data use are far from trivial – £6bn in benefit affirmed through the latest smart meter roll-out cost-benefit analysis<sup>3</sup>.

Equally, multiple requests have been received for access to **system data** from researchers, innovators and public sector organisations. Today it is retained within DCC's own operations where analytics and insight help drive efficiencies and process improvements across our customer base.

**"It would be a great shame if having created one of the world's largest real-time, two-way, secure smart device platforms all we do with it is save some money by making billing more accurate."**

*Phil Male, DCC Non-Executive Director*

enabling the integration of a wide range of other datasets, is the best means of taking on society's big challenges.

We want to combine modern technology, Application Programming Interfaces (APIs), for dynamic data access, and innovative licensing models. We envisage balanced but robust controls and permissions that reflect the sensitivity of the data and the usage. We want to share open data free of charge, or at cost and not for profit where we are entirely confident that we can do so safely, securely and without adverse consequences.

For the most sensitive datasets, a new wave of technologies – multi-party computation, for instance – may present new options, allowing external users to generate their own insights without exposing the underlying raw data<sup>4</sup>.

This type of approach has been proven to give the assurance that governments seek for handling and allowing access to even the most sensitive datasets – genomic medical data, for example<sup>5</sup>.

Whilst it is vital that we don't constrain ideas about what better access data might unlock, we have started to scope out what might be possible.

### 4.2 Tomorrow

As a first step, we want to provide appropriate access to **system data**. Our aim is to maximise public benefit from the breadth and depth of the unique datasets DCC retains – whilst retaining the privacy, security and consumer-centric thinking that makes the current model so robust.

A broad variety of data access models have appeared and evolved over recent years: further work, input and expertise are required to develop the correct model for DCC. We would emphasise that we are not seeking stewardship of this data for commercial gain – we want to expose more data at the lowest possible cost for consumer benefit and public interest purposes.

This is not about consolidation and storage within vast "data lakes" as advocated by some other organisations ie prescriptive insights and analytics offered through subscription models. Such an approach would only inhibit innovation, limit opportunities for data use and integration, create artificial controls driven by cost and affordability.

To maximise innovation and impact, we need a more inclusive approach. By operating as a data exchange, we can deliver greater access to the broadest spectrum of data to the most diverse range of users. This approach,

<sup>3</sup> Innovative energy suppliers and their technology partners are using this data to help deliver consumers financial savings. Delta-EE estimates the benefits at up to £115 per household, just by understanding energy consumption. £300 per year through choosing better tariffs.

<sup>4</sup> The UK's involvement in the Square Kilometre Array – an international effort to build the world's largest radio telescope, generating 5 terabits per second – represent good examples of data access models of this nature.

<sup>5</sup> *Data is the new gold*. This is how it can benefit everyone – while harming no one – World Economic Forum



### 4.2.1 Impacts and benefits

Through collaboration with the Connected Places and Energy Systems Catapult, Smart Meter Energy Data Public Interest Advisory Group stakeholders, Citizens Advice, academia and other key stakeholders, we have started to understand where we can help industry to develop propositions with smart meter system data.

A few of the emerging examples include:

**Helping consumers understand their meter** – we’ve built an ‘interoperability checker’ with Citizens Advice, a tool that uses system data to help consumers understand what type of meter they have. Launching soon as our first API, the tool will help consumers understand their choices when looking to change supplier.

**Helping households in fuel poverty** – 47% do not currently receive benefits and energy suppliers invest an estimated £100m of ‘search costs’ trying to ensure interventions go to those that most need it<sup>6</sup>. Sensitive and appropriate use of system data can help to improve this.

**Supporting better visibility of the energy system** – the Energy System Catapult estimates that the unique insights (e.g. meter flow direction, outage, EV charge point activity, load control transactions, device status) and cross-network learning that could be derived from DCC system data could help realise savings of up to £2.4bn<sup>7</sup>.

“We see massive opportunities to combine Met Office and smart meter data to advance understanding and proposition development in the field of energy system flexibility”

Phil Hodge,  
Business Development Director,  
Met Office

**Making the energy sector work for everyone** – integrating datasets to steer policy, regulation and planning:

- Improving consumer archetypes – helping to assess the impact of a new energy system – interaction with time-of-use tariff and demand side response. Understanding which consumer segments are missing out.
- Local area energy planning – ensuring the granularity of data can help to validate and enhance existing models, planning for low-carbon heating, for example.
- Event-driven impacts – understanding how economic events or even extreme weather affects consumer behaviour, supplier switching or interaction with pre-payment meters for example.

In parallel, other DCC user access to **message contents** is helping to enable current innovation on a scale that was previously unimaginable, whilst helping to drive competition in the energy sector – a licence objective we seek to uphold<sup>8</sup>.

The DCC has been inundated with requests for message content data access from innovators and tech companies of every size and scale. These include hundreds of companies (some funded through BEIS innovation competitions) with emerging applications which use smart data to deliver financial savings, smarter tariffs, warmer homes, better health, carbon savings and much more. We believe that better systems data access can help industry to develop even more new business models and propositions designed to tackle the pressing social challenges of today.

### 4.3 Looking to the horizon

As we look to the future, we will shift focus to our licence obligation to drive re-use of the technology in other markets<sup>9</sup> in order to reduce costs for our existing customers. To maximise the benefit of this growing opportunity, it is vital that an enhanced system data access model is fully scalable alongside.

We see this as a joined-up process. As the secure network is scaled to support more connected end points (environmental sensors, water meters, EV chargers etc) we must ensure that our secure data exchange grows in tandem.

The benefits are obvious: the more securely accessible system data, the greater the opportunities for integration, innovation and, ultimately, better outcomes for everyone.

We can see the potential with EV smart charging already. Accelerating EV adoption through re-use of our secure communications and interoperability would offer not just speed of implementation, efficiency and value for money from an existing public asset, but would also enable controlled access to a nationwide dataset of EV charge points, servicing any car, any charge point and any tariff.

Combined with energy usage and tariff information, we can enable a better-balanced grid and informed policy development – when is the right time for default off-peak charging? – and enable consumers to generate income from flexibility and ‘charge on my drive’ propositions.

In just 6 years  
Transport for London’s  
Open Data Initiative led to  
the creation of more than  
600 apps and delivered  
£58m annual savings for  
passengers.



<sup>6</sup> Better use of data and AI in delivering benefits to the fuel poor – BEIS / Committee on Fuel Poverty

<sup>7</sup> Smart DCC Data Explore Report – Connected Places & Energy Systems Catapult – Sep 2019

<sup>8</sup> ‘Facilitate effective competition between persons engaged in, or in Commercial Activities connected with, the Supply of Energy under the Principal Energy Legislation’.

<sup>9</sup> the reduction (by virtue of benefits arising from the provision of Value Added Services) of the charges payable for Mandatory Business Services.





## 5. Conclusions

The DCC platform is a public asset with open and equal benefit for all. Our ambition is for data to deliver the best possible outcomes for society, the energy system, our customers and their consumers. All of which, we hope, will accelerate decarbonisation.

Our focus is to ensure we can freely share (or provide at cost) system data, securely and in the right way. To achieve this, we know there is some big thinking to do. There are critical issues to resolve: data privacy, consequences scanning, access and licensing models, and the implications for our regulatory framework.

The current data access regime is necessarily robust – and rightly so. But we believe that to deliver the full array of outcomes from smart meter data and help tackle society's great challenges, we need to address the balance.

We need to move on from a one-size-fits-all approach to an access regime and technologies that offer secure but easy access, commensurate with the data sought and the purpose intended. We need a level playing field; a democratised service with the same level of access to all organisations, large and small.

None of this is activity the DCC can, or should, undertake in isolation. We want to work with you, our customers, partners, and stakeholders, to deliver wider benefits for everyone from the data we carry and safeguard. To achieve this, over the coming months, we will outline a series of activities to capture inputs and expertise. We would very much welcome your participation.

We want to work with you to benefit everyone. Please offer us your thoughts and feedback.

### Further reading:

[https://www.ey.com/en\\_gl/life-sciences/how-we-can-place-a-value-on-health-care-data](https://www.ey.com/en_gl/life-sciences/how-we-can-place-a-value-on-health-care-data)

<http://content.tfl.gov.uk/deloitte-report-tfl-open-data.pdf>

<https://www2.deloitte.com/content/dam/Deloitte/uk/Documents/deloitte-analytics/open-data-driving-growth-ingenuity-and-innovation.pdf>

[https://www.ofgem.gov.uk/system/files/docs/2020/02/ofg1190\\_decarbonisation\\_action\\_plan\\_revised.pdf](https://www.ofgem.gov.uk/system/files/docs/2020/02/ofg1190_decarbonisation_action_plan_revised.pdf)

<https://www.gov.uk/guidance/national-data-strategy>

[The economic value of data: discussion paper \(publishing.service.gov.uk\)](https://publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/531111/The-economic-value-of-data-discussion-paper.pdf)

<https://www.weforum.org/agenda/2016/02/the-importance-of-open-data>

<https://www.weforum.org/agenda/2020/07/new-paradigm-business-data-digital-economy-benefits-privacy-digitalization/>

<https://www.weforum.org/agenda/2020/01/future-of-data-protect-and-regulation/>

<https://www.gartner.com/smarterwithgartner/gartner-top-10-trends-in-data-and-analytics-for-2020/>

You can get in touch via email: [communications@smartdcc.co.uk](mailto:communications@smartdcc.co.uk)