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10 May 2023

Subject: DCC's response to Ofgem's Future of Distributed Flexibility Call for Input

Dear Doug,

Smart DCC Ltd (DCC) welcomes Ofgem's call for input on the Future of Distributed Flexibility.

Last winter's Demand Flexibility Service has highlighted that consumers are able and willing to engage in flexibility, and that smart metering will be central to many consumers' engagement in providing flexibility to the energy system.

However, it also highlighted opportunities to enhance the consumer experience of flexibility, particularly around switching between flexibility providers, and ensuring transparency and consistency of information on how much could be earned and how best to respond to reduce energy consumption.

In submitting this response, we endeavour to share experience and perspectives which we hope are both relevant and valuable, building on our experience of operating digital infrastructure – the smart metering system – serving domestic and small non-domestic consumers, delivering industry change programmes (e.g. Ofgem's Faster and More Reliable Switching Programme) and our ongoing involvement in the Automatic Asset Registration Programme.

In addition, we have considered how these proposals align to and might interact with the government's Smart and Secure Electricity System (SSES) programme, which is also considering what 'common systems' (for cybersecurity in particular) may be necessary in the future electricity system, and how they should be delivered.

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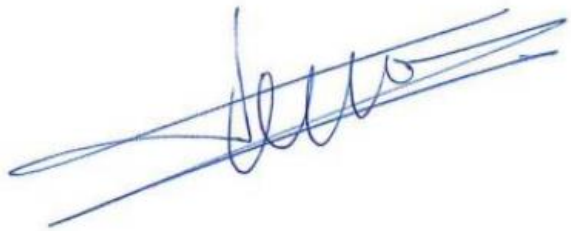
We are supportive of a new digital infrastructure that increases transparency and efficiency in operating the electricity system. In our response we highlight that:

- We agree that a new common digital infrastructure is required to enable a flexible energy system that delivers the transition to net zero at least cost to the consumer.
- However, common digital infrastructure may not need to be delivered as a single service by a single entity, and could instead be delivered by several interoperable systems, potentially leaning on the Digital Spine proposals,
- DCC has existing capabilities, governance and business processes which could be re-used to support some use cases within the common digital infrastructure (for example asset registration for domestic Consumer Energy Resources),
- Cyber security requirements for any common digital infrastructure need to be considered at an early stage (in line with government's plans within the SSES programme) and, especially where the infrastructure has a direct impact on the safe and reliable operation of the electricity system,
- There are potential benefits of a phased approach to implementation of new services and functionality, given the urgency of enabling the energy transition and embedding consumer flexibility within the energy system, supported by a robust delivery plan with appropriate governance to ensure adherence to programme plans.

We would welcome an opportunity to meet with you to discuss our response and look forward to continued engagement as this policy develops and moves towards design and implementation.

We are of course on-hand to provide any further information or respond to any questions you may have from this response.

Yours sincerely,



Stève Hervouet
Chief Strategy & Regulation Officer

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Annex 1: Smart DCC Response

1. What do you think distributed flexibility could contribute to the energy system?

We note that the call for input outlines a range of economic benefits from distributed flexibility, primarily from reduced investment in generation capacity, network reinforcement, and cheaper reserve services. Regarding the scale of these benefits, we recognise that several estimates exist. The government's recent response to the *Delivering a smart and secure electricity system* consultation, which estimated flexibility will reduce system costs by £6-10bn per year by 2050.

That government response also identified that use of smart systems and flexibility could create 10,000 jobs and increase GDP by up to £1.3bn by 2050. The proposals in this Call for Input, seeking to increase the ability for flexibility to contribute to operation of the energy system, could contribute to the growth of the overall flexibility and smart systems sector, by increasing investor confidence, reducing barriers to entry, and ultimately enabling consumers to reap financial rewards from investment in smart appliances.

In the ESO's Future Energy Scenarios the most ambitious 'Leading the Way' scenario sees demand side flexibility reducing unmanaged peak demand by over 40% by 2035. In any scenario, consumer engagement with smart appliances and thermal storage is seen as important to help to mitigate the increase in peak residential electricity demand from electrification of heat.

Perhaps most importantly, distributed flexibility will underpin the achievement of net zero fastest, and at least cost to the end consumer. Wherever flexibility can deliver system reliability in place of additional generation assets or network reinforcement, this represents avoided carbon emissions.

2. Will a focus on Consumer Energy Resource (CER) flexibility also help enable other forms of flexibility, especially distributed flexibility?

We support the initial focus on CER flexibility. We agree that tackling the CER-specific flexibility challenges will likely resolve the distributed energy resources (DER) specific challenges simultaneously, and that taking the converse approach would leaving CER flexibility excluded.

CER flexibility requires widespread adoption of smart enabled appliances across the home, and then nationally. There are a number of considerations which will play into this widespread adoption, including price point, availability of suitable technologies and models, trust in technology providers and flexibility service providers, user experience, and interoperability.

When designing systems that serve consumers, even if that is indirect via an aggregator or other intermediary, it is essential to consider domestic consumer-specific needs such as:

- Data privacy and ethics – elements of the proposed digital infrastructure, particularly asset registration and reconciliation, are likely to contain personal data. Whether or not that data is

considered particularly sensitive, consumer sentiment around personal data can be polarised. The system design should consider the needs and views of all consumers, not just highly engaged consumers who may have a relaxed attitude to sharing of their personal energy data. In addition, consideration should be given to the implications of sharing asset level data across a whole household.

- Habits and expectations in switching between providers – since the introduction of the Central Switching Service for switching energy supplier, consumers are becoming accustomed to next working day switching. Our engagement in the Demand Flexibility Service has highlighted that there is a potential lack of transparency for consumers about how to switch between flexibility providers, the timelines involved, and potential risks around double registration or registrations cancelling each other out. We consider this to be a CER-specific risk, because at the DER level contracts are generally struck many months in advance.
- Integration with proposals for a Smart and Secure Electricity System (SSES) – the SSES programme is focussed on domestic-scale smart appliances, i.e., CERs. The devices that provide the flexibility services in the future will be mandated to meet standards based on PAS 1878, which will include requirements related to interoperability and grid stability. By focussing on CERs first, the future of distributed flexibility work can help to ensure alignment between the needs of system operators, common digital infrastructure, and stakeholders in the SSES programme.
- Supporting and enabling a just transition – the enabling structures for flexibility services should support equity of access to flexibility services for end consumers, being mindful of variation in digital literacy, geography and property typology, and technology availability.

3. Is there a 'case for change' and a need for a common vision for distributed flexibility?

We agree that there is a compelling case for change, and that without a common vision there is a risk of markets continuing to develop in an uncoordinated way that reinforces barriers to entry for flexibility providers and hinders the uptake and acceptance of flexibility services with consumers.

Without a common vision for distributed flexibility, there is a risk of inefficiency and barriers being baked into the future system. Ultimately, an efficient market with appropriate governance and transparency will deliver the best outcomes for consumers, in terms of choice of service providers and lowest overall cost.

In addition, it is important during the policy development phase to send clear signals about what is in scope and out of scope of potential reforms, as the 'vision' develops. Current market participants and new entrants need clarity on the vision for the future to avoid duplicated costs, which could be incurred from trying to overcome some of the issues in the market within their own systems.

While initial consideration of the architecture is helpful, we believe greater focus at this stage should be placed on scoping the functions and services that are required and expected to exist in the future market. We also consider that, in line with proposals in the recent Data Best Practice consultation, Ofgem should set a baseline for what information should be available freely or at minimal cost.

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4. What is your vision for how to accelerate the delivery of accessible, coordinated and trusted markets for distributed flexibility?

In our view the following factors are critical to accelerating the successful delivery of accessible, coordinated, and trusted markets for distributed flexibility:

- Clearly defined scope and success criteria. Homing in on what is in scope and what will be out of scope at an early stage will enable decisions on architecture and delivery model to be taken decisively and with more confidence. To support those decisions, it may be helpful to define success criteria against which various options can be assessed.
- Phased implementation, bringing forward no-regret options ahead of more complex solutions. As noted in the call for input, there are existing programmes of work to deliver some elements of the proposed common digital infrastructure, for example the Automatic Asset Registration programme. We believe this presents an opportunity to bring forward the benefits of each of the use cases across the end-to-end flexibility process as soon as possible, without waiting for an end-to-end service to be designed, developed and tested with the entire industry. In particular, we consider the 'thin' model could be an immediate no-regret solution, while further development is undertaken on the elements of the medium and thick options that may be desirable in the end solution.

In addition to the considerations above, we would particularly note that it may not be most efficient to place responsibility for end-to-end delivery of common digital infrastructure for flexibility with a single regulated entity. For reasons we discuss further in questions 7-10, we believe the functionality/ use cases supported by a common infrastructure can be disaggregated and potentially split across several organisations with different capabilities and remits.

Disaggregating the service, while ensuring interoperability of systems, would be consistent with the approach currently taken across the energy industry, where related but separate processes are managed and governed by different organisations, for example registration of suppliers and the meter points they serve (i.e. switching) is managed by DCC and governed under the Retail Energy Code, versus settlement of energy supplied to each meter point being managed by Elexon and governed under the Balancing and Settlement Code.

This approach enables organisations to develop specialisms, for example in different types of operations, data processing, security controls, or data retention practices. In the context of accelerating delivery, it also de-risks delivery by spreading responsibility across several actors and ensures that key elements of the overarching service receive the appropriate prioritisation within those organisations.

5. Will certainty of an end vision help accelerate enabling work and make it cohesive?

Certainty of an end vision can help to create focus and a sense of working towards a final product. However, it may be too early in the development of the CER flexibility market to define an end vision that

demonstrates a positive cost-benefit ratio, while also being future-proofed to developments in technology or market structures.

Any defined end vision must be credible and feel achievable if it is to secure buy-in from the parties required to deliver and integrate with digital infrastructure.

However, what is 'achievable' today may change by the time the infrastructure is in development or rolled out. Following our experience operating the smart metering system, we believe a degree of flexibility should be retained for future development of the infrastructure as technology evolves, for example initially aiming for the 'medium' archetype, recognising that this will be based on the existing market structure, with flexibility to incorporate elements of the 'thick' archetype as the market develops.

Waiting for 'certainty' on an end vision may delay some immediate no-regret reforms. For example, the 'thin' archetype looks to be something that could be rolled out at relatively low cost in the short term to address some of the most obvious issues in the current market.

6. When should a common digital energy infrastructure be in place? And therefore, when should development begin?

DCC does not have a specific view on when the common digital energy infrastructure to support flexibility markets should be in place, although we support an ambitious timeline reflective of the climate emergency and the scale of change required to enable the transition to net zero. With that urgency in mind, we do not consider that the infrastructure must be conceived of or delivered as a single end-to-end system. Therefore, there may not be a single date for delivery or completion of the infrastructure.

Some of the common digital infrastructure discussed in this call for evidence is already in development via the Flexibility Innovation Programme, i.e., the Automatic Asset Registration (AAR) project. Similarly, as outlined above, we believe some no-regret actions could be initiated immediately, such as the 'thin' directory archetype.

The overall timelines for delivery will depend on the chosen archetype, for example the 'thick' archetype is likely to require significantly more development and testing of algorithmic decision-making, versus the functionality required in the 'medium' archetype.

However, we expect that in determining an ideal timeline for delivery, consideration should be made of alignment to the timelines for SSES, which will accelerate consumer awareness of flexibility propositions and service providers (e.g., through smart mandates, licensing frameworks and interoperability). It may be preferable for the flexibility market supporting structures in place by the time that standardised, interoperable smart functionality is being sold at scale to consumers.

We would express caution around tying the delivery of this digital infrastructure to wider changes in the regulation of industry bodies, for example the transition to the FSO or creation of a new licensing framework for DCC. We consider it is important that delivery is driven by consumer and market participant needs, rather than being potentially delayed to fit into long term regulatory work which is largely divorced

from operational delivery. To avoid these delays, we think delivery can commence within existing suitable bodies, with enduring operation potentially transferring to new/ reformed organisations such as the FSO.

7. What should a common energy digital infrastructure look like, and why? Please consider the archetypes or develop your own proposition.

As DCC is not a flexibility provider or buyer, we feel that this question is best answered by the customers of any common digital infrastructure. However, we have considered how the common infrastructure could be delivered, which we discuss further in the next question, and how it might interact with wider changes in the energy system, such as the SSES programme.

The archetypes are helpful to bring a potentially long list of options and combinations to life. However, we agree with statements in the call for input and supporting documents that the archetypes do not represent a choice between three options, and instead represent points on a spectrum of potential end points.

As we have mentioned above, we consider that the thin archetype is a potential no-regret action that could be taken immediately or in the short-term.

The medium or the thick archetypes comprise of options that we consider are likely to more suitable long-term solutions to enable an efficient and competitive flexibility market for CERs and DERs. In either case, while we recognise the value of presenting these as standalone archetypes, we consider that the most successful delivery will come from breaking down the system into its component functions/ use cases and delivering some of the services separately while ensuring interoperability.

Regardless of the archetype and approach to delivery, the system design must be cognisant of other common systems being developed to support interoperability. In particular, the SSES programme is considering what common systems may be needed to support cyber security and interoperability of energy smart appliances. Anomaly detection systems, for example, could generate additional data on the operation of CERs by flexibility providers, which may also be valuable to market participants and regulators, in addition to the market data within the scope of this call for input.

We note that cyber security was out of scope of the work that IBM undertook and was not discussed directly in the call for input.

8. What is your view on the desirability and feasibility of the archetypes or your own alternative proposition?

As mentioned above, we consider the thin archetype could be an interim 'quick win', but do not believe it would solve the wider market failures identified in the call for input. In our answer to this question, we therefore focus on the elements that comprise the medium and thick archetypes.

<u>Value for money</u>

On balance, we consider the medium archetype is likely to present a more realistic option with a strongly positive cost-benefit ratio. This archetype brings forward primarily 'additional' functionality, such as asset registration and historic data, and replaces existing functionality that is not 'core business' for existing actors (e.g., contractual terms), and therefore is plausibly likely to be more efficiently delivered centrally.

De-risking delivery

Another advantage of focussing on bringing forward primarily 'new' functionality and services is that delivery can be phased, with support for various use cases introduced over time as the service beds in and scales up. For example, an asset register can be rolled out initially to the largest OEMs in the market, with the coverage built up over time. Similarly, standardised contracting can be rolled out to individual markets over time with no requirement for a hard cutover.

On the other hand, the thick archetype seeks to replace existing business-critical functionality with new systems. From a deliverability perspective, replacing existing critical functionality often requires large change programmes, e.g., MHHS, or Ofgem's Faster Switching Programme, to manage cutover. This poses additional delivery challenges where you must maintain live services during cutover (e.g., dispatch and balancing of the electricity system).

Viability of technology

Elements of the thick archetype require assumptions about the availability and suitability of technology such as Artificial Intelligence (AI). In practice, we agree with the conclusions of the IBM report published alongside the call for input, which notes that the 'whole market optimisation' use case has very high mathematical and computational complexity, would be time intensive to deliver, has complexities around managing bias in which objective(s) should be optimised for and how they are weighed, and governance challenges who decides on the objectives and limitations to be included. We believe that these factors would create significant concern amongst stakeholders and the wider public.

AI may not be able to explain the reasons for their decisions, and algorithms can build in and disguise biases in those who create them. This makes transparency in operational decisions difficult and could hinder future investigations into system failures or near-misses. We believe that utilisation of AI and algorithms could be explored via future innovation projects.

However, we also recognise the potential AI, and other next generation technology, provides to enable fundamental system wide change. This is why we have suggested a degree of flexibility is built into design decisions at an early stage, to enable the infrastructure to evolve over time as these types of technology continue to evolve.

Operational capabilities

Within the medium and thick archetypes there are multiple use cases and categories of functionality under the broad umbrella of 'common digital infrastructure'. In light of this, we believe it is necessary to consider the skills and expertise that may be required to manage each part of the system/ use case.

For example, an asset register for domestic assets requires understanding of location data, GDPR/ personal data considerations, consumer behaviour, installer practices and expectations around switching flexibility providers/ moving between aggregators' portfolios. These are activities and considerations that network operators do not commonly need to make and may require significant changes to existing processes relating to registration of assets and sites connected to the transmission system.

Through our engagement in the Automatic Asset Registration programme, we have explored with Greensync and the Energy Systems Catapult various options for delivering, governing and funding an asset register focussed on domestic and small non-domestic assets (i.e., CERs). We consider that DCC has the necessary skills, expertise and relevant business processes to operate a domestic asset register. Such a register should be fully interoperable with any other digital infrastructure to support flexibility markets.

Another area where existing organisations, such as DCC, may have business processes and expertise that can be re-used for supporting flexibility markets may be registration and verification of organisations or key individuals. There are existing processes within the Smart Energy Code (SEC) that require verification of organisations and key personnel for security purposes, which may be analogous to the requirements here. There may be potential efficiencies in requiring new flexibility providers to navigate only one accession/ onboarding process, which could give them access to the smart metering system, common systems for SSES, and the common digital infrastructure for flexibility markets, for example. This could align to the proposals to licence CER flexibility providers, within the SSES programme.

9. Should a common digital energy infrastructure be new-build, or should it build-out from existing infrastructure?

We don't believe there is a one-size fits all answer to whether a common digital energy infrastructure should be new-build or built-out from existing infrastructure. However, we do believe efficiencies can be gained from re-using existing capabilities, governance and business processes which are all essential to support any new digital infrastructure.

Either approach should ensure that system design is suitably future proofed, for example requiring that systems can be modified at an appropriate cost (e.g., being mindful of any fixed costs for impact assessment of changes).

There are some aspects of the proposed digital energy infrastructure that we think could benefit from experience in alternative sectors. For example, standardised contracting could be explored through a blockchain platform, similar to that seen in 'fintech' in the financial services sector. This again emphasises the need to consider each use case individually, while ensuring interoperability of systems, rather than deciding upon an implementation body and approach for the system as whole.

10.What are the important areas for consideration when designing institutional delivery models for a common digital energy infrastructure?

Based on our experience from a number of similarly large-scale, multi-party systems change programmes, including the smart metering implementation programme, faster switching programme, and the current market-wide half hourly settlement programme, we believe governance is key to the successful and timely delivery of digital energy infrastructure.

DCC successfully delivered the faster switching programme. That programme was governed via obligations in DCC's, suppliers' and network operators' licences[1], and via an Ofgem-led Significant Code Review. This ensured that all key parties were under unambiguous requirements to meet programme milestones, engage in testing phases, and report on business readiness for go-live. In our view, Ofgem must have direct powers to compel core parties to deliver against agreed plans, and to agreed specifications, to ensure the final product meets all stakeholders' needs.

We have considered the various delivery models set out in the call for evidence. On balance, we consider that in live operation, any delivery body should ideally be licenced and mandated to provide the required infrastructure. For the purposes of this response, we consider that mandating the DCC to provide any elements of this infrastructure would be analogous to the "mandated central entity" option in Table 4, as opposed to "tendered and licenced". This is because we do not expect that it would be necessary or appropriate to create a new licence and tender that licence, simply to provide (elements of) this common digital infrastructure. Indeed, the government has, through the SSES consultation, recently discounted this option from the delivery options for common systems to support smart appliances, due to the disproportionate cost and long timelines required to create the legislative framework to underpin the licence, and the lengthy public procurement process.

Currently in the energy industry digital infrastructure is normally governed under a combination of codes and licence obligations. While a minority of digital infrastructure is governed solely under code obligations, we note that major digital infrastructure underpinning key industry processes is provided under various licence obligations – whether that is placed on DCC, the ESO, or a collective of licensees such as DNOs or GDNs.

In live operation, changes to digital infrastructure are normally governed by code frameworks. While code frameworks can be perceived as slow to respond to change, and act as a barrier to entry/ engagement for smaller companies, we believe that these problems are not insurmountable, and the benefits of code frameworks deployed appropriately can outweigh the perceived bureaucracy.

Energy codes create transparency around service specifications, data access frameworks, accession and integration requirements, and security/ audit regimes. This transparency can come at the cost of pace, as the current code governance processes can be slow. However, we are optimistic and supportive of the current programme of work jointly led by Ofgem and government to review and modernise codes, and note that the Retail Energy Code was created to address many of these concerns, for example by enabling the code manager to have more authority and autonomy, and enabling any interested person to propose changes to the code.

[1] The 'Duty to cooperate' with Significant Code Reviews

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With regard to the options put forward in the call for input, we broadly agree with the pros and cons identified. We would add the following observations, in addition to our comments above:

- Fully private: We would question whether this model is appropriate for an essential service such as facilitating the operation of the electricity system. We would also question whether a fully private model would result in a revenue model that accurately reflects the social benefit from efficient procurement and dispatch of flexibility, or if it would overly extract revenue from the private benefits that accrue with flexibility providers.
- Mandated central entity: As noted above, we would consider that DCC sits within this categorisation as an existing central body, and broadly agree with the observations and benefits noted in Table 4. With regard to the risks, we would question whether the risk around pace is symptomatic of this type of delivery, or if it can be remedied through strong governance. Ultimately any digital infrastructure that requires integration of existing or new services will take some time to design, build, test and implement due to dependencies across organisations. For this reason, we would advocate for the phased approach we have discussed above, which allows the pace to somewhat follow the fastest mover rather than the slowest. A potential pace-advantage associated with this model would be that the revenue and governance arrangements are already largely in place, and DCC has proven delivery capability for large scale complex digital programmes. Re-use of existing entities could avoid significant work to define a new governance and charging methodology from scratch before design and build can commence (although we acknowledge the charging model in live operation will need to be designed alongside the build of the new systems).
- New mandated consortium: We note that the example provided of the Open Banking Implementation Executive was formed by virtue of a Competition and Markets Authority (CMA) Order. Without a corresponding Order for this work, we agree that legislation or licence changes would be required. Without further detail on who Ofgem would expect to mandate to form the consortium, it is difficult to comment on whether the mandated entities would have in-house expertise in creating common infrastructure. This would be a novel approach in the energy sector, which has a high degree of heterogeneity of parties and their interests… We therefore have concerns that in practice this model would be slow to deliver due to unfamiliarity of the model, a risk-averse approach to entering contracts to build and operate central systems without a clear and secure revenue model, and challenges in ensuring parties feel their interests are adequately represented by an organisation other than themselves.
- Tendered and licenced: We recognise the similarity to the approach taken to tender the Smart Meter Communications Licence, however as noted above we do not believe that DCC as it exists would sit within this category. The tendering process that led to the creation of DCC required changes to legislation to create the powers to licence the new entity. We expect that legislative change would be needed to create a new licence solely for provision of common digital energy infrastructure. Further, we would highlight that the majority of DCC's services are provided through contracts with service providers, with DCC directly providing a service management layer through which our customers engage with the system. In regard to risks, as outlined above, government has recently discounted this option for provision of common systems within the SSES programme, due

to the lengthy process and uncertainties around making the legislative changes required to create a new licence.

- Code body: As noted above, while codes are a common feature of digital infrastructure governance, they are rarely the sole 'hook' for provision of core industry central services. If a code body will manage common digital infrastructure at an operational level, we would still expect this to be underpinned by a licence obligation on a central body or collective of licensees, to prevent the scope or quality of the service from shifting outside of Ofgem's policy parameters over time. This would align to decisions under the Retail Code Consolidation Significant Code Review, where obligations were retained within the DNO and GT licences to provide various central services despite these being specified and governed within codes.
- Government IT project: We have no specific comments on the viability of this option as this is a matter for Ofgem and government to consider. We agree with the benefits and risks identified in the table.

11. What are the important areas for consideration when designing financial delivery models for a common digital energy infrastructure?

In considering this question we have broken it down into three key questions: who should pay for the services, how should costs be split between those parties, and under what mechanism should costs be recovered.

Who should pay

Overall, we believe this should be informed by an assessment of where the private and social benefits from more efficient procurement and deployment of flexibility accrue. There should primarily be a user-pays approach, i.e., those that benefit from the services should fund it. However, any funding from system operators will ultimately be spread across all consumer bills, so this funding route should be reflective of the public benefit from the system.

Funding from flexibility providers may be appropriate but should be monitored to ensure it does not become a barrier to entry to unduly cannibalise the earnings for consumers of providing access to control their assets to provide flexibility.

To address these issues, it may be helpful to consider different funding models for different elements of the system. For example, system operators might be best placed to pay for procurement and dispatch services, while flexibility providers pay for asset registration and some element of reconciliation services. Similarly, the appropriateness for private finance to be involved in funding of services may differ across the use cases/ functionalities; in general, we would not expect it appropriate to manage household-level asset data within a fully private model which is strongly incentivised to generate profit from a highly valuable, but sensitive, data set.

While some data may be considered 'open' and freely available, a further category of 'third party' users could be charged for certain types of access to historic, asset and user data. The level of cost may vary depending on the purpose of access, for example investors and financial organisations that will use the data for profit making purposes could be charged at a commercial price, while public services that seek access to asset data, for example for fire safety management, may be given access 'at cost' or at zero cost.

How should costs be split between parties

Beyond considering *who should pay,* there is a further question of *how much* they should pay, i.e., how should costs be split between market participants within a given category. We agree with the risk identified in the call for input that revenue models could create perverse incentives to manipulate charges. We expect that some form of charging by market share would be appropriate, although consideration should be given to whether, for example, that is share of customers, number of assets, flexibility capacity of assets or volume of flexibility traded. Given that CER and DER will be competing against each other, charging by share of flexibility capacity or volume of flexibility traded may offer a level playing field and address some of the identified risks around incentivising excessive churn or slicing of contracts.

In any event, funding methodologies should be transparent and flexible, with the ability to adapt over time to reflect changes to the market structure, scope of services and address any problems with the current funding model.

Mechanism for cost recovery

There are several cost recovery mechanisms in use across the industry, including ex-ante price controls, ex-post price controls, Contracts for Difference (CfD), Regulated Asset Base (RAB), and costs being agreed via annual code budget-setting processes.

The degree of delivery risk is somewhat dependent on the archetype and scope of services. However, we expect that cost recovery could be done largely via existing code funding mechanisms, with charges recovered from code parties. Some factors that may need to be considered in this case are:

- Who pays for development versus live operation – given that new regulated market roles such as flexibility provider/ load controller roles have not yet been introduced, it may be necessary or appropriate for development of common infrastructure to be funded by all consumers via system operators, with live operation being funded by a wider range of parties.
- Mutualisation in the event of insolvency – as is the case for other industry charges, there may need to be provisions to ensure that some or all costs can be recovered from funding parties in the event of bad debt resulting from market exit or insolvency of a funding party.
- What credit or collateral requirements may be necessary – similar to the second bullet above, depending on the scale of the costs, there may need to be credit or collateral requirements to protect the digital infrastructure provider and wider industry from the impact of non-payment.