Response to Consultation on the Governance of a Data Sharing Infrastructure

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In responding to this consultation, we synthesis the views from a broad range of thought leaders, academics and researchers[1].

Dear Jeff,

The University of Bath welcomes the opportunity to respond to Ofgem's consultation on the Governance of the Data Sharing Infrastructure (DSI).

Who we are

The University of Bath worked alongside Arup and Energy System Catapult in undertaking the feasibility study of 'Energy System Digital Spine', commissioned by the Department of Energy Security and Net Zero (DESNZ) in 2023. The feasibility study explored the concept of a thin layer of data sharing infrastructure (DSI), first proposed by the Energy Digitalisation Taskforce (EDiT), allowing for secure and interoperable data to be shared to drive a whole system approach for reaching net zero.

We hosted a pivotal workshop at the University of Bath to kick off the study which brought together a broad range of stakeholders, featuring representatives from governmental, regulatory, core industry stakeholders and SMEs. Topics discussed include but not limited to:
- Do we need an energy system data sharing infrastructure?
- What are the benefits to the development of a smart, flexible energy system, and the social value?
- What does the ideal digital infrastructure look like and how to deliver?

Our knowledge was informed through our Digital Net Zero Energy Systems Lab established in 2019, brought together academics from across engineering, sciences and social sciences with core energy players, SMEs, and the regulator. Together, we co-developed our open, circular and agile whole-system data and digitalisation strategy, setting out our vision and approach for transforming the energy system into an open 'system of systems' that is agile and responsive[2]. We advocate for the concept of microservices to promote an open digital architecture to host modular, interoperable functions and datasets. Through three practical transmission and last mile distribution software development projects, we demonstrated how transmission and distribution subsystem modelling/analyses could be standardised through this open, service-oriented architecture (SOA), showcasing a new possibility to perform agile, interoperable, and scalable system modelling and analysis for an extensive and complex system[3].

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[1] Lewis Dale, Nigel Turvey, John Scott, Julian Padget, Nico Ostler, Jennifer Fitzpatrick, Isaac Flower, Furong Li.

[2] University of Bath, ' Data & Digitalisation Strategies Towards Open, Self-Organising & Circular Smart Energy Systems'.

[3] https://lv-app.net-zero-energy-systems.org/lowVoltage

We believe the present centralised, siloed and monolithic approach to managing energy resources, flexibility and system planning must adapt to remain fit for purpose. Significant improvements in data sharing can foster cross-sector, cross-actor and cross-discipline coordination, creating high-impact coalitions to address some of society's most testing problems, such as the energy crisis and pandemics [4]. A coalition that crosses the traditional boundaries of the industry, businesses, governments, academia and NGOs will bring together leadership, resources, and skills across multiple organizations to deliver coordinated and radical solutions, driving a greater alignment between supply affordability, security and sustainability. The benefits of the sector-wide coordination will best be achieved through the creation of a well-functioning and future-proof DSI.

Executive Summary

"Mission Control for Clean Power 2030", the creation of British Energy, and increased governmental contribution to Contracts for Difference (CfDs) to boost clean renewable energy, show the commitment of the new government to a rapid transition to net zero, and to power the nation's clean growth and prosperity.

Data sharing is fundamental to this transition, from increasing whole-system visibility, through enabling multi-party participation and collaboration, to increasing the alignments at multiple levels:
* Energy affordability with security and sustainability
* Interests of large and small energy players with national net zero targets
* Rapid decarbonisation of energy systems with clean growth and the nations prosperity

We welcome the consultation for the initial governance of a data sharing infrastructure (DSI) at this pivotal time. This will help to facilitate, steer, assess and report initial data sharing activities for an MVP (minimum viable product) for the data sharing infrastructure, including both its development and operation. The consultation also seeks views for the future, both in terms of future DSI technologies, use cases and enduring governance.

We consider that the following attributes are key to the success of a fit-for-purpose DSI:

* **Securing** the support of both data providers and data consumers is crucial. Data providers (core industry in particular) can benefit from making better and quicker decisions, while data consumers (small and median enterprises in particular) can effectively engage with the development of a smart, flexible energy systems as well as exciting opportunities without extensive additional resources or time to understand the complexities of the energy system.

* **Sustaining** the interests of data providers and data consumers for a long term. The DSI should offer a measurable and sustained value proposition to both data providers and data consumers.

* **Offering** accessibility for less sophisticated users, allowing for faster innovation, access to wider markets, and the creation of transformative business models.

* **Applying** the principle of minimal disruption to data providers when it comes to the implementation of the infrastructure, data standardization and publishing in return for improved decision making.

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[4] R. M. Kanter and T. C. Hayirli, "Creating High-Impact Coalitions," Harvard Business Review, Mar. 01, 2022. https://hbr.org/2022/03/creating-high-impact-coalitions

- **Ensuring** that the infrastructure is high-level and minimally burdensome to encourage the provision of data from all parties and to enable innovation in data provision and formatting.

Delivering these key attributes will increase user participation, adoption, and value creation. Collectively they will contribute to the government's objectives of energy affordability, security and sustainability, which will help secure the political (and potentially financial) backing. Delivering these will help bring together a broad range of energy players, demystifying the complexity of the energy system and allowing GW energy generation to power millions of electric vehicles, heat pumps and businesses and industry.

The complexity, scale, and multi-stakeholder nature of the DSI project suggests that a minimum viable product (MVP) is a logic approach for an early version of the product. This approach follows a low cost, low regret, iterative, phased methodology to mitigate risks associated with a large-scale project[5]. An MVP means that the core features and functionality of the product is discovered through continued engagements with key stakeholders. It is deployed to an earlier subset of customers who can provide quick feedbacks to improve the product development for the long run[6].

We are pleased that the government and the regulator gave strong backing to the DSI MVP, this has the potential to facilitate the development and adoption of a DSI to drive mass collaboration, innovation and coordination for sustained value creation.

Recommendations

We would like to put forward further recommendations to maximise the success of the MVP development, adoption, value creation and future evolution before answering selective questions in turn in Appendix I.

Recommendation 1 – Design for adoption to drive sustained participation, innovation and value creation

In the face of mounting pressure on energy systems to deliver against sustainability, affordability and energy security targets, transforming the way in which we currently perform system data exchange is crucial to bring a wide range of facilitatory benefits, including but not limited to promoting competition, technological growth, customer engagement, flexibility services, security of supply and system efficiency enabling new insights, functions, and businesses.

We agree with the proposed use cases of outage planning and strategic planning as the day 1 and day 2 use cases. We are also mindful that they can be perceived to support large energy players. whist they will ultimately benefit energy customers, they may limit the immediate interests of SMEs and innovators. There are significant further benefits to be gained by exploring opportunities for improved data, function and model availability, transparency and openness to all energy players, For example, we think use cases for improving the visibility of the connection times and costs at differing parts of the system levels, and projecting fu-

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[5] L. Brown, "What is Minimum Viable Product?," Invensis Learning Blog, Dec. 14, 2023. https://www.invensislearning.com/blog/minimum-viable-product/ .

[6] Curley, M., and Salmelin, B.: 'Open innovation 2.0' Springer Press 2018

ture ongoing energy costs (potentially zonal prices), use of network charges, will substantially reduce the cost and time that innovators/developers have to spend in speeding up grid connection at present. We do not advocate further use cases at this stage but recommend that parallel work is commissioned by the government to develop understanding, capability, and potentially a differing platform for less sophisticated energy users, ensuring these aspects can be integrated with minimum delay in the future. It will be essential to ensure a level of participation of all players, both small and large, as the long-term success of an DSI is heavily dependent on the level of adoption and value creation for all.

Recommendation 2 – Multi-user testing, validating, stress-testing platform
Successful deployment at each stage of the DSI will be assured by thorough verification and validation (V&V). We advocate the provision of a sandbox environment and highlight the wider benefits and risks that differing degrees and scales of data sharing could offer, including stress-testing, user training, verification of resilience and validation of stakeholder requirements. A testing platform could verify multi-user and large data volume handling, stress-test access controls, and verify resilience, for example to simulated cyber-attack. Achieving effective testing may also be applicable for the training and certification of users. We will be pleased to share our experience from the University of Bath Net Zero Digital Energy System Lab in development and use of a V&V platform.

Recommendation 3 – Increase the pace of the MVP DSI delivery
To sustain the interests and adoption of the DSI, an early MVP delivery is crucial for improved sector understanding, trust and transparency. Early delivery will also improve confidence for wider adoption to drive sector-wide innovation and value creation. The shape of an early MVP could be a skeleton version DSI at a much reduce size, functionality and complexity, they would be much more effective than pages of documents to illustrate the concept, the process, and anticipated end results.

Recommendation 4 – Demystify the complexity of the needs and opportunities of energy systems for less sophisticated users
Less sophisticated users typically have less time and resources with which to understand, respond, and subsequently benefit from any proposals and consultations. It is therefore crucial that they are not overwhelmed by more information that they can digest or directly use. Instead, tools or calculators, similar to those used in mortgage calculation that they can generate new insights to support their businesses, can lower the bar to offering valuable and up-to-date information to energy actors. This would improve their understanding of the current/future challenges in energy and system balancing, and the current and future values of energy and flexibility at different times and locations in the system. Such ability supports innovators in developing their products and services without the need for a full understanding of energy system complexity. It also serves the purpose of testing the impacts of differing options to the system costs, benefits, risks and connection queues from introducing alternative LCTs, markets, business models, and services to provide wider system benefit.

Recommendation 5 – Assessment of DSI governance

The criteria of the DSI governance should include but not be limited to:

- Impartial DSI Coordinator's influence on NESO
- Open, transparent and inclusive of new ideas, parties and systems
- Large number of participants in adoption of the DSI
- Small players able to interface and benefit from the infrastructure
- Large scale of benefits to a wide range of industry, including but not limited to the core energy industry, such as NESO, DNOs, National Gas, suppliers, the third parties such as local authorities, academia, progressive suppliers, such as Octopus and OVO, and innovative SMEs, such as Propflo, CEPRO, Connected Curb, and the end consumers and community energy.

We provide response to the detailed consultation questions in Appendix 1. We would be happy to further discuss our response with you.

Sincerely,

University of Bath
Net Zero Digital Energy System Lab
EPSRC Supergen Hub for Energy Networks

Appendix 1 – Responses to questions

Q1. Do you see potential uses for the DSI within your day-to-day operation in the energy sector?

The data sharing infrastructure will hold value in the day to day operation of companies in the energy sector. Value will be created for entities connecting different assets, including small scale generation, heat pumps, EV chargers, and Internet of Things devices. These will offer different levels of capability and flexibility. Improving our understanding of both current and future system challenges will assist in the development of new solutions to address them, encouraging development and participation in the offering of new services. Data sharing would enable entities to replicate, subsequently validating and iterating on, the exploration of historical System Operator level development analysis. This would include analysis of power flow patterns, network constraints and limitation, reinforcement optioneering and charging implications.

Q2. Do you have any comments on the funding mentioned within this section?

To ensure equitable entry into the data sharing infrastructure, including for smaller players, we can take two approaches: either funding for the data sharing infrastructure needs to be extended to other non-regulated parties, to ensure their systems can interface, or put responsibility on the regulating parties to assist and guide these other parties from Day 1.

Q3. Do you have any comments on the timeline shown?

The timescales for the implementation of the MVP, despite the urgency around the development of the DSI, appear to be unduly and unnecessarily lengthy. The infrastructure will assist in reaching the UK's decarbonization goals but its own timeline does not appear to align with other system dates.

Q4. Do you agree with our short-term governance structure model where the Interim DSI Coordinator is responsible for leading the short-term governance (2024 – 2028) of the DSI?

Yes, however management of the DSI through the stakeholder advisory group, will require representation from all sectors for effective governance. This should include established large system governance players through to small scale equipment installers and research and academia. We have to ensure that there is no misuse of the data sharing infrastructure and its governance structures, for commercial advantage, since its very purpose is to allow the development of new arrangements that provide the first mover with an advantage and potential for commercial gain.

Q6. Are there any additional governance roles that are not covered by the proposed governance model? If so, what are these?

There should additionally be a role within the governance model interim DSI which will seek to encourage participation and openness for system planning and development. This can help counter the long period required for secrecy and data security that is widely

practiced in operational timescales. The role can also be used to promote the DSI to the smaller players to encourage their involvement with the system.

Q7. Do you agree with the responsibilities of the interim DSI Coordinator? Are there any additional responsibilities that it should undertake?

The proposed responsibilities for the interim coordinator are all the key ones. A further responsibility that the interim coordinator could undertake is to generate an exit strategy in case of failure of all or part of the DSI. Other DSI systems (e.g. NHS digital spine) have failed in the first attempt with significant cost to tax payers. A plan for what the coordinator would do if this happened could mitigate the risks, and ensure key elements of developments retained for future developments.

Q8. Do the proposed deliverables reflect the outputs that the Interim DSI Coordinator should focus on in the initial DSI stages? Do you suggest any additional deliverables?

Whilst the deliverables of interim DSI coordinator should have a focus on these initial stages, care must be taken to consider the long-term development of the DSI. The wide range of data and parties that will be incorporated over the lifetime of the DSI must be considered at the initial design stages.

Q9. Do you agree with us that the System Operator is the best option as the Interim DSI Coordinator? If no, explain your reasons and justify your proposed option.

Given the urgency to establish the DSI, the System Operator (NESO) appears to be the best interim DSI Coordinator. The system operator will have a good understanding of the current state of play and will be knowledgeable in data standards and formats. Consideration needs to be given to whether an independent organisation would remove any perception that the DSI development is focused on delivering purely the NESO's objectives. If the NESO does become the interim DSI coordinator care needs to be taken to ensure innovators and small players are still involved in the development of the DSI and ensure an independent view is maintained.

Q10. What assessment criteria do you foresee being required when transitioning from short-term governance to an enduring governance model?

The short-term governance should be assessed on its independence and the speed of delivery of the initial governance. The DSI should also be assessed how effective it was in the initial outage planning use case and, its applicability beyond this day 1 use case should be.

Q11. What suggestions or feedback do you have for refining these governance assessment criteria to better meet the requirements and challenges of digitalisation in the energy sector?

The assessment criteria should also consider the openness of the solutions developed, the speed of their development, and the diversity of use cases addressed. Stakeholder satisfaction should also be considered as it will reflect the participants' confidence in the DSI going forward. This approach will ensure that the criteria are not solely focused on network operators but also encompass the broader governance outcomes.

Overall, the proposed model is strong and provides a very positive start for the DSI. Outage planning as a first use case for the MVP will be vital for gaining insights into the future of the DSI. Stakeholders will be able to understand the DSI's potential following this and its use in important operations will be emphasized. A high-level governance structure is presented by the proposal and all key elements for success of the DSI are laid out. There is a real opportunity for the regulator, NESO (national energy system operator once established) or a sector-wide orchestrator to transform data quality, accessibility and transparency, delivering a blue-print to drive mass collaboration and sector-wide alignments and co-changes to meet our net zero target.