

# EnergyREV response to Ofgem Call for Input: Future of local energy institutions and governance

## About EnergyREV

Our submission has been written by researchers on behalf of the Energy Revolution Research Consortium (EnergyREV). EnergyREV is a consortium of >60 academic researchers across 22 UK universities. We are part of the Governments' £100M Prospering from the Energy Revolution (PFER) Industrial Strategy Challenge Fund. The PFER programme aims to demonstrate:

*"...investable, scalable local business models using integrated approaches to deliver cleaner, cheaper energy services. This will lead to prosperous and resilient communities and benefit the energy system as a whole."*

EnergyREV works with the smart local energy system demonstration and design projects funded through the PFER programme. We undertake analysis and evaluation, building and driving best practices and, leading knowledge exchange through national and international engagement with policy, academic, industrial and public communities.

This submission was put together by Dr Jeff Hardy and Dr Madeleine Morris (Imperial College London), Professor Jan Webb, Dr Thomas Morstyn & Dr Iacopo Savelli (University of Edinburgh), Professor Elena Guara & Dr Alison Halford (University of Coventry), Dr Tim Braunschweig (University of Manchester) and Hywel Lloyd (University of Strathclyde) on behalf of the consortium. We have provided responses to each of the questions and also a summary.

## Summary of response

We have answered your call for input questions in the sections below. In this summary, we consolidate the recurring themes from our response. Given the richness of the work of the consortium to date, we would welcome an opportunity to further discuss our research with you.

Our EnergyREV research demonstrates that smart local energy systems (SLES) could enable a net zero transition that is faster, fairer, cheaper, and more enduring than top-down, centralised approaches. SLES deliver these benefits because they are better able to tailor a response that translates local needs and preferences into energy systems where the benefits endure.

They endure, in part, because trusted actors, end-user engagement and participation are critical components in SLES.

Your call for input places limited emphasis on the importance of this trust and engagement, not least with end users (especially households and small businesses). Our research shows that trust in the actors planning and delivering local energy systems is crucial and that local actors are key to delivering locally appropriate and acceptable energy systems thus realising enduring benefits from SLES.

We think there is a case for digitalisation to be a function in its own right. Digitalisation is crucial for end user engagement, participation and unlocking new energy business models. It also brings new governance challenges, particularly around the ethics of data sharing, collection, storage and artificial intelligence.

Our research has identified that GB energy governance lacks an independent planning and coordinating body that sits between local and national energy systems. Its purposes would include overseeing the net-zero transformation of the GB energy system and coordinating national and local energy system approaches to planning, investment, zoning and licensing. To some extent, this aligns with your RSO scenario.

Local authorities have an important role to play in energy system planning because they have the local democratic mandate and often hold the local planning function as the Local Planning Authority. However, many local authorities lack the powers, resources and capabilities to effectively deliver the energy system planning role. Whilst it is not in Ofgem's remit to address this resource imbalance, it is important that you recognise the barriers to planning, engagement and trust that currently exist.

We note that Ofgem does not discuss its own roles and responsibilities within the call for input. You identify a number of challenges (for example the roles and responsibilities of network operators) for future energy governance that are already within Ofgem's power to change.

We are also concerned with Ofgem's current framing of the lowest cost to consumers. Wider benefits are ignored in such cost calculations. This is constraining and may also not align with the objectives of local actors such as local authorities and community energy groups – where they would see wider benefits making for a better case for a particular course of action.

Finally, we note that this call for input comes during a period of significant policy and regulatory governance reform. It is important that local stakeholders and actors can be heard during this period. It is also important that the objectives of the various reforms are aligned so that the outcome is a net zero, rapid, beneficial, fair and locally appropriate energy transition.

# Call for input questions

In the section below we provide responses to the call for input questions.

## Strategic energy context

### Question 1

***Are the three energy system functions we outline (energy system planning, market facilitation of flexible resources and real time operation of local energy networks) the ones we should be focusing on to address the energy system changes we outline?***

We agree that the three energy system functions outlined are the correct technical energy system functions. We also agree that digitalisation is a critical enabler of the functions and more generally for enabling and upscaling decarbonised smart local energy systems<sup>1,2,3,4</sup>.

In our EnergyREV research, we have also identified other important functions, such as information, engagement, coordination and collaboration. These functions materially affect how the technical functions are delivered and the roles and responsibilities of actors. Local project stakeholders can have a significant influence in shaping the outcomes and affect positively benefits of local energy systems<sup>5,6</sup>. Your call for input recognises the importance of these non-technical functions in the proposed assessment criteria, although we think they could be better emphasised, as discussed in Question 2.

In framing digitalisation and the digitisation of energy systems as a cross-cutting theme, Ofgem could dilute accountability and limit innovative responses. The unique challenges that arise from implementing AI and cyber-physical advances in energy systems require discrete considerations around the adoption, standardisation, and optimisation to ensure the uptake of ethical practices in data sharing, collection, and storage. For example, Ofgem will need to consider the impact of significant technological advances in the following areas of: big data; machine learning and AI; the Internet of things; and distributed ledger technology (for example, blockchain).

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<sup>1</sup> N. Verba et al., 'Cyber-Physical components of an autonomous and scalable SLES', 2021. [Online]. Available: [https://www.energyrev.org.uk/media/1864/energyrev-cyber-physical\\_20211215\\_final.pdf](https://www.energyrev.org.uk/media/1864/energyrev-cyber-physical_20211215_final.pdf)

<sup>2</sup> E. Morris and S. McArthur, 'A plug and play artificial intelligent architecture for smart local energy systems integration', 2021. [Online]. Available:

[https://www.energyrev.org.uk/media/1727/energyrev\\_plugandplayreport\\_202110.pdf](https://www.energyrev.org.uk/media/1727/energyrev_plugandplayreport_202110.pdf)

<sup>3</sup> M. Morris and J. Hardy, 'Working Paper 2: Digital energy platforms', 2020. [Online]. Available: [https://www.energyrev.org.uk/media/1439/energyrev\\_digital-platforms\\_202007final.pdf](https://www.energyrev.org.uk/media/1439/energyrev_digital-platforms_202007final.pdf)

<sup>4</sup> P. R. Baldivieso Monasterios et al., "Incorporating forecasting and peer-to-peer negotiation frameworks into a distributed model predictive control approach for meshed electric networks," in IEEE Transactions on Control of Network Systems, doi: 10.1109/TCNS.2022.3158806.

<sup>5</sup> P. Devine-Wright, 'What does "local" mean in emerging UK smart local energy systems', 2022. [Online]. Available:

[https://www.energyrev.org.uk/media/1915/energyrev\\_what-is-local\\_final\\_202202.pdf](https://www.energyrev.org.uk/media/1915/energyrev_what-is-local_final_202202.pdf)

<sup>6</sup> Fuentes González F, Webb J, Sharmina M, Hannon M, Pappas D, Tingey M. Characterising a local energy business sector in the United Kingdom: Participants, revenue sources, and estimates of localism and smartness. Energy. 2021 May 15;223:1-12. 120045. <https://doi.org/10.1016/j.energy.2021.120045>

Energy system digitalisation is key to delivery of net zero targets. Digitalisation and digitisation will generate new energy models that have interconnected links between generators, suppliers and consumers. This means that households and small businesses could be active digital participants in the energy system. Therefore, there needs to be specific protocols and programs to develop skillsets, regulations, and infrastructures to promote explainable AI and more equitable data sharing<sup>7</sup>.

## Question 2

### ***Do you agree with the criteria we have set out for assessing the effectiveness of institutional and governance arrangements?***

We agree that the five criteria are appropriate to assess the effectiveness of governance arrangements.

We encourage Ofgem to consider more specific definitions of some of the terms employed. For example, in terms of accountability, it is unclear which stakeholders institutions are accountable to and, in some cases, whether multiple institutions are currently accountable.

We think that engagement, particularly with locally embedded stakeholders (for example local government and community energy groups), should have higher prominence. It is currently somewhat hidden under coordination, but we believe it plays an important part in accountability and credibility also. Embedding community voices when designing, deploying, and implementing local energy systems encourages responsible innovation that promotes inclusion, builds capacity, and supports community resilience. Our research shows that local energy systems that harness grassroots support could endure longer and produce greater local co-benefits than company-led investment in local energy schemes<sup>8</sup>.

Our research also shows an important relationship between trust and engagement and information. In the UK, there is limited awareness of, and skills to use, the home smart technologies that are essential to unlocking demand side flexibility<sup>9</sup>. Local energy actors, such as local authorities, community energy groups and local academics can play an important role in local engagement and digital skills development<sup>10</sup>.

Our research with current local energy system operators and developers found that many consumers are cautious, or even sceptical, of new energy technologies. However, there was greater acceptance and apparently more environmental awareness where the local system included mechanisms for system operators to be accountable to consumers, and where

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<sup>7</sup> Rhodes, A. (2020). Digitalization of Energy: An Energy Futures Lab Briefing Paper.

<sup>8</sup> C. Vigurs, M. J. Fell, C. Maidment, and D. Shipworth, 'Starting to join the dots - An interim review of EnergyREV insights', 2021. [Online]. Available: [https://www.energyrev.org.uk/media/1710/energyrev\\_joiningdots\\_report\\_2021final.pdf](https://www.energyrev.org.uk/media/1710/energyrev_joiningdots_report_2021final.pdf)

<sup>9</sup> R. Bray, A. Mejía Montero, and R. Ford, 'Skills deployment for a "just" net zero energy transition', Environ. Innov. Soc. Transit., vol. 42, pp. 395–410, Mar. 2022, doi: 10.1016/j.eist.2022.02.002.

<sup>10</sup> R. Gupta and S. Zahiri, 'Evaluation of user engagement in smart local energy system projects in the UK', 2020, p. 15. [Online]. Available: <https://energy-evaluation.org/wp-content/uploads/2020/07/eee2020-paper-rajat-gupta-abstract77.pdf>

consumers were actively engaged<sup>11</sup>. Similarly, greater dialogue between energy stakeholders, such as community groups, and industry can promote transparency to address public concerns around privacy, security, and misuse of energy data<sup>12</sup>. Whilst these factors are included in your criteria for credibility and coordination it is not clear whether the important link between trust, accountability, engagement and information is recognised.

Our final point is that it is unclear how the proposed criteria have been applied. Many of the criteria are qualitative in nature. The EnergyREV consortia has developed a range of tools and approaches to assess such qualitative criteria, and to quantitatively evaluate smart local energy system outcomes considering different market arrangements, network characteristics and resources<sup>13</sup>. We would be happy to organise a meeting to discuss our tools and approaches.

## Strategic case for change

### Question 3

***Do you agree with our assessment of how far the current institutional arrangements are, or are not, well suited to deliver the three key energy system functions?***

We present our input and evidence against the three functions below.

#### **Planning function**

We agree that planning roles and responsibilities should be assigned to the institutions best suited to deliver them and that currently multiple actors undertake energy system planning functions at a national and sub-national level. The degree to which this is currently coordinated varies across GB.

Our EnergyREV research indicates that local authorities have an important role to play in energy system planning because they have the local democratic mandate and often hold the local planning function as the Local Planning Authority. However, many local authorities lack the powers, resources and capabilities to effectively deliver the energy system planning role<sup>14</sup>. We identify five reforms needed to enable GB local authorities to act systematically on ambitions for net zero localities in a recent EnergyREV report<sup>15</sup>. Local energy systems could also help engage consumers and harness the willingness of groups to act cooperatively

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<sup>11</sup> T. Braunholtz-Speight, M. Sharmina, D. Pappas, J. Webb, M. Hannon, and F. Fuentes-González (2022) "Beyond the pilots: Current local energy systems in the UK. Available: <https://www.energyrev.org.uk/outputs/insights-and-tools/beyond-the-pilots-current-local-energy-systems-in-the-uk/>

<sup>12</sup> Véliz, C., Grunewald, P. (2018) Protecting data privacy is key to a smart energy future. *Nature Energy* 3, 702–704 (2018). <https://doi.org/10.1038/s41560-018-0203-3>

<sup>13</sup> T. Morstyn *et al.*, "OPEN: An open-source platform for developing smart local energy system applications," *Applied Energy*, vol. 275, p. 115397, 2020. <https://doi.org/10.1016/j.apenergy.2020.115397>

<sup>14</sup> M. Morris *et al.*, 'Working Paper 3: Decarbonisation of heat: how SLES can contribute', 2022. [Online]. Available:

<https://www.energyrev.org.uk/media/1907/energyrev-decarbonisation-of-heat-jan-2022.pdf>

<sup>15</sup> Tingey M, Webb J. Net zero localities: Ambition & value in UK local authority investment. 2020. [https://www.energyrev.org.uk/media/1440/energyrev\\_net-zero-localities\\_202009.pdf](https://www.energyrev.org.uk/media/1440/energyrev_net-zero-localities_202009.pdf)

towards objectives valued by the local community. This could help achieve public policy goals, such as reducing energy poverty and promoting climate change mitigation measures, e.g. through cooperative green investments<sup>16</sup>. So, whilst we agree with the principle that “planning roles and responsibilities are assigned to the institutions best placed to perform them”, these institutions also need the commensurate resources and capabilities, and to promote a more active role of local users. We note that whatever the existing capacities of an institution to carry out a function, these can be addressed both in law and funding.

We recently organised a series of EnergyREV workshops with energy stakeholders to explore the appropriate policy, institutional and regulatory framework to realise the technical, economic and societal potential of smart local energy systems<sup>17</sup>. Planning and the role of the DNO were central themes emerging from these workshops. On planning stakeholders saw an important role for (appropriately resourced) local authorities and local area energy planning to deliver integrated smart local energy systems. They also identified the need to coordinate local plans with wider national energy systems planning.

On the role of DNOs, the workshops identified that DNOs have an important role in enabling smart local energy systems, but that there are potential conflicts with how the network is currently planned and built. They indicated a role for Ofgem to align the role of future DSOs with emerging smart local energy systems.

An important synergy identified in the call for input is the interaction between market facilitation and planning. One of the findings of our work is the importance of explicitly considering flexibility market operation when planning distribution network investments<sup>18</sup>. Otherwise, over-investment in network infrastructure has the potential to undermine the value that distributed flexible resources can offer.

In your call for input, you suggest that local actors may have different mandates and priorities compared to network companies. We believe that the difference in priorities between different actors is a consequence of the (co-)benefits sought (local actors value different benefits compared to DNOs) and the incentives (for example, DNOs are strongly incentivised under RIIO to achieve specific outcomes). These differences are within Ofgem's power to better align.

A final point is that the call for input places emphasis on Local Area Energy Planning (LAEP), which we agree is a useful tool. However, a notable weakness of LAEP identified in our workshops is that it is a techno-economic approach and therefore underplays the crucial engagement with local actors (see question 2). This engagement is crucial for creating enduring benefits in local energy systems. This finding is reinforced in research by Richard Cowell and Janette Webb on LAEP and the EnergyPath Networks Decision Support Tool which shows that effective local energy planning needs 'local ownership' of, and use of local

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<sup>16</sup> I. Savelli and T. Morstyn, *Energy Research & Social Science*, Volume 78, 2021, 102125, <https://doi.org/10.1016/j.erss.2021.102125>

<sup>17</sup> We are currently writing up the findings of these workshops. We are happy to organise a meeting to discuss these findings before we publish them.

<sup>18</sup> I. Savelli, C. Hepburn and T. Morstyn, "Nodal and fixed price coexistence in distribution networks with optimal investment planning and tariff design," 2020 17th International Conference on the European Energy Market (EEM), 2020, pp. 1-6, doi: 10.1109/EEM49802.2020.9221972.

knowledge and priorities in, energy planning<sup>19</sup>. Inherent in local ownership is a shared understanding of the purpose(s) that drive the plan, recognising while these will include net zero they will also go further, for example local wealth retention for levelling up.

### **Market facilitation of flexible resources**

We agree that markets should be coordinated across local, regional and national levels. In our recent EnergyREV workshops stakeholders placed importance on energy markets to enable local energy business models (such as peer-to-peer<sup>20</sup>, multiple suppliers at a single meter, and energy as service propositions). There was also a consensus that market (and wider energy decisions) need to be delivering wider benefits (such as environmental and social benefits) than they currently do and these objectives need to be aligned nationally. Ofgem and Government have an important role in setting these objectives.

Trust is key for local and national actors to engage in emerging markets. Our workshops showed in order for engagement with emerging markets the following principles would need to be in place: open data; transparency and visibility of the value of flexibility; the ability to stack value (for example, value available to distributed energy resources in local and national markets); and accessible and simple markets. Existing local energy systems are often operated by local organisations whose primary function is not energy<sup>21</sup>. Simplicity, transparency and accessibility will be important for supporting growth of this sector. For example, lowering the minimum capacity thresholds for flexibility markets may make these more accessible to local and smaller-scale actors, potentially avoiding extra levels of aggregation and allowing more flexibility revenues to flow to the consumer.

### **Real time operation of local energy networks**

Ofgem rightly suggests that the operation of future networks will look and feel different and will require investment in skills and resources. It seems odd that the call for input does not note the significant investment in ICT and skills proposed across the DNO RIIO-ED2 business plans and the extent to which this addresses this gap.

Our work also shows that even incrementally introducing locational marginal pricing at the local level (e.g. only for customers with significant flexibility) can have significant benefits, both for owners of distributed energy resources, as well as customers without flexibility who will benefit from lower network charges associated with more efficient network investment and operation<sup>22</sup>.

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<sup>19</sup> R. Cowell and J. Webb, Making useful knowledge for heat decarbonisation: Lessons from local energy planning in the United Kingdom. Energy Research & Social Science. 2021 Mar 25;75. 102010. <https://doi.org/10.1016/j.erss.2021.102010>

<sup>20</sup> T. Morstyn, I. Savelli, and C. Hepburn, 'Multiscale design for system-wide peer-to-peer energy trading', One Earth, vol. 4, no. 5, pp. 629–638, May 2021, doi: 10.1016/j.oneear.2021.04.018.

<sup>21</sup> T. Brauholtz-Speight, M. Sharmina, D. Pappas, J. Webb, M. Hannon, and F. Fuentes-González (2022) "Beyond the pilots: Current local energy systems in the UK. Available: <https://www.energyrev.org.uk/outputs/insights-and-tools/beyond-the-pilots-current-local-energy-systems-in-the-uk/>

<sup>22</sup> I. Savelli and T. Morstyn, 'Electricity prices and tariffs to keep everyone happy: A framework for fixed and nodal prices coexistence in distribution grids with optimal tariffs for investment cost recovery', Omega, vol. 103, p. 102450, Sep. 2021, doi: 10.1016/j.omega.2021.102450

Our recent EnergyREV workshops agreed with Ofgem that there may be conflicts with traditional approaches to network operation and emerging local energy systems. Our workshops proposed that it is within the gift of Ofgem to better align the role of the DNOs with enabling emerging smart local energy systems. This is an example where Ofgem raises a problem but does not allude to its own role and responsibility in the solution.

## Question 4

***Overall, what do you consider the biggest blocker to the realisation of effective energy system planning and operation at sub-national level?***

Our EnergyREV research shows that a lack of common objectives and formalised roles and responsibilities is a major blocker to effective system planning and operation at sub-national levels. For example, in the absence of statutory duties for local government to develop energy and climate plans, local authority action remains mostly small scale and piecemeal, relying on 'wilful individuals' to drive action<sup>23</sup>. We find that there is an absence of a robust framework that could facilitate local action, and think that clarity is needed on the expectation of local authorities.<sup>24</sup>

Our research shows that actively engaged local authorities are associated with higher success of local energy activities<sup>25</sup>. However, local government lacks the resources necessary to efficiently develop and deliver energy plans, and capital investment in local area initiatives is currently at a fraction of their potential<sup>26</sup>. We appreciate that the resourcing of local government is a wider topic and outside of Ofgem's remit. However, as noted in paragraphs 3.7-3.9 of the Call for Input, democratic input into energy system planning is needed to build trust and credibility in the process; as well as to ensure that end user interests are represented and to effectively engage consumers as we have noted above.

Our recent EnergyREV workshops confirmed the importance of local authority action on climate and energy plans as a key decision for unlocking local energy systems<sup>27</sup>. A key outcome these workshops was that a decision is required that empowers local actors, including local government, through funding, skills, and capacity that is commensurate with ambitions and expectations regarding energy and climate plans.

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<sup>23</sup> M. Tingey and J. Webb, 'Net zero localities: ambition & value in UK local authority investment', EnergyREV, 2020. [Online]. Available:

[https://www.energyrev.org.uk/media/1440/energyrev\\_net-zero-localities\\_202009.pdf](https://www.energyrev.org.uk/media/1440/energyrev_net-zero-localities_202009.pdf)

<sup>24</sup> M. Morris et al., 'Working Paper 3: Decarbonisation of heat: how SLES can contribute', 2022.

[Online]. Available:

<https://www.energyrev.org.uk/media/1907/energyrev-decarbonisation-of-heat-jan-2022.pdf>

<sup>25</sup> Vigurs, C., Fell, M.J., Maidment, C. and Shipworth, D. 2021, Starting to join the dots: An interim review of EnergyREV insights. Energy Revolution Research Centre, Strathclyde, UK. University of Strathclyde Publishing. ISBN: 978-1-909522-91-6

<sup>26</sup> M. Tingey and J. Webb, 'Net zero localities: ambition & value in UK local authority investment', EnergyREV, 2020. [Online]. Available:

[https://www.energyrev.org.uk/media/1440/energyrev\\_net-zero-localities\\_202009.pdf](https://www.energyrev.org.uk/media/1440/energyrev_net-zero-localities_202009.pdf)

<sup>27</sup> We are currently writing up the findings of these workshops. We are happy to organise a meeting to discuss these findings before we publish them.



## Question 5

***Do you agree with the opportunities of change we outline and the potential benefits they may create?***

Our recent EnergyREV workshops on local energy system governance highlighted that a key missing function is an independent planning and coordinating body that sits between local and national energy systems. Its purposes would include overseeing the net-zero transformation of the GB energy system and coordinating national and local energy system approaches to planning, investment, zoning and licensing. This finding agrees that there are gaps in the institutional landscape, particularly around planning and coordination.

This body, or another institution could also undertake a role to establish energy sector-specific guidance to develop a culture of critical ethical thinking. Our research shows there are limited spaces for energy stakeholders, including industry, that specifically discuss potential ethical issues and barriers to innovative projects. An independent coordinating body could also facilitate diverse voices to be heard on local community energy needs and aspirations to improve accountability and responsibility in the decision-making process<sup>28</sup>.

We agree that one organisation is not capable of fulfilling all the functions. The evolution of local energy systems is a function of geography, socio-economics, capabilities, resources and (between England, Scotland and Wales) the nature of devolved responsibilities and powers. Whatever future governance arrangements are implemented the future will need to be sensitive to geographical differences and also to ensure the net-zero transition is just and fair.

A final point is that it would have been helpful if the call for input had provided tangible examples of some of the existing conflicts between the functions.

## Question 6

***Are there additional opportunities for change and benefits that we have not set out***

In our work in SLES, we have identified the importance of local approaches to energy governance. By taking advantage of strengths of local actors and planning methods, a SLES approach could help in enabling a transition that is faster, fairer, cheaper, and more enduring than top-down, centralised approaches<sup>29</sup>. Recent work by EnergyREV has revealed that annual energy system savings of £1.1-2.5 bn can be achieved through uptake of SLES.<sup>30</sup>

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<sup>28</sup> Morris, E. Stamp, K, Halford, A, and Gaura, E (2022) The Practice of AI and Ethics in Energy Transition Futures. EnergyREV (Forthcoming)

<sup>29</sup> M. Fell, R. Bray, R. Ford, J. Hardy, and M. Morris, 'Post-pandemic recovery: How smart local energy systems can contribute', 2020. [Online]. Available: [https://www.energyrev.org.uk/media/1490/energyrev\\_postpandemic\\_report\\_final.pdf](https://www.energyrev.org.uk/media/1490/energyrev_postpandemic_report_final.pdf)

<sup>30</sup> M. Aunedi, J.E.C. Ortega, and T. C. Green, 2022. Benefits of flexibility of Smart Local Energy Systems in supporting national decarbonisation. Energy Revolution Research Centre, Strathclyde, UK. University of Strathclyde Publishing. ISBN: 978-1-914241-07-9

Additionally, through a systematic review, EnergyREV has revealed a range of economic and non-economic benefits that can be attributed to SLES (EnergyREV work in progress<sup>31</sup>). These co-benefits range from process-related benefits (e.g. wider participation in decision-making and more accountability), outcome-related benefits (e.g. environmental benefits and wider societal benefits) through to a wider distribution of any benefits (e.g. local ownership models, aligning with community priorities).

The importance of a 'just' energy transition was also a key outcome of our stakeholder engagement workshops. In the majority of workshops, participants agreed that decisions were needed to improve the fairness of energy systems through the consideration of wider benefits. Government, Ofgem, and the entrepreneurial sector were cited as key actors in this decision.

The extent to which different benefits may be unlocked will depend on how SLES are designed and operated, and indeed on local energy governance structures. Trade-offs will therefore often need to be made, yet good governance design will allow these trade-offs to be seen, understood and accepted by those involved.

A final question to Ofgem is whether you have considered what the most important opportunities are for local energy systems and will you adjust governance objectives to achieve these?

## Question 7

***We set out a number of risks associated with change. Do you agree with these risks and the potential costs they create? Are there additional risks of change and costs that have not been set out?***

We agree with the risks outlined. We also see several additional risks.

First, this call for input arrives during an extremely busy period, which includes: RIIO-ED2 final determinations; the FSO programme, the Review of Energy Market Arrangements, implementation of the Access and Forward Charging SCR and the Energy Security Strategy<sup>32</sup>. This is in addition to piecemeal structural changes in local government with the continued replacement of two tier county & district arrangements with new unitary arrangements. We agree that is a critical area to address but question whether stakeholders (particularly smaller charitable bodies representing end-users) will have the timely capacity to engage.

Second, there is a risk that the objectives of this and the other significant policy programmes outlined above have differing objectives and lack coordination, leading to poor or conflicting outcomes<sup>33</sup>.

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<sup>31</sup> We are currently writing up the findings of this review. We are happy to organise a meeting to discuss these findings before we publish them.

<sup>32</sup> See recent blog by Dr Jeff Hardy, EnergyREV researcher:  
<https://www.linkedin.com/pulse/local-governance-institutions-sustainable-energy-futures-ltd/>

<sup>33</sup> See recent blog by Dr Jeff Hardy, EnergyREV researcher:  
<https://www.linkedin.com/pulse/net-zero-energy-objectives-what-consistent/>

Third, reforming local governance is a significant undertaking and doing so at a time with other major policy programmes underway raises the question of whether Ofgem (and BEIS) has sufficient resources and capabilities to achieve its objectives.

Fourth, it is unclear how the costs and benefits of different governance models will be assessed. For example, Ofgem's duty refers to net-zero and the lowest cost for consumers. The lowest cost for consumers is quite constraining (for example in terms of techno-economic modelling) and may also not align with the objectives of local actors - for example, local authorities and community energy groups, while ignoring wider cost benefit calculations.

Finally, it is unclear whether the risks associated with the changes will be weighed against the costs and risks incurred by inaction.

## Framework model options for enduring arrangements

### Question 8

***For each model, we have set out the key assumptions which need to be true for the model to offer the right solution. Which of these assumptions do you agree with?***

We agree that the four models represent a good framework to engage stakeholders. That said, it is unclear how the models were generated, whether stakeholders were involved, and what models were discounted (and why?).

On the assumptions:

- **DSO** - We see the assumptions as being reasonable. A key assumption is that DNOs are coordinating effectively with other bodies. Our recent EnergyREV workshop identified that it is crucial that DNOs are coordinating effectively, and that this isn't always the case today. On this point, it would have been useful to have some narrative about what Ofgem sees as effective coordination. From an EnergyREV perspective, this would appear in the form of enabling smart local energy systems to emerge.
- **IDSO** - The assumptions are unclear as to whether all functions reside in the IDNO or whether some are retained by the DNO. Splitting the functions would have significant implications for how the governance arrangements would work. For example, is the DNO or IDSO responsible for the security of electricity supply?
- **RSO** - The assumption states that planning is the most significant gap in coordination. Our recent EnergyREV workshops agree with this finding, however, the call for input does not evidence this point. It is also a notable absence that the assumptions do not discuss coordination as this would be critical.
- **Interacting organisations** - The assumptions appear to open up the possibility of any form of governance in different locations. This makes this framework very difficult to comment on. It is clear however that coordination between institutions would be absolutely critical and this is a notable absence.

## Question 9

***Out of the framework models we have developed which, if any, offer the most advantages compared to the status quo? If you believe there is another, better model please propose it.***

In our recent workshops, expert stakeholders were asked to agree the key decisions that will unlock smart local energy systems. We outline the top decisions here and identify links to the proposed framework models.

### **Creation of a new institution**

In half of the workshops, the creation of a new, independent, transparent, and overarching institution to fulfil currently missing functions including planning, investment, and coordination. One suggestion was that this would be led by local or regional government or institution which aligns most closely with Model 3.

### **DSO roles**

In the majority of workshops, the importance of aligning DSO roles with SLES was recognised. While one workshop stipulated that the DSO should be ‘truly independent’ (aligning closely with Model 2), others did not specify who should carry out these roles and could therefore align with any of the Models.

### **Planning**

The majority of workshops indicated key decisions relating to planning. Some of these cited a leadership role for local authorities in terms of planning functions, however, there was also recognition that local authorities may not be best placed to operate local energy systems. Therefore these align more closely with Models 3 and 4, in which local and regional actors can be responsible for developing local area energy plans.

## Question 10

***What do you consider to be the biggest implementation challenges we should focus on mitigating?***

In Question 7 we outlined several additional risks including the complex energy policy environment, a lack of common objectives in policy programmes, a question of resources of capabilities and how costs and benefits will be assessed. These are all material in terms of implementation.

In addition, there is a lack of attention in the document on end-users (citizens, customers and consumers). Whilst end-user engagement is identified in the criteria, all four frameworks fail to discuss implications for end-users. This includes active participation of end-users in local energy systems, such as households providing flexibility services or selling energy through devices such as batteries, EV chargers and solar PV. In our response to question 2, our EnergyREV research places great importance on the engagement and trust of local actors. End-users will need to be central to Ofgem’s thinking regarding the implementation of local energy governance arrangements.

Finally, our EnergyREV research indicates that emerging smart local energy systems (SLES) are complex integrated systems that are multi-vector, involve local actors, and are smart<sup>34</sup>. Our research indicates that compared to other approaches these SLES have the potential to deliver zero-carbon at better value and better targeted, with more and quicker (but enduring) action and investment<sup>35</sup>. As such, a factor in implementation should be how well local energy governance enables these beneficial local energy systems.

## Question 11

***Taking into account the varying degrees of separation of DSO roles from DNOs under framework model 1, do you consider there are additional measures we should consider implementing, in particular in the short term (e.g. changes in accountability etc)?***

The DNOs have recently submitted their business plans for RIIO-ED2, including their costed proposals for DSOs. As such there appears to be little scope for additional measures in the short term without significant disruption and resubmission.

If there is scope, then our previous points (for example in question 9) relating to DSO better enabling smart local energy systems should be considered. We would also call on Ofgem to reflect on the lack of attention to end-users in this call for input.

It is certainly the case that this work and its development should set the scene for future governance to be a definitive part of the RIIO3 regime and/or process

## Question 12

***Are there other key changes taking place in the energy sector which we have not identified and should take account of?***

This call for input arrives at a time of significant crisis in the energy sector, not least the cost of living crisis and energy security crisis caused by the war in Ukraine. Both these call for urgent action and a more rapid transition to net-zero energy. To what extent can this urgency be addressed through this programme of work on local energy governance reform?

In question 7 we outlined several additional risks that we think are also relevant to this question. These include the myriad of energy policy programmes underway, the lack of common objectives, the capability and resources of key institutions to deliver and how costs and benefits will be assessed.

There are also concerns, both in the sector and the wider public, on the increasing digitisation and digitalisation of energy systems. Complex cyber-physical systems that use

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<sup>34</sup> R. Ford, C. Maidment, C. Vigurs, M. J. Fell, and M. Morris, 'Smart local energy systems (SLES): A framework for exploring transition, context, and impacts', Technol. Forecast. Soc. Change, vol. 166, p. 120612, May 2021, doi: 10.1016/j.techfore.2021.120612.

<sup>35</sup> M. Fell, R. Bray, R. Ford, J. Hardy, and M. Morris, 'Post-pandemic recovery: How smart local energy systems can contribute', 2020. [Online]. Available: [https://www.energyrev.org.uk/media/1490/energyrev\\_postpandemic\\_report\\_final.pdf](https://www.energyrev.org.uk/media/1490/energyrev_postpandemic_report_final.pdf)

vast quantities of data are needed to respond to the political, economic, and environmental challenges that are currently facing the sector.

Without a systemic, robust, and visionary understanding of how ethics can be applied that respects and protects all actors in the energy sector, this could result in exploitative practices and increased infrastructure vulnerabilities. Ethical practices that promote transparency in data practices will move toward an informed, collective understanding of new technologies that increase public trust in businesses and institutions. This, in turn, will encourage new business models that respect and acknowledge the role of communities in the uptake of smart energy services<sup>36</sup>.

A final point that we referred to in question 5 is the interaction between any changes to local energy governance and the energy policy regimes in England, Scotland and Wales.

## Next steps

### Question 13

***What do you consider to be the most important interactions which should drive our project timelines?***

In our response, we have identified several important interactions. We summarise these below:

- The extent to which local energy governance accelerates net-zero transition in a just and fair way and can be delivered in a timely manner
- How local energy governance reform overcome issues with coordination and planning of local energy systems
- The interaction between local energy governance and the myriad of other energy policy programmes in flight and the commonality or differences in objectives
- The extent to which local energy governance reform enables smart local energy systems to emerge
- The extent to which local energy governance reforms include end-users in their design and implementation
- How differences between energy policy in devolved administrations affect local energy governance reform

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<sup>36</sup> N. Verba et al., 'Cyber-Physical components of an autonomous and scalable SLES', 2021. [Online]. Available: [https://www.energyrev.org.uk/media/1864/energyrev-cyber-physical\\_20211215\\_final.pdf](https://www.energyrev.org.uk/media/1864/energyrev-cyber-physical_20211215_final.pdf)