

Ofgem Call for Input: Future of local energy institutions and governance

Prospering from the Energy Revolution Introduction

The UKRI Prospering from the Energy Revolution (PFER) Challenge is investing up to £102.5 million in industry and research to accelerate innovation in smart local energy systems. Its flagship projects the three demonstrator and 10 detailed design smart local energy system projects that are designing and operating smart local energy systems across the UK. All of these projects are working with local network operators (DNO/DSO, GDN, heat networks and private wires) as well as local authorities and private enterprise to plan, design, deliver and operate smart local energy systems for towns and regions across the UK.

The programme is also funding the EnergyREV academic consortium and the Energy Systems Catapult led 'ERIS service'. ERIS is developing the local authority "Net Zero Go" toolkit and Local Area Energy Plans for regions as part of the programme. We are also funding over 20 data and digital projects and collaborating with Ofgem and BEIS as part of the Modernising Energy Data (MED) initiative.

The programme has also developed the "Accelerating Net Zero Delivery" report alongside PWC which has found that place-specific approaches to delivering net zero bring significant benefits (costs, energy savings, clean air etc) and lower costs. At a glance, tailoring local net zero interventions to complement national action could save £130bn in investment costs and deliver an additional £400bn in benefits, when compared with taking national action alone. In addition to economic modelling of these scenarios across six city regions, the report also explores delivery frameworks for place-based decarbonisation.

In exploring the optimal approaches and potential benefits of local net zero delivery, the programme also has a focus on finance and investment. We are partnering with the Green Finance Institute to tackle the structural challenges that exist when it comes to financing net zero delivery at a local level.

PFER Key Messages

- The PFER programme believe that current arrangements are insufficient to deliver optimal outcomes for decarbonising regions equitably, with citizen and community – ie bill-payers' - interests at the fore, and at least cost.
- The core objectives of the organisation(s) delivering the proposed functions need to focus on equitable decarbonisation of the whole energy system at least cost.
- Taking a whole systems view needs to extend from planning all the way through to delivery implications with a focus on outcomes and impact. Positive outcomes for citizens and communities should be central to all local energy system functions. Energy system planning should integrate wider considerations including the ability to finance new, required low carbon measures, supply chain upskilling, training and upscaling, and local job creation.
- There is an immediate need for national policy to be better joined up with local delivery, which current arrangements are failing to do, and without which a slower, costlier and less beneficial route to net zero risks being locked-in.
- Given these points and within the scope set out in this call for input our view on the future direction of local energy system governance is aligned with the characteristics set out in frameworks 3 and 4.

PFER Response to Questions

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?

The focus on the three functions is a good approach, but there is also a need to consider concurrent delivery requirements and customer engagement for equitable outcomes:

- The speed and scale of change required necessitate delivery of change in coming years which must be resourced equitably for success. PFER have been working on the Smart Local Energy System funding gap with the [Green Finance Institute](#).
- Too much focus on long term planning and not enough on delivery of low/no regret activity will delay impact. For example, proactive reinforcement of the networks, and demand reduction activities including energy efficiency and retrofit.
- There is a real risk of unequal outcomes for customers across the system if focus is not applied to creating equitable solutions, the net zero transition will involve significant levels of participation by citizens and communities, which will require greater levels of trust, to avoid resistance.
- Synergies between the three functions, and similar adjacent institutions and functions (particularly for frameworks 3 & 4) should be considered in more detail, such as whole system and regional planning, the evolution of energy markets in general, and potentially functions to accelerate and coordinate net zero transformation and delivery that sit outside of the current regulated remit of DNOs.

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

The institution(s) performing these functions need to have a clear, unambiguous mandate to deliver a zero carbon energy system that delivers benefits to citizens and communities at least cost.

- Accountability is important but this should include accountability to the end users of the energy system. Putting local authorities, who have the democratic mandate, in a position of greater authority when planning for net zero could enable greater accountability based on what citizens and communities want from their energy system.
- Coordination across institutions is essential, however those institutions need to be properly resourced and positioned to take part. Local authorities struggle to engage because of resource and skill constraints and they don't have a clear mandate to engage in energy system planning. Inclusivity should also be included in the scope of coordination or set out as a separate criterion.
- Simplicity needs to be seen in the context of transforming to a net zero system and market design, and not a short term implementation of functions delivered today.
- The institutional and governance arrangements should include being proactive not reactive so that the planning is happening to avoid constraints and enable more low carbon generation to connect.

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?

Planning: Current institutional and governance arrangements present challenges to achieving effective energy system planning which drives the most cost-effective decarbonisation outcomes. This starts with a focus on techno economic solutions by network operators, rather than non-asset based solutions that might be better for citizens such as reducing demand via energy efficiency and retrofit. The decarbonisation outcomes that citizens and communities want might be more expensive but have additional social outcomes, for example addressing fuel poverty and improving health.

DNO's have developed significant skillsets and capability to plan for future networks, but what's best from an engineering perspective and for shareholders, may not be best for citizens and communities. It's also worth noting most DNOs outsource some of the DFES process and stakeholder engagement on local energy to Regen, Barringa and Element Energy. DNOs are not focusing enough on non-asset based solutions like demand reduction, or local balancing to alleviate constraints. Local actors have different mandates and priorities, and that currently planning activities are carried out in different ways, to different ends. This is where Ofgem could deliver significant impact by incentivising better coordination, if the right governance were in place and the outcomes more aligned. Greater alignment of DFES with LAEP, for example, could reduce cost and speed up delivery, making it easier to coordinate local decarbonisation plans at a regional level, and build a national picture of local action.

Flexibility Markets & Operations: In relation to market facilitation of flexible resources, accessibility of local flexibility markets nationally is not currently equitable. DNOs to date have rolled out flexibility market opportunities at varying speeds and levels of accessibility, which presents equity concerns for citizens, communities and system users both in relation to market access, as well as system costs incurred through underutilised flexibility solutions.

Standardisation and interoperability are also important considerations for flexibility markets. Flexibility providers (e.g. aggregators) need to be able to seamlessly provide flexibly services across all local DSO markets, as well as national markets for flexibility. To date there has been some standardisation of flexibility markets between DSOs, and some innovation projects aligning local and national flexibility markets, but much greater integration of markets and standardisation is required.

Flexibility and market solutions for further integrating renewable electricity on local systems has largely relied on engineering solutions such as AMN and export limiting schemes. There have been a number of trials (such as TraDER) associated with reducing the curtailment of renewable generators, but no enduring solutions have been introduced. Renewable power integration needs to be a significant priority for institutions delivering local market functions, alongside solving demand constraints and system restoration.

Flexibility has largely been procured by DNOs so far for demand turn up and down services, rather than system optimisation to enable more low carbon generation to connect. To compound this issue, fossil fuel generators have been connecting to the distribution network taking up valuable capacity that will prevent more low carbon generation connecting in the future. The way the markets are structured does not support net zero ambitions and policy levers and market mechanisms could be used to focus on net zero outcomes.

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

The biggest blockers to realisation of effective energy system planning and operation at sub-national level is a lack of alignment and coordination with national energy system planning and policies, lack of alignment with local stakeholders, and poor integration with local planning activities such as transport, built environment and economic planning. There is also a funding and skills gap that makes it challenging for local authorities, and other local community members including the wider local energy ecosystem of universities, housing associations, local business, industry etc. to properly engage in the process. The playing field is not level. The paper below outlines the types, shapes and sizes of local energy system in the UK today, who often sit outside the core energy sector.

[Beyond the pilots: Current local energy systems in the UK \(energyrev.org.uk\)](https://energyrev.org.uk)

To achieve more effective, wholistic, cheaper energy planning and delivery, better alignment of the the DFES and LAEP process should be properly explored, including for example:

- Making the outcomes more proactive, impactful, ambitious for net zero, and citizen led
- Making DNOs more accountable to local authorities, local citizens and community members including the wider local energy ecosystem of universities, housing associations, local business, industry etc.
- Greater requirements for stakeholder engagement that leads onto effective delivery
- Incorporation of a housing model and heat network planning
- A greater focus on delivery of no regrets action whilst planning is taking place for more uncertain elements of local energy planning.
- A greater focus on cross boundary strategic planning increasing opportunities to achieve economies of scale, reduce risk and achieve significant investment.

This could create a more unified and impactful whole energy plan, which, if well thought through could achieve better local, to regional to national integration for achieving net zero at best cost (least cost might not be the preferred local option). The “Accelerating Net Zero Delivery” report developed with PWC outlines a number of frameworks for joining up local delivery to national policy, in which joined up planning is central across all frameworks.

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

We do agree with the opportunities of change highlighted. There are significant benefits that could be delivered as a result and our Smart Local Energy System (SLES) projects go some way to providing evidence that this is the case.

One of the biggest opportunities highlighted within the synergies identified is the ability to better facilitate input from local actors that can add value to the system, such as local authorities, who are currently underrepresented in current decision-making processes. The involvement of regional planning will ultimately lead to better informed decision-making and improved outcomes for citizens in the net zero transition, especially if, as identified in Synergy 3, a more iterative process can be achieved between planning, operation and delivery.

As argued earlier, there is a real need for a greater focus on delivery and outcomes to ensure the network can not only operate effectively to deliver net zero, but to ensure it facilitates the desired

activity beyond the network that leads to optimal outcomes for households and communities and maximises opportunities for local economic growth and wider social benefits.

A key pillar of the Prospering from the Energy Revolution Challenge is the understanding that taking a place-based approach to energy system design allows a better understanding of local needs, opportunities and challenges, and ultimately leads to better informed decision-making with impacts both at the national and local level. Designing interventions with local intelligence and the perspective of local communities/households in mind within a national framework, allows the opportunity to optimise our approach to net zero.

Our recently published '[Accelerating Net Zero](#)' report has found that tailoring local net zero interventions to compliment action at the national level could save around £130bn in investment costs and potentially deliver an additional £430bn (a doubling vs a one-size-fits-all approach) in wider socio-economic benefits. This points to the need to take a holistic view of the system and recognise that making the right decisions informed by local intelligence at the outset may not necessarily be the lowest cost locally, but offers significant savings nationally. Interventions may have higher upfront costs whilst offering to deliver greater value and savings downstream with impacts on both national and local scales.

In designing and modelling the optimum pathways to net zero for their cities and regions through methodologies such as Local Area Energy Planning (LAEP), many of the SLES projects supported by the programme have found that the creation of district heat networks in particular areas could deliver greater value and benefits than a single national approach to install individual heat pumps in every household. Despite higher upfront capital investments, they found this approach would be more inclusive, allowing more households to participate, such as small houses and flats, which otherwise would not have the space to store a heat pump. This would accelerate the decarbonisation of local household heat by providing a tailored solution for particular housing stock that would otherwise be excluded from this part of the transition if individual heat pumps were the only solution.

Equally, a local authority could achieve levels of co-efficiencies by being able to coordinate trenching for heat network infrastructure with local climate mitigation activities such as tree planting. This could provide savings across multiple stakeholders if the road only has to be dug up once to deliver multiple interventions.

A key recommendation in our Accelerating Net Zero report is for policy makers and regulators to prioritise interventions that resolve multiple issues, such as the example provided above. To achieve this local needs and issues must be understood and joined up with national efforts to achieve net zero.

We also agree that the synergies identified do have the potential to enhance accountability in the system at the sub-national level. A big benefit this could deliver is ensuring the decision-making process is free of bias and provides opportunity for a level of quality-assurance in evidence and materials used to navigate through the planning process into delivery and operation. However this can only be achieved with the involvement of an independent institution, and sufficient support to build capacity at a local level.

6. Are there additional opportunities for change and benefits that we have not set out?

As set out above, joining the dots to achieve a coordinated approach to both planning and delivery can deliver additional value and benefits beyond achieving net zero at the lowest cost to the network. The downstream savings highlighted could also extend further still.

Better recognition and facilitation of locally tailored opportunities within the governance of the system could support the de-risking of such projects, decrease development and deployment timescales and make these local energy projects much easier to fund. It could also enhance the ability of regions to maximise the opportunities for local job creation and forecast supply chain upskilling and retraining opportunities locally.

Recent work by EnergyREV in the “[Benefits of flexibility of Smart Local Energy Systems in supporting national decarbonisation](#)” paper has revealed that annual energy system savings of around £1.7billion a year can be achieved through uptake of SLES, when compared to a centralised counterfactual. It found SLES facilitates low-cost DSR and offers flexibility that reduces peak demand negating the need for costly grid-scale storage and network reinforcements achieving these savings. Depending on SLES uptake levels and the degree to which the counterfactual is optimistic or pessimistic, we could see savings increase to £2.1bn per year in the case of the latter.

Innovate UK have also funded Energy System Catapult’s insight paper on ‘Building a Governance Framework for Local Area Energy Planning’ (will be publish in coming weeks but available in draft on request). This explores how coordinated Local Area Energy Planning could deliver significant financial benefits on the road to net zero, and the future policy, regulatory and governance reform that is needed to deliver it.

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?

There will be short term risks and costs associated with this and other market reform activities, but these risks and costs need to be weighed against the potential risk of failing to reform markets and governance suitable for an enduring net zero energy system. The call for input mentions risk of increased costs through the duplication of some functions and services if DSO functions are separated out from DNOs, however, the current DSO arrangements are already creating duplication across DNOs which may be unnecessary. Whilst there is some collaboration and standardisation at an ENA level, functions such as whole system planning and flexibility markets need to be entirely standardised, and this standardisation may not be optimally achieved by replicating the geographically defined boundaries and institutional arrangements of DNOs.

Networks have also been slow to standardise as a collective, and PFER projects have seen non standardised approaches to digitalisation and data across networks including open and shared data access and visibility, data sharing agreements and data licensing.

DNOs should be regulated with outcomes in mind. PFER project experience, such as ReFLEX, has demonstrated that DNOs to date have lacked the ability to consider decarbonisation as a principal objective. They have prioritised their current role of security of supply and could go further than considering the potential for distributed energy resources' (DER) to both cause and alleviate network

constraints. There is such a clear demand for networks to facilitate more low carbon generation on the system to connect, and for existing and future generation to be managed more effectively for net zero outcomes.

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?

Framework 1:

The three DSO roles are inextricably linked and must be carried out by one electricity body. This model also assumes that effective coordination takes place with other bodies and that conflicts of interest can be managed internally.

Given the vital importance of (integrated local to national) whole system energy planning to achieve net zero at lowest cost delivering benefits to citizens and communities, the need for truly trusted, unbiased and capable actors to facilitate system flexibility and markets, and that many of these functions are in a formative and early development stage for DNOs, it is unlikely that these functions are optimally delivered by one electricity body at a local level, and 6 institutions at a national level.

Framework 2:

three DSO roles are inextricably linked and must remain in one electricity body. This model also assumes that effective coordination takes place with other bodies but that independence of the DSO from the DNO is necessary to mitigate conflicts of interest.

PFER projects such as the [West Midlands Regional Energy System Operator](#) and the [Greater Manchester Local Energy Market](#) projects are exploring models where roles such as energy system planning and flexibility market facilitation can be optimally delivered in institutions and bodies that are not DNOs. There are also various other projects developing independent market facilitation functions across DSO and ESO markets, showing that these roles do not necessarily need to remain within a DNO. The role of whole energy system and wider strategic regional planning (economic, spatial etc) is also much greater than the role currently fulfilled by DNOs, and a strategic energy system planning function in future could join up these currently loosely connected planning activities.

Independence of the DSO from the DNO is necessary to mitigate conflicts of interest and maintain trust with regional actors.

Framework 3:

assumes that the planning function poses the most significant gap in coordination and that there is a case for integrating planning across energy vectors at a sub-national level. This model also assumes that DSO roles need to be carried out by a separate body to manage the conflicts of interest.

PFER project experience would suggest that there is definitely a case for integrating planning across energy vectors at a sub-national level, but that there is also a case to expand the scope of this planning function to incorporate whole system planning beyond the pipes and wires of energy

networks, to include aspects such as built environment and transport. There is already a range of planning activities being undertaken by various actors at a local level (e.g. LAEP and DFES), and these planning activities can be better coordinated and optimised if joined up.

The need for standardised and interoperable flexibility markets across DSOs and with other flexibility and energy markets should also not be underestimated when considering current and future challenges with current arrangements.

Framework 4:

This model assumes that roles are most effectively delivered when within function synergies are maximised, and assigned to the institution(s) with the competencies to deliver them.

Greater consideration needs to be given to wider market reform and whole system functions and synergies to deliver net zero at lowest cost, delivering benefits to citizens and communities. For example, the Future System Operator could undertake market facilitation at a local and national level, but some of the PFER projects would argue that regional and local markets are better able to tackle challenges such as resilience and security of supply, and deliver additional social impact. The PFER 'Accelerating Net Zero' report outlines a number of conceptual frameworks that aim to deliver national policy objectives by enabling local action, which in turn could save around £130bn in investment costs and potentially deliver an additional £430bn in wider socio-economic benefits.

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.

Based on the frameworks and scope presented, and insights from the PFER programme, framework 3 and 4 represent the most viable options, but we believe wider consideration needs to be given to synergies with other current and future energy market operators and institutions, and with other functions required to deliver and operate a net zero energy system, ensuring that local action enables and accelerates national policy objectives.

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

The energy sector is not a level playing field, there are traditional actors who understand the complex system and terminology, and new entrants (e.g. PFER participants, local authorities, community organisations etc.) whose roles are not well recognised or defined and who do not have as much capacity or knowledge to engage on an equal footing. Ofgem can help by making additional effort to engage smaller and less well-resourced organisations who represent citizens and communities, and clearly defining roles as much as possible.

Given the current condition of the energy sector, and multiple workstreams in government to address these, Ofgem will need to be mindful of silos to ensure whole system optimisation that benefits the end users of that system.

Uncertainty over future national strategic infrastructure investments in the energy system poses significant challenges for delivery of net zero at a regional and local level. The lack of clarity around accountabilities needs to be prioritised, and a framework for joining up local delivery with national planning and policy needs resolution in the short term. This needs trusted coordination of multiple stakeholder groups with different agendas.

Focusing too much on planning, can divert attention from delivery that could be happening now to address net zero.

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).

Short term measures should ensure that any short term investments in functional capabilities that may be stripped out from DNOs in the event of a separation of DSO functions are not stranded investments. These assets should also be standardised by design, and consideration given to approaches such as presumed open source development to ensure interoperability across institutions. Processes and methodologies such as DFES should also be standardised and open.

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

There are a significant number of changes under way or mooted such as energy market reform, establishment of the FSO, innovation and reform around the retail market and non traditional distributed energy business models, and digitalisation right across society and the energy sector. It is vital that national and local initiatives and governance are joined up across energy system and market reform, as ultimately local and regional systems are a part of the national system, and national policy needs local solutions and action to be delivered optimally.

There is a clear need to join this activity on local energy institutions and governance up with the definition and formation of the FSO. It's not clear yet what boundaries sit around FSO's remit. In the same way that national policy needs to link up with local energy project delivery – as per PWC report – national network operation and planning must be seamlessly integrated with local network operation and planning. Whatever governance structure emerges from this work must have FSO integration as a key activity.

The [Taskforce on Innovation, Growth and Regulatory Reform](#) (TIGRR) report outlines 5 areas of focus to enable innovation in smart grids including standardised data sharing, accelerating low carbon technology deployment, reform of retail market regulation and rules, prioritising infrastructure investment and to “align gas and electricity price reviews, creating a more strategic, cross-sector approach to pricing and investment overall.” Following this report, a ministerial roundtable was held in April with a number of innovators in the energy sector. A collaborate working group from across Ofgem, BEIS and Innovate UK are currently identifying opportunities for change based on the report recommendations and follow-on roundtable.

The BEIS funded Local Net Zero Hubs in England are already providing capacity to local authorities and local initiatives, and are providing some coordination of planning, stakeholder engagement,

skills development and delivery of projects at a local level. The Local Net Zero Forum will also better support local authorities in delivering on their climate commitments.

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

Settlement for the next RIIO ED2 price control, and interactions with other policy programmes in progress will be clear considerations.

Interactions with non-traditional stakeholders who are less able to engage in calls for input such as this one should be considered. We'd be happy to help arrange workshops with PFER participants, local authorities and other non-traditional stakeholders, should you wish to seek their views more directly.

As we wrap up PFER by March 2023, we look forward to sharing learning and impact with Ofgem, including the significant workstreams we have funded such as the ESCs LAEP programme, and the Energy Rev academic consortium. We are working with BEIS to share the learnings from the LAEP programme and to establish next steps. ESC will publishing the latest LAEP guidance for local authorities in July 2022.