

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

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About Energy Systems Catapult

Energy Systems Catapult (ESC) was set up to accelerate the transformation of the UK's energy system and ensure UK businesses and consumers capture the opportunities of clean growth. ESC is an independent, not-for-profit centre of excellence that bridges the gap between industry, government, academia and research. We take a whole-system view of the energy sector, helping us to identify and address innovation priorities and market barriers, in order to decarbonise the energy system at the lowest cost.

Responses 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?

Yes, we agree with Ofgem's framing of the three energy system functions and strongly support digitalisation as a cross-cutting enabling function. Whilst these are certainly the main *technical* areas for delivering energy system changes, it is perhaps worth highlighting another function or responsibility around implementation and 'delivery' with respect to end users and the role of local actors within these energy systems, particularly as the pace of change is likely to be a major consideration.

As revealed through our extensive work on Local Area Energy Planning (LAEP), local actors such as Local Authorities are key players in the delivery of Net Zero, and as highlighted in the consultation document, coordination between local government and GDNs/DNOs varies hugely across the country given local resource and commitment.

The future system needs much greater interaction between spatial, transport and energy planning frameworks – which fall under separate remits at the moment. As we move towards decarbonisation, the level of interaction between local interventions and sectors will increase – heating will rely more on electrification, electric vehicles will require charging, public fleets and industrial clusters may require additional hydrogen infrastructure. These interactions between stakeholders across local, regional and national scales will become increasingly complex and as such, we envision a strong role for place-based leadership; likely built on the premise of partnerships between local actors including local government and network operators.

This implies that the energy system planning function should evolve into a broader system architect function to ensure that local, regional and national planning, operation and governance

across different sectors, (e.g. transport, power, heat, buildings, industry) is integrated and strategically aligned with the delivery of net zero across all major emitting sectors of the economy. The development of an energy system planning/architecting function of this nature does not imply 'central planning' of the net zero energy sector. It should recognise the importance of a mixed economy comprising both effective co-ordination of infrastructure decisions with active and dynamic market signals and price incentives. A combination of strategic planning and co-ordination, strong incentive-based regulation and open and dynamic markets should be employed to deliver an optimal pathway to net zero both at national and sub-national levels.

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

Yes, we broadly agree with the five assessment criteria for evaluating the institutional and governance arrangements described –

- Accountability
- Credibility
- Competence
- Coordination
- Simplicity

However, we would like to emphasise a point around greater engagement with local actors. Energy Systems Catapult's work on developing LAEPs suggests a stronger role for Local Authorities (LAs) in leadership responsibilities for net zero planning. Existing roles and responsibilities in planning domains such as the built environment are key for net zero driving the potential location of new demand and supply in the local energy system. Importantly, LAs have democratic accountability with strong links to communities. Our [initiative](#) with Bury council, 'zerocarbon.vote' for instance, allows local people to vote for their zero carbon preferences – such as heating and transport – informed by the Local Area Energy Plan.

As your Call of Input paper recognises (page 20) it is vital to develop an effective set of mechanisms for integrating technical/technocratic planning with democratic decisions and vice versa. ESC sees a vital role for LAs in this space, and for an LA-led Local Area Energy Planning function. In building a strong framework to develop and exploit LAEP we believe it is vital to:

- develop a coherent, consistent and nationally agreed methodology for LAEPs so that local plans, declarations and emergencies can be converted into coherent regional and national strategic plans. ESC are in the process of finalising a report on this methodology; and
- Develop a governance framework for LAEP (our response to question 3 below also refers) which ensures that the planning process has genuine traction in shaping and influencing investments and decisions made by a range of actors (network companies, developers, transport service providers, actors in the built environment etc).

- 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 agree with Ofgem's view that there are significant gaps and lack of accountability in roles and responsibilities for local actors within the energy system. As revealed through our forthcoming report for Innovate UK, "*Building A Governance Framework for Coordinated Local Area Energy Planning*" the future system needs much greater coordination across not only the geographic scale (national – regional – local), but also across the planning scale (spatial, transport and energy). A consistent local evidence base established through LAEPs is the starting point for coordinating local, regional and national decisions, however this will require new processes and governance arrangements. A range of coordinating mechanisms are required for both for the creation and implementation of LAEP which seek to:

- better align spatial and energy planning frameworks
- incentivise coordinated action across local authority boundaries
- address key tensions between local level ambition and regional network investment regulatory price controls
- enable aggregation of LAEPs to a scale which can inform strategic infrastructure investment and policy

Energy System Planning

Local Authorities are key players in the delivery of net zero. At the moment there are no formal requirements for network companies to engage with LAs on energy planning, and we agree with Ofgem's assessment that there is insufficient coordination between actors across the energy system at a sub-national level. We would also reiterate the statement in the document that there is certainly confusion and regional variance in approaches to delivering the outlined functions which may delay the transition to net zero.

As part of our stakeholder engagement on the *Building A Governance Framework for Coordinated Local Area Energy Planning* report, ESC explored the interactions between stakeholders across local, regional and national scales which revealed the contradictory plans, objectives and incentives across spatial and energy planning frameworks. Decisions made by stakeholders across those scales are often made in isolation and lack coordination with wider energy system decisions. As such, stakeholders including installers, housing associations, energy services companies agreed that coordinated LAEPs would help them to make more informed and strategic decisions.

The role of 'regional' planning was highlighted as a promising starting point to deliver on the country's net zero goals. Importantly, sub-national powers and functions must reserve local influence and be accompanied by regional governance which is able to oversee, understand and articulate the impacts on the wider energy system. Organisational (LA, DNO/GDN, ETO/GTO and ESO) coordination is also required, and we foresee a strong role for Ofgem to incentivise or require energy network providers to interface with regional LAEP coordination structures, to ensure plans are aligned and areas of potential future network congestion are identified.

Ofgem can play a key role by adapting the RIIO / network price control policy framework to incentivise stronger engagement and alignment by regulated network companies with LA-led LAEP

processes. The RIIO framework and licences should require and/or incentivise network companies to integrate and align their approaches to network planning and investment with LAEP evidence and analysis. We set out a series of proposals on this in our Policy Brief: Make Energy Networks Invest for Net Zero by Adapting the RIIO2 Framework¹

In addition, the role of digitalisation and open data in facilitating more effective energy system planning should be considered. Any system architect function would require access to core data about the energy system in coordination with other actors, such as the Future System Operator, system operator(s) and others. Ensuring that each organisation with a role in planning can access, understand, and utilise data to make effective decisions will be fundamental to the future operation of such an architect function. Standards for metadata, data licensing and interoperability being paramount for ensuring these energy data assets can be understood alongside other vectors, such as heating and transport.

Market Facilitation of Flexible Resources

We broadly agree with the assessment of the current arrangements for market facilitation of flexible resources set out in the call for input document. There are clear potential conflicts and uncertainties around the role of DNOs in shaping and/or facilitating local markets for flexibility. The incentives on DNOs will be highly conditioned by the broader price control and regulatory framework set by Ofgem, and there are risks that network companies may inherently favour traditional asset solutions and that the regulatory framework may not reward or incentivise innovative approaches to delivering broader decarbonisation outcomes.

At present we doubt that there is sufficient evidence or analysis to clearly define the “right” configuration of institutional responsibilities, and the mix of price control/regulated incentives versus markets and trading arrangements to unlock an optimal mix of flexible and traditional network asset solutions to enable the transition to net zero.

There may be there may be a case for incentivising DNOs strongly around enabling decarbonisation outcomes, while allowing them freedom to own and run flexibility markets and/or assets themselves as an integrated part of their networks. Other options could require the creation of open markets to unlock as broad a range of flexibility solutions as possible from a wide range of competing sources, enabled by open digitalisation. Crucially, this may vary in different places depending upon the specific nature of the flexibility challenge. Given the range of unresolved questions, we suggest Ofgem conduct a detailed analysis of the options and potential value of the new local flexibility markets and how they could interface both with the regulatory framework for monopoly networks and the role of wholesale markets (including the potential introduction of nodal pricing) , as well as the additional benefit to consumers,.

Irrespective of whether the market design for flex resources is highly centralised or based on autonomous decentralisation, the data requirements need to be clearly defined, well understood and interoperable with the rest of the energy ecosystem. Each difference beyond geography and temporal boundaries increases costs for providers to serve that market. Standard registrations

¹ <https://esc-production-2021.s3.eu-west-2.amazonaws.com/2021/10/step-3.pdf>

where possible and consistent data standards should be a primary focus of any market design to accelerate uptake and reduce complexity for participants.

We would agree with Ofgem's evaluation that market facilitation of flexible resources may be hindered depending how the DNO interacts with these markets. DNOs will likely have an important role in certain aspects of market facilitation, particularly with regards to provision of data to such markets (such as forecasts of generation curtailment, forecasts of constraints etc.). However, whilst DNO ownership/operation of these markets is possible if incentivised correctly, this approach creates much more tension and risk, particularly with regards to competition distortion (e.g. conflict of interest in procurement, perceived risks of favouring traditional network solutions over flexible ones). The nature of flexibility requirements, particularly at differing voltage levels, means that the suitable approaches to resolve such requirements (including the development and operation of market processes) may vary in different places depending upon the specific nature of the flexibility challenge.

Market facilitation of flexible resources will need to provide adequate value to consumers and flexibility providers at the local level, and where possible should be aligned with the benefits that such flexibility can provide across the whole energy system (i.e. wholesale, balancing and ancillary markets) as opposed to exclusively focusing on the narrow needs of a network operator due to the potential for conflicts and inefficiencies. The ongoing work on ESO-DNO coordination will need to be enhanced and extended to ensure non-discriminatory access to a wider range of flexible resources, as well as ensuring that whole systems approaches are taken.

Decarbonisation of heating and transport at the local level will create new demands – and new sources of potential flexibility – which are likely to be highly locational, provided they are adequately incentivised.

The future system requires integration of planning, network infrastructure and flexibility markets to open up opportunities that do not exist at the moment. The optimal mix of markets at local, regional and national levels remains to be seen, but will be a key aspect of forward planning activities.

There is possible tension between integrated network operation by DNOs and other (market-based) approaches to flexibility. Ultimately there will be a trade-off between incentivising DNOs to take on responsibility for integrated network planning and operation, and requiring them (or DSOs) to run more local markets and flexibility trading arrangements.

Our insight [paper](#) on DNO-led innovations such as Active Network Management (ANM) has highlighted some of the potential issues of DNO developments affecting market processes, particularly for those seeking to develop Smart Local Energy System (SLES) concepts. ANM is a non-standardised DNO-led protection system to facilitate faster and cheaper connections to the distribution grid in areas of constraint. Lack of standardisation of ANM systems is resulting in different DNOs developing ANM and associated systems and connections with vastly differing capabilities, particularly regarding interactions with market-based alternatives to curtailment. In addition, the lack of coordination with the ESO has meant that assets with ANM flexible connections agreements are largely excluded from ESO markets. These issues have at times created notable uncertainties and difficulties for projects seeking to develop SLES concepts as part of the Prospering from the Energy Revolution (PFER) programme.

We would encourage Ofgem to carry out further empirical analysis of the evidence, and engage with stakeholders to better understand incentives for DNOs around delivering decarbonisation outcomes for their areas.

Real time operation of local energy networks

Further development of how the ESO/FSO and DNO/DSO will communicate, share information and work together in real time is required. Progress in this area is being made through the ENA's Open Networks Programme but it is still unclear how Distributed Energy Resources (DER) will be able to stack revenue and participate in local and national services and how this will be coordinated in real time between parties.

Local and national markets must be interoperable to reduce the burden on DER and ensure they are able to enter all markets. The communication systems required by the DER for instruction is an example where the same requirement and specification of communication system must be the same for all markets.

There also needs to be guidance issued on the architecture local energy markets should adopt. Whilst standardising markets may seem counter-productive when it comes to innovation, there is a real risk the cost of establishing control and communications between potentially hundreds of local energy networks, the DSO and ESO may offset any cost saving benefits that could have been achieved through local energy markets. This risk would be amplified further if each local area adopted different communication standards and different architectures. For example; one area has a local energy exchange but another does not. Both areas wish to sell aggregated generation to the ESO and the control room must have a system to register and manage these dataflows by having compatible systems or spending money on creating a bridging system on each variation.

ESC's [Energy Digitalisation Taskforce](#) makes specific recommendations regarding how to ensure real time operation of the energy system. The "Digital Spine" recommendation is a service that surfaces "operation critical" data to be ingested, standardised, and shared in near real time. This type of service will be a key enabler of any highly distributed energy system. Without open or permission-based access to key market or system signals, any local energy network will be limited in function.

Similarly, data generated about the energy conditions in a local energy network has upstream impacts, meaning data created in those localities will, at a minimum be required to be shared with any system operator(s) responsible for that area and adjacent ones, depending on network topology. Clarity of what key data assets, network topology information and other data is required for each participant should be well understood and embedded into relevant requirements.

Data Best Practice guidance has a framework that is suitable for encouraging market participants to develop interoperability, however more work would be required developing the UK's overall digital energy infrastructure (Data Sharing Fabric, Digital Spine, Data Standards and Data licensing) to ensure the outcomes of a Local Energy system can be achieved.

- 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 blocker to effective energy system planning and operation at sub-national level in our view is the lack of a clear framework for multi-vector energy system planning at local (LAEP) and regional level. ESC's work has shown how such a framework, based on a clear consistent

methodology can be built, and placed within a wider governance framework to ensure that LAEP processes influence decisions and investments by a range of public and private sector actors.

The creation of the FSO should help to address the issues around multi-vector strategic co-ordination and long term infrastructure planning at national level, but as yet there is no clear mechanism for achieving the same at local and regional levels.

A clear, well-resourced process and framework for developing and updating LAEPs across the country is needed to overcome this blocker, along with a broader regional and national framework for integrating, co-ordinating and aligning local level planning with national strategic planning and the emerging role of the FSO.

Energy Systems Catapult's 'Building a Governance Framework for Local Area Energy Planning' revealed how coordinated Local Area Energy Planning can deliver significant benefits to the wider system, exploring in detail the future policy, regulatory and governance reform required for net zero.

Through a combination of stakeholder interviews, market research and whole system modelling, this report revealed some blockers as highlighted:

Lack of coordination

- a) Between local authorities and network operators
- b) Between spatial and energy planning
- c) From local to regional to national geographic scales

Although there is a broadly agreed benefit to local level action, the current lack of coordination between actors will impact the cost and time needed to achieve net zero. This report revealed a coherent planning framework is required which integrates with existing processes and stakeholders where possible. LAEPs can play a key role in shaping the energy transition between actors by aligning spatial and energy planning at local and regional levels.

Lack of definitive roles and responsibilities

There needs to be clarity on the roles and responsibilities being performed by LAs and DNOs. There is currently a lack of clearly defined roles and responsibilities to effectively integrate different planning frameworks and ensure that market and operability issues across different sectors and geographical areas are effectively addressed. For example, there may be several network operators in the same LA, or a single network operator may be covering several LA boundaries. Similarly, any local market arrangements may cross boundaries of different network operators or LAs, as well as including any multisector assets and functions (e.g. – across power, heat, transport).

Furthermore, funding and investment decisions are currently governed and decided in silos and there is no effective way to integrate them to ensure optimum outcomes. Local areas need to be clear on their mandates and powers; roles and responsibilities need to recognise that local and national interventions or pathways need to align. Local decision-making has to make sense nationally, but equally needs to be enabled by national signals.

National policy does not reflect local context

While the Planning Act exists to ensure decisions have regard to local impacts, National Policy Statements themselves are not planned within a local context; raising uncertainty over future strategic infrastructure investments. Often, local policies are subject to the constraints imposed by the regulated network operators in certain areas. In our Governance Framework report, ESC found evidence to suggest that neighbouring authorities are missing opportunities to coordinate on potential cross boundary net zero opportunities.

Aggregating LAEPs up to a regional level could help decision making and with greater coordination provide certainty with regard to whole system network planning. Processes such as those contained within the Localism Act can set a precedent for enabling LAEP to feed into national decisions on net zero infrastructure planning.

Furthermore, different National Policy Statements and strategies are developed and implemented in silos, which could result in significant misalignment and result in non-optimum outcomes. Areas such as EV charging infrastructure, building regulations, DNO investment plans, heat decarbonisation, smart energy devices and flexibility markets are addressed by different organisations with little coordination.

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

Given the framing of the three energy system functions, we agree there must be greater interdependencies between planning, market facilitation and operation roles. There is significant opportunity for change and potential benefit here – and agree that more can be done to marry up these three functions through the synergies outlined.

There should certainly be a stronger element of regional governance in the future institutional arrangements and we agree with Ofgem’s conclusion in re-assigning sub-national roles and responsibilities to the most applicable actors to perform these duties. The evidence and analysis set out in our Governance Framework report suggests the creation of an independent technical assurance facility or coordinating body can be of significant value to the future system.

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

We are pleased to see ESC’s work on LAEPs cited heavily in the document, however this now needs to go one step further in driving a consistent methodology and considering LAEPs formally in the pricing framework. The RIIO2 business plans highlight commitment from network companies, but this needs to be consistent across all regions.

We would echo the point made in the document that even where there are efforts to deliver coordinated energy planning, this often lacks consistency, in terms of methodology and approach. In response, ESC is shaping proposals for a more coherent and consistent methodology by we are developing guidance on creating a Local Area Energy Plan.

The Guidance itself is divided into seven stages of creating a LAEP, with each stage containing several steps and each step having at least one objective that should be met. The Guidance is very much focussed around ‘what’ activities should be carried out and documented in the LAEP, but not focussed on ‘how’ they should be undertaken.

This Guidance has been developed in consultation with the sector, through a series of workshops held in Spring 2022. These have included a diverse set of attendees – including local authorities, network operators, national organisations (e.g. – BEIS, Welsh and Scottish Government, Ofgem, UK100) and delivery consultants (Arup, Buro Happold, etc).

We suggest that evidence and analysis developed through LAEPs should be a formal consideration for network companies to take account of in infrastructure investment planning. There are several mechanisms which Ofgem could use to achieve this, for example, through business planning guidance, licence conditions and the RIIO incentive and re-opener process.

We would suggest that Ofgem considers how best to foster the emergence of an effective multi-vector system architect function (as described in our response to question 1), along with the development of an effective governance framework to ensure that markets, planning and operation across different geographical areas and different sectors can be effectively aligned to deliver optimum outcomes.

- 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 Ofgem's assessment that there is a risk that system operators may give priority to the development of their own flexibility markets which may not necessarily be for the benefit of the wider system. Regulated utilities ultimately have legal duties and commercial objectives to satisfy. They participate in a competitive space promoting competing technologies, often meaning that neighbouring authorities miss opportunities to coordinate on potential mutually beneficial cross boundary net zero opportunities.

Our Governance Framework report found that decisions in local heating and transport supply chains are often made in isolation. Attempts to plan and scale opportunities can be hampered due to a lack of cross boundary cooperation, and in some cases contradictory decision making. Together, this sends mixed signals to supply chains and regional network operators. As such, we would encourage promotion and evaluation of improved ways of collaborative working, including through exploring models such as statutory enhanced partnerships, as are commonplace in the transport sector.

Additionally, as mentioned in response to question 4, there are risks arising from the lack of clearly defined roles and responsibilities to effectively integrate different planning frameworks and ensuring that market and operability issues across different sectors and geographical areas are effectively addressed. For example, there may be several network operators in the same local authority boundary with different objectives and priorities, which could create significant risks for creation of successful local energy markets if there is no effective coordination and decision making across DNOs.

- 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?
- **MODEL 1 / 2: Internal separation of DSO* roles within DNOs* / Independent Distribution System Operator(s) (IDSO)** – we would suggest further evidence and foresighting on whether these should be performed by one or multiple bodies

- **MODEL 3: Regional System Planner and Operator(s)** – we strongly agree that there is a case for integrating planning across energy vectors at a sub-national level as evidenced through our work on Local Area Energy Planning.
 - **MODEL 4: Interacting organisations** – this framework is open to interpretation, with multiple variations of the model applicable, but we would agree that roles are most effectively delivered when assigned to the institution(s) with the right competencies to deliver them.
- 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.

Creating a foundation of robust LAEPs can begin to pull together the necessary pieces for regional coordination across heat, transport and power. Following extensive stakeholder engagement, our Governance Framework report recommended the creation of an independent technical assurance facility at the regional level to support with the development of high quality LAEPs.

Coordination will require greater steer and influence from a sub-national level, coupled with the functions and responsibilities to enable coordinated network planning across regions. Therefore, strictly from a planning perspective, we are encouraged by proposals for models 3 and 4 which could be advantageous relative to the status quo.

Model 3 aligns well with our assessment from our report *Building A Governance Framework for Coordinated Local Area Energy Planning*, in that independent coordination at the regional level is required to ensure delivery of lowest cost of net zero.

However, as depicted in the model 4 diagram, Local Authorities have an important role to play too; not only in feeding planning information to the regional body, but for information to come back the other way. It is our view that LAs may lead LAEPs but not necessarily deliver all aspects of the LAEPs. We suggest a decision on this function should be made from BEIS and Ofgem to clarify the exact roles and responsibilities in stitching together LAEPs across regions.

Having said this, from a market facilitation and operation point of view, we would urge further evidence, trials and learning to uncover the optimal functions and roles of the Regional System Planner (and Operator). It is our position that stronger incentives are needed for DNOs to develop arrangements and take responsibility for delivering decarbonisation outcomes.

Local authorities have a pivotal role to play in any future energy system design with their ability to directly influence and co-ordinate a range of important functions across local energy systems which can support and enable new operating models. The four models proposed by Ofgem should be further tested to understand the roles and responsibilities of stakeholders in each framework, understanding how value is generated and distributed across the proposed system, and the required interdependencies between local energy actors to enable the operating models to succeed.

This could be achieved through using pilot local authorities to test proposed models in further detail, enabling an assessment of the benefits, risks, interdependencies and requirements. A representative local authority area which experiences market reflective challenges (for example generation connection constraints) and with the appropriate levels of engagement and influence with other energy system stakeholders could be selected to host a pilot to understand the requirements in further detail.

Given the scale of changes needed, likely timescales to implement these changes, and the urgency to enable fulfilment of DSO functions, an evolutionary approach may be required. This could take the form of early adoption of Model 1, with progression perhaps towards Model 3 or 4 later down the line.

In addition to primary legislation change, the challenges and timescales associated with code change processes would also need to be considered and addressed. Given the need for alignment and integration at local, regional and national levels, (as well as in different sectors, e.g. power, heat and transport), a governance model based on a structured lifecycle, 'gated' approach could be effective. This approach would ensure alignment whilst being feasible within current legislation, regulatory and organisational landscapes, and also enable the development of effective transition plans.

This would require early definitions of functions and subfunctions, outlining the various roles and responsibilities in delivering the aforementioned functions. A 'delegated authorities' approach, with effective review and course correction processes could be implemented to ensure the ongoing alignment of changing and evolving plans and functions.

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

We set out some of the blockers to effective decarbonisation in question 4, however we would reiterate some of the points made across our response:

- **Lack of common methodology**

Delivering coordinated local area energy planning lacks consistency in methodology and approach. In collaboration with industry stakeholders, ESC are working on proposals to offer guidance to local actors on creating local area energy plans with a common framework.

- **Mixed incentives across planning and geographic scales**

The plans, objectives and incentives of stakeholders across spatial and energy planning frameworks from local to regional to national scales are often contradictory. Decisions made by stakeholders across these scales are made in isolation and lack coordination with wider energy system decisions.

- **Resource constraints in existing institutions (Local Authorities)**

Local Authorities are key to the energy transition, however they are often under significant resource constraints. We would recommend enabling local authorities to support with strategic policy coordination by rolling out LAEP. Additionally, support should be expanded to help in the deployment of multidisciplinary resources within local authorities with appropriate incentives to make best use of resources available.

- **Missing regional coordination**

Independent coordination at the regional level is required to ensure Net Zero can be delivered at lowest cost. A decision on this function is required from BEIS and Ofgem to clarify who will be responsible for understanding how LAEPs fit together across regions.

Here, we view the need for a systems architect function to enable alignment and optimum delivery of Net Zero, whilst maximising other societal and economic benefits and supporting other policy objectives.

- 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 separation of DSO roles from DNOs under model 1 would be helpful in the context of driving a coordinated approach involving relevant stakeholders with clearly defined roles and responsibilities.

We view the need for a systems architect function to guide and support the definition of short and medium term measures, ensure effective coordination, provide initial definitions of roles and responsibilities, as well as establishing effective review processes as plans mature and change. Importantly, this role would not be a central planning function, but instead look to plan the monopoly infrastructure as well as designing how the market could work.

DNOs have recently submitted their business plans which are unlikely to change, however RIIO-ED2 will have significant uncertainty mechanisms built into it which allow for a wide range of situations, including explicit links to Net Zero. We would suggest a strong focus should be on those which allow for such changes to be incorporated between price control periods.

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

Developing low carbon industrial clusters is important for reducing emissions from industry. But industrial clusters can also play a key role in building a longer-term strategy and policy framework for industrial decarbonisation and competitiveness across the economy. We explored this in our report on The Strategic Role of Industrial Clusters², including the potential implications for energy system planning and choices at local and regional level. Ofgem's work on local energy institutions and governance should take account of the potential interactions between decarbonisation investment and infrastructure for industrial clusters and wider local and regional energy system planning.

In our report we recommended some early actions to ensure that the UK extracts maximum value from cluster-focused investment and policies for wider industrial decarbonisation in the decades ahead, including:

1. Establish regular reviews of whole system modelling scenarios for CCUS and hydrogen supply and demand. These can be used to inform wider decision making when considering the challenges associated with CCUS and hydrogen infrastructure/network investment as a national resource. This could potentially form part of the National Infrastructure Commission's 'National Infrastructure Assessment'.

² <https://es.catapult.org.uk/report/towards-industrial-decarbonisation-the-strategic-role-of-industrial-clusters/>

2. Commission tailored Local Area Energy Plans that include the spatial and energy demands of industrial clusters. LAEP can have a significant role in decarbonising communities, including regional industrial clusters, and enabling investment for associated infrastructure requirements. These should support the UKRI funded Net Zero industrial cluster plans to develop regional roadmaps, which can eventually be combined to inform a UK-wide route to Net Zero industry.

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

We suggest that there is scope for Ofgem to be much more proactive in supporting and directing network companies to develop Local Area Energy Plans and to make resources available for network operators.

- **LAEPs should be an essential piece of evidence for RIIO**

The regulatory framework will need to be robust in the face of inevitable uncertainties, as such Ofgem should shape and lead a robust process to drive network companies to make coherent strategic decisions across their networks based on LAEPs and do this in a way that delivers maximum value for the wider energy system transition. New processes to coordinate across the whole system may be required to ensure decisions are made based on comparisons between low carbon gas, other vectors and full system value.

- **Define function of regional coordinating body**

A foundation of robust LAEPs is necessary for regional coordination across heat, transport and industry. Coordination will require greater steer and influence from a sub-national level to enable coordinated network planning across regions. We see the role of an independent coordinating body at the sub-national level as a feasible point to support in the creation of high quality LAEPs.

- **Formalise the link between LA and DNO through statutory enhanced partnerships**

Better and more consistent coordination between local authorities and network companies is required, and statutory enhanced partnerships have been highlighted as a potential supporting mechanism. Having said this, it remains unclear whether this should be statutory; further evaluation is required to confirm.