

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

E3G Submission

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Objectives

Delivering a net zero energy system requires a transformation at local, national, and international levels. Institutions and governance must work across these levels to ensure important and inter-linked outcomes are achieved:

- > New infrastructure must be delivered at the right time and in the right place. This is especially important on the demand-side of the market, where electric heating and vehicle chargers need to be installed alongside the instrumentation and control technology that will enable flexible consumption. This flexibility will be essential to enable variable renewable generation to be integrated onto the system cost-effectively and without expensive and time-consuming upgrades to grid capacity.
- > The nature of system operation must change to make best use of all available resources, including millions of connected devices. Institutions and governance must support the digitalisation of the grid by creating an environment that supports innovation in system operation and the interface between users and the grid.
- > Consumer consent, protection and engagement will be fundamental to a successful energy system transition. It will be impossible for national or regional level institutions to understand and respond to the diversity of local circumstance that affect people directly. Governance processes must, therefore, provide the flexibility to respond to differing local needs.

Local institutions and governance will be critical in delivering these outcomes and meeting the challenges involved. E3G has been exploring delivery of net zero at local level. Working with a small group of stakeholders, we have mapped the required functions, identified the gaps, and explored potential solutions. This work has also considered the politics of local net zero delivery and how this might affect the ability to implement reforms.

This exercise primarily relates to the topic of energy system planning in the Ofgem consultation. However, other E3G projects looking at market design and digitalisation are relevant to the issues of market facilitation of flexibility and real time operation. We have, therefore, also responded to all the topics covered by this consultation.

Key conclusions from E3G Analysis

Infrastructure choices

The future is inherently uncertain and there are diverging views on the infrastructure investments that should be taken to ensure a resilient and cost-efficient pathway towards a net zero energy system. Different organisations will have their own priorities and objectives and governance processes will need to ensure good and consistent decisions are made. Government has set targets which establish some 'stakes in the ground', but there remain many choices, especially at local level. For example, Local Authorities may wish to prioritise deployment of electric heating in certain areas for social reasons and this might require network reinforcement or operational challenges that were not previously envisaged. Alternatively, a Local Authority may wish to develop a 'hydrogen hub' to

support the local economy without clarity over future sources of, and transport links for, hydrogen supply.

An independent body that provides latest technical assumptions and the methodologies to tackle future uncertainty would be an important step. However, ultimately the governance system must make choices to ensure consistency in the plans of the various delivery bodies. It should not be the role of Distribution Network Businesses to make these decisions. An independent system operator with responsibility to plan and operate all energy infrastructure should have this responsibility, overseen by clear statutory requirements for the cost-efficient delivery of a net zero energy system.

Closing the loop between planning and delivery

The extent of the changes required during the energy system transition means that planning cannot be an infrequent process and it is certainly inappropriate for system developments to proceed in 5-yearly steps as demanded by the current network price control process. There must be clear mandates across all delivery bodies with strong incentives to ensure progress to time and budget. However, delivery, especially of new and innovative technologies and involving the consent and engagement of energy consumers, will not always proceed as intended. Lessons from delivery must be rapidly assimilated, shared and fed into a constantly updated planning process.

A learning and feedback process will be one of the critical functions needed to support delivery and planning at local level. This should form part of a wider requirement to ensure local authorities are fully supported and resourced as they plan and deliver energy measures. People will sit at the heart of local net zero delivery, and we cannot afford to lose hearts and minds through failing to understand what works well and what does not. A process must be developed which is much more akin to fast-moving retailing than engineering project management. These learnings and insights must be fed in directly to all aspects of energy system planning and delivery and constant adjustments made as required.

Innovation culture

The energy system transition will require constant innovation if it is to meet the needs of all stakeholders, especially energy consumers. The current approach to innovation in grid system operation is wholly inadequate, relying on bottom-up generation of ideas coordinated by network companies and without any mechanism to drive deployment and change across the system. Innovation must be embedded at the heart of energy system governance. Processes that ensure efficient use of resources (including both energy and other system services) will need to become more dynamic, localised and enabled by digital technologies and artificial intelligence. Achieving this requires a system that is constantly evolving, driven by all stakeholder needs especially those of innovators providing solutions to meet customer needs. System and network operators must not be in the driving seat as is the case with many current market developments. The [Open Energy](#) platform developed by Ice Breaker One provides an insight into how such an approach might be governed.

Delivery functions mapping and key gaps

E3G has mapped the core functions that will be necessary to deliver a net zero energy system and identified the gaps (see Appendix 1). The gaps are:

- > Net zero delivery strategy fails to clarify the role of public sector and how it interacts with market-based delivery.

- > There are no clear delivery body mandates linked to net zero or comprehensive associated policy delivery guidance.
- > There is no consistent set of technology and behavioural assumptions used throughout the process or agreed way to use assumptions.
- > Monitoring by the Climate Change Committee is too infrequent and there is no process for sharing lessons amongst delivery bodies or recommending innovation requirements.
- > There are no bodies formally responsible for identifying energy aspects of regional spatial plans.
- > There are no bodies formally responsible for delivering local targets related to energy system decarbonisation.
- > Local spatial planning processes are *ad hoc* with poor links into network planning.
- > Local Authorities use various consultancies and city networks to support delivery which is costly and inefficient.
- > It is difficult for Local Authorities to extract and then feed social and other issues into the regional energy and infrastructure planning process.

The absence of a consistent set of technology and behavioural assumptions and an agreed approach to managing future uncertainty is an important omission that affects all organisations involved in the energy planning process. E3G has argued¹ that this is a fundamental requirement that deserves an independent institution capable of providing unbiased, science-based advice. Whilst the government has proposed that a Future System Operator might provide technical advice, its core expertise will be in energy system architecture with a bias towards understanding existing system operational practices. The future energy system will be very different from the past with consumer behaviour and digital technologies playing a critical role. We remain convinced that an independent source of technical assumptions and a consistent approach to dealing with future uncertainty is a fundamental requirement for coherent energy system planning.

Apart from the need for consistency in assumptions, there are four key gaps that specifically relate to the planning and delivery of local net zero energy systems:

- > Ensure local energy plans are produced that are consistent with delivery of net zero.
- > Allocate clear responsibility to deliver measures necessary to achieve net zero at the local level.
- > Co-ordinate between local energy plans and the planning of energy networks and other national infrastructure such that local and national priorities can be aligned.
- > Provide technical, financial, and capacity support to enable local delivery of net zero measures.

Appendix 2 sets out the analysis that E3G has undertaken to assess how these options might be filled. Our preferred solution is described in the following table alongside a series of questions that we have still to address:

¹ See, for example, [Breaking the Logjam](#), December 2019.

Preferred approach	Open questions
Requirement on Local Authorities to produce a plan to deliver local aspects of the net zero energy system	<ul style="list-style-type: none"> • What form should the requirement take? Should it be a statutory mandate? What are the other options? • What should the plan cover? Who specifies this? • Who reviews the plan? What remedial actions are in place to ensure plans are adequate?
Requirement on Local Authorities to deliver projects in line with the plan	<ul style="list-style-type: none"> • What delivery models could be used? Should this be specified? • How to ensure resources are appropriate? Who regulates delivery costs? • How to deal with elements of the plan that do not have a viable business case? • Who monitors delivery? What remedial actions should be taken where delivery fails?
Combined Authorities and energy networks required to work with local authorities to ensure local plans are consistent with regional and national infrastructure	<ul style="list-style-type: none"> • What is the governance structure for this process? How is Ofgem involved? • How are the requirements enforced? • Who resolves conflicts? • How does this feed into the network planning process?
Establish an easy to access one-stop-shop to provide financial, technical and capacity support	<ul style="list-style-type: none"> • Who currently provides these services, if at all? • Does this require a new institution or can it be provided through an existing organisation? • How is support allocated/rationed? How does this link with the delivery monitoring process?

It is clear from an initial analysis of political deliverability that there are practical issues that need to be addressed. It is of paramount importance that the governance structures take account of the range of capability and interest that local authorities have in the topic of energy system planning. It is important that mandates and centralised approaches are designed to provide a back-stop that prevents any local authorities from being left behind whilst providing the flexibility for more progressive authorities to move faster. This flexibility is necessary to garner support from key local government actors as well as providing confidence to central government that any new obligations will be acted upon. It is also important to ensure that other regional bodies (combined authorities, metro mayors, net zero hubs, local enterprise partnerships) have a role in supporting local authority delivery requirements.

Ofgem has an important role to play in articulating to government that change is necessary to achieve political objectives – primarily delivery of net zero and the energy security strategy, but also other political goals such as the levelling up agenda. This will be especially important where solutions require primary legislation.

Digitalisation and the innovation imperative

The UK energy system must change. The UK Government has set a target for decarbonising the electricity grid by 2035 with the ambition to have achieved 90% of this goal by 2030. It is important that this is delivered at least cost to consumers. This will involve building, connecting, and integrating huge volumes of relatively cheap renewables which will protect consumers from volatile fossil fuel prices. Cost-effective integration of renewables requires a more efficient and flexible power system that allows consumers, flexibility providers, and network operators to manage demand to match increasing percentages of renewable supply. At the same time the electricity system will see rapidly increasing demand for electricity due to the electrification of heat, transport, and various industrial processes.

Cost-effective integration of renewables cannot be achieved through a small change to the way the system operates. The electricity sector must move from a situation where we have a few large power plants that can be controlled to one where we will have millions of connected devices offering and requiring electricity services. This cannot be achieved without innovation in, and deployment of, a range of digital technologies – both in consumer premises and the power network.

Cost-efficient decarbonisation requires that all system assets are used as much as possible, avoiding wasting investment on resources that are not required. A large proportion of the new sources of demand for electricity are going to be connected to the distribution networks (EVs, heat pumps) and, to avoid having to massively reinforce the network, operators will need to use incentives and protocols to control demand. Without such changes, there is the real prospect that consumers will be prevented from using EV chargers and electric heat pumps due to the lack of network capacity.

This is a huge challenge for the entire energy system. We cannot move from the centralised system of today to a dynamic, digital, and decentralised system in one or two steps. Instead, a process of constant innovation is required. Governance and institutions must be designed to support and promote the changes involved. Network operators must be required by their regulatory agreements to ensure the status of the entire system is known and this information is available in consistent and accessible digital formats. System operators must be required to ensure efficient use of resources where assets are smaller and more decentralised. This will inevitably require balancing actions that are much more granular in space and time, something that can only be credibly achieved through local markets enabled by automated control and artificial intelligence. Moreover, network investment requirements must be integrated into whole system infrastructure plans. Producing such plans is a task that suits an independent system operator function rather than distribution network operator businesses given the need for a balance of expertise across all system assets, especially those on the demand side.

This suggests that a new institutional structure is required. System operation should be separated from network operation to create a single integrated approach to infrastructure planning and asset utilisation across the entire system. In other words, the proposed Future System Operator function should be expanded to include distribution system operation and should operate under the mandate to develop the markets and operational capabilities to cost-efficiently deliver the government decarbonisation targets.

Creating new institutions will not be sufficient. These institutions will require the right culture that is consistent with a constantly innovating digital context. The ‘design, procure, implement’ engineering mindset must be replaced by one in which designs are constantly updated, and delivery involves regular updates of which most system users are largely unaware. For example, achieving an efficient dispatch involves not so much a new market design, but a new approach to market design whereby a core system is constantly updated in line with latest technical opportunities and user requirements. For this reason, E3G supports the creation of a separate Digital Delivery Body as recommended by the Energy Digitalisation Task Force². This should be established as soon as possible and allowed to develop a strong independent culture before merging into the Future System Operator.

² [Delivering a digitalised energy system](#)

Responses to specific questions

Strategic energy context

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?

These are important functions; however, they do not cover all the topics that need to be addressed. A more comprehensive framing would be:

- > Energy system planning, including defining the basis for analysing the future and learning from experience with deployment
- > Deployment of infrastructure, covering supply, networks, and demand side
- > Efficient use of resources, including development of markets and protocols

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

The most important criterion is missing: will the proposed approach deliver the required outcomes including the overall goal to achieve a net-zero energy system along with the interim sub-goals such as 95% decarbonisation of the power system by 2030, heat pump deployment targets, support electric vehicle charging requirements, offshore wind deployment targets, etc.

There is a lot of debate over the need, or otherwise, for Ofgem to have a statutory net zero mandate. It is the absence of a clear focus on delivering outcomes that lies behind these concerns. It would be interesting to understand whether new mandates or guidance would enable Ofgem to take a different approach to assessing policy proposals.

The views we express in this consultation response are based largely on what needs to happen to deliver the key outcomes.

Strategic case for change

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 are clear that the current arrangements are inadequate. We do not think that your assessment of the inadequacies considers the challenges that must be faced and overcome during the coming years. Whilst you correctly identify deficiencies that are already apparent, you do not consider the extent of the change that will be needed to take advantage of the opportunities of new digital technologies to revolutionise the nature of system operation for the benefit of consumers. Put simply, we need to create a system that responds to the evolving needs of consumers rather than the other way around such that it is consumer needs that drives change in system operation.

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

All commercial organisations with an established business model will resist change that introduces risks to future earnings. Only incremental reform will be possible if change is addressed from a bottom-up and technocratic perspective. This will be wholly inadequate. Creating the political champions at local and national levels will be essential to drive change from the top. There must, therefore, be a focus on relating these issues to the needs of the key political stakeholders.

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

The opportunities are too narrowly defined, and the focus is too short-term. The critical element of the next stage of the transition will be to build popular consent and encourage consumer engagement. The current framing is focused on meeting the needs of the industry and must be changed. Local energy systems have a direct impact on individuals, and it is the opportunity to improve people's lives that needs to be considered.

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

See answer to question 5

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 are always risks associated with change. However, the risks associated with failing to achieve the required outcomes are far greater.

The current regulatory framework encourages risk-aversion in network and system operation. Whilst that might be appropriate when the industry context is largely static, it has failed completely to engender the innovation that is necessary to decarbonise the energy system in the required timescales. The focus should move to managing rather than avoiding risks.

Framework model options for enduring arrangements

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?

The assumptions focus on managing conflicts of interest and ensuring co-ordination. Whilst these are important issues that require effective management, especially for planning functions, the core organisational challenge will be to create the appropriate culture that drives innovation and change in local market operation and consumer interface. The philosophy behind the 'interacting organisations' model, therefore, appears most relevant where a pro-innovation culture would be the most important competence to consider.

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.

A sub-variant of the 'interacting organisations' model, in which local network operation is merged with the operational functions of the Future System Operator appears to tackle the key requirements. It provides a clear point of interface for local authorities to develop coherent energy system plans and provides an institutional environment that can underpin radical and on-going reform in system operation in line with technical opportunities and the evolving needs of consumers.

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

There are two. Firstly, the need to create a strong political case to ensure appropriate legislation is passed – can this be incorporated into the current energy bill process? Secondly, regulatory processes need to be established that retain the highest standards of operational integrity whilst incorporating new technologies and updating markets.

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)?

Ofgem needs to fast-track the instrumentation of the entire network to ensure comprehensive and useable data is available on the system condition. This must be progressed alongside other recommendations of the Energy Digitalisation Task Force and completed during the RII0-ED2 period. Also, the reform electricity market arrangements (REMA) must implement a process that allows for on-going market development that facilitates increasingly granular markets (in space and time) and this must be linked to requirements on system operators to adopt new approaches including artificial intelligence to ensure they are consistent with market designs that meet consumer requirements.

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

Digitalisation will create a new paradigm for change in the sector, bringing it into line with the evolving needs of consumers. It will no longer be acceptable to constrain this process with prolonged industry change protocols. The governance structures under consultation must lay the foundations for more agile and dynamic change in the emerging digital era.

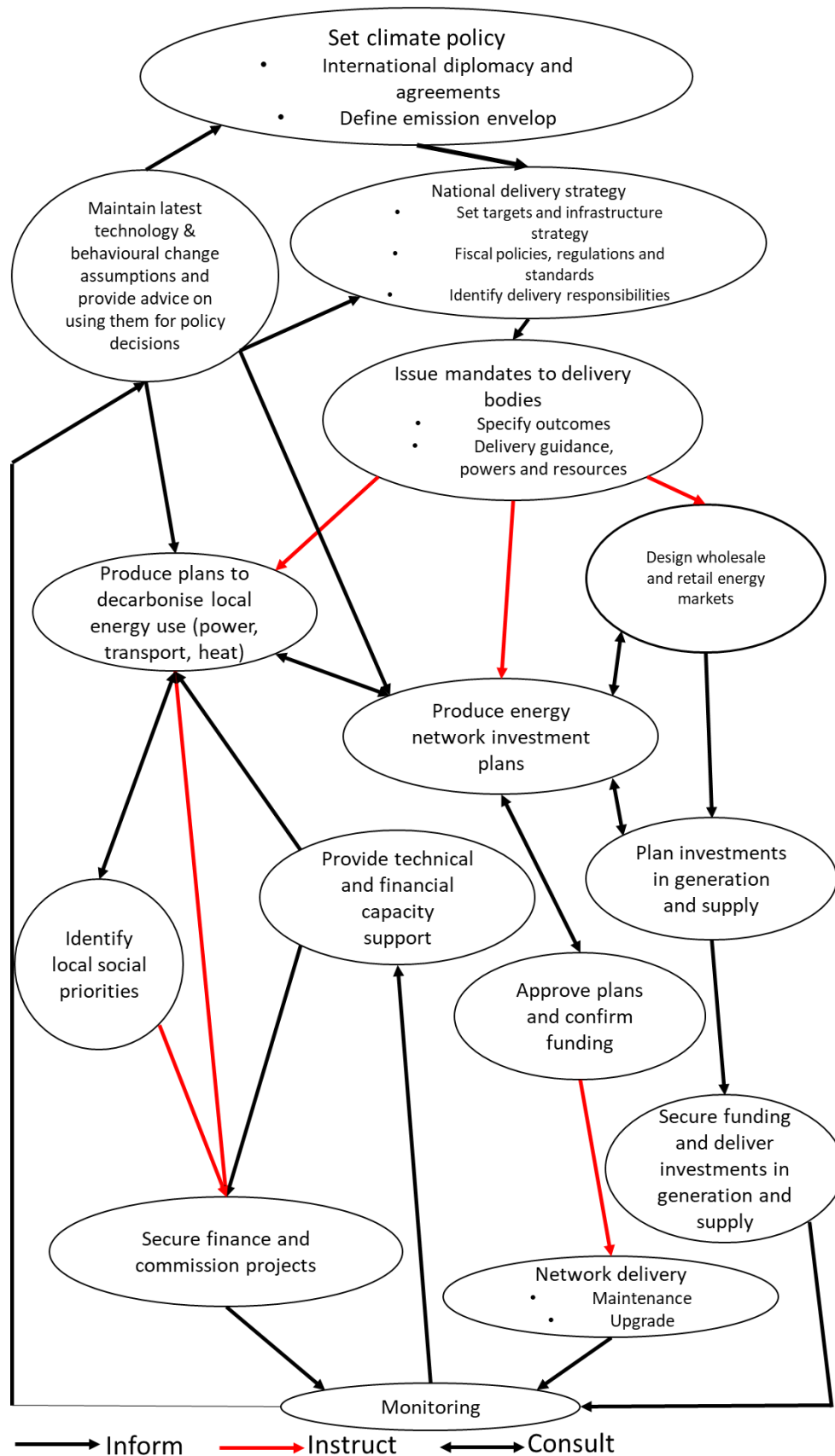
Next steps

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

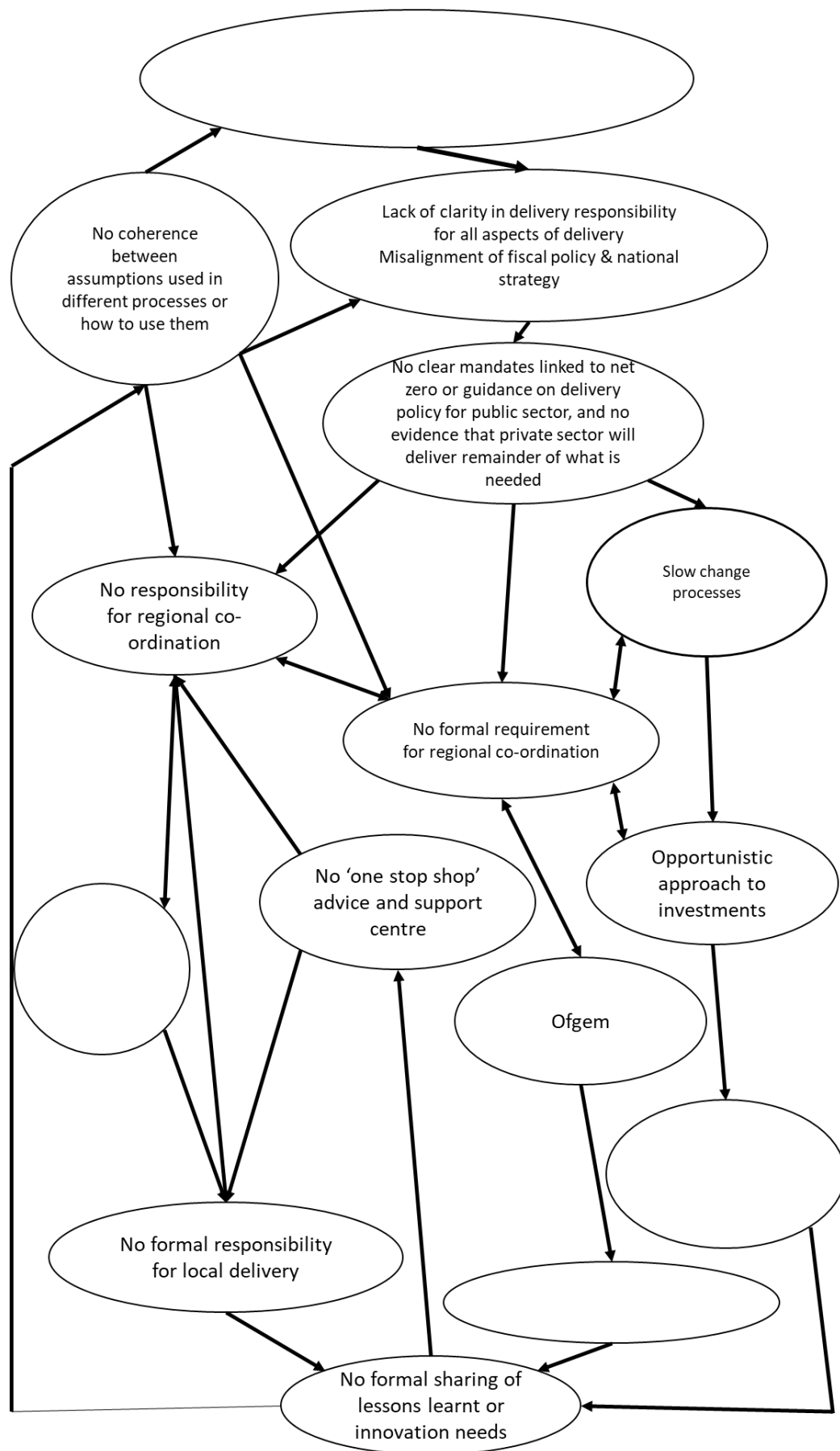
The Ofgem process must proceed at sufficient pace such that any requirements for legislative change can be included in the Energy Bill which was announced in the recent Queen's Speech. This suggests that Ofgem should aim to reach conclusions before end of this calendar year.

Appendix 1 – Delivery functions and gap analysis

Delivery functions



Gap analysis



Appendix 2 – Analysis of options to fill key gaps

Options to ensure local energy plans are produced and consistent with achieving net zero emissions by 2050:

- > Every local authority has statutory mandate to show how net zero energy will be delivered as part of local spatial planning based on methodology endorsed by BEIS
- > A new independent body is established with the mandate to ensure all local spatial plans deliver net zero energy (modelled on BEIS-led central heat network planning support team)
- > BEIS reviews and adjusts local spatial plans to ensure consistency with net zero energy
- > Ofgem and energy networks required to agree energy components of local spatial plans
- > No formal mandate, but Local Authorities encouraged to tackle net zero energy issues on basis of accessing delivery funding

Options to ensure that the energy measures included in the spatial plans are delivered on time:

- > Every local authority has statutory mandate to deliver local measures in line with net zero spatial plans
- > A set of delivery bodies are established to deliver key elements of net zero plans (e.g. heat pump deployment, hydrogen networks, EV charging network, heat networks)
- > No formal mandate, but Local Authorities encouraged to deliver measures on basis of accessing delivery funding and improving local amenity.

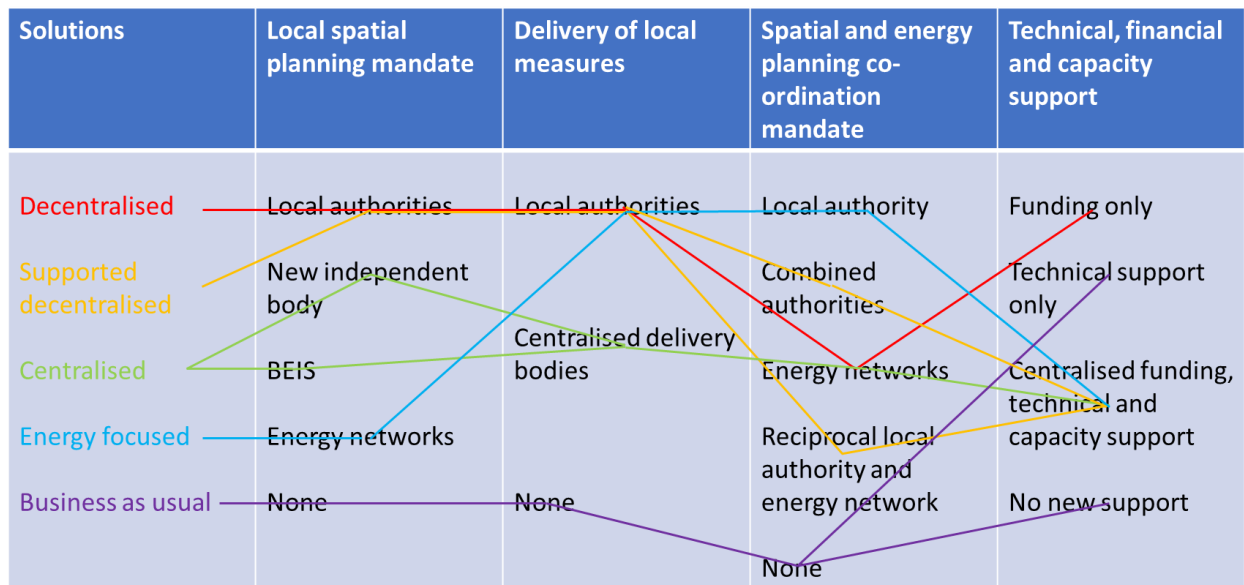
Options to ensure that the energy measures included in the spatial plans are consistent with regional and national energy network plans:

- > Local authorities required to ensure consistency with energy network plans as part of statutory mandate to deliver net zero energy as part of local spatial planning
- > Formal requirement for regional combined authorities to ensure consistency between local spatial plans and energy network plans
- > Ofgem required to mandate energy networks to ensure energy system plans support delivery of local spatial plans
- > Reciprocal requirement of local authorities and energy networks to ensure consistency between local spatial and energy system plans
- > No formal mandate, but Local Authorities and energy networks encouraged to work together to produce consistent plans

Options to ensure that local energy measures are planned and delivered to high quality using appropriate resources and up-to-date technical knowledge:

- > Local authorities provided additional funding which they can use to procure planning and delivery services from a range of consultancies and service providers
- > A new body established to provide technical assistance for planning processes
- > A new body established to provide a one-stop-shop of technical, financial and capacity support for planning and delivery processes
- > No additional funding or support – planning and delivery activities resourced from existing budgets

These options can be grouped together to create internally consistent policy approaches. This process is set out in the following table:



These options were analysed by a group of stakeholders³. This suggested that the ‘supported decentralised’ approach would be most effective in achieving the desired outcomes (see table below).

Solution	Does it address the problem?	Can it be delivered technically?	Can it be made politically attractive to Government	Total score
<i>Decentralised</i>	3.3	3.3	2.9	9.5
Supported decentralised	4.6	4.2	4.3	13.1
Centralised	2.1	3	3	8.1
<i>Energy focused</i>	3.1	3.5	3.3	9.9
Business as usual	1	1.2	2.6	4.8

³ Scored out of 5 against three criteria: addressing the problem, technical deliverability, and political attractiveness