Call for Input: Future of local energy institutions and governance

Subject	Details
Publication date:	26 April 2022
Response deadline:	7 June 2022
Contact:	Victoria Low, Head of DSO Governance
Team:	DSO Governance
Email:	flexibility@ofgem.gov.uk

Contents

Executive Summary

As we transition to net zero, we will see rapid decarbonisation and decentralisation of generation and demand. Transforming the ways in which we generate electricity, heat our homes and power our vehicles will require radical changes across the energy system, with particular focus on the electricity distribution system.

Electricity distribution network operators (DNOs) have been building capabilities in planning, operating and market facilitation of flexible resources to drive more efficient development and use of the decarbonising electricity system. These capabilities are currently referred to as Distribution System Operation (DSO) roles. However, other institutions also play a role in facilitating the energy system transition at a sub-national level, including Gas Distribution Networks (GDNs) and local government, including local and combined authorities as well as other supporting bodies.

As the energy system undergoes the unprecedented transition to net zero, it is imperative that key energy system functions are performed by institutions with the competence, appropriate skillset and incentives to drive net zero at least cost, and that there is clear accountability and coordination in the delivery of these.

This Call for Input begins our review into the effectiveness of institutional and governance arrangements at a sub-national level to support delivery of net zero at least cost, and the case for alternative approaches.

This review builds upon our joint commitment with the Department for Business, Energy and Industrial Strategy (BEIS) to ensure that arrangements governing the energy system are fit for purpose in the long term, as well as our more recent commitment to proceed with the creation of a Future System Operator (FSO) which, once established, will play a vital part in facilitating the net zero transition at national level.

In this Call for Input, we identify functions we consider are required at a sub-national level to meet evolving energy system needs. We establish criteria for assessing the effectiveness of current and planned future institutional and governance arrangements to support delivery of these functions and explore whether changes are needed for delivering cost effective net zero.

As part of this, we set out a case for change by articulating the challenges we see with existing, and planned future arrangements, which are summarised below:

- That there are institutional gaps and a lack of accountability in regard to the delivery of certain energy system functions;
- That even where there is clear accountability of roles and responsibilities, it is not clear that these are assigned to the institutions best placed to perform them in future; and
- That there is insufficient, or ineffective, coordination between actors across the energy system at a sub-national level, and that confusion and regional variance in approaches to delivering functions could delay the transition to net zero.

We set out some of the opportunities we see with changing institutional and governance arrangements, as well as some of the known key risks.

To facilitate input from stakeholders on the case for change and potential reform options, we include sample framework models for alternative arrangements. These sample models range from relatively small changes, such as governance reforms within existing institutions to drive effective delivery of energy system functions, to more significant reforms such as the creation of new institutions to deliver some or all functions. The sample models presented are not intended to be exhaustive of all possible reform options, but aim to stimulate a wider discussion with stakeholders about challenges presented by existing arrangements and how to best address them.

Some of the model options set out will not be in Ofgem's regulatory remit to deliver, or will require primary legislation. We recognise the importance of working closely with BEIS, the Department for Levelling Up, Housing and Communities (DLUHC), the Office for Zero Emission Vehicles (OZEV), Devolved Administrations as well as local government as we respond to the findings of this Call for Input and develop our thinking. Our proposals for taking this forward are set out in the 'Next Steps' section of this document.

We welcome input from stakeholders on the effectiveness of institutional and governance arrangements currently in place, whether we have identified the right challenges, as well as views on the sample framework models and any alternative suggestions. A summary of the Call for Input questions can be found in the Appendix.

1. Introduction

Background

1.1. The UK Government has set legally binding targets that mean the economy needs to reach net zero greenhouse gas emissions by 2050 ('net zero'), and in line with the recommendation from the Climate Change Committee ('CCC'), the Government is aiming for power sector decarbonisation by 2035. Delivery of these targets will require a transformation of the entire energy industry.

1.2. We are already seeing rapid decarbonisation and decentralisation of generation and demand in order to meet our net zero targets. However, transforming the ways in which we generate electricity, heat our homes and power our vehicles will require radical changes across the energy system.[1]

1.3. Strategic planning and effective coordination across the energy system can deliver significant consumer savings by making the most of available resources and technologies. The integration of distributed sources of generation, storage and flexibility can help to drive efficient network investment decisions and reduce costs for consumers. More broadly, the effective participation of distributed low carbon energy resources in local, and national, flexibility markets can help to keep customer bills as low as possible.[2]

1.4. Unlocking these benefits will require changes to the way the electricity system is planned and operated at all levels, but the particular focus of this publication is the distribution level. Whilst there is national ambition for electrification, changes will be needed locally to realise the ambition around electrifying heat and transport. These local developments are happening amidst uncertainty around the precise future roles of hydrogen, heat, Carbon Capture, Usage and Storage (CCUS) and gas networks. The difference between local needs and opportunities across Great Britain means that investments suitable in one area will be less appropriate in another. Given this, as well as region-specific drives

[1] In this Call for Input, we adopt a broad definition of the energy system: a system of interconnecting components that enables energy (e.g. electricity, gases and heat) to be produced and supplied to end-users in homes, businesses and industry. It includes production, conversion, trading, storage, transport, delivery and usage.
[2] We define flexibility as modifying generation and/or consumption patterns in reaction to an external signal (such as a change in price) to provide a service within the energy system.

to deliver net zero (e.g. regional net zero plans), decisions on how to best meet evolving system needs will need to be increasingly led by local actors.

1.5. Additionally, realising the benefits of flexibility will rely on effectively coordinated markets to provide signals that enable flexibility assets to be optimised across local, national (and European) systems. Underpinning all this, significant advancements in data and digitalisation will be needed as data sharing and open data standards will be a critical enabler of our achievement of net zero.

1.6. The electricity sector has taken steps towards delivering a local level net zero transition. At a sub-national level, electricity distribution network operators (DNOs) have been building capabilities in planning, operating and market facilitation of flexible resources to drive more efficient development and use of the decarbonising electricity system. These capabilities are currently referred to as Distribution System Operation (DSO) roles.

1.7. Other institutions also play a role in facilitating the energy system transition at a sub-national level, including Gas Distribution Networks (GDNs) and local government, including local and combined authorities as well as other supporting bodies.[3] The Electricity System Operator (ESO), which will transition to the FSO once established, will play a vital part in facilitating the net zero transition at national level.[4]

1.8. As the energy system undergoes the unprecedented transition to net zero, it is imperative that key energy system functions are performed by institutions with the competence, appropriate skillset and incentives to drive net zero at least cost, and that there is clear accountability and coordination in the delivery of these functions. The existing institutional landscape is complex, and it's not clear that current arrangements will deliver net zero at least cost.

[3] Supporting bodies include Local Enterprise Partnerships and Energy Hubs.
[4] We set out in our recently published consultation response that the FSO could be established by, or in, 2024, depending on a number of factors, including timings of legislation. Key priorities during this transition will be to avoid disruption to current energy system operation activities and to have a phased approach to implementation of any new roles. We acknowledge that a number of options in this document include potential new DSO roles for the FSO and, depending on which option is taken forward, we will be mindful of not overburdening the FSO too early. It will be important that the FSO has the time needed to develop its own culture, as well as recruitment policies and plans, to ensure it is appropriately resourced to perform further new roles as they arise. You can find the joint BEIS-Ofgem statement on FSO at the following link: https://www.gov.uk/government/consultations/proposals-for-a-future-system-operator-role/outcome/joint-statement-on-the-future-system-operator

Purpose and scope

1.9. The purpose of this Call for Input is to examine the institutional and governance arrangements needed to deliver the functions we consider are required at a sub-national level to drive the evolving energy system, in order to achieve a timely and cost effective net zero transition.

1.10. We think the right place to start is with the planning of the energy system at a sub-national level to drive the most cost-effective decarbonisation outcomes, and as part of this on the relationships between planning, markets and operation. We believe the electricity distribution system is a key starting point due to the clear changes in demand and generation we are seeing and will continue to see. However, in this Call for Input we acknowledge that changes to the electricity system will both drive and respond to changes in other energy systems, and we have widened our focus on planning to consider electricity, gas(es) and heat.

What we are calling for input on

1.11. In this Call for Input, we set out and seek input from stakeholders on:

- The energy system functions needed at a sub-national level to facilitate the transition to net zero at least cost and the criteria we consider need to be met for effective delivery of these functions;
- The suitability of current and planned institutional and governance arrangements for delivering these functions; and
- The opportunities and risks of change, and possible options for alternative arrangements.

How to respond

1.12. We want to hear from interested stakeholders. Please send your response to flexibility@ofgem.gov.uk by 7 June 2022.

1.13. We've asked for your feedback in each of the questions throughout. Please respond to each one as fully as you can. We will publish non-confidential responses on our website at www.ofgem.gov.uk/consultations.

1.14. In addition to publishing this Call for Input, we will also be conducting a programme of engagement through stakeholder workshops, to ensure we are gathering evidence and views from a range of stakeholders. See the 'Next Steps' section for more information on our plans for upcoming engagement.

Your response, data and confidentiality

1.15. You can ask us to keep your response, or parts of your response, confidential. We'll respect this, subject to obligations to disclose information, for example, under the Freedom of Information Act 2000, the Environmental Information Regulations 2004, statutory directions, court orders, government regulations or where you give us explicit permission to disclose. If you do want us to keep your response confidential, please clearly mark this on your response and explain why.

1.16. If you wish us to keep part of your response confidential, please clearly mark those parts of your response that you do wish to be kept confidential and those that you do not wish to be kept confidential. Please put the confidential material in a separate appendix to your response. If necessary, we'll get in touch with you to discuss which parts of the information in your response should be kept confidential, and which can be published. We might ask for reasons why.

1.17. If the information you give in your response contains personal data under the General Data Protection Regulation (Regulation (EU) 2016/679) as retained in domestic law following the UK's withdrawal from the European Union ("UK GDPR"), the Gas and Electricity Markets Authority will be the data controller for the purposes of GDPR. Ofgem uses the information in responses in performing its statutory functions and in accordance with section 105 of the Utilities Act 2000.

1.18. If you wish to respond confidentially, we'll keep your response itself confidential, but we will publish the number (but not the names) of confidential responses we receive. We won't link responses to respondents if we publish a summary of responses, and we will evaluate each response on its own merits without undermining your right to confidentiality.

2. Strategic energy context

Section summary

This section sets out the strategic energy context for our review of institutional and governance arrangements. It sets out the energy system functions needed at a sub-national level to deliver the net zero transition and outlines a set of criteria that we consider need to be met for these functions to be delivered effectively.

Questions for response:

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?

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

Energy system changes required to deliver net zero transition

2.1. The energy sector is undergoing rapid change, which will need to accelerate over the next decade if we are to be on track for delivering net zero. Consistently across all net zero compliant future scenarios,[5] we expect to see a rapid growth in electric vehicles[6] and heat pumps, as well as significant decarbonisation and decentralisation of energy generation.

2.2. On the supply side, cleaner energy sources are replacing today's fossil fuels. The Sixth Carbon Budget estimates that unabated fossil fuel generation will be phased out by the mid-2030s, and variable renewable energy will provide 80% of generation by 2050.[7]

[5] Scenarios and indicative pathways for how we reach net zero by 2050 are set out in the UK Government's Net Zero Strategy https://www.gov.uk/government/publications/net-zero-strategy

[6] We are already seeing significant growth in EVs. For example, figures from the IEA 2021 study show that global EV registrations rose in 2020 by 41%, despite overall car sales falling by 16% in the same year – Trends and developments in electric vehicle markets – Global EV Outlook 2021 – Analysis - IEA

[7] Sixth Carbon Budget - Climate Change Committee (theccc.org.uk)

2.3. On the demand side, decarbonisation will require changes across all sectors, particularly transport, buildings and industry. The UK government has set ambitious goals of ending sales of petrol and diesel cars by 2030 and deploying 600,000 heat pumps a year by 2028. The Sixth Carbon Budget sets out that with the anticipated growth of EVs and heat pumps, demand is likely to double by 2050 to 610 TWh.

2.4. Transforming the ways in which we heat our homes and power our vehicles to meet our net zero ambitions, in a cost effective way, will require fundamental changes across the energy system. To accommodate increased electricity demand, strategic investment in electricity network infrastructure will be needed, in particular at the distribution level. Flexibility could drastically reduce the amount of network infrastructure that will be needed, with the potential to save consumers between £6-10bn per year in 2050.[8] However, to reduce the burden of increasing demand and keep costs down for consumers, distributed low carbon assets will need to have routes to market their services.

2.5. The governing institutions of the system will need to adapt and evolve to support and enable the transition to net zero. BEIS and Ofgem recently committed to proceed with the creation of a FSO which, once established, will play a vital part in helping us deliver the required changes at national level. However, as set out in the Smart Systems and Flexibility Plan, we also need to ensure that institutional and governance arrangements at a sub-national level are fit for purpose to meet energy system needs in the long term.[9]

Energy system functions needed at a local level

2.6. In this Call for Input, we identify and define three energy system functions: energy system planning, market facilitation of flexible resources and real time operation of local energy networks. We also note a cross-cutting enabling function, digitalisation, which will be needed at a sub-national level to facilitate information flows and support the net zero transition.

[8] 2012 prices, Second Smart Systems and Flexibility Plan, Electricity System Flexibility Modelling Annex, Transitioning to a net zero energy system: smart systems and flexibility plan 2021 - GOV.UK (www.gov.uk)
[9] The joint BEIS-Ofgem Smart Systems and Flexibility Plan was first published in 2017 and updated in 2021. The 2021 Plan set out that network companies need to evolve to meet the challenges associated with an increasingly decarbonised system and we committed to undertaking a review of DSO governance arrangements - Transitioning to a net zero energy system: Smart Systems and Flexibility Plan 2021 (publishing.service.gov.uk)

Energy system planning

2.7. **Function description:** Energy system planning is the process of taking a forward look at the needs of the energy system and deciding what needs to be put in place to meet those needs. In this review, we focus on the planning of the energy system at a sub-national level to drive and support the most cost effective decarbonisation outcomes. We believe the electricity distribution system is a key starting point due to the changes in demand and generation we are seeing and will continue to see. However, we see that changes to the electricity system will both drive and respond to change in other energy systems, and so we consider planning across electricity, gas(es) and heat in scope.

2.8. **Why it is important:** There is a significant amount of investment across the energy system needed at a local level to deliver the changes needed to meet net zero.[10] Some of this investment will be directed through markets. However, to ensure we deliver our net zero targets efficiently, there is a need for coordinated energy system planning to inform the decisions on the most efficient long term investments.

2.9. **What effective delivery looks like in the context of the net zero transition:** Effective delivery means that planning is coordinated across the energy system both at a local level and nationally. This means that network planning both informs and is informed by wider energy planning activities (such as transport, gas, heat, hydrogen and CCUS), and that network planning is also coordinated between transmission and distribution.

2.10. **Institutions who perform this function currently:**

- DNOs undertake electricity network planning of their distribution areas, developing detailed network development plans to inform network investment decisions.
- GDNs have a similar responsibility to the DNOs for the gas distribution networks.

[10] UK100 and Siemens have estimated £100bn of local level investment by 2030 (up to around half the amount of investment needed in that time frame to meet net zero) - Accelerating climate action-NoN-Final-10th Nov.pdf (uk100.org)

- Several local government[11] institutions, including local authorities (LAs), (District, County and Unitary)[12] and Combined Authorities[13] undertake planning activities, ranging from project-specific planning to local energy plans (for example using local area energy methodologies),[14] to inform decarbonisation targets, prioritisation of activity and funding, and to inform other decisions such as where to locate heat networks.
- The ESO is developing holistic network plans for electricity and the FSO is expected to start taking on some roles for gas network planning. In both cases, these plans shape transmission network investments, delivered by the transmission networks.

Market facilitation of flexible resources

2.11. **Function description:** In this paper, we focus on the facilitation of markets used in distribution network management. Today, these markets are used to procure flexibility services to alleviate constraints and support restoration of electricity on the distribution networks, but this could evolve over time. Whilst we consider peer-to-peer and wholesale energy markets (including the balancing mechanism and other balancing services that ensure the security and quality of electricity supply across the GB transmission system) to be out of scope of this review, we do recognise the important links between these markets. We therefore consider the effectiveness of current and planned future institutional and governance arrangements to facilitate distribution flexibility markets, as well as test how well these arrangements are likely to be able to coordinate with other markets now and in the future.

2.12. **Why it is important:** At a national and sub-national level, flexible resources will be needed to alleviate pressure on electricity networks, maintain security and quality of service and to make better use of the variable renewable energy on our system. We know that increased system flexibility will provide significant reductions in costs to

[11] When we use the word local government in this document, we are referring to local and combined authorities, as well as the associated system of metro mayors.
[12] Local authorities hold wide ranging responsibilities, notably on strategic planning, housing, and local taxation, and are one of the few local actors to have a democratic mandate. They also undertake a number of different planning functions, including spatial and town planning, but these are not the focus of this review.
[13] These are supported by Local Enterprise Partnerships and Energy Hubs, who work to support investment and planning at a local/regional level.
[14] This is a recognised method, albeit with different methodologies and approaches to delivering it. Many, such as ESC, Arup, Carbon Trust and Innovate UK have worked on LAEP with local authorities. An example of one is Bury Council, who produced one in 2021 supported by Greater Manchester Combined Authority. They usually cover heat and transport, and focus on how to join-up to plan their transition in an optimised way.

consumers, and could save between £6-10bn per year in 2050.[15] At distribution level, distributed resources participating in markets to provide flexibility services in congested areas provide value in deferring and/or avoiding investment to when there is more certainty around network need. At the very local level, peer-to-peer trading may emerge to support local net zero ambitions. Collectively, these layers of markets create investment and operational signals for flexible resources, and we need these to be optimised across these layers. Effective delivery of market facilitation will help ensure owners of flexible assets receive the full value of the benefit they bring to the energy system, supporting investment where it is needed.

2.13. **What effective delivery looks like in the context of the net zero transition:** Effective market facilitation of flexible resources includes embedding simple, fair and transparent rules and processes for procuring flexibility services, that enable service providers to participate easily in different markets. Effective delivery also includes the provision of accurate, user friendly and comprehensive market information, that allows a diverse range of flexibility providers to respond to accurate market signals of system needs. Open and transparent markets, that are coordinated and mesh smoothly at all levels (e.g. across local, national and European levels) will drive the most efficient solution for the energy system, unbiased by commercial interests.

2.14. **Institutions who perform this function currently:**

- At a distribution level, DNOs facilitate flexibility markets for distribution network management.[16] DNOs have so far defined four products that manage congestion and restoration of power[17] and use third party platforms to advertise their needs under each of these products, then secure contracts, publish the outcome on their tenders and perform settlement. There are trials exploring how local government institutions and DNOs can better facilitate peer-to-peer markets run between local parties, not network operators. Some DNOs are also involved in innovation trials for near term markets to coordinate national and distribution needs in the very short term.

[15] 2012 prices, Second Smart Systems and Flexibility Plan, Electricity System Flexibility Modelling Annex, Transitioning to a net zero energy system: smart systems and flexibility plan 2021 - GOV.UK (www.gov.uk)
[16] DNOs began developing flexibility markets following Ofgem and BEIS's joint request in our Smart System and Flexibility plan Upgrading our energy system: smart systems and flexibility plan (publishing.service.gov.uk)
[17] The products have evolved under the ENA's Open Networks project, that was in part started to develop coordinated flexibility markets. See https://www.energynetworks.org/creating-tomorrows-networks/open-networks

- At a national level, the ESO procures services to balance real time demand and supply and to ensure the security and quality of electricity supply across the GB transmission system. The ESO, in its role as the Electricity Market Reform Delivery body, also administers key elements of the capacity market, including auctions.
- The majority of wholesale energy market trading is done ahead of time between suppliers and generators via over-the-counter trades, or through exchanges. Short term power trading takes place on two power exchanges, Nordpool and EPEX Spot.

Real time operation of local energy networks

2.15. **Function description:** At distribution level, this means managing electricity flows on the distribution network in real time, including through dispatching assets (i.e. issuing instructions for flexible assets to change behaviour to use more or less energy than they planned), either directly or via aggregators, who contract and manage multiple assets. In carrying out network operation, DNOs must consider the potential for distributed energy resources' (DER) to both cause and alleviate network constraints, which requires DNOs to have sufficient visibility of their networks. Similarly, GDNs and heat network operators safely manage their gas and heat networks, respectively.

2.16. **Why it is important:** Real time operation of distribution energy networks is key to ensuring network reliability and system stability. Increasing volumes of decentralised assets, such as small scale sources of generation and storage, have changed what used to be a simpler one way flow of electricity down to the end consumer. This means there is the need for more active management locally to maintain system stability and manage network congestion. Alongside coordinated security of supply responsibilities at a national level, local operation can help maintain functionality of the system and ensure sufficient capacity is available on the distribution network.

2.17. **What effective delivery looks like in the context of the net zero transition:** Wherever possible, assets need to do the 'right' thing at the right time. In addition to managing planned and unexpected technical issues on the network, any conflicts between market instructions or consumer choices need to be surfaced and dealt with and primacy rules must be in place, to allow dispatch instructions to be issued in a way

that supports overall system efficiency.[18] Effective delivery means the system will benefit from reliable, transparent operation with efficient decision making.

2.18. **Institutions who perform this function currently:**

- At national level, the ESO is responsible for balancing the National Electricity Transmission System (NETS) in a safe, reliable and efficient way. Alongside the real-time operation of the NETS, the ESO performs other key control centre functions including coordinating with other network operators on planning and operational decisions including outage changes, short-term energy forecasting, managing and sharing system data and information and restoration and emergency response and restoration.
- At distribution level, DNOs are responsible for operating the electricity networks, by managing real time flows to keep the lights on, accounting for planned and unexpected outages and capacity constraints using physical network and flexible resources. There is an increasing need for more active management of the network at smaller (household) voltage levels and to deliver this, the DNOs are increasing their operational network visibility and data availability, including their forecasting and reporting of expected and contracted flexibility needs. Similarly, GDNs and heat network operators safely manage their respective networks.

Enabler of the above functions: Digitalisation

2.19. All the complex decisions involved in our national progress towards net zero will be infinitely harder if granular data cannot be shared securely between parties. Digitalisation, in short, is a critical enabler of all the other functions and indeed of our achievement of net zero. This requires the urgent progression and/or adoption of consistent, open data standards and frameworks, with all participants recognising that their actions form part of a public good. It also requires a culture of 'openness' and

[18] For example, to meet a national system need, the ESO usually has multiple offers from resources across the country. It would be inefficient for the system overall if the ESO were to issue a dispatch instruction to a flexible resource that was connected in an already congested distribution area, if it had had the option to issue an instruction to a flexibility asset in another, uncongested area for a similar payment. Because the DNO in the congested area would have to take actions to manage the now even more congested area, costing consumers more through dual activity taken (by the ESO and the DNO), when a more efficient solution would have been for the ESO to just use a different asset in another, uncongested area, where no further action would have been needed by a distribution company.

sharing, based on the realisation that each participant's actions have a bearing on the assumptions, inputs and actions of others.

Criteria for assessing institutional and governance arrangements

2.20. In order to be confident these energy system functions will be delivered effectively, we need the right institutions to own them, and the right governance arrangements in place to support them. We examined national level governance arrangements in some depth when reviewing national energy system operation.[19] Criteria for that review reflected the criteria most appropriate to review the effectiveness of that institution. We set out below a similar set of criteria that we consider need to be met for effective delivery of functions at a sub-national level. Where these criteria differ from the national energy system operation review, it is because we are assessing the effectiveness of the delivery of functions by a number of institutions rather than by a single institution:

- **Accountability:** There needs to be clarity on the roles and responsibilities being performed by institutions, with recourse for non-delivery.

- **Credibility:** Institutions are both trusted and perceived to be credible in delivering their respective roles and responsibilities.

- **Competence:** Institutions have the necessary skills and competencies to deliver their roles and responsibilities effectively.

- **Coordination:** There is effective coordination between institutions (not just at a sub-national level, but also with institutions at the national level), supported by robust engagement with stakeholders. A key consideration for the effectiveness of coordination will be the extent to which information exchange is enabled or hindered to support delivery of the energy system functions.

[19] https://www.ofgem.gov.uk/publications/review-gb-energy-system-operation

- **Simplicity:** Institutional and governance arrangements are simple, such that stakeholders, such as market participants, can engage with a given set of arrangements.

3. Strategic case for change

Section summary

This section sets out our view of the suitability of current and planned institutional and governance arrangements and the key opportunities and risks associated with change.

Questions for response:

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?

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

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

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

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?

Status quo

DNOs performing DSO roles

3.1. In our 2019 Position Paper on Distribution System Operation (DSO), we described DSO as a set of functions and services which need to happen to run a smart electricity distribution network.[20] We recognised the value in DNOs developing DSO capabilities and driving progress in the short term, but set out our intention to review governance arrangements in future to ensure they were fit for purpose in the long term. We also set out that we did not consider that DSO would need to be performed by a single operator in future, but could be performed by a range of parties.

[20] Ofgem position paper on Distribution System Operation: our approach and regulatory priorities | Ofgem

3.2. For RIIO-ED2, we have established a number of expectations on DNOs in regard to delivering three DSO roles during the price control period (planning and network development, network operation and market facilitation).[21] One of these expectations is that DNOs will need to implement measures to mitigate actual and perceived conflicts of interest between delivering these DSO roles and its network ownership roles and other business interests. In our RIIO-ED2 Business Plan Guidance we set out that, at a minimum, these measures should include executive-level accountability and board level visibility of DSO decisions, clear and separate decision-making frameworks between DSO and DNO parts of the business, as well as independent oversight of systems and processes. We are currently reviewing DNOs' RIIO-ED2 Business Plans including evaluating the level of ambition associated with their proposals to meet our expectations. These measures are expected to be in place by the start of the RIIO-ED2 price control, on April 1 2023.

Relationship between DNOs and other actors

3.3. The DNOs have important and evolving relationships with other actors in the energy system to support the delivery of the DSO roles. One of these key relationships is with the ESO. For example, DNOs and the ESO have been working to improve coordination in the planning and operation of the electricity system across transmission and distribution levels, as well as in the coordinated development of markets.

3.4. DNOs have also been working increasingly with local government on their local area energy plans.[22] Some DNOs coordinate with their respective GDNs on the development of cross sector network plans, although this can be limited by the fact that their respective boundaries of their networks do not always overlap.

Suitability of current arrangements

[21] Our methodology decisions on DSO for RIIO-ED2 can be found in the Overview to our Sector Specific Methodology Decision, RIIO-ED2 Sector Specific Methodology Decision | Ofgem; The DSO baseline expectations are set out in our RIIO-ED2 Business Plan Guidance, RIIO-ED2 Business Plan Guidance | Ofgem.

[22] Whilst there is coordination between local government and GDNs/DNOs, the quality of this varies across the country. This is due to different local authorities having different capabilities and plans to engage with DNOs, as well as varying approaches taken by DNOs and GDNs about how they engage. This will need to be developed in the future.

3.5. In this section, we set out our understanding of the issues with existing institutional and governance arrangements, in which we include RIIO-ED2 and planned arrangements for the FSO.

Energy system planning

3.6. As described above, there are several actors currently carrying out some form of energy system planning at a sub-national level. In addition to the need for clear accountability regarding roles and responsibilities, and that they are assigned to institutions best placed to perform them, it is key that energy system planning is coordinated across institutions to drive the most cost-effective decarbonisation outcomes. By this, we mean that planning the electricity distribution network needs to take account of planning at transmission level, and vice versa, to ensure efficient network investment decisions. Additionally, coordinated network planning needs to both inform and be informed by wider energy planning activities at a sub-national level (such as gas planning (including hydrogen) as well as heat and transport). We think current institutional and governance arrangements present challenges to achieving effective energy system planning which drives the most cost-effective decarbonisation outcomes. These are set out below.

Competence and credibility:

3.7. Various actors carry out some form of energy system planning at a sub-national level. DNOs and GDNs plan the electricity and gas distribution networks, whilst several local government institutions undertake energy system planning activities, ranging from project-specific planning to local energy plans. As we transition to net zero, planning the future energy system will require a mix of technical skills as well as a democratic mandate, and it is key that planning roles and responsibilities are assigned to the institutions best placed to perform them.

3.8. Whilst local government institutions have a democratic mandate to carry out energy planning, and have shown clear ambition to do so, resource constraints as well as skills gaps have made this challenging, especially on technocratic elements. In turn, this impacts the ability of technical planning to inform democratic decisions, and vice versa, due to a lack of understanding of each other's work.

3.9. DNOs have this technical skillset, although we consider there are credibility challenges with DNOs carrying out certain planning activities. This is because DNOs could be, or are

perceived to be, conflicted in decision making between short-term flexibility deployment and long-term asset upgrades. For example, as asset owners and operators, DNOs may have an inbuilt technical and risk bias towards asset solutions, resulting in underutilisation of flexible solutions. Whilst both are needed, we need to consider whether existing arrangements provide DNOs with sufficient incentives to make efficient trade-offs between asset and non-asset based solutions.

Accountability and coordination:

3.10. Local actors have different mandates and priorities, for example network companies plan to deliver safe, reliable, and efficient networks, whereas different local government institutions will consider the needs and opportunities in their area and plan accordingly. As a result of these mandates and priorities, planning activities are carried out in different ways, to different ends.

3.11. As we transition to net zero, coordination of these various actors across different planning activities will be increasingly important to driving efficient outcomes. For example, the timing and detail of any electricity network investment will be critical, and planning decisions will increasingly rely on active consideration of system interactions between energy vectors at a local level. At the moment, a local authority could be subject to large connection charges for a heat pump project, due to network constraints. If energy system planning was effectively coordinated, it may have been possible for this constraint to be avoided.

3.12. Whilst there is evidence of some coordination between distribution and transmission network planning, as well as between some networks and local authorities, we think there is significant room for improvement.[23] Even where there are efforts to deliver coordinated energy planning, this often lacks consistency, in terms of methodology and approach. We consider this could lead to sub-optimal outcomes or at least make it more difficult to consider different plans in a consistent way in order to determine most efficient outcomes. Whilst there can be credible reasons for planning approaches to differ, for example due to variation in local policy, industry and geography between different parts of local government, we consider there are areas where there should be

[23] The future of Local Area Energy Planning in the UK - Energy Systems Catapult
Look before you LAEP: Ending the postcode lottery of local area energy plans - Citizens Advice

a commonality of methodology and approach. One area where there have been efforts to provide more consistency, particularly around methodology, is Local Area Energy Planning (LAEPs).[24]

3.13. Within this landscape, there is the challenge of deciding who is accountable for ensuring consistency in methodology and approach, as well as for ensuring there is effective coordination between actors to deliver efficient planning outcomes overall. BEIS, with Ofgem input, has been looking to understand the opportunities and challenges present in existing policy in driving accountability and coordination.[25] Similarly, stakeholders such as Energy Systems Catapult (ESC) have continued development of methodologies for LAEP in collaboration with local actors, to provide more consistency. Moreover, devolved administrations have shown considerable ambition, particularly through target setting, and working with local government in a hands-on way to develop plans and give advice.[26,27]

3.14. Whilst progress is being made to improve consistency in planning approaches and coordination across actors at a sub-national level, it's important to consider whether changes to institutional and governance arrangements could help achieve this. For instance, we should consider whether lowest cost outcomes could be better achieved if one actor with sufficient breadth and scope led the coordination of energy system planning at sub-national level, and informed other actors' work or could the same be achieved by existing actors streamlining planning and being clearer about how they all fit together and how they will support each other. This discussion must include how those with a democratic mandate interact with more technocratic aspects of planning.

[24] In 2020 Ofgem commissioned the Centre for Sustainable Energy and Energy Systems Catapult (ESC) to produce a LAEP methodology, particularly to outline the key elements of a successful LAEP. This was included in our ED2 Business Plan Guidance as a reference for DNOs. Similarly, ESC and others continue to develop methodologies for local authorities to follow for LAEPs.

[25] BEIS, with Ofgem input has been looking to 'develop a better understanding of the opportunities and challenges presented by local area energy mapping and planning (LAEMP) and considering the most appropriate policy options to take forward'; Net Zero Strategy, pg. 266 - net-zero-strategy-beis.pdf (publishing.service.gov.uk). There is also work underway to introduce heat network zoning policy, which will see a zoning co-ordinator at the local level establish zones; Heat network zoning (publishing.service.gov.uk)

[26] The Scottish Government introduced Local Heat and Energy Efficiency Strategies (LHEES) with the LHEES Order (SSI) being laid in the Scottish Parliament on Friday 11 March 2022. If the order progresses through the Scottish Parliament, it will come into force in May 2022 placing a statutory duty on local authorities to develop LHEES Strategies and Delivery Plans in line with the 2023 commitment.

[27] Similarly, Welsh Government has completed a series of Regional Energy Strategies and have now set the commitment to create a national energy plan by 2024 as well as Local Area Energy Plans in local authorities by the end of 2023-24. 42949 Second All Wales Low Carbon Delivery Plan (2021-2025) (gov.wales)

Market facilitation of flexible resources

3.15. Whilst DNOs facilitate flexibility markets for the provision of local constraint management services at a distribution level, the ESO runs flexibility markets to manage the flow of energy on the transmission network to ensure security and quality of energy supply, and also procures services to balance demand and supply. We think open and transparent flexibility markets that are unbiased by commercial interests are key to driving the most efficient solution for the energy system. To achieve this, we also consider that markets must be coordinated smoothly (i.e. across local, regional, national levels). We see challenges around credibility, coordination and simplicity as set out below.

Credibility:

3.16. Rapid growth in volumes of procured flexibility by DNOs over the last couple of years has been a positive development. At the moment, though, volumes are still small in absolute terms. As we transition to net zero, the growth of these markets may be hindered if DNOs continue to perform the market facilitation role as they currently do. It would require a step-change in their expertise in market design and operation, areas in which others already have significant experience (for example the ESO). In addition, existing DNO flexibility markets fill near and longer term expected needs and whilst they do not yet offer within-day or real time products, some trials have started. It is not yet clear whether there will be enough liquidity in very localised markets to enable real time trading to meet the needs of the distribution networks. But if there is, facilitating real time markets would require even more investment in skills and resources, and more work would also be needed to seamlessly mesh these with other markets operating in real time. While these skills may be acquired, we need to consider whether DNOs will transition quickly enough or if another body would be better placed to facilitate efficient flexibility markets.

3.17. Additionally, potential providers of flexibility may not have confidence that there will be a secure revenue stream from DNO markets if they perceive there to be a conflict where DNOs would prefer traditional network solutions over flexible ones. Trust is the foundation of any market arrangement, and any conflicts could limit the growth of efficient flexibility markets. Even the perception of conflicts has the potential to lower stakeholder confidence and discourage participation. If there is not enough participation to secure the level of flexibility to meet the needs of the network, the DNO would have to meet the need through traditional network solutions when it is less efficient to do so.

Coordination:

3.18. For multiple markets to flourish in the future there must be consistent, standardised, open and near real time sharing of any non-commercially sensitive data, and low market access costs. Both the ESO and DNOs have obligations to develop coordinated markets. The work in the ENA Open Network's project has facilitated good coordination in a number of areas.[28] But there remains a number of areas where full coordination still needs to be achieved. There is a risk that respective system operators (DNOs and ESO) may give priority to the development of their own flexibility markets to meet their needs more quickly or maximise their revenue, without sufficient sharing of information or coordination with other markets. As well as resulting in inefficient outcomes for the system, a lack of coordination across markets could preventing them from easily participating across multiple markets and stacking value, which would limit their ability to receive their full value to the system. This could limit much needed investment.

Simplicity:

3.19. Overall, issues around credibility and a lack of coordination between markets means the landscape is complex and not simple for market participants and other users.

Real time operation of local energy networks

3.20. At a national level, the ESO balances the NETS in a safe, reliable and efficient way; and is responsible for making sure enough power is generated overall to keep the system running at 50Hz. At distribution level, DNOs are responsible for operating their networks, by managing real time flows to keep the lights on, accounting for planned and unexpected outages and capacity constraints using physical network resources and flexible resources. Additionally, GDNs and heat network operators manage their respective networks. We recognise that coordination between vectors in real time may become more significant.

Competence and credibility:

[28] Open Networks: developing the smart grid - Energy Networks Association

3.21. DNOs have traditionally developed skills in deploying and maintaining critical physical infrastructure and managing the secure operation of the physical network directly. In future, system operation will likely look and feel very different. Whilst continued deployment and maintenance of physical infrastructure will be key, a decentralised energy system may also require the secure digital and active integration of complex software systems for the provision of new services, to be operated by third parties such as aggregators and demand-side response companies. There are likely to be large numbers of these institutions, bringing together large numbers of diverse low voltage assets that are individually almost impossible to inspect (unlike today's asset fleet). For DNOs to manage and operate the distribution system in the future, in a safe and secure way, they will likely require significant investment in skills and resources.

3.22. There is also the potential issue that DNOs could be, or be seen to be, conflicted in performing the operation role with regard to issuing efficient dispatch instructions, given that these would be considered against traditional network solutions.[29]

Coordination:

3.23. Operational coordination will be critical. There may be a risk of inefficient or opposing instructions to flexible assets or aggregators from national and local markets, particularly if there is secondary trading. If not effectively and quickly deconflicted, this may lead to system inefficiencies that in turn result in consumers paying more than would have been necessary if whole system needs had been taken into account. Whilst DNOs are building capabilities to deliver DSO roles, and the ESO markets are evolving to meet future national system needs, we need to be sure that they can transition quickly enough – with the right resources and skillsets – to deliver the proactive and coordinated systems management needed. In future, cross-vector operation coordination may emerge as an increasing issue depending on the routes the energy system goes down.

Opportunities of change

3.24. This review of institutional and governance structures provides the opportunity to secure clear accountability for energy system functions at a sub-national level and ensure that

[29] For example, a DNO employing flexible assets that may have been more efficient in meeting a national need as other options were more expensive, even taking into account the DNO's actions.

roles and responsibilities are assigned to the actors who are best placed to perform them. It allows us to consider reform options that include improved facilitation of information exchange and improved coordination between actors, the opportunity to reconsider roles and responsibilities of these functions as currently scoped, but also to redraw the boundaries for roles and responsibilities in a way that maximises synergies between functions to achieve the best outcomes for consumers and deliver cost effective net zero.

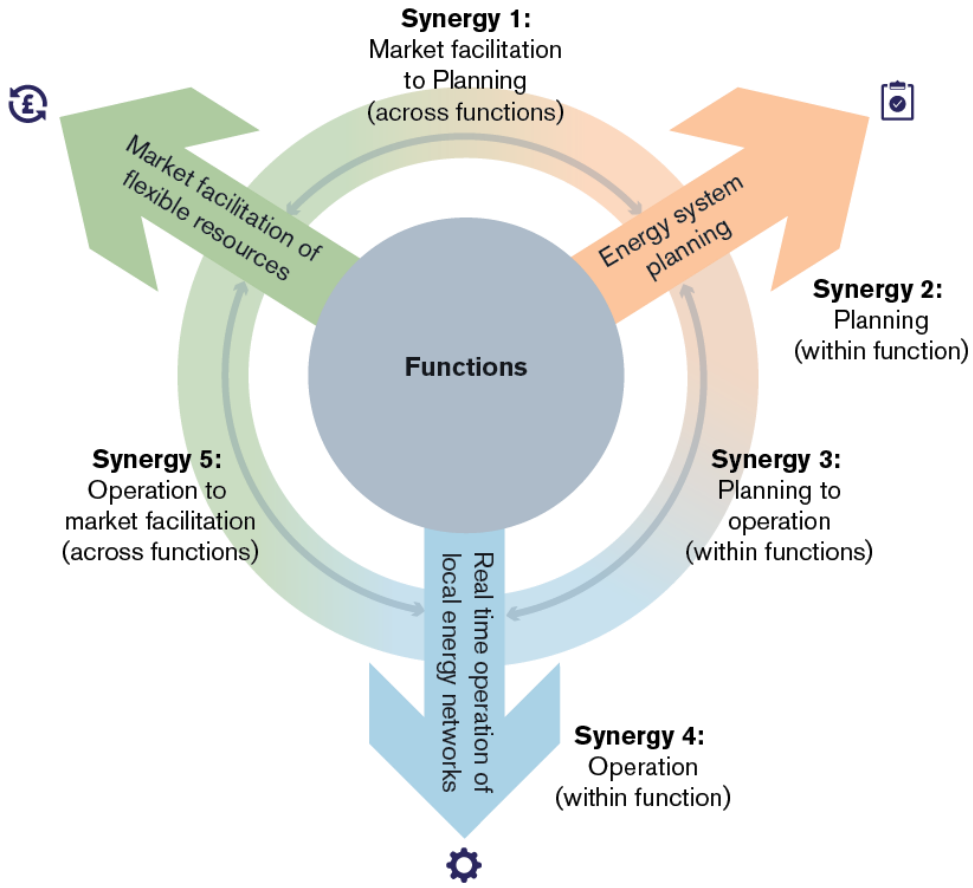
Maximising functional synergies

3.25. The three energy system functions which are the focus of this Call for Input are closely related to each other. We consider it important to identify and recognise the synergies that exist both within and across these functions, to understand how and where to best draw lines in regard to roles and responsibilities.

3.26. In considering reform options, we should look to maximise these synergies. For example, where there are within-function synergies, these should either stay together (if they currently sit together, under one institution's roles and responsibilities), or if not currently together, bringing these activities together should be a key consideration in developing reform options. Alternatively, we should consider where synergies can be maximised by ensuring there is effective information exchange and coordination between actors. We have to accept that bringing all synergies into one organisation may create something that is unwieldy and tries to combine an unrealistic combination of roles and skills.

3.27. Figure 1 sets out some of the synergies we have identified.

Figure 1: Summary of functional synergies within and across functions.



- **Synergy 1 – Market facilitation and planning (across functions):** Planning decisions will need to trade-off between flexible and traditional network solutions, and decision makers will need to actively consider the opportunities provided by flexibility, both historically and in the future. This will also help with forecasting what flexible resources are required in future.

- **Synergy 2 – Planning (within function):** We identify synergies within the planning function, although the activities within this function are currently spread across different institutions. We think there could be a case for bringing these activities together under one institution's roles and responsibilities, or to at least ensure effective information exchange and coordination between actors.

- **Synergy 3: Planning and Operation (across functions):** There is a feedback loop between what has been operationally possible, what issues have arisen, and what is needed in the future to manage potential future operations.

- **Synergy 4 – Operation (within function):** As the use of flexible resources to manage the network grows, the operations role will include more dispatching of flexible resources, with digital and software-based interfaces, as well as the traditional activities DNOs perform in maintaining critical physical infrastructure and managing secure operation.

- **Synergy 5 – Operation and Market facilitation (across functions):** Decisions around the design of flexibility markets need to consider potential changes required for efficient operation of the energy system. This will ensure that flexibility markets are set up to ensure any near real time or planned changes in energy requirements are delivered. Operational decisions need to take into account and be coordinated with actions taken on flexibility markets at all levels, including at distribution and national level.

Risks of change

3.28. The opportunities of any institutional and governance reform need to be weighed up against the risks. A key risk to consider is that any change to current arrangements in place will have significant time and resource implications. Given the urgent need to decarbonise and deliver the net zero transition, time and resource will be a key factor in any decision to proceed with change.

Differences between transmission and distribution level reform

3.29. Reforming institutions and governance at distribution level would not be akin to the changes implemented at transmission level, i.e. the legal separation of the ESO from National Grid Electricity Transmission (NGET) and the subsequent decision to create an FSO. For the ESO and NGET, for example, there was already a clearly defined system operation section in National Grid's electricity transmission licences. The system operation section was ring-fenced and run separately as there were multiple transmission operators (TOs) but only one system operator (SO). An SO-TO code was in place to govern interactions between the system operator and transmission operators. When legal separation was implemented, the dedicated system operator section of NGET's licence was transferred to only apply to the legally separate ESO and some additional separation measures were taken at NGET and the ESO. In practice there were

largely housekeeping or minimal structural changes to licences and industry flows of information.

3.30. At distribution level, there is not currently an equivalent separation in the licences for system operator activities, and no industry flows of information directed to a 'system operation' function specifically at distribution level. Given this, there would need to be significant changes made not only to DNOs as institutions – structurally, financially, and in licences - but all through the industry, for example to redirect flows of information, create new industry codes, etc. Additionally, all participants of the energy industry would need to change systems to accommodate any new entity, which would have both cost and time implications. As a result, separation of system and network functions at distribution level will take longer and be more expensive than at transmission level.

3.31. Additionally, a new regime of regulation would need to be implemented to price control any new entities. Separate cost reporting for the ESO and NGET was already in place and well established prior to legal separation. Whilst more separate cost allocation and specific incentives is something we are introducing for DSO in RIIO-ED2, the costs and incentive drivers are significantly less well understood and developed at distribution level than it was at transmission level.

Risks of change highlighted through DNOs' Request for Information (RFI) responses

3.32. In December 2021, we issued a Request for Information (RFI) to DNOs with the aim of developing our understanding of the changes that would be required to deliver DSO roles under different governance arrangements and the associated implications.[30] In their responses, DNOs identified a number of key risks associated with implementing changes, a summary of which we provide below.

3.33. Similar to above, the DNOs noted that change can be disruptive and costly, and that implementing significant changes to DSO governance arrangements could result in distractions and delays to the delivery of net zero.

[30] The different governance scenarios set out in the RFI included a range of different conflict mitigation options (including full ownership separation) which would introduce varying degrees of separation of the DSO function from the DNO.

3.34. DNOs also noted more specific risks associated with change. They noted that separation of DSO roles from the DNOs would likely result in increased costs through the duplication of some functions and services and loss of operational efficiencies. Additionally, depending on the specific reforms that are considered for implementation, there is the risk of misaligned incentives and the creation of conflicts of interest. Another specific concern noted by DNOs was that separation of DSO roles from the DNOs could lead to uncertainty of responsibilities that could result in operational failures and affect network reliability, which could lead to potential safety risks. The DNOs also noted that there may be increased engagement complexity for stakeholders where separation means that they need to engage with more than one organisation, which may result in decreased customer satisfaction.

3.35. Finally, DNOs noted that the number and magnitude of risks increased with the degree of separation of DSO roles from the DNO. Whilst we didn't ask DNOs to comment on whether risks were more relevant to some DSO roles than others, some DNOs noted that greater DSO-DNO synergies existed in the operations and planning roles.

4. Framework model options for enduring arrangements

Section summary

This section sets out four distinct, high level framework models for enduring institutional arrangements. This section includes a high level description of each framework model, its key features and how it seeks to address the issues raised in relation to existing arrangements.

Questions for response:

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?

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.

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

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)?

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

Framework models for enduring arrangements

4.1. This section sets out four sample framework models we have developed for alternative institutional and governance arrangements, the key features of each model and how it seeks to address the issues raised in relation to existing arrangements. Each framework model focuses on an institution, or a set of institutions, to deliver the energy system functions we have identified, and includes the relationship between other relevant institutions. Each framework model is supported by a figure which provides a high level illustration of the functions each institution could perform, and how institutions could interact with each other.

4.2. The framework models presented are not intended to be exhaustive of all possible reform options, and the models themselves contain multiple possible variations. The aim of the models is to provide a basis for further engagement, to make discussion around potential options for reform tangible and encourage input and views from stakeholders. We want the framework models to help us understand the kinds of changes that will best meet the success criteria we have outlined, whilst identifying and minimising risks.

4.3. Table 1 provides a summary of the four framework models we have developed including:

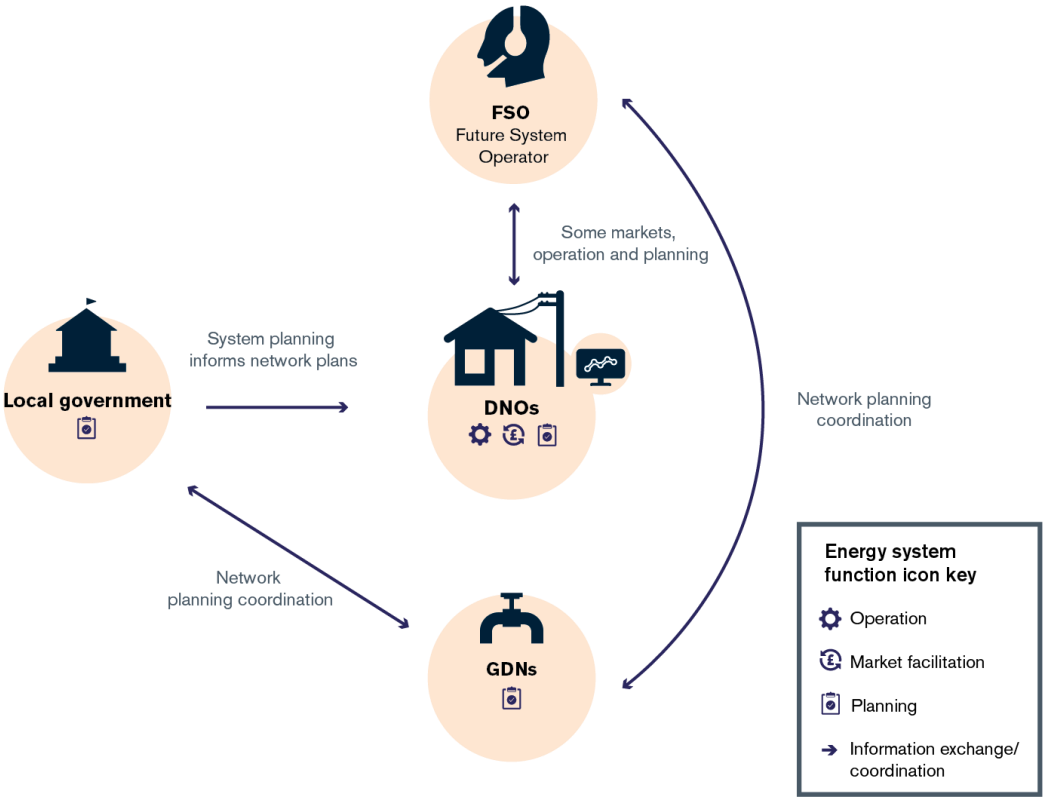
- Potential roles and responsibilities of the institution(s),
- Potential key features including geographic scale, vector coverage and ownership status of the institution(s),
- Key assumptions made in developing the framework model; and
- Ease of implementation of the framework model, which reflects the degree to which the option is in Ofgem's control to implement.

Table 1: Summary of potential framework model options

	Internal separation of DSO* roles within DNOs*	**Independent Distribution System Operator(s) (IDSO)**	**Regional System Planner and Operator(s)**	**Interacting organisations**
				
Roles	DNOs continue to perform all DSO roles	New independent institutions take on some of or all DSO roles	New regional institutions take on some of or all DSO roles as well as wider cross vector planning roles	Roles are dispersed to create the clusters with the strongest functional synergies and existing core competencies
Features	Geographical scale: DNO Vector coverage: Electricity Ownership: Private	Geographical scale: Regional Vector coverage: Electricity Ownership: Public or private	Geographical scale: Regional Vector coverage: Energy system planning across electricity, gas and potentially other vectors eg heat Ownership: Public or private	Geographical scale: National, regional and/or DNO Vector coverage: Energy system planning across electricity, gas and potentially other vectors eg heat Ownership: Public and/or private
Key assumptions	• Three DSO roles are inextricably linked and must be performed by one electricity body • Potential conflicts mitigated by internal governance measures • Coordination takes place between institutions	• Some or all DSO roles are inextricably linked and must be performed by one electricity body • Independence of DSO from DNO is necessary to mitigate potential conflicts of interest • Coordination takes place between institutions	• DSO roles need to be carried out by a separate body to manage potential conflicts of interest • There is a case for integrating planning across energy vectors at a sub-national level	• Roles are most effectively delivered when within-function synergies are maximised, and assigned to the institution(s) with the competencies to deliver them.
Ease of implementation	High to medium – Ofgem is able to deliver changes, in coordination with DNOs	Medium – requires primary legislation	Low – would require primary legislation and significant changes to electricity and gas networks, and roles of local government	High to low due to possible sub-variants. A 'base' model could assign roles without establishing new institutions, and would be fairly simple for Ofgem to implement. Alternatively, the creation of new bodies would require primary legislation

Framework model 1 – Internal separation of DSO roles within DNOs

Figure 2: Internal separation of DSO roles within DNO



Key features

4.4. High level model description: Under this model, the DNOs would continue to carry out the DSO roles with potential conflicts of interest mitigated by internal governance measures. We expect this would include internal separation of the DSO function, such as through the separation of people, processes and systems, or even separate licensing of DSO activities (i.e. a separate DSO function within the same DNO parent group).[31] By introducing separation measures, this relatively 'low-change' model focuses on improving the credibility and transparency of the DNO delivering the DSO roles. This

[31] For the purposes of this Call for Input, we use the terms separate licensing and legal separation interchangeably.

model can be seen as an extension of the internal separation measures being implemented by DNOs for the RIIO-ED2 price control period.

4.5. Geographic scale: Under this model, the DSO function would cover the same geographic scale as the DNOs do under existing arrangements.

4.6. Roles and responsibilities:

- Market facilitation: The DSO function within the DNO, or legally separate DSO, would be responsible for the development of distribution flexibility markets and would need to coordinate with the ESO/FSO to ensure distribution markets work alongside, and mesh with, national markets.

- Operation: The DNO would be responsible for maintaining network reliability and ensuring safety of the system. The DSO function within the DNO, or legally separate DSO, would be responsible for monitoring the distribution system for emerging network constraints and managing constraints by dispatching or curtailing assets and coordinate with the ESO/FSO where appropriate.

- Planning: The DSO function within the DNO, or legally separate DSO, would be responsible for long term planning of the electricity network. Energy system planning would also continue to be carried out by GDNs, the ESO/FSO and local government. Coordinated energy system planning would rely on effective join-up of institutions (DNOs, GDNs, the ESO/FSO and local government).

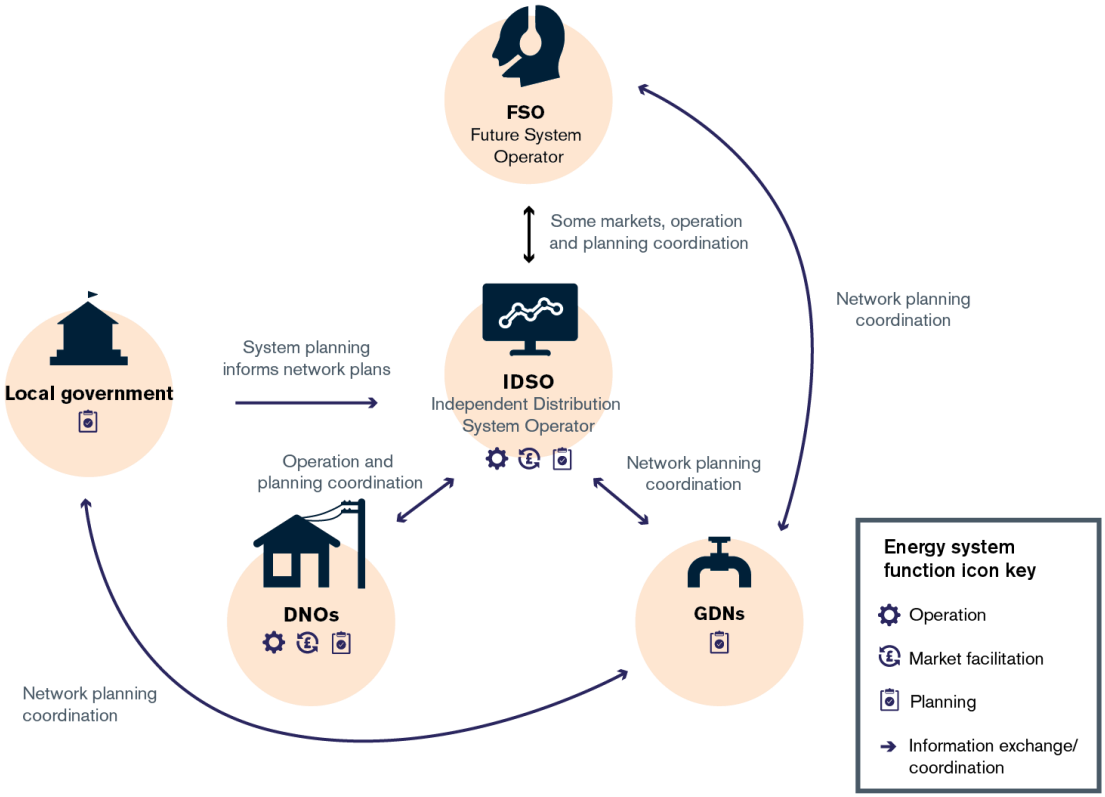
4.7. Ownership: Under this model, the ownership of DSO continues to sit within the DNO parent company.

4.8. Assumptions: This model assumes that 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.

4.9. Ease of implementation: Incremental internal separation of DSO roles from DNOs is within Ofgem's powers to implement, and Ofgem could also implement legal separation and separate licensing of DSO roles, in coordination with the DNOs.

Framework model 2 – Independent Distribution System Operator(s) ('IDSOs')

Figure 3: IDSO(s)



Key features

4.10. High level model description: Under this model, fully Independent Distribution System Operator(s) ('IDSO(s)') are established, which perform some of or all of the DSO roles currently performed by the DNOs. This model goes further than any internal (including legal) separation of the DSO function from the DNO in framework model 1 by requiring separate parent company ownership.

4.11. Geographic scale: We have not set out how many IDSO(s) there could or should be, although we consider this could be a regional body. There could be more than one IDSO per DNO region or there could be geographic synergies with one institution (or part of the ESO/FSO) serving as much as the whole country if the data existed for them to do so.

4.12. Roles and responsibilities:

- Market facilitation: The IDSO(s) would be responsible for the development of flexibility markets for their geographic region, and would need to coordinate with the ESO/FSO to ensure markets work alongside, and mesh with, national markets.

- Operation: The DNO would continue to be responsible for maintaining network reliability and ensuring safety of the system. The IDSO(s) would be responsible for monitoring the distribution system, across their geographic region, for emerging network constraints and managing constraints by dispatching or curtailing assets and coordinating with ESO/FSO where appropriate.

- Planning: The IDSO(s) would be responsible for long term planning of the electricity network. Energy system planning would also continue to be carried out by GDNs, the ESO/FSO and local government. Coordinated energy system planning would rely on effective join-up of institutions (DNOs, GDNs, the ESO/FSO and local government).

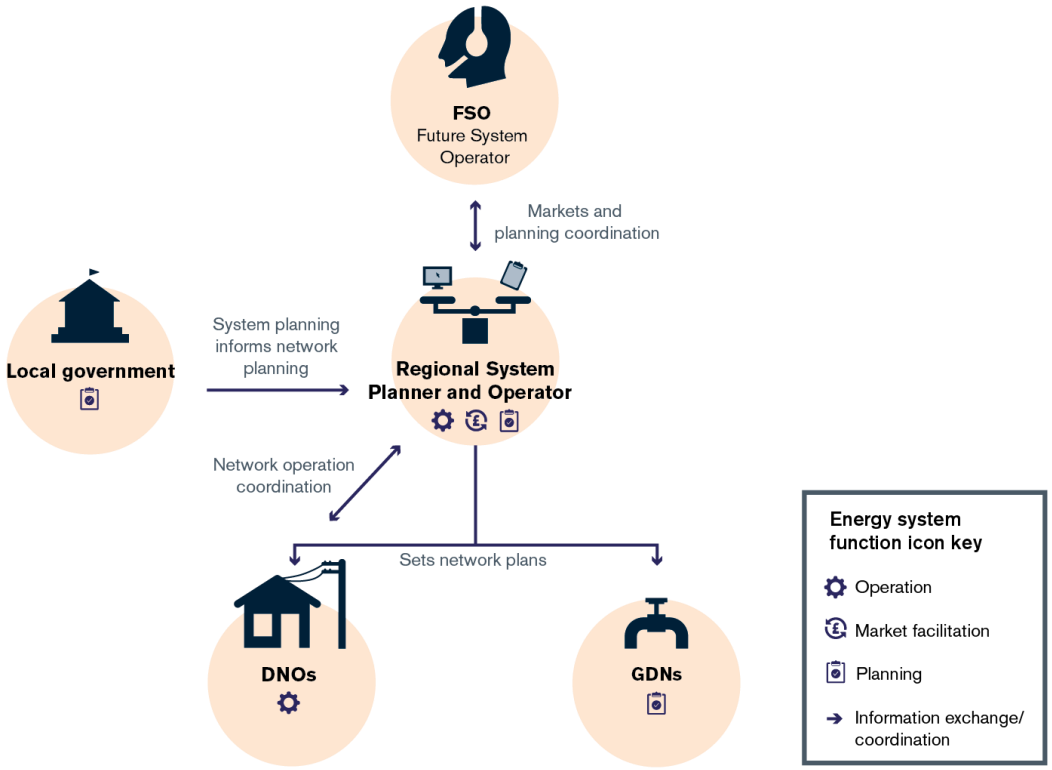
4.13. Ownership: IDSO(s) could be either public or privately-owned. The IDSO(s) would have independent ownership and governance from the DNO.

4.14. Assumptions: This model assumes that the 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.

4.15. Ease of implementation: Establishing IDSO(s) as new and separate entities would require primary legislation. Implementation of this model could, but would not necessarily need to, follow sequentially from the implementation of model 1, whereby the separately licensed DSO activities are transferred to the newly established IDSO(s).

Framework model 3 – Regional System Planner and Operator(s)

Figure 4: Regional System Planner and Operator(s)



Key features

4.16. High level model description: Under this model, new regional bodies, Regional System Planner and Operator(s), are established to perform the three energy system roles, with a broader vector coverage for planning. This would include taking on DSO roles of flexibility market facilitation and parts of the operation role, as well as whole-system regional energy planning (including electricity and gas).

4.17. Geographic scale: We have not set out how many Regional System Planner and Operator(s) there should be, but consider their geographic scale could be established taking account of electricity distribution licence areas, gas distribution licence areas and potential local government boundaries, to facilitate coordination.

4.18. Roles and responsibilities:

- Market facilitation: Regional System Planner and Operator(s) would become responsible for flexibility market development across its geographic region.

- Operation: The DNO would continue to be responsible for maintaining network reliability and ensuring safety of the system. A Regional System Planner would be responsible for monitoring the distribution system, across its geographic region, for emerging network constraints and managing constraints by dispatching or curtailing assets and coordinating with ESO/FSO where appropriate.

- Planning: The Regional System Planner and Operator(s) would develop regional energy system plans (potentially based on local energy plans from local government) and ensure integrated network development plans for both electricity, gas and potentially other energy vectors (e.g. heat). It would consider inputs across energy vectors at a sub-national level, taking account of national goals with authority to define what is needed where, across gas, electricity and potentially heat, setting this out for network operators. Local government could be involved in providing some democratic oversight of the regional energy plans. Whilst the Regional System Planner and Operator(s) could take a stronger more strategic role in planning the system at a regional level, Ofgem would remain the ultimate decision-maker on network investment plans submitted through price control processes.

4.19. Ownership: The body would be independent from the DNOs and GDNs, could be publicly or privately owned and could include representation from local government.[32] The Regional System Planner and Operator(s) could be part of the ESO/FSO, or a separate entity.

4.20. Assumptions: This model 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.

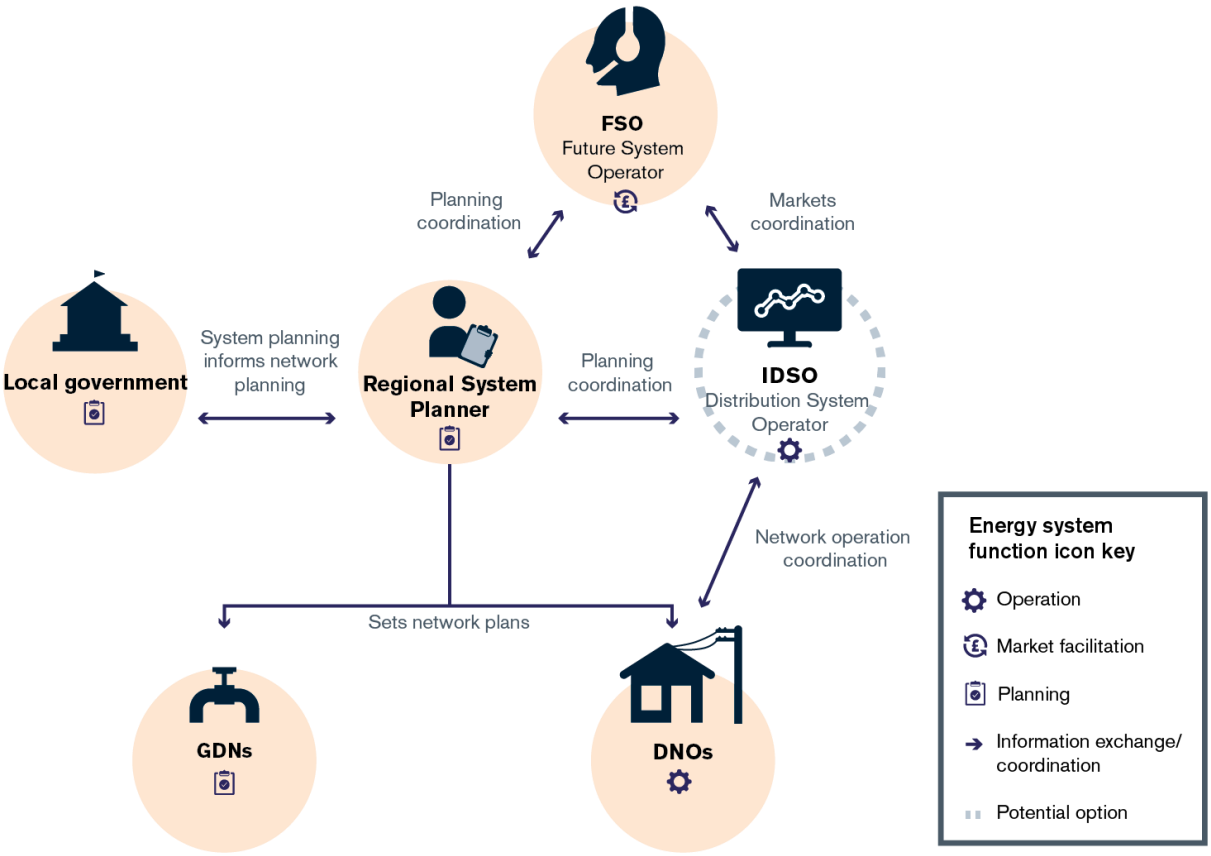
4.21. Ease of implementation: Establishing Regional System Operator and Planner(s) would require primary legislation. Implementation of this model could, but would not

[32] There is a precedent for this where a new body could be performing functions previously done by local government, or where the work is clearly linked. This can be seen in the case of Local Enterprise Partnerships, where local authorities have representatives for the LEP.

necessarily need to, follow sequentially from the implementation of model 1 and model 2, whereby the separately licensed DSO activities are transferred to the newly established bodies. However, depending on vector coverage (e.g. gas and heat), implementation would require changes to roles and responsibilities of other existing entities beyond DNOs.

Framework model 4 – Interacting organisations

Figure 5: Sub-variant of interacting organisations[33]



Key features

4.22. High level model description: This framework model has many potential sub-variants, but the key premise is that this model would involve dispersing roles and responsibilities

[33] Figure 5 illustrates one sub-variant within framework model 4, and sets out that this could involve establishing Regional System Planner(s) and potentially also separating out the operation function from the DNOs, through establishing IDSO(s). Alternatively, framework model 4 could involve dispersing functions in a way that does not require establishing new bodies.

to maximise the strongest within-function synergies, whilst allowing institutions to focus on delivering functions under their core competencies. For example, a 'base' model could include local area planning remaining with local government bodies, supported by the energy system planning capability based in the FSO. The market facilitation role could sit with the FSO so that local, regional and national markets for flexibility are developed in a similar way with similar rules. Finally, responsibility for local system operation (including security of supply) could remain with the DNOs. This 'base' model would minimise the proliferation of new institutions as functions would be placed with existing institutions best suited to deliver them.

4.23. Alternatively, sub-variants of this model could involve establishing new bodies to take on some functions. For example, to drive planning coordination at a sub-national level, Regional System Planners could be established, a new body could be established (potentially as a separate function or body of the ESO/FSO), to develop sub-national markets for flexibility and to address potential conflicts of interest, IDSOs could be established to perform the operation function.

4.24. Geographic scale: The operation function, whether separate from the DNO e.g. through establishing an independent body (IDSO) or retained within the DNO, would likely continue to be performed within the DNO licence area boundaries. We have not set out how many Regional System Planners or market facilitation bodies (or separate function of the ESO/FSO) there could be, but we consider their geographic remit would be established based on geographic need. For example, both could be established taking account of electricity distribution licence areas, gas distribution licence areas and potential local government boundaries, to drive better coordination.

4.25. Roles and responsibilities:

- Market facilitation: Either the FSO could take responsibility for this function, or a new body could be established (potentially as a separate function or body of the ESO/FSO), to develop sub-national markets for flexibility. Either way, we envisage the FSO would take the role as lead coordinator for ensuring markets work together.

- Operation: The DNO retains responsibility for operating secure supply at distribution level. Similar to framework models 1 and 2, the DNO or IDSO would be responsible for monitoring the distribution system, across their geographic region, for emerging network constraints and managing constraints by dispatching or curtailing assets and coordinating with ESO/FSO where appropriate.

- Planning: A base model could involve local area planning remaining with local government bodies, supported by the energy system planning capability based in the FSO. Alternatively, new Regional System Planner(s) could be established to develop regional energy system plans (potentially based on local energy plans from local government) and ensure integrated cross-vector network development planning for both electricity and gas sectors and potentially other energy vectors (e.g. heat). The Regional System Planner(s) could consider inputs across energy vectors at a sub-national level, taking account of national goals with authority to define what is needed where, across gas, electricity and potentially heat, and setting this out for network operators. Local government could be involved in providing democratic oversight of the regional energy plans. Whilst the Regional System Planner(s) could take a stronger more strategic role in planning the system at a regional level, Ofgem would remain the ultimate decision-maker on network investment plans submitted through price control processes.

4.26. Ownership: Similar to framework models 1 and 2, the DSO (operation) role could be within the DNO or held by an IDSO; depending on this, the role could be performed by either a public or privately-owned body. The Regional Planner would be independent from the DNOs and GDNs, could be publicly or privately owned and could include representation from local government.[32] The body that takes on the market facilitation role could be a new entity or a function of the ESO/FSO, and could therefore be publicly or privately owned.

4.27. Assumptions: 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.

4.28. Ease of implementation: This would depend on the sub-variant of the model that was implemented. A 'base' model could assign roles without establishing new institutions, and would be fairly simple for Ofgem to implement. Alternatively, the creation of new bodies would require primary legislation.

5. Next steps

Section summary

This section sets out the next steps for this Call for Input and the work on future of local energy institutions and governance, including plans for engaging with stakeholders over the course of the year.

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

Next steps

5.1. This Call for Input will be open for six weeks, and will close on 7 June 2022; we encourage responses from all interested stakeholders.

5.2. Over the first half of this year, we aim to compile perspectives and evidence on the case for change to institutional and governance arrangements at a sub-national level as well as the other reform options to be considered to address this. In addition to this Call for Input, and to complement our information gathering, we will be carrying out a programme of stakeholder workshops which we aim to begin in June 2022.

5.3. Over the second half of this year, we will focus on evaluating reform options, with a view to arriving at conclusions by early 2023.

Stakeholder workshops

5.4. The aim of our stakeholder workshops will be to continue to develop our understanding of the challenges with existing arrangements and to work with stakeholders to co-generate and refine model options to address these. These workshops will help to inform how we take our work forward, including how to evaluate change options.

5.5. If you are interested in attending these stakeholder workshops please email flexibility@ofgem.gov.uk by 10 May 2022. Please set out in your email an explanation for your interest in this work and whether you are interested in contributing to developing a case for change and/or developing and assessing framework model options. Please note that by expressing interest you will be expected to contribute to the workshop(s)

in some form, for example by presenting. Based on the level of interest we receive, we will consider how best to run the workshops.

Delivering reform

5.6. We aim to publish our conclusions on reform by early 2023, at which point, and depending on the conclusions we arrive at, the work will enter its implementation phase. Our role in implementing reform is likely to vary depending on the conclusions reached and the extent to which changes may be delivered by our regulatory framework, such as through codes and licences.

5.7. As set out above, our conclusions on the effectiveness of institutional and governance arrangements may be outside the scope of Ofgem's remit to implement, or require legislation. Given this, we intend to work closely with other departments including BEIS, DLUHC, OZEV, devolved administrations, local representatives as well as industry. In the event that the changes decided on will require primary legislation, we will consider how best to take implementation forward and who is best placed to do so. For example, in conjunction with other Government departments.[34]

[34] We note that future changes to legislation will depend on the availability of Parliamentary time.

6. Appendix: Summary of Call for Input questions

Call for Input 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?
2. Do you agree with the criteria we have set out for assessing the effectiveness of institutional and governance arrangements?
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?
4. Overall, what do you consider the biggest blocker to the realisation of effective energy system planning and operation at sub-national level?
5. Do you agree with the opportunities of change we outline and the potential benefits they may create?
6. Are there additional opportunities for change and benefits that we have not set out?
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?
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?
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.
10. What do you consider to be the biggest implementation challenges we should focus on mitigating?
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)?
12. Are there other key changes taking place in the energy sector which we have not identified and should take account of?
13. What do you consider to be the most important interactions which should drive our project timelines?