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ESO RIIO-2 Stakeholder group
Developing the ESO's Network Planning

Executive summary

Agenda item: ERSG-2.8

Date: 14/11/2018

Context

The Network Options Assessment (NOA) is a key tool for the Electricity System Operator (ESO) to ensure coordinated and economical network investment. It has already driven significant consumer value over the lifetime of the network assets since it was introduced three years ago, through efficient coordination of transmission network development. We have set out an ambitious programme of developments for the NOA in RIIO-T1 through the Network Development Roadmap. We think there is the potential for it to drive further value in RIIO-2 across the whole electricity system and for the ESO to play an important role in facilitating competition in the build of onshore transmission networks. The options we have developed align with our new SO mission and our 2030 ambitions under our roles of 'facilitating whole system outcomes' and 'supporting competition in networks'[1]:

- Planning, development, investment and operation of the GB T&D networks performed irrespective of the ownership boundaries.
- Solutions to T&D challenges open to a full range of participants, which can either be market or asset solutions.
- Best value for consumers is achieved, whether it is the ESO or DSO performing the analysis.
- All investment decisions of value are assessed through a consistent cost benefit assessment across the network.

Some of the proposals in this paper will have corresponding implications for other network companies and will need careful discussion to ensure this is reflected in their business plans.

Options

There are a number of ways we could further develop our network planning in RIIO-2 to benefit consumers. These are primarily through developing the NOA tool beyond those commitments set out for RIIO-1. There are four options we have been testing with stakeholders:

1. Expand the NOA to include a wider range of transmission network needs.
2. Expand the NOA to assess more voltage levels
3. *Fundamentally review the Security and Quality of Supply Standard (SQSS)*

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[1] These roles align to principle (5): coordinate across system boundaries to deliver efficient network planning and development, principle (6): coordinate effectively to ensure efficient whole system operation and optimal use of resources, and principle (7): facilitate timely, efficient and competitive network investments.

4. Define the role for the ESO in facilitating competition in the build of onshore transmission networks

Engagement and Analysis

We have tested the first three options with the Transmission Owners (TOs) and with a broader audience at the Electricity Customer Seminars. It has been difficult to get views from stakeholders beyond the TOs on options 1 and 2 apart from Distribution Network Operators (DNOs), who generally do not see the value of option 2. Some of the TOs see value in expanding the NOA to include a wider range of transmission network needs. For all options we need to do further work to assess the potential benefit compared to the effort involved before taking them further. There is broad support for assessing whether there is a need for a fundamental review of the SQSS and if so progress the work to do that. We are yet to carry out substantial engagement on option 4.

We will explore all of the options further at a RIIO-2 stakeholder workshop in December to help develop the position to go into the business plan further.

Recommendation

We recommend we continue to explore options 1, 3 and 4 with stakeholders to provide a more developed view at the May ERSG.

Ask of ERSG

ERSG is asked to:

- Note the options being explored,
- Confirm you are comfortable with option 2 not being progressed further, and
- Provide any views on the three remaining options:
    - Should they continue to be progressed?
    - Is there anything missing in this space you would have expected to see?
    - What are the important considerations?

ESO RIIO-2 Stakeholder group
Developing the ESO's Network Planning
The Report

Further Context

Within the context of the new ESO mission our 2030 ambitions under our roles of *facilitating whole system outcomes* and *supporting competition in networks*[2] are:

- Planning, development, investment and operation of the GB T&D networks performed irrespective of the ownership boundaries.

- Solutions to T&D challenges open to a full range of participants, which can either be market or asset solutions.

- Best value for consumers is achieved, whether it is the ESO or DSO performing the analysis.

- All investment decisions of value are assessed through a consistent cost benefit assessment across the network.

One of the enablers for these 2030 ambitions is the facilitation of timely, efficient and competitive network investments, which aligns with principle 7 of the ESO's regulatory framework. We have committed under this principle to develop the Network Options Assessment (NOA) to introduce a form of competition in RIIO-T1 through taking a whole system approach and inviting network and non-network solutions across transmission and distribution, to meet transmission network needs. The NOA is produced annually by the ESO. It sets out the future of major projects to meet network requirements and ensure that the GB TOs' investments in their transmission networks are efficient, economical and coordinated. Since its introduction three years ago it has driven significant savings for consumers through deferring or avoiding network reinforcement. We are also extending the range of network needs the NOA assess in RIIO-1 to include regional high voltage challenges and are considering whether we should expand the NOA-approach to system stability. If it is feasible and of value to expand the NOA-approach to system stability, this will also have implications on resourcing in RIIO-2. All of these developments are set out in our Network Development Roadmap.

In addition to the changes we are making to the NOA over the remainder of RIIO-T1 we think there is the potential for the NOA to drive further value in RIIO-2 across the whole electricity system, which this paper explores. The paper has links with the whole electricity system paper also being considered at this meeting.

Another consideration in this paper relates to Ofgem's intention to introduce competition in onshore network build to a much greater extent in RIIO-2. They are currently introducing an approach that does not involve legislative change and intend to develop a broader reaching form of competition when there is time in the legislative agenda. Ofgem is keen for the ESO to play a supportive and proactive role in the introduction of onshore competition to help maximise

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[2] These roles align to principle (5): coordinate across system boundaries to deliver efficient network planning and development, principle (6): coordinate effectively to ensure efficient whole system operation and optimal use of resources, and principle (7): facilitate timely, efficient and competitive network investments.

the benefits for consumers it should deliver. The resources put into this activity need to be balanced against when legislation will be in place to enable the roll out of the competitively appointed TO (CATO) model.

Options Analysis

What options did we consider?

There are a number of ways we could further develop our network planning in RIIO-2 to benefit consumers. These are primarily through developing the NOA tool beyond those commitments set out RIIO-1. There are four options we have been testing with stakeholders:

1. **Expand the NOA to include a wider range of transmission network needs**. This option covers two ways in which the NOA could be applied to new transmission network needs to drive greater value to consumers. The first way is to extend the NOA's reach into planning currently covered by TOs in connection agreements. Through the NOA the SO currently considers the transmission network requirements to facilitate flows of electricity across planning boundaries. The TOs separately consider reinforcements between boundaries (wider works) as part of connection agreements. This runs the risk of building network between boundaries that cannot be utilised because NOA recommends it is not economic to reinforce the boundary. In this proposal wider works are included within the NOA to get greater consistency of approach within and across boundaries to reduce the risk of building underutilised assets. The second way the NOA could be expanded is into end of life replacement of assets, considering whether replacing with similar modern equivalents is appropriate or whether there is an economic case to replace with larger assets or non-network approaches.

2. **Expand the NOA to assess more voltage levels**. The NOA currently coordinates and recommends the most economic options for the transmission network in GB. In England and Wales the transmission network is at the 275kV and 400kV voltage levels; in Scotland it also includes 132kV. We initially considered that there would be the potential to drive further value to consumers by applying a consistent CBA approach and considering investment in the 132kV networks across all of GB. Recent analysis suggests that load-related investment at the 132kV level in RIIO-ED1 was anticipated to average around £40m per year across all DNOs, compared to the anticipated £1bn/year at the transmission level in England and Wales (source – RIIO-1 business plans)[3].

3. **Fundamentally review the Security and Quality of Supply Standard (SQSS).** The network needs that the NOA assesses are specified by the SQSS, which sets out how the SO and TOs should plan and operate the transmission system. It was put in place when generation was predominantly thermal and its relevance is increasingly being questioned as we have much higher levels of renewable and distributed generation on the electricity system. There have been some amendments to reflect the changing electricity system but it is potentially time to step back and consider whether a more fundamental review is needed that goes beyond what can be incorporated in the current code change process. This would require additional focused resources within the SO and the TOs, with the first stage being a detailed assessment of whether there is a need for such a review and the objectives of it if taken forward. We also need to explore whether it is more appropriate to develop a single planning code across transmission and distribution or harmonise the SQSS with the DNO equivalent – P2 – and this is explored further in the whole electricity system paper.

4. **Define the role for the ESO in facilitating competition in the build of onshore transmission networks.** The introduction of competition in onshore transmission build should be a positive move for consumers in driving additional value. The design of competition model will be important in determining the extent

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[3] It should be noted these figures relate to all load related investment, some of which would not be included within the scope of NOA and may include different elements in the distribution and transmission business plans. The RIIO-T1 outputs also delivered at a much lower level due to different to changes in the anticipated generation mix. However, it is not envisaged the difference will bring the figures significantly closer together.

of that value. We believe that optimal consumer value can be delivered by introducing competition at the very early stages of the development of a transmission circuit so that the full benefits from innovation in design solutions, risk management and delivery can be realised. We feel there is benefit in the ESO proactively supporting Ofgem to help progress from the current position to one where the early model of the Competitively Appointed TO (CATO) regime is viable. We would like to test with stakeholders what role they consider we should play prior to the introduction of a competitive onshore transmission regime and following its introduction.

What are the strengths, weakness, opportunities and threats of each option (evidence base)?

	Opportunities	Risks
1a. Expand the NOA to connection wider works	• Brings a consistent cost-benefit analysis (CBA) approach to a wider set of investment decisions, reducing the risk of underutilised assets and therefore benefitting consumers • Should increase the confidence in the business cases for investment.	• Increased cost in carrying out the expanded analysis. Option would only be taken forward if the costs are significantly outweighed by the savings delivered • Would need to ensure the addition of the CBA did not delay the solution delivery.
1b. Expand the NOA to end of life asset replacement	• Brings a consist CBA approach to a wider set of investment decisions, and ensures the best solutions for consumers are taken forward in a wider range of situations • Should increase the confidence in the business cases for investment.	• Increased cost in carrying out the expanded analysis. Option would only be taken forward if the costs are significantly outweighed by the savings delivered • Would need to ensure the addition of the CBA did not delay the solution delivery.
2. Expand the NOA to assess more voltage levels	• Brings a consist CBA approach to a wider set of investment decisions, reducing the risk of underutilised assets and therefore benefitting consumers	• A risk that the costs of developing the capability and running the process will not significantly outweigh the benefits • Could add additional operational risk through an organisation less familiar with a network carrying out assessments.
3. Review the SQSS	• Should give all transmission parties greater confidence that we are planning and operating a secure transmission system • There is the potential a revised standard could reduce the costs associated with planning the system. Conversely, it may result in increased costs if that is what is needed for a secure system	• It is a large task which may result in a standard that is no better than the one we have now, following significant resource input. • Could result in a less secure or more expensive system if not got right.
4. ESO's role in competition	• Has the potential to help drive additional consumer value in the building of transmission network	• It is unclear when legislation to enable competitive tendering of transmission investment will be implemented and therefore whether this potential role

	• Aligned with principle 7 to facilitate timely, efficient and competitive network investments	could materialise in the RIIO-2 time period.

Stakeholder Engagement

What engagement did we undertake (including Forward Plan)?

- We engaged with the TOs directly on options 1, 2 and 3 as they will have the most impact on them and will need corresponding adjustments in their business plans. We have also spoken them to make them aware we will be engaging more broadly on option 4.

- We have engaged a range of stakeholders on options 1, 2 and 3 at our electricity customer connections seminars in London and Glasgow in October. The attendees included current and potential generation and storage connection customers, TOs, DNOs and consultants and allowed us to reach a broad group of interested parties at one focused event.

- We also explored some questions on onshore competition at our 2030 vision event at the end of September, which included a broad selection of stakeholders from across the energy industry.

What feedback did we receive?

Our engagement on the options is summarised below.

- **Option 1 Expand the NOA to include a wider range of transmission network needs** – Two TOs support the wider works extension and also support extension to end of life asset replacement for larger projects. The third TO did not think the drivers for either aspect of option 1 materialised in their region. It was difficult to get a clear view from wider stakeholders.

- **Option 2 Expand the NOA to assess more voltage levels** – One TO could see the value in this option from their experience with their DNO although highlighted the resource implications for the SO. Another TO did not have a view on it although questioned whether conversely it should be considered whether the 132kV network in Scotland should become distribution network. We did not explore the question with the third TO. Initial conversations with the DNOs through the ENA Open Networks project suggest they are not supportive of it although may be more comfortable with more detail on what it could mean for them, or with the approach of using a common methodology and carrying out the economic analysis themselves. They are keen that any developments to the NOA are in line with the longer-term investment planning models being developed through the Open Networks Projects. It was difficult to get a clear view from wider stakeholders.

- **Option 3 Fundamentally review the Security and Quality of Supply Standard (SQSS)** – Two TOs were supportive of this, the third was non-committal. The majority of broader stakeholders we tested this option with were supportive of consideration of whether a review is needed, and if so it being carried out. A couple questioned whether the review should take place in advance of RIIO-T2 so that any changed standard could be incorporated within the new price control. It has also been suggested you could jointly review the SQSS and the distribution network equivalent, P2, to get consistency across the networks where it is feasible.

- **Option 4 Define the role for the ESO in facilitating competition in the build of onshore transmission networks** – We have only asked very initial questions on this and will engage to a greater extent after this ERSG. Nearly all stakeholders agreed with the introduction of competition to drive greater value for consumers although most were more focused on the form of competition we are introducing in RIIO-1 as the highest priority – between different sorts of solutions and providers. We did not get a clear steer on the role the ESO should play in facilitating competition.

ESO recommendation

What is the ESO's position?

We propose working up and testing option 1 and 3 in more detail, with the potential to include them in our business plan. We will take a view before bringing the options back to a future ERSG. We also propose exploring option 4 with stakeholders to bring a more informed view to a future ERSG. We propose not developing option 2 further. Our current analysis suggests the potential savings to consumers from option 2 are unlikely to significantly outweigh the costs in carrying out the work due to the relatively low level of investment at the 132kV level so it is proposed that option is not developed further.

What are the key arguments for the ESO's position?

The options we are continuing to explore are those we feel have the potential to result in the most significant benefit to consumers, without the costs and risks to implementation being too high. They should help progress our network planning towards our vision. The decision to continue progressing the options, with an open mind, is also in line with the stakeholder feedback we have received to date.

What level of risk and uncertainty applies to the position?

For option 4, uncertainty lies in whether and when the legislation to enable a competition in the build of onshore transmission networks will be introduced and if there is an additional, formal role the ESO in that. If we were asked to take on additional roles, we would expect a reopener. Our aim for RIIO-2 is to agree the parameters of any reopener before the start of the price control.

Next Steps

We plan to:

- Engage further on the options at an engagement event in December
- Carry out a high level cost benefit analysis on the remaining three options
- Further develop the options we consider are justified to be part of the business plan, working with the TOs to reflect those proposals in their plans where relevant
- Bring the more fully developed proposals to the May ERSG.

Ask of ERSG

ERSG is asked to:

- Note the options being explored,
- Confirm they are comfortable with option 2 not being progressed further, and
- Provide any views on the three remaining options:
    - Should they continue to be progressed?
    - Is there anything missing in this space you would have expected to see?
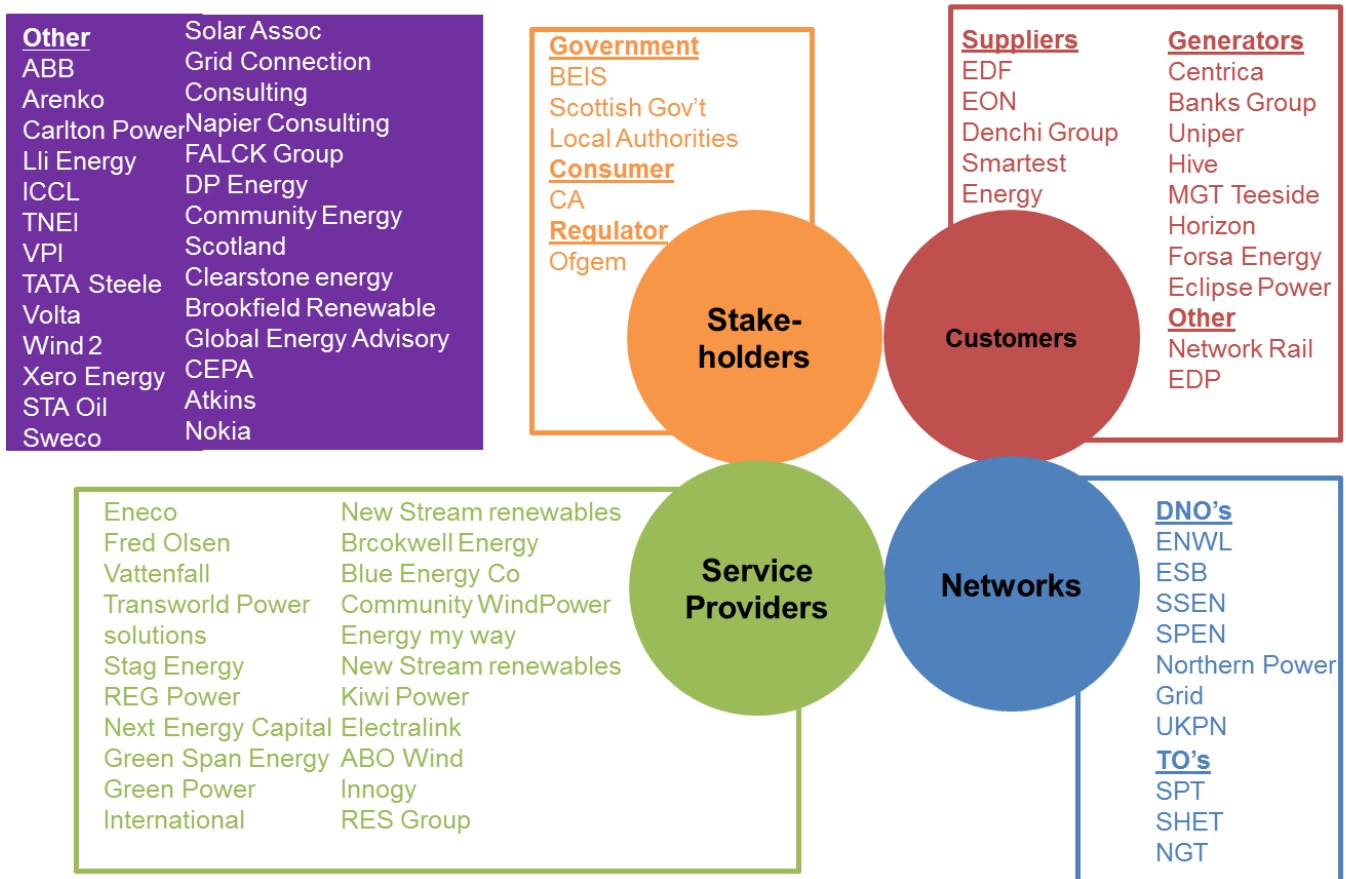   - What are the important considerations?

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Developing the ESO's Network Planning
Annex

Annex 1 – *Stakeholder Engagement*

The table below shows the stakeholders we have engaged with throughout our different activities and has been segmented into 5 main areas. Stakeholders have only been listed once but may fall into more than category.

Other
ABB
Arenko
Carlton Power
Lli Energy
ICCL
TNEI
VPI
TATA Steele
Volta
Wind 2
Xero Energy
STA Oil
Sweco
Solar Assoc
Grid Connection Consulting
Napier Consulting
FALCK Group
DP Energy
Community Energy Scotland
Clearstone energy
Brookfield Renewable
Global Energy Advisory
CEPA
Atkins
Nokia

Government
BEIS
Scottish Gov't
Local Authorities
Consumer
CA
Regulator
Ofgem

Stake-holders

Suppliers
EDF
EON
Denchi Group
Smartest Energy

Generators
Centrica
Banks Group
Uniper
Hive
MGT Teeside
Horizon
Forsa Energy
Eclipse Power
Other
Network Rail
EDP

Customers

Eneco
Fred Olsen
Vattenfall
Transworld Power solutions
Stag Energy
REG Power
Next Energy Capital
Green Span Energy
Green Power International
New Stream renewables
Brcokwell Energy
Blue Energy Co
Community WindPower
Energy my way
New Stream renewables
Kiwi Power
Electralink
ABO Wind
Innogy
RES Group

Service Providers

Networks

DNO's
ENWL
ESB
SSEN
SPEN
Northern Power Grid
UKPN
TO's
SPT
SHET
NGT

ESO RIIO-2 Stakeholder Group
Code Administration
Executive Summary

Agenda item:	ERSG-2.9
Meeting date:	14/11/2018

Executive Summary

Context

We are currently the code administrator for the Connection and Use of System Code (CUSC), System Operator-Transmission Owner Code (STC) and the Grid Code. Our industry codes determine the commercial and technical obligations for over 600 industry participants, including for the ESO and all of the electricity TOs. We play an important role in facilitating the process of change and ultimately delivering valued outcomes for consumers. Our code administrator role falls under principle 4: 'promote competition in wholesale and capacity markets'.

Options

Working with our stakeholders, we have identified four options for our code administration role in RIIO-2 as follows:

(1) Continue as a code administrator for the codes we administer today;

(2) Step up to a new role as a Code Manager for the codes we administer today;

(3) Step away from our current code administration role; and

(4) Grow our code administration role, actively seeking further codes to manage.

We have also considered:

- What the Code Manager role could entail, and initial views on resource requirements. This could include code simplification, consolidation and/or harmonisation; and

- Possible funding approaches for our code administration role, alongside our work on a layered funding model.

Engagement and analysis

We have undertaken engagement on this topic through a variety of channels including bilateral meetings, two webinars, our 2030 ambition workshop and two Code Panel meetings. We have received support for some elements of our proposals and have identified further areas of work on others.

Recommendation

Our emerging preferred option at this stage is to enhance our current code administration role to become a Code Manager for our own codes whilst recognising that we will need to undertake further stakeholder engagement. To account for future uncertainty in the volume and complexity of future framework change, we propose that we introduce a flexible funding approach for the Code Manager role.

Ask of ERSG

1) Does the ERSG agree with our emerging proposal to become a Code Manager for our current codes (i.e. CUSC, Grid Code and STC) given the engagement we have undertaken on this topic to date?

2) Does the ERSG agree that our emerging proposal for codes is aligned with the SO mission and can provide a foundation for a number of our consumer and stakeholder priorities?

3) Does the ERSG agree that we should be seeking a new licenced Code Manager layer within the overall ESO RIIO-2 model which has separate funding and governance arrangements?

ESO RIIO-2 Stakeholder group
Code Administration
The Report

Further context

In recent years, customer and stakeholder satisfaction with our performance as code administrator has tended to be lower than for other codes. Ofgem and other parties have also raised the possibility of our code administration role being carried out by another party in RIIO-2, as part of an approach to use competitive pressure, where possible, to drive good outcomes for consumers. We have sought to address performance through our codes 'customer journey' project where we have conducted over ten bilateral discussions with consumer bodies, trade associations and customers, and are now making changes to improve our service. We have already seen an improvement in the Code Administrator Code of Practice survey[1] results in 2018 compared with the previous year but we know we have more work to do.

Our code administration role falls under Principle 4: 'promote competition in wholesale and capacity markets'. Within the context of the new SO mission, our 2030 ambitions for this principle is:

- Agile industry market frameworks to support change; and
- Underpinning infrastructure to allow efficient decision-making.

The enablers for this 2030 ambition are:

- **A governance model** which works for a large number of market participants, allowing sufficient pace of change whilst maintaining investor confidence; and
- An **infrastructure** that supports parties to make efficient decisions across a range of markets.

Options analysis

Working with our stakeholders, the options that we considered for our code administration role along with the strengths and weaknesses of each are set out in the table below:

Option	Strengths	Weaknesses
1) Continue as code administrator for our current codes	• We have already started a programme of improvement through our customer journey project.	• We do not think that this option is feasible given stakeholder feedback to date on our current level of service. • Lower levels of stakeholder satisfaction with current performance mean that we would not be responding to stakeholder needs.
2) Step up to a Code Manager role for our current codes	• Aligned with the consumer and stakeholder priorities, our SO Mission and Ofgem's wider direction of travel on code governance.	• We need to address concerns about potential conflict across the possible responsibilities of a Code Manager e.g. that modifications that we raise will be given priority over those raised by others in industry.

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[1] As part of its 2016 Code Governance Review Final Proposals (Phase 3) (CGR3), it was concluded that Ofgem should commission a standardised cross-code study to monitor and assess the performance of Code Administrators in their role in respect to each code that they administer.

	• This role would enable us to better address the needs of our customers and add value e.g. looking to increase the pace of framework change and preventing wasted time/ effort through the modification process. • Enables us to leverage our expertise in, and knowledge of, our codes in order to have strategic input to market change. • Opportunity to explore new, more flexible funding models as part of RIIO-2 to complement and optimise performance in the role.		
3) Step away from code administration and allow this role to be undertaken by another party	• In the interest of consumers and stakeholders, the codes should be managed by the party that is best placed to do so.	• Misaligned with our SO Mission and our customer and stakeholder priorities. • We have heard very limited support for this option in our engagement to date. • We believe that we can add greater value particularly with the appropriate funding arrangements.	
4) Grow our code administration role, actively seeking further codes to manage	• Opportunity to leverage our strengths across additional codes and possible streamlining / harmonisation of code content.	• Unlikely to be supported by stakeholders due to perception of current code administration performance. • Outside of our core competencies, requiring significant additional time and resource which may not be in the interest of stakeholders and consumers at this time.	

We have also considered what the Code Manager role could entail and we have started to engage stakeholders more specifically on this. For example, most respondents to a poll question in our RIIO-2 webinar in August agreed that the role should include the following characteristics (when compared to the responsibilities a code administrator holds):

- Code Administration Code of Practice (CACoP) compliance and survey improvement
- A better critical friend to industry participants
- Wider scope to raise code modifications
- More strategic code change
- Proactive stakeholder engagement
- Greater use of tools and technology
- Driving innovation e.g. code simplification
- Greater prioritisation capability
- Stronger consumer value objective

These characteristics are also aligned with the emerging Code Manager role that Ofgem is developing in respect of its dual-fuel Retail Energy Code project. The role is therefore expected to be a material change to the one that we undertake for our codes today, for example we expect a Code Manager to have the power to raise code change which could include substantial code rationalisation, code harmonisation and even code consolidation.

Code Reform

Whilst this paper is focused on our role in code administration, stakeholder feedback is additionally telling us that there is a need to propose how Code Reform can be shaped and delivered and hence we are adding this to our options for consideration. The Code Manager model could provide additional stakeholder and consumer benefit in terms of how

the ESO might deliver leadership in Code Reform such as harmonising the complexity of the code structure that exists today. We believe there is a strong relationship between Code Reform and any potential Code Manager model and will look to consult more widely on this moving forward.

Funding our Code Administration Activity

We have also considered possible funding approaches for the code administration activity, in line with our work on a possible layered funding model for the ESO. Given future uncertainty, we are not able to accurately forecast the volume, type and complexity of the code modification work that we will need to undertake over the RIIO-2 period. It is anticipated that the uncertainty associated with potential workload and complexity can be addressed through a more flexible funding mechanism than the ex-ante fixed allowance we have in place today through RIIO-T1. We have explored the different ways and relative merits of how other code administrators across the industry are funded (see table below) and have shared our initial thinking with both the Grid Code and CUSC Panels. The outputs of these discussions have been focused on the need for the process to be transparent and work efficiently with the uncertainty on the number and complexity of future modifications.

Code Administration Models
CUSC / GC / STC Model (Electricity)
NGET / NGESO
For-Profit; RIIO-T1
NGET Budgets – No Consultation
NGET Pays (Sharing Factor)
2018/19 CA Budget ~ £650k
UNC Model (Gas)
Joint Office
Not-for-Profit
Annual Process – No Consultation
Transporters Budget
Transporters Pay Share
2018/19 CA Budget ~ £1.4m (GSO share is 11%)
BSC Model (Electricity)
BSCCo / Elexon
Not-for-Profit
Annual Process with Consultation
Elexon Budgets and Board Approves
(Board Members can be removed by Parties)
Industry Pays Share
2018/19 CA Budget Unknown
Smart Energy Code Model (Dual-Fuel)
SECCo / Gemserv
For-Profit
Annual Process with Consultation
(Three Year Outlook)
SEC Budgets and Panel Approves (with Party rights to Appeal to Authority)
Industry Pays Share
2018/2019 CA Budget ~£7m

Stakeholder engagement (See Annex for detailed 'You said, we did')

We have undertaken engagement via bilateral meetings, webinars, workshops and code panel meetings on this topic with a range of different stakeholders. We also planned round table discussions at our customer seminars in October but there was limited interest from stakeholders in this forum so we have learned from that and are thinking about how we engage more effectively on this topic in future.

Code Manager Role and funding

Whilst more stakeholder feedback is required to shape the detailed roles and responsibilities of a Code Manager, initial stakeholder feedback has provided us with a view on what is important to customers. Key outputs of this feedback demonstrate the need of the service to have strong analytical and modelling capability to help support the development and need case for shaping new proposals. There is also a requirement to have timely legal support throughout the process to produce legal text that can be discussed and agreed at the applicable time of the modification process. In terms of what this could mean for a future code structure there are four key capabilities required to provide the level of service that we believe customers require, this consists of Modelling and Analytical skills, content specialists to act as a critical friend throughout the process, legal resource and strong stakeholder and communication skills.

Some stakeholders think there is a requirement for the ESO to build trust as a more independent code administrator in order to be really effective in any future Code Manager role and stakeholders will be judging us by our actions following legal separation. So far we have heard from a very small number of stakeholders from our 'wider stakeholder' sector that they think our codes should be removed from us but we wish to test this further.

Conversely, a consumer body has specifically said that our code administration role should not be tendered out and that having multiple code administrators is beneficial because it allows benchmarking across different parties and provides competitive pressures. In addition, they thought that separate identification of this activity in a funding model layer would allow better benchmarking of costs and level of service.

We have had discussions at both the Grid Code and CUSC panel meetings. Feedback from these discussions has broadly been positive in terms of the transition to a Code Manager and that this requires the right funding process to work well. An area where we still need to work with stakeholders is providing clarity are around how the critical friend activities to support customers will work if a Code Manager has powers to raise its own code proposals and how this might produce a conflict in the outcomes that some customers and a Code Manager would be looking to achieve. In terms of the funding model the panels were keen that any process is efficient, transparent and unlocks the required value of funding to deliver important outcomes. The panels were keen that any funding process takes into consideration the fact there are multiple codes that are currently administered by the ESO.

Code Reform

Market frameworks was discussed as part of the ESO 2030 Ambition workshop on 28th September with industry stakeholders. At these discussions, there was agreement that the existing governance model is not fit for purpose with too much complexity, a slow pace of change and limited opportunity for involvement by smaller players being cited as common concerns. We have heard similar messages from customers through our codes customer journey work.

Some stakeholders at the workshop event considered that we as ESO are best placed to take an overview of, and drive, market change and to reform the codes that we currently administer.

ESO recommendation

Our emerging preferred option is Option 2, enhancing our role to become a Code Manager for our own codes. More work is required to define our role as a Code Manager in detail but generally the transition is expected to be supported by stakeholders as it has the potential to address their current concerns with the existing governance model.

Our rationale for taking forward the Code Manager role as our emerging preferred option is as follows:

1) Customer and stakeholder feedback on our current service provision indicates that they want us to improve - given feedback from the 2017 and 2018 CACoP surveys (although the 2018 survey results show a 7-18 percentage points improvement on satisfaction scores from 2017), our codes customer journey work and other engagement, we think that our 'continue as a code administrator' option (option 1) is not viable. Following this feedback, that shows we are performing sub-optimally in code administration, we at least need to improve our performance as a code administrator and step into an enhanced role which will also add significant value for consumers;

2) The role of a Code Manager is aligned to the ESO mission and the strategic themes and enablers for principle 4, is a natural continuation of the customer journey work that we have already started. The role would provide the ability to meet many of the concerns that we are hearing from our customers and stakeholders It is also aligned with the direction of travel of industry more generally through Ofgem's drive to transition Code Administrators to Code Managers; and

3) It harnesses the benefits of legal separation - customers and stakeholders want us to show that we can be truly independent in the code work that we drive forward rather than being perceived to be proposing or supporting modifications for the benefit of our own business.

We do not think we should move away from the code administration role (option 3) because we are the experts in our codes and the processes and activities set out in them. We believe we can add consumer value in the role due to our experience and expertise compared to potential competitors and so we should be advocating continuing in this role (with appropriate funding and governance arrangements) rather than stepping away.

We will need to prove our ability to undertake a Code Manager role for the codes that we currently administer before being able to potentially take on additional codes in future and hence the reason we have discounted option 4 at this stage.

We believe a specific funding approach for code administration / management as a potentially separate 'layer' in the overall ESO funding approach should be considered. There is potential for more direct competition in code administration activity across parties and at present each code administrator has different funding and governance models. A layered approach could enable a more tailored model to be developed that could better facilitate competitive pressure, whether or not competition is actually in place for the role i.e. it will be much easier to benchmark between code administrators. This is an important feature for some of the stakeholders we have engaged with.

Next steps

We want to undertake further stakeholder engagement on this topic to:

- further shape what the role of a Code Manager should be given the characteristics already identified;

- explore with stakeholders their views on different code administration funding approaches and how these could be applied to the ESO and develop a set of principles that reflect stakeholder requirements; and

- understand to what extent we should have a role in shaping and proposing code reform.

We are aware that Ofgem started some work on a code governance review, with some discussion around what a Code Manager should do, but postponed work earlier this year due to legislative constraints and other more immediate priorities. Their work on the development of a new code has however picked up the Code Manager elements of such reforms and this is well advanced.

We therefore want to keep Ofgem in the loop of the work we are doing for RIIO-2 which might interact and inform their work when it recommences next year, or through the ongoing Retail Energy Code development, but Ofgem's work will also inform our own thinking on our role transition, including funding and governance arrangements.

We intend to speak to Ofgem bilaterally on this topic and seek further bilateral discussions with stakeholders, particularly those who have been involved with our codes customer journey work to date.

Ask of ERSG

1) Does the ERSG agree with our emerging proposal to become a Code Manager for our current codes (i.e. CUSC, Grid Code and STC) given the engagement we have undertaken on this topic to date?

2) Does the ERSG agree that our emerging proposal for codes is aligned with the SO mission and would provide a foundation for a number of our consumer and stakeholder priorities?

3) Does the ERSG agree that we should be seeking a new licenced Code Manager layer within the overall ESO RIIO-2 model which has separate funding and governance arrangements?
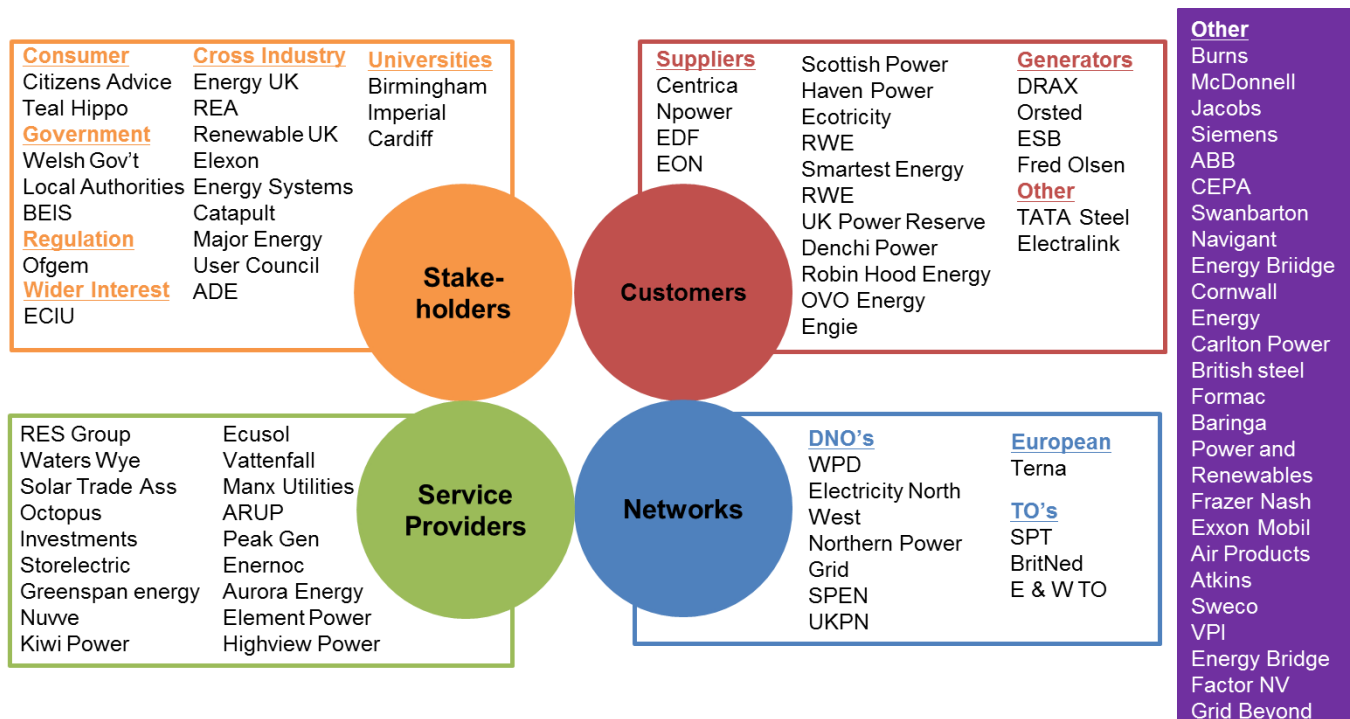
nationalgridESO

Code Administration

Annex

Annex 1 – stakeholder engagement

The table below shows the stakeholders we have engaged with throughout our different activities and has been segmented into 5 main areas. Stakeholders have only been listed once but may fall into more than category.

Stakeholders

Consumer	Cross Industry	Universities
Citizens Advice	Energy UK	Birmingham
Teal Hippo	REA	Imperial
Government	Renewable UK	Cardiff
Welsh Gov't	Elexon	
Local Authorities	Energy Systems	
BEIS	Catapult	
Regulation	Major Energy	
Ofgem	User Council	
Wider Interest	ADE	
ECIU		

Customers

Suppliers		Generators
Centrica	Scottish Power	DRAX
Npower	Haven Power	Orsted
EDF	Ecotricity	ESB
EON	RWE	Fred Olsen
	Smartest Energy	**Other**
	RWE	TATA Steel
	UK Power Reserve	Electralink
	Denchi Power	
	Robin Hood Energy	
	OVO Energy	
	Engie	

Service Providers

RES Group	Ecusol
Waters Wye	Vattenfall
Solar Trade Ass	Manx Utilities
Octopus	ARUP
Investments	Peak Gen
Storelectric	Enernoc
Greenspan energy	Aurora Energy
Nuvve	Element Power
Kiwi Power	Highview Power

Networks

DNO's	European
WPD	Terna
Electricity North	**TO's**
West	SPT
Northern Power	BritNed
Grid	E & W TO
SPEN	
UKPN	

Other
Burns
McDonnell
Jacobs
Siemens
ABB
CEPA
Swanbarton
Navigant
Energy Briidge
Cornwall
Energy
Carlton Power
British steel
Formac
Baringa
Power and
Renewables
Frazer Nash
Exxon Mobil
Air Products
Atkins
Sweco
VPI
Energy Bridge
Factor NV
Grid Beyond

Issue	You said (include reference to sector)	We did
Our current code administrator role	As part Our customer journey work we have engaged via bilateral meetings with a number of stakeholders from various sectors across the industry (generators, suppliers, interconnectors, industry bodies, DNOs, interconnectors) and gained considerable insight, including: • Current code change is tactical rather than strategic • Change and process can be opaque for new entrants • Questions on the independence of parties involved • Lack of upfront work on change – unclear motives and drivers	• We have started and will continue to make change to our current service provision. • We have ensured that our list of possible characteristics for the Code Manager role reflects this feedback and we therefore think that many of the issues identified can potentially be addressed by a Code Manager e.g. requirement for a 'critical friend' and more strategic code modification.
	2017 and 2018 Code Administrators Code of Practice (CACoP) survey results reflect the discussions we have had in our customer journey discussions e.g. feedback received on information on our website, meeting facilities / location and frustrations with the modification process and support for smaller players / new entrants.	• As above, we are making changes prior to RIIO-2 and feedback in the latest survey shows, for example, that we have improved our service provision for smaller companies and we know we can add further value. • This feedback has also led us to discounting our Option 1 which is to remain as a code administrator as this option will not meet the needs of our stakeholders.
Stepping away from our Code role	We have heard from only one stakeholder that we should potentially step away from our current codes role and when we discussed this further their concern was around perceptions of independence and making decisions in the right interests. They also agreed with others' frustrations around the number of mods and some mods taking a long time to progress. This stakeholder also, however, recognised that other code administrators have more flexible funding arrangements that could make mod processes more responsive to stakeholder needs.	We have taken on board the concerns surrounding independence and we think possible enhancement of code objectives under a Code Manager role to better represent the interests of consumers will be important.
Role of a Code Manager	In our RIIO-2 webinar we asked a poll question on the potential characteristics of a Code Manager and most respondents agreed that the characteristics we had presented were appropriate.	We looked to further explore the characteristics of a Code Manager with additional stakeholders and presented to Code panel members (see below). In these discussions we heard more about what resource requirements a Code Manager might need.
	We offered a round table discussion on this topic at the Customer (Connections) Seminars in October but there was limited uptake by stakeholders.	The customer seminar wasn't the right forum for this discussion so we are thinking about what, more effective, future engagement channels we use for this topic. We decided that engaging with the code panel members directly would be beneficial at the code panel meetings.

	We presented to the Grid Code and CUSC panel members where we heard that: • There is a perceived conflict between the ability to raise modifications and be a good 'critical friend'. • A Code Manager role will require modelling / analysis resource and legal resource to do the legal text.	• We will look to address any potential conflicts in the Code Manager role in future detailed design work and test this further with stakeholders. • The potential resource requirements will be fed into baseline funding discussions.
Funding the Code Manager activity	An example of the layered funding model was shared with the ERSG members on 24th September and there was a general consensus that it was right to pull out code administration as a layer in the model.	We will further develop our work to look at funding models across other code administrators and engage stakeholders on the relative merits of each.
	In a bilateral meeting, a consumer body also agreed that a code administration funding layer was appropriate and allows for better benchmarking between different code administrators and introduces competitive pressures.	We recognise that the ability to benchmark across code service providers is important for stakeholders. This provides support for a proposal to have a discrete funding layer for our code activity in RIIO-2 which will increase transparency for stakeholders.
	In our discussions in the CUSC panel, one panel member talked about the following attributes for any funding arrangement: • Benefits in an agile funding model that unlocks the right value of funding at the right time. • Needs to be transparency in the process and level of funding • Even with a short term funding duration, such as an annual process there needs to be an element of certainty for the Code Administrator to control OPEX resources etc So a funding model with an element of baseline and a process that provides additional top up against workload / outputs could work.	We will take these requirements and build upon them to determine a set of principles that a 'good' funding mechanism should have.
Code reform	In our 2030 Ambition workshop on 28th September stakeholders raised common concerns on the existing market frameworks in terms of complexity, slow pace of change and limited opportunity for smaller / new players to participate in modifications.	• We have added this to our options for consideration for RIIO-2 as discussed in this paper. • We are now considering how we could take possible Code Reform forward in parallel to the development of a Code Manager role.
	In our CUSC Code Panel discussions, one stakeholder set out that we need to align the obligations of driving towards consumer value outcomes with the objectives that sit within the Code and we have also heard this through our customer journey work.	• A 'stronger consumer value objective' sits within our list of possible characteristics of a Code Manager.

ESO RIIO-2 Stakeholder group
Whole Electricity System
Executive summary

Agenda item:	ERSG-2.7
Date:	14/11/2018

Context

The energy landscape is changing to meet the challenges of decarbonisation, decentralisation and digitisation. We need to take a whole system view to ensure efficient outcomes that drive value for the end consumer. Stakeholders have identified six key topics of focus for the ESO to drive efficient whole electricity system outcomes. While whole electricity system issues extend across all of the ESO's activities it is most evident in our role to 'facilitate whole system outcomes' and the associated principles (principles 5 and 6[1]).

For these six specific Whole Electricity System topics we have posed a question to inform our RIIO-2 business plan. We believe that the answers to each of these questions lie on a spectrum between the extreme positions described. We have provided an initial ESO view across this spectrum but we recognise the need for this to be informed by stakeholder feedback. We therefore invite ERSG to provide thoughts on both the questions and the initial ESO position.

Options

Below are the six specific topics and associated questions for ERSG. For each of the questions we recognise that there are a potential range of answers and would be interested in views across this range.

1. Markets – information provision
   - How should the ESO provide data to DNOs and market participants to support efficient decisions in investment and operational timescales?
2. Governance – framework accessibility and alignment
   - What should the role of the ESO be in achieving greater harmonisation of technical frameworks and standards across the whole electricity system?
3. Technology – facilitating routes to market
   - What is the role of the ESO in the development and operation of whole electricity system flexibility platforms?
4. Options Development – Clarifying responsibilities across the T-D interface
   - How should the ESO work with DNOs and distributed parties to manage technical requirements across the T/D interface?
5. Operability – system event preparedness and restoration
   - In a highly-distributed world, what is the ESO's role in system event preparedness and response?
6. Innovation – balancing regional requirements with national consistency in innovation and framework development.
   - To what extent should the ESO tailor its approaches to regional differences?

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[1] *Principle (5): coordinate across system boundaries to deliver efficient network planning and development, and principle (6): coordinate effectively to ensure efficient whole system operation and optimal use of resources.*

Engagement and Analysis (You Said, We Did Provided in Annex 2)

Identification of the six specific topics above has been informed by stakeholder engagement including responses to the Future Worlds consultation undertaken by the Electricity Networks Association (ENA) Open Networks project and engagement at industry events

Recommendation

We have provided initial ESO views for each of the six specific topics. These initial positions reflect our view of the ESO as a facilitator of markets rather than a body that makes decisions on behalf of other participants. They have been informed by stakeholder engagement and also recognise our intent to use our role to add value. These will be further informed by ERSG views before being used to develop our RIIO-2 business plan.

Ask of ERSG

ERSG is invited to:

- Provide confirmation that the six specific topics are appropriate topics for the ESO to consider in a whole system context and identify any further topics that may be of relevance.

- Comment on the initial ESO views on the question raised for each specific topic, including whether our proposed position is aligned with our SO mission and can deliver our consumer and stakeholder priorities.

ESO RIIO-2 Stakeholder group
Whole Electricity System
The Report

Further Context

Facilitating Whole Electricity System Outcomes strategy paper

The ESO provided its high level views on Whole Electricity System in a paper published in July[2]. This paper indicated how, by focusing on the six key areas shown, efficient outcomes for the end consumer could be realised.

The paper was intentionally not a consultation document, recognising the rich stakeholder feedback expected to the ENA Open Networks Future Worlds consultation launching later that month. We signposted that further context on these six areas was to be delivered through a broader publication later this calendar year.

ENA Open Networks project & the Future Worlds

The Open Networks Project brings together 9 of the UK and Ireland's electricity network operators and other stakeholders to review how energy networks work, underpinning the delivery of the smart grid. The ESO is a proactive member of the project leading on several key deliverables including the Future Worlds consultation[3].

The 'Future Worlds' consultation considered how a range of relevant industry functions and activities (such as system design and operation) will change to meet the challenges of the future energy landscape. It did this through the development, with stakeholders, of five 'future worlds'. We see greatest value in a future where the ESO works closely with Distribution System Operators (DSOs) to facilitate markets, operate efficient and secure networks and deliver value for the end consumer. However we recognise that further work is needed to understand the costs and benefits of each potential future.

The ESO 2030 Whole Electricity System vision

In September we shared with stakeholders our new mission for the ESO and our 2030 ambition for each of the principles. For whole electricity system questions, our ambition is:

Planning, development, investment and operation of the GB networks will be optimised on a whole electricity system basis irrespective of ownership boundaries.

Solutions to system operator challenges will be open to a full range of participants, facilitating both market and asset solutions.

Best overall value for consumers will be achieved, irrespective of the ESO or DSO performing the analysis.

We believe that our position on the six questions is in line with this ambition.

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[2] https://www.nationalgrideso.com/sites/eso/files/documents/Whole%20Electricity%20System%20final.pdf
[3] http://www.energynetworks.org/electricity/futures/open-networks-project/

Options Analysis

What options did we consider?

We have developed six key areas of focus for Whole Electricity System work and a specific topic for discussion in each area. These topics will be discussed in more detail in the forthcoming broader Whole Electricity System publication but further context is provided in Annex 3 of this paper.

This paper is specifically interested in the potential RIIO-2 business impacts for the ESO in these six topics. We have therefore developed six questions for discussion at ERSG. These are shown below.

1. Markets – information provision
   - How should the ESO provide data to DNOs and market participants to support efficient efficient decisions in investment and operational timescales?
2. Governance – framework accessibility and alignment
   - What should the role of the ESO be in achieving greater harmonisation of technical frameworks and standards across the whole electricity system?
3. Technology – facilitating routes to market
   - What should be the role of the ESO in the development and operation of whole electricity system flexibility platforms?
4. Options Development – Clarifying responsibilities across the T-D interface
   - How should the ESO work with DNOs and distributed parties to manage technical requirements across the T/D interface?
5. Operability – system event preparedness and restoration
   - In a highly-distributed world, what is the ESO's role in system event preparedness and response?
6. Innovation – balancing regional requirements with national consistency
   - To what extent should the ESO tailor its approaches to regional differences?

For each of these specific topics we have illustrated extreme options but there exists a range of options between these extremes. We have presented our initial views as sliders on the scale between the extremes. These are shown in Annex 1 alongside our initial thoughts of the benefits of these views.

These will be informed by further stakeholder feedback including that of ERSG.

Stakeholder Engagement

What engagement did we undertake (including Forward Plan)?

We have carried out the following engagement so far:

- Through the 'Facilitating Whole System Outcomes' paper we have provided our high level thoughts on the need for a whole system approach to the changing energy landscape and the six key areas of focus.

- We have reviewed the 47 responses to the ENA Open Networks Future Worlds consultation to inform the specific topics of relevance to the ESO that will facilitate whole system outcomes

- We have refined these topics through feedback from industry events including Future Worlds seminars and webinars, customer seminars, the 2030 ESO Ambition workshop and RIIO2 webinars. More detailed stakeholder engagement can be found in Annexe 2.

What feedback did we receive?

Feedback is summarised in Annex 2 of this paper. Broader messages from the ENA Future Worlds consultation will be published on the ENA website before the end of this calendar year.

ESO recommendation

What is the ESO's position?

The ESO's initial position for each of the six specific topics is presented in the sliders in Annex 1. We intend that this initial position will be further informed by ERSG views along with stakeholder feedback to the broader Whole Electricity System publication later this calendar year.

What level of risk and uncertainty applies to the position?

The development of Whole System arrangements is still at an early stage. We believe there is significant risk and uncertainty in all areas. It is likely that whilst greater certainty will be known by the start of the ESO's RIIO-2, there will be continued development through to the start of RIIO-ED2 two years later.

Next Steps

We are currently drafting a broader publication building on the six specific topics described in Annex 3. It is intended that these will be published at the end of this calendar year. We are not proposing that this publication will be a formal consultation, rather we will engage with stakeholders through industry events over the winter period including a RIIO-event in December.

The six specific topics will then be considered in further detail through 2019. This consideration will be both through specific ESO initiatives and also through collaborative work with the ENA Open Networks project.

Ask of ERSG

ERSG is invited to;

- Provide views on the six specific topics
- Comment on the initial ESO views on the question raised for each specific topic

ESO RIIO-2 Stakeholder group
Whole Electricity System
Annexes

Annex 1 – *Questions for ERSG and initial ESO views*

For each of the six specific Whole Electricity System topics we have posed a question to inform our RIIO-2 business plan. We believe that the answers to each of these questions lie on a spectrum between the extreme positions described. We have provided an initial ESO view across this spectrum but we recognise the need for this to be informed by stakeholder feedback. We therefore invite ERSG to provide thoughts on both the questions and the initial ESO position.

We have also provided some initial thoughts on the strengths, weaknesses, opportunities and risks of each extreme position.

Topic; Markets – Information provision

Question; How should the ESO provide data to DNOs and market participants to support efficient decisions in investment and operational timescales?

Extreme options

    A. Provide access to raw data only (that is compliant with the requirements of data privacy, confidentiality etc.)

    B. Provide raw data and also provide analysis of that data, tailored to the needs of different parties, to turn it into more useful information to support decision making

Initial ESO View

A ⚠ B

We believe an approach closer to extreme option A meets stakeholder requirements. It is important that data is provided in a usable format so it can be refined by data experts. This will ensure consistent information that avoids duplication. However we also recognise the importance of providing supporting information to new market entrants.

Topic; Governance – Framework accessibility and alignment

Question; What should the role of the ESO be in achieving greater harmonisation of technical frameworks and standards across the whole electricity system?

Extreme options

A. The ESO should be a stakeholder, feeding its opinions into the process with other stakeholders, but with no special role beyond its unique perspective

B. The ESO should use its unique position to provide the thought leadership and analysis to lead the change on behalf of the industry

Initial ESO View

A ⚠ B

We believe that the ESO can play a unique role providing thought leadership to technical code change across the whole system. However we also recognise the importance of discussion of framework changes with other stakeholders and that we are not the experts in all code areas (e.g. distribution).

Topic; Technology – Facilitating routes to market

Question; What should be the role of the ESO in the development and operation of whole electricity system flexibility platforms?

Extreme options

A. "Architect" – we specify the platform and provide our part of the needs case, with other users providing their own needs cases, and a 3rd party building, owning and operating it

B. "Owner" – we build, own and operate the platform, to meet our needs and the needs of other users

Initial ESO View

A ▲ B

We believe that the ESO role in development and operation of whole system flexibility platforms should be limited to that of 'architect'. We believe that other parties may have more relevant skills for development and operation of platforms, but see a key role for the ESO in laying out the high level requirements for consistent platforms across GB.

Topic; Options Development – Clarifying responsibilities across the T-D interface

Question; How should the ESO work with DNOs and distributed parties to manage technical requirements across the T/D interface?

Extreme options

A. Market based solutions, where the ESO states its requirements, which DNOs and connected parties can compete economically to provide

B. Codified requirements for DNOs to operate within technical envelopes (e.g. voltage) at the T/D interface, with DNOs able to contract with connected parties to help them achieve this

Initial ESO View

A ▲ B

We believe there is merit in both market based solutions and codified requirements. Clear consistent accountabilities and responsibilities should be placed on system operators which facilitate innovative market based solutions.

Topic; In a highly-distributed world, what is the ESO's role in system event preparedness and response?

Question;

Extreme options

A. ESO makes increasing use of DER for managing system events, notifying DNOs of contracts and working with DNOs to dispatch providers

B. DNOs take an increased responsibility for providing the ESO with system event response services by aggregating the capability on its networks

Initial ESO View

A ⚠ B

We believe that through working closely with the emerging DSOs we can ensure system event management continues to be managed responsibly and professionally. An approach close to option A builds on our recognised and valued ability to maintain national security of supply.

Topic; To what extent should the ESO tailor its approaches to regional differences in innovation and framework development?

Question;

Extreme options

A. We should look to develop arrangements based on one set of rules, market arrangements and ways of working for GB, that allows stakeholders to readily understand ways of working

B. We should develop arrangements from a common foundation, innovating mindful of potential regional differences that account for different needs, depth of DER penetration and maturity of DSO functionality
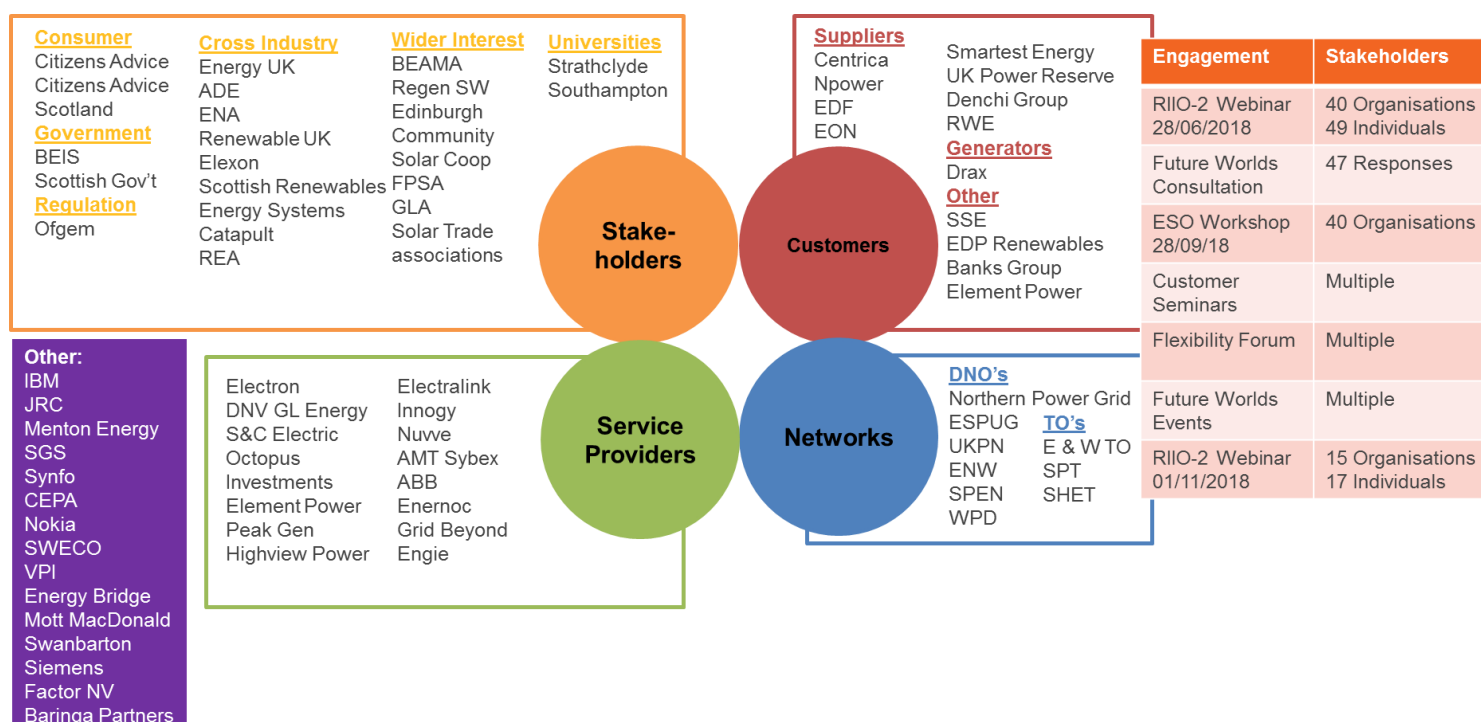
Initial ESO View

A ⚠ B

Stakeholders have told us the importance of national consistency and common approaches across GB. However we recognise that there may be merit, on a case by case basis, to explore regional differences. This may be of particular relevance during the transition to whole electricity system when innovation is key.

Annex 2 – *Stakeholder Engagement*

The table below shows the stakeholders we have engaged with throughout our different activities and has been segmented into 5 main areas. Stakeholders have only been listed once but may fall into more than category.

Consumer
Citizens Advice
Citizens Advice Scotland
Government
BEIS
Scottish Gov't
Regulation
Ofgem

Cross Industry
Energy UK
ADE
ENA
Renewable UK
Elexon
Scottish Renewables
Energy Systems Catapult
REA

Wider Interest
BEAMA
Regen SW
Edinburgh Community Solar Coop
FPSA
GLA
Solar Trade associations

Universities
Strathclyde
Southampton

Stake-holders

Suppliers
Centrica
Npower
EDF
EON

Smartest Energy
UK Power Reserve
Denchi Group
RWE
Generators
Drax
Other
SSE
EDP Renewables
Banks Group
Element Power

Customers

Other:
IBM
JRC
Menton Energy
SGS
Synfo
CEPA
Nokia
SWECO
VPI
Energy Bridge
Mott MacDonald
Swanbarton
Siemens
Factor NV
Baringa Partners

Service Providers

Electron
DNV GL Energy
S&C Electric
Octopus Investments
Element Power
Peak Gen
Highview Power

Electralink
Innogy
Nuvve
AMT Sybex
ABB
Enernoc
Grid Beyond
Engie

Networks

DNO's
Northern Power Grid
ESPUG
UKPN
ENW
SPEN
WPD

TO's
E & W TO
SPT
SHET

Engagement	Stakeholders
RIIO-2 Webinar 28/06/2018	40 Organisations 49 Individuals
Future Worlds Consultation	47 Responses
ESO Workshop 28/09/18	40 Organisations
Customer Seminars	Multiple
Flexibility Forum	Multiple
Future Worlds Events	Multiple
RIIO-2 Webinar 01/11/2018	15 Organisations 17 Individuals

The table below shows how stakeholder feedback has been used to inform the six specific topics discussed in this paper. Feedback sources include the Future Worlds consultation responses and feedback from industry events including the 2030 Ambition workshop.

The six areas were introduced to stakeholders at a recent RIIO-2 webinar and attendees were invited to provide their views. Attendees generally believed the topics focused on the right areas, with a good spread of support across the topics.

Specific Whole Electricity System topic	Relevant stakeholder feedback
Information provision	• There will be a need for increased data exchange between parties and collaboration with SOs. • Whole Electricity System needs to consider consumer impacts including protections and choice • Service providers want to be able to access distribution and transmission flexibility markets and stack revenue streams. • Need for consistent arrangements • Data should be in an accessible format and data experts will innovate if there is value • Need for transparency and openness to avoid fragmentation.
Framework accessibility and alignment	• Stakeholders would value an explanation of how the DSO transition aligns with other industry reform • Need for consistent arrangements • Different regions may need different solutions at a distribution level
Facilitating routes to market	• Different views on the ownership and operation of platforms • Service providers want to be able to access distribution and transmission flexibility markets and stack revenue streams.
Clarifying responsibilities across the T-D interface	• Need for consistent arrangements • Different regions may need different solutions at a distribution level
System event preparedness and restoration	• The ESO needs to retain a pivotal role in the national security of GB's electricity supply • Different regions may need different solutions at a distribution level
Balancing regional requirements with national consistency	• Different regions may need different solutions at a distribution level • Need for consistent arrangements

Annex 3 – *Further context for the Specific Topics for Whole Electricity System*

Below is further context on the six specific topics derived from stakeholder feedback.

Markets – Information provision

Data is exchanged between network organisations and third parties for the purposes of operating the system, forecasting, developing networks etc. Retaining current arrangements will result in limited exchange of data and a piecemeal approach to developing information. We believe that going forwards the need for data sharing and collaboration therefore has to increase and we are building this into our business plans.

Governance – Framework accessibility and alignment

Industry frameworks such as technical codes and planning standards need to evolve to meet the challenges of the changing energy landscape. There are a number of ways such change could be progressed. An incremental approach, based on the current process for framework change, could deliver end results but this would likely be at a slower pace, be less transparent for stakeholders and could result in inconsistent sub-optimal outputs between different frameworks. An alternative approach would involve fundamental change which we believe could result in a faster transition to the required end state in a holistic manner creating value for the consumer and 21st Century frameworks that are accessible for all.

Technology – Facilitating routes to market

Responses to the Future Worlds consultation have recognized the importance of routes to market and the role of flexibility platforms in facilitating these routes. We believe the future integration of such platforms is essential to drive value to the consumer and as the ESO, through initiatives such as TERRE and MARI, will continue to integrate our systems to improve market accessibility for all current and future participants.

Options Development – Clarifying responsibilities across the T-D interface

The ESO works with other network organisations to ensure efficient development of the whole electricity system, and safe and secure operation of networks. These are underpinned by technical and operational standards which have served the industry well. However we recognize that these arrangements were developed for traditional unidirectional power systems where distribution networks were passive with relatively small volumes of Distributed Energy Resource. We believe these technical and operational standards need to be overhauled, reflecting the increasing complexity of developing and operating across the whole electricity system. This would allow clear responsibility across a broad range of technical parameters including voltage, harmonics, and fault level.

Operability – System event preparedness and restoration

Responses to the Future Worlds consultation have recognized the ESO's role in overall management of the national electricity system including in times of system stress and emergencies. With the challenges of decarbonization, decentralization and digitization these risks are evolving and we recognize the need to work with other system operators to ensure overall system security. We need to ensure that appropriate cybersecurity measures are in place and that we are fully exploring all emergency response options to ensure we manage system security at the lowest cost to the end consumer.

Innovation – Balancing regional requirements with national consistency

Through the Future Worlds consultation respondents have told us that they value accessible common approaches and frameworks that will work for them wherever they are connected in GB. However some respondents have also indicated a need to consider the merits of more tailored local approaches, meeting the need of a particular conurbation or region. We understand this need and our Regional Development Programmes show that, when appropriate, we will consider tailored approaches to meet specific regional requirements. We believe that this is particularly appropriate during periods of significant change, particularly when change is happening at different rates in different areas. However we believe there is real value for the end consumer in common standardized approaches in the required end states.

ESO RIIO-2 Stakeholder Group
Using scenarios in ESO RIIO-2
Executive Summary

Agenda item:	ERSG-2.4
Meeting date:	14/11/2018

Context

This paper provides an update on how the Electricity System Operator (ESO) plans to use scenarios in developing options and managing uncertainty, recommending an eight-step approach centred on a commonality and uncertainty scorecard (**Annex 1**). This paper provides additional detail and background on how we created the scorecard, a summary of the stakeholder feedback received and addresses the comments made by the ERSG at its meeting of 25 July 2018 (ERSG-1).

Options (proposed approach)

At ERSG-1 we outlined our high-level approach to using scenarios in our business plan, setting out the framework we will work under (identifying the commonalities across the FES 2018 scenarios and the uncertainties that would likely drive industry change). The ERSG broadly agreed with the ESO's recommendations and requested supplementary information to the provided at the next meeting (see **Actions from ERSG-1**).

Building on this framework we have developed an eight-step process for assessing the various activities/options the ESO would like to undertake in RIIO-2 against the commonalities and uncertainties across the scenarios. This process has been tested internally and externally by stakeholders (**Annex 2** and **Annex 4**). This process will allow us to understand the uncertainty around the various activities/options in a consistent way, allowing for analysis on trigger points, cost benefit analysis (CBA), uncertainty mechanisms and risk to be undertaken for the final business plan submission.

Engagement and analysis

Since ERSG-1 we have engaged stakeholders across a variety of forums. This includes webinars in June and August 2018 and industry wide roundtable discussions at the Future Energy Scenarios (FES) workshops in Warwick and London in October 2018. More targeted engagement with stakeholders in Wales and Scotland was conducted throughout October 2018. The feedback received has been broadly supportive of our recommended approach to creating and using the commonality scorecard and the eight-step approach to develop options and manage uncertainty.

Recommendation and ask of ERSG

It is recommended that the ERSG approve the proposed approach to using the commonality scorecard and the eight-step process to develop options and manage uncertainty. This approach is transparent, has been developed and tested with stakeholders, and is robust. The ERSG is also invited to note the current position on the "consistent view of the future" work (detailed in **Annex 3**).

ESO RIIO-2 Stakeholder Group
Using scenarios in ESO RIIO-2
The Report

Context

To develop an ambitious, meaningful and robust ESO business plan that serves the current and future needs of consumers and helps the SO meet its 2030 mission, we need an understanding of the future energy landscape. This should underpin the business plan, by helping to guide the design of the decision-making process and the investment decisions the ESO makes and advises on.

The exact form of the future energy landscape is, however, uncertain. Whilst we expect to see increased decarbonisation and decentralisation, the exact form and timing of this is imprecise. A single "best view" of the energy landscape may not be accurate and could lead to over or under-investment. Scenarios present a way of understanding and managing this uncertainty by outlining plausible future energy landscapes.

We have developed a commonality and uncertainty scorecard that provides a base set of data and the range of uncertainty for our business plan to be built around (**Annex 1**). This acts as a guide when developing our options and testing them with stakeholders, as proposed in our eight-step approach (**Annex 2**). This will have natural links to associated work on developing cost-benefit analysis and the regulatory funding model.

Actions from ERSG-1

The table below summarises the actions from ERSG-1 and provides a summary response, with full details in the methodology section (**Annex 2**) below.

Ask from ERSG	Summary response
Description of the underlying analysis undertaken to this point and how it will be developed	We have worked with stakeholders to produce a commonality and uncertainty scorecard and have proposed an eight-step process for using it in developing our options.
Description of key dependencies (with a focus on those areas that the ESO can influence)	This is contained within the commonality and uncertainty scorecard, via mapping the drivers of change and focus areas.
Updated list of areas of change and uncertainty	This is contained within the commonality and uncertainty scorecard.
Description of the commonalities across the scenarios	This is contained within the commonality and uncertainty scorecard.
Initial analysis be expanded to include storage, demand side response and the decarbonisation of heat	This is reflected in the commonality and uncertainty scorecard.

Using scenarios in our ESO RIIO-2 business plan

We have created a detailed methodology on how we will use scenarios in RIIO-2 (see **Annex 2**); below is a summary:

Part one: Description of the underlying analysis taken so far
We worked with stakeholders to produce a set of key changes in the energy landscape out to 2030 ("drivers of change"), and to focus FES 2018 to electricity and those changes that would materialise out to 2030 ("focus areas").

We then used an established process to categorise the uncertainty and mapped the drivers of change and focus areas to this.

Part two: Updated list of areas of change and uncertainty
The output of this process is the commonality and uncertainty scorecard (**Annex 1**). This provides a base set of data and the range of uncertainty that our business plan needs to account for, and acts as a guide in developing our options and testing them with stakeholders.

Part three: Using the commonality and uncertainty scorecard
We have devised an eight-step process to developing options that uses the scorecard to check that the options we develop are robust against the uncertain future energy landscape. The process and a worked example are provided in **Annex 2**.

Stakeholder engagement

Summary of engagement

The ESO has engaged with a broad range of stakeholders through a variety of forums on our approach to scenarios. In our June 2018 webinar and workshop, we presented our draft high-level proposal for using scenarios and worked with stakeholders to develop the key drivers of change. In our August 2018 webinar, we presented our commonality and uncertainty scorecard. At the October 2018 FES workshops, we presented and sought feedback on our approach for using scenarios in developing options, in particular around trigger points and uncertainty mechanisms. We have also engaged bilaterally with a range of stakeholders.

Feedback received

Stakeholders have been broadly supportive of our approach. A summary of the feedback received is below.

At our **June 2018 webinar**, we outlined why we felt it appropriate to use scenarios as the basis of our business plan on and asked stakeholders if they agreed with our proposal to use FES 2018

Question	Yes	No	Unsure
Do you agree with the ESO using FES 2018 as the basis for its business plan?	56%	0%	44%

Given the levels of people unsure around our approach, we agreed to provide more detail at the **August 2018 webinar**. We developed and presented our commonality scorecard at our August webinar, along with a high-level process for using it.

Question	Yes	Somewhat	Unsure
Do you agree with our approach for using the commonality scorecard and understanding the uncertainty?	52%	45%	3%

The level of response in the "Somewhat" category may be explained by the high-level nature of the proposal presented in the webinar, due to time and format constraints. More detail was provided at the October 2018 FES workshops.

At the **October FES workshops** (more detail in **Annex 4**), we presented our eight-step approach to developing options and managing uncertainty, which uses the commonality and uncertainty scorecard. Stakeholders were broadly supportive of the overall proposed approach, some stakeholders questioned if three levels of uncertainty were

required while others saw the middle level for more binary choices e.g. polices. We will look to ensure these levels are used and explained appropriately

There was varied feedback as to what trigger points should look like and how to ultimately manage any uncertainty, with a number of stakeholders questioning how a more "mechanistic" approach would work for the ESO. We will continue to our work on trigger points and uncertainty mechanisms.

Taking all the feedback on board, we will proceed with the proposed process, while ensuing each step of the process is sufficiently documented.

ESO Recommendation and ask of ERSG

What is the ESO's position?

It is recommended that the ERSG approve the proposed approach to using the commonality scorecard and the eight-step process to develop options and manage uncertainty. The ERSG is also invited to note the current position on the "consistent view of the future" work (**Annex 3**).

What are the key arguments for the ESO's position?

- Our recommended approach is supported by stakeholders as outlined in the stakeholder engagement section of this document.
- In using FES 2018 as the base for our business plan we are using a suite of plausible, authoritative and widely used scenarios that are stakeholder developed and cover the whole energy system.
- Our commonality and uncertainty scorecard and eight-step process provide a transparent method of developing options and managing uncertainty.

What level of risk and uncertainty applies to the position?

It should be noted that this recommendation is subject to the ongoing discussions with Ofgem and the Challenge Group on the development of a "consistent view of the future" (**Annex 3**).

Next steps

We will use the commonality and uncertainty scorecard and eight-step process in developing proposed activities for our RIIO-2 business plan. This will be reflected in our draft business plan, provisionally scheduled for release in Q1 2019 and in the development of uncertainty mechanisms. We will continue to work with the Energy Networks Association (ENA) group on the development of a "consistent view of the future".

ESO RIIO-2 Stakeholder Group
Using scenarios in ESO RIIO-2
Annex

Annex 1: Commonality and Uncertainty Scorecard

Level 1: clear enough future			
Area	**Now**	**2030 commonality / uncertainty**	**Drivers**
Installed coal capacity	12.7GW	All coal phased out by 2025	• Policy and governance • Decarbonisation of electricity supply
Peak electricity demand	59.4GW	62-64GW in all scenarios	• Digitalisation • Policy and governance • Decentralisation • Consumer behaviour • Decarbonisation of heat • Demand side response • Decarbonisation of electricity supply • Storage • Electric vehicles

Level 2: alternate futures			
Area	**Now**	**2030 commonality / uncertainty**	**Drivers**
Installed gas capacity	35GW	Two scenarios ~31GW; two scenarios 41-43GW	• Decarbonisation of electricity supply • Policy and governance • Decentralisation
Electric vehicles	~100,000	Two scenarios at 11m; two at 2m	• Policy and governance • Electric vehicles and decarbonisation of transport
Distributed generation capacity	28GW (27%)	Two scenarios at 70GW and 73GW (45%), two at 45GW and 47GW (35%)	• Decentralisation • Policy and governance • Decarbonisation of electricity supply
Smart meters	11m	All scenarios ~28.3m, peak installation in 2019 or 2022	• Policy and governance • Consumer behaviour • Decentralisation

Level 3: range of futures			
Area	**Now**	**2030 commonality / uncertainty**	**Drivers**
Total wind capacity	17.6GW	Range 37GW to 49GW	• Decarbonisation of electricity supply • Policy and governance • Decentralisation

Interconnection capacity	4GW	Two scenarios 15-16GW, one at 10GW and 20GW. One scenario in net export	• Policy and governance
Solar capacity	12.5GW	Three spread at 16—24GW; outlier at 33GW	• Decarbonisation of electricity supply • Policy and governance • Decentralisation • Consumer behaviour • Digitalisation
Storage capacity	3GW	Two scenarios at 9GW, others at 6GW and 7GW	• Policy and governance • Digitalisation • Consumer behaviour • Decarbonisation of electricity supply

Annex 2: Detailed Methodology
Part one: Description of the underlying analysis undertaken so far

The ESO proposed the use of scenarios, and in particular FES 2018, to base its business plan on, as a way of managing the uncertainty in the future energy landscape. A single scenario may not be accurate and could lead to under or over investment. This was supported by stakeholders and subsequently the ERSG at their meeting on 25 July 2018. To help us understand the changing energy landscape better, the ESO produced an initial list of key uncertainties we felt would affect the ESO over the RIIO-2 period. This involved focusing FES on electricity and those changes that would materialise out to 2030. The year 2030 was chosen to cover the RIIO-2 period (based on the assumed five-year price control) and to avoid the artificial "cliff-edge effects" that price controls have been known to create. Network companies raised concerns about such effects in their responses to Ofgem's Framework Document[1].

Ofgem have indicated that the ESO may be subject to a one-to-two-year price control (essentially a series of Forward Plans). We would like to explore the option for a longer price control for some areas, for example capex and IT spend. This can be achieved as part of a layered funding model, with different layers having different timescales. The proposed process is independent of the timescale because only the categorisation of the uncertainty (and possibly subsequently our options) would potentially change. The focus areas and drivers of change would still remain relevant, and it is likely that the chance of changes to the landscape during the price control becomes smaller.

The initial list was based on the expertise of the ESO and its knowledge of what factors affect our role as electricity system operator. The result was a set of 10 focus areas (listed below) along with their present state and possible states in 2030 under the various FES scenarios. In line with our rationale for using scenarios, an assumed view or "best bet" was not taken.

We also developed with stakeholders a set of key drivers of change in the energy landscape, focusing on areas that the ESO can influence (to varying degrees). This was developed in response to stakeholder feedback that the focus areas are very technocratic and do not capture all the areas of change. A list of focus areas and key drivers is below.

Focus areas	Drivers of change
• Installed coal capacity	• Consumer behaviour
• Installed gas capacity	• Decarbonisation of electricity supply
• Installed wind capacity	• Decarbonisation of heat
• Installed solar capacity	• Decentralisation

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[1] RIIO-2 Framework Decision. https://www.ofgem.gov.uk/system/files/docs/2018/07/riio-2_july_decision_document_final_300718.pdf

• Installed interconnection capacity	• Demand side response
• Installed storage capacity	• Digitalisation and 'big data'
• Distribution generation capacity	• Electric vehicles
• Peak electricity demand	• Policy and governance
• Number of electric vehicles	• Storage
• Number of smart meters	

When creating any business plan, it is helpful to categorise the level of uncertainty associated with each area of the plan, as this acts as a guide on how to manage it. Areas common across all scenarios ("commonalities") can be "banked" and so the focus can move on to how we manage this *known* change. Where FES shows differences across areas ("uncertainties") we must consider how to manage any *unknown* change. This may involve trigger points and uncertainty mechanisms, as outlined in later sections.

To categorise the commonalities and uncertainties we used an established process called *The Four Levels of Residual Uncertainty* developed by consultants at McKinsey & Company and featured in the Harvard Business Review[2]. The process uses four levels of uncertainty:

- Level 1: A *clear enough future*. These are the commonalities, where the outcome is the same in all four of the FES scenarios.
- Level 2: *Alternate futures.* This is typically where two FES scenarios show one possible outcome, and two show another possible outcome.
- Level 3: *A range of futures*. This is typically where the FES scenarios show the outcome to be within a wide range, for example distinct outcomes in all four scenarios.
- Level 4*: True ambiguity*. This is where there is no basis to forecast the future. Due to physical, economic and regulatory constraints and that all FES scenarios represent plausible and comprehensive outcomes we have not used level 4 uncertainty in our analysis. The uncertainty created by certain topics (e.g. Brexit) and its categorisation was discussed, but due to the constraints listed above it was deemed not appropriate to place these into level 4.

We then produced an initial mapping of our key drivers of uncertainty to the 10 focus areas. The result of this is our commonality scorecard – the focus areas, with their level of commonality/uncertainty and the key drivers of change that will influence them. It should be noted that the commonality scorecard does not represent *all* the data we plan to use in developing options and managing uncertainty, and other factors will be considered as appropriate to specific options. The commonality scorecard provides a base set of data and the range of uncertainty that our business plan needs to account for, and acts as a guide in developing our options and testing them with stakeholders. It should be noted that the commonality scorecard is a live document, with drivers of change added or removed as necessary in response to stakeholder feedback.

Part two: Updated list of areas of change and uncertainty

The updated list of areas of change and uncertainty is the commonality and uncertainty scorecard. This can be found in **Annex 1**.

Part three: Using the commonality and uncertainty scorecard

This section outlines how we will use our scorecard in developing our business plan to help manage uncertainty. It centres around an eight-step process that has been developed with stakeholders.

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[2] *Hugh Courtney, Jane Kirkland, Patrick Vigurie: Strategy Under Uncertainty. Harvard Business Review, November-December 1997. https://hbr.org/1997/11/strategy-under-uncertainty*

Our business plan will be co-created with stakeholders. This means we will work with stakeholders to understand how the ESO can best deliver consumer value, promote a whole energy system approach and be adaptable to future market options. This culminates in the ESO proposing activities in its business plan that it believes will help meet the current and future needs of consumers. These will be tested with stakeholders and subjected to cost-benefit analysis (CBA) to support the choice of a preferred option. It should be noted that the details around the exact form of CBA are still under consideration by Ofgem.

To ensure that we can deliver for consumers, the proposals we develop need to account for how the future energy landscape could evolve and allow us to manage this uncertainty. This involves testing proposed activities against our commonality scorecard to ensure that they are robust. It is possible, for example, that against an uncertainty future energy landscape a particular activity may not be the best solution and an alternative activity would be better value for consumers.

The process for testing the activities against the commonality scorecard is given diagram below. For guidance, we have informally applied this to the NOA options (also being presented to ERSG-2). It should be noted that because this process has not been consulted with ERSG this is for example only (i.e. the process has not been formally applied to the NOA options) More detail on specific steps is given underneath.

Eight-step process to developing options and managing uncertainty

Process step	Description	Indicative application
1. Define an ESO activity to test	Activities that help the ESO meet the needs of current and future energy consumers will be developed by the ESO in conjunction with stakeholders.	NOA development option 2 – Expand the NOA to assess more voltage levels
2. Determine which key drivers will impact the activity 3. For each key driver identify the industry and ESO detailed drivers	For the ESO to proactively respond to changes in the future energy landscape we will look across the commonality and uncertainty scorecard to assess what drivers may affect the activity. For example, specific policy or regulatory decision.	• *Policy and governance* (e.g. charging review could change the relative incentives to connect transmission and distribution connected generation) • *Decentralisation* – increased levels may require greater 132kV analysis capability • *Electric vehicles* – uptake level of smart charging will affect peak demand and so guide level of reinforcement needed

4. Determine the level of uncertainty associated to that detailed area
 	
5. Level:
  i. Common
  ii. Alternate
  iii. Range
	The level of uncertainty will be categorised. This acts as a guide as to whether we looking to manage a known change (in which case we can consider how we can best deal with it) or an unknown change, which may require trigger points or uncertainty mechanisms as outlined in subsequent steps.	• *Policy and governance* (charging review) **alternate** outcomes possible
		• *Decentralisation* – **alternate** (as per FES)
		• *Electric vehicles* – **alternate** (as per FES), smart charging uptake likely to be binary

6. If level i) or ii) is there a "trigger point" for the option?	We need to decide whether the uncertainty matters – will it have a big impact on the system and/or the ESO? If so, a change in a particular driver could lead to wider industry change that may require the ESO to adjust (including starting or stopping) a particular activity. We call such changes "trigger points". Examples may include volumes of installed capacity, the number of electric vehicles or a specific policy decision.	• *Policy and governance* – outcome of charging review • *Decentralisation* – actual level not relevant (process unchanged, capability variance unlikely to be significant) • *Electric vehicles* – possible trigger in higher (i.e. 11m scenario) depending on smart charging uptake / policy
7. Determine if the activity is Stable, Sensitive or	These outcomes can be grouped into three categories:	Option is **Sensitive** to FES, depending on the balance of transmission/distribution

	Dependent on the key driver(s)	• The activity is stable under the driver(s) e.g. no change to the activity under any scenario.	connections and uptake level of smart charging.
8.	If Sensitive or Dependent, are additions to the activity required for the final business plan?	• The activity is sensitive to the driver(s) e.g. the core activity remains, but details may vary. • The activity is dependent on some/all drivers e.g. the activity is not appropriate in some/all scenarios or a secondary activity is needed. Related work is ongoing as part of the wider regulatory mechanism thinking into specific uncertainty mechanisms.	Option to **remain** with scope to further increase work depending on balance of transmission/distribution connections and uptake level of smart charging. Scope for further work to be incorporated into volume driver / uncertainty mechanism.

Annex 3: Update on "consistent view of the future"

In Ofgem's Business Plan Guidance document[3] published on 28 September they requested that the RIIO-2 licensees (gas and electricity, transmission and distribution) work to develop a "consistent view of the future". The ESO is working with all the network groups to work through how to deliver this for the Challenge Group on 29 November 2018 and to further understand this request with Ofgem and determine how this would fit with our existing work.

Further Context

In September 2018, there was a request by Ofgem's RIIO-2 Consumer Challenge Group for a "Consistent views of the future" for RIIO-2 (this is often referred to as the "single scenario"). This request was further briefed out by Zak Rich (ZR) of Ofgem to all licensees through September and October and included in Ofgem's RIIO-2 Business Plans Initial Guidance Document.

All licensees, across gas and electricity, distribution and transmission and system operation, convened a new group (the "Scenarios & Forecasting Group") under the Energy Networks Association in October 2018 to consider and understand this request. Work under this group is ongoing. The group is chaired by James Hope (JH) of UK Power Networks.

The group is aiming to deliver findings and output to Ofgem by early Q1 2019 with an interim report to Ofgem and the Consumer Challenge Group on 29 November – this meeting will include representatives from all network sectors, including the ESO.

Ongoing Work

Further clarification has been requested from Ofgem as to the purpose, scope and remit of the "single scenario", including a request for meetings with both Ofgem and the Challenge Group. The following was received via email from ZR. Although focused more on the meeting with the Challenge Group it stated at the very least it should consider:

- A breakdown of changes across time (e.g. what is likely to happen within RIIO-2, RIIO-3 and beyond)
- An explanation of changes in demand overtime and how this relates to current forecasts, and
- How the companies will forecast the impacts of the energy transition.

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[3] *RIIO-2 Business Plans Initial Guidance Document*
https://www.ofgem.gov.uk/system/files/docs/2018/09/riio-2_business_plans_-_initial_guidance.pdf

The Scenarios & Forecasting Group has undertaken a number of work streams to start to address this request:

- Continuing engagement with Ofgem and Consumer Challenge Group – looking to fully understand the rationale and scope of the work, in particular around the context of licensees existing work on scenarios, stakeholder engagement and use outside of its core RIIO-2 purpose.
- Bottom up analysis of FES 2018 assumptions – looking for commonalities across licensees, using FES 2018 assumptions as a starting position and considering out to 2030. Note the ESO as "owner" of the FES has taken on the responsibility to perform a consistency check on the output of this process.
- Narrative and scope of work - including wider communications and terms of reference.

The next meeting of the Scenarios & Forecasting Group is on 13 November 2018.

The ERSG is invited to note this and comment here if required.

Annex 4: Stakeholder Engagement

The table below shows the stakeholders we have engaged with throughout our different activities and has been segmented into 5 main areas. Stakeholders have only been listed once but may fall into more than category.

Stakeholders

Consumer
Citizens Advice
CA Scotland
Teal Hippo

Cross Industry
Energy UK
REA
Elexon
ADE
Scottish Renewables
RenewableUK

Universities
Birmingham
Imperial
Cardiff

Government
Welsh Govt
Scottish Govt
BEIS

Regulation
Ofgem

Wider Interest
ECIU

Customers

Suppliers
Centrica
Npower
EDF
EON

Scottish Power
Haven Power
Ecotricity
RWE
Smartest Energy
UK Power Reserve
Denchi Power
Ovo Energy
Opus

Generators
DRAX
Orsted
ESB
VPI

Other
Electralink

Service Providers
RES Group
Waters Wye
Solar Trade Assn
Octopus Investments
Storelectric
Greenspan energy
Nuvve
Kiwi Power

Ecusol
Vattenfall
Manx Utilities
ARUP
Moixa
Liberty
Aurora Energy
Element Power
Highview Power

Networks

DNOs
WPD
Electricity North West
Northern Power Grid
SPEN
SSEN
UKPN

European
Terna

TOs
SPT
SHE-T
BritNed
NGET

Other
- ABB
- Air Products
- Atkins
- Balfour Beatty
- Baringa
- British Steel
- Carlton Power
- CEPA
- Exxon Mobil
- Formac
- Frazer Nash
- IBM
- Jacobs
- Navigant
- NG Ventures
- Power and Renewables
- Siemens
- Stag Energy
- Stantech
- Sweco
- UK100
- Wales and West

Comments from October 2018 FES workshops

General comments:

- At the (earlier) Warwick workshop some stakeholders were not familiar with RIIO or any of the work the ESO was doing to prepare. For the (later) London workshop we added in an upfront presentation on ESO RIIO-2.
- Stakeholders asked about the need for a separate ESO price control and how the options and business plan are approved. We confirmed that Ofgem have the final say.

Comments on overall process:

- The overall approach was supported. Stakeholders mentioned that understanding the key drivers is extremely important – "a business plan is only a good as its key drivers".
- Some stakeholders commented that security of supply should be listed as a separate driver of change, given levels of renewable generation may intermittency and operability issues.

- It was suggested that the eight-step process should start with "outcomes" rather than activities. The options we develop, and subsequent activities, will be developed around meeting out 2030 ambition.
- Some stakeholders were concerned that the ESO could categorise much of the uncertainty as level 2 due to its place as a middle ground. It was confirmed that level 2 should be used for genuine binary choices as indicated by FES or, for example, where a policy decision may reasonably go one of a few ways.
- There were discussions around regionalisation of the key drivers. This will be picked up by our regional stakeholder engagement plan.

Comments on trigger points and uncertainty mechanisms

- Stakeholders felt that a shorter price control can help manage uncertainty, but had concerns this could lead to price signals changing too often which could hinder investment decisions. Incremental smaller changes on a regular basis are better than making big changing on a less regular basis.
- Stakeholders questioned how we would deal with big uncertainties. A specific example on renationalisation was given. The commonality scorecard is designed to ensure the ESO is proactive in looking at specific regulatory and/or policy decisions that may arise. On renationalisation, we stated that we would be proceeding in the manner set out in Ofgem's Framework Decision document.
- There was a lack of support for mechanistic trigger points (e.g. on the number of EVs or installed wind capacity).
- There were suggestions to structure the business plan for different timeframes e.g. short, medium and long term for different investment types. We confirmed that this was being picked up by the regulatory mechanism work.