Engagement Log
NGET_A7-8.01_Engagement Log (Whole system - DNO & ESO)
December 2019

As a part of the NGET Business Plan Submission

nationalgrid

ESO / DNO ENGAGEMENT LOG

Priority: Enable the ongoing transition to the energy system of the future

Topic: Building a whole system plan with electricity network companies

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EXECUTIVE SUMMARY

The process described in this log, covering our engagement with the **Electricity System Operator (ESO) and the 12 England and Wales Distribution Network Owners (DNOs)**, primarily impacts on our plans within the stakeholder priorities, *I want you to enable the ongoing transition to the energy system of the future* and *I want you to make it easy for me to connect and use the network* – Chapters 7 and 8 respectively of the main business plan narrative.

We already engage extensively with both the ESO and the England & Wales DNOs on a range of business as usual activities. Our T2 engagement process sought to build on this existing engagement with a specific focus on the content of our T2 proposals.

Our engagement with the ESO sought to gain feedback on the approach we had taken to developing our baseline plans and how these plans, and the associated uncertainty mechanisms (UMs), would address future system operation issues raised by the ESO.

This engagement took the form of a number of regular bilateral engagement meetings between subject matter experts from both the ESO and NGET. Feedback was recorded as the outcomes of these meetings and also through formal responses provided by the ESO to published NGET consultation materials.

Our engagement with the England and Wales DNOs was undertaken through individual bilateral workshops in a 2-phase approach allowing for initial plans to be discussed, feedback to be received, and updated proposals presented. This engagement sought to examine the specific investments being made for each DNO and how our proposed T2 approach would facilitate future whole system working.

The following table summarises the engagement activities undertaken:

Channel	Who	When (green = complete)
Phase 1 bilateral workshops	NGET and DNOs	17th Sept – 23rd Nov 2018
Electricity Networks Association	NGET, DNOs, ENA	18th Feb 2019
Phase 2 bilateral workshops	NGET and DNOs	13th Mar – 1st May 2019
ESO RIIO-T2 Workshop	NGET attendance at ESO event	17th December 2018
Bilateral meetings	NGET and ESO	Feb 2019 – Nov 2019
Formal written response to NGET publication	ESO	5th April 2019
Formal written response to NGET publication	ESO	23rd August 2019

A summary of this engagement and the outcomes, replicated in Chapter 7, Section 3 of the main business plan narrative, is shown in the table, below. These outcomes were reviewed and confirmed by external experts (Truth and Frontier Economics in January 2019 and September 2019 respectively).

	Engagement to build a whole system plan with electricity network companies	
	DNO engagement	*ESO and other TO engagement*
Purpose	As a key stakeholder, we engaged extensively with all England and Wales DNOs through a series of all-day workshops and conversations. This working level interaction was supplemented with bilateral and senior level conversations as well as meetings through the ENA to: a) share assumptions around future demand and generation growth b) understand DNOs future capacity requirements at grid supply points c) collaborate on proposed investment plans. d) collaborate on whole system options and processes e) collaborate on asset replacement plans.	As a key stakeholder, we engaged extensively with the ESO in an iterative process through bilateral discussions, with other TOs and through their System Operability and NOA processes to: a) understand the network reinforcement that delivers boundary capability in the most economic way for consumers b) understand what services the ESO require to operate the network in the T2 period c) explore the potential of an incentive to minimise costs at the network owner/system operator interface. d) collaborate on potential new services that could help reduce the cost of system operation.
What stakeholders told us	Through these various channels, the DNOs: • indicated there is an ongoing need for transmission infrastructure at the distribution interface • agreed a national view of timing of electric vehicle growth and electrification of domestic heating • indicated that DNO data submissions, rather than a national scenario, should be used for identifying specific investment requirements at the interface • stated a preference for a strong ESO role in whole systems, particularly through NOA expansion, and agreed interim approach to building T2 plans • supported the introduction of a reactive, unit cost allowance based, uncertainty mechanism	Through these various channels, the ESO have indicated that they: • support our intention to help facilitate the energy transition and further develop an approach to anticipatory investment that mitigates consumer risk • are keen to ensure that any network options recommended through the expanded NOA process or other ESO needs are appropriately funded and they support progressing our proposed uncertainty mechanisms with Ofgem • believe our proposals to develop an economic modelling capability to better inform our NOA submissions and explore options with flexibility providers may cause confusion with stakeholders on the role of the TO versus the ESO.
What consumers told us	Delivering efficiency savings showed very strong consumer support in both the quantitative and qualitative acceptability testing (92% positive). Nevertheless, when asked to rank priorities, consumers positioned efficiency savings in 4th place after reliability, protecting the network and planning the energy system of the future. Delivering whole system solutions benefits all these areas and we have strongly pursued it as a result.	
Key trade-offs and how engagement influenced our plans	The ESO's requirements and recommendations have a huge influence on the proposals in this plan. Our investments in network reinforcements to increase boundary capability, innovation in new technologies and investment in system monitoring, together representing over 70% of costs in this priority, are all directly recommended by the ESO. A **key trade-off** for this strand of engagement was whether to include costs in our baseline to maintain compliance with security standards against the Common Energy Scenario where whole system alternatives could exist, or to exclude these costs from our baseline and develop an uncertainty mechanism that would provide funding where transmission investment is found to be the best solution for consumers. Based on the insights gathered through this engagement, we have decided not to put full reactor investment costs into our baseline to fully embrace the potential of whole system solutions to reduce costs for consumers, thereby **reducing our baseline proposals by £184m** (i.e. the cost difference between [redacted] and 35 reactors). Uncertainty on roles in the whole system planning process was highlighted by some **DNOs** and there were different views on the role of the TO. Some DNOs were keen to work exclusively with the ESO, whilst the ESO and other DNOs indicated a preference for full collaborative working. Most preferred the collaborative approach and, on balance, we think this is likely to lead to better consumer outcomes. As such, our proposals are based on this approach.	
How we've responded to the Independent Stakeholder Group/ Challenge Group	The **Independent Stakeholder Group** has challenged whether our plans are doing enough to support system operability into the future – this feedback was later echoed by both the **Challenge Group** ("we are particularly interested in your plans to support the ESO in its goal of carbon-free operation by 2025…") and in the **ESO's direct feedback** on our July draft plan ("keen to see you thinking more broadly around stability issues and what solutions you could provide there.") – as a result we developed a system operability uncertainty mechanism as set out in Section 7 of this chapter and in annex NGET_ET.12 Uncertainty mechanisms.	

1. PRE-ENGAGEMENT

1.1 WHAT IS THE TOPIC AND WHY IS IT BEING ENGAGED ON?

The **stakeholder priority, *I want you to enable the ongoing transition to the energy system of the future*** *(Chapter 7 of main business plan narrative)*, is comprised of several topic areas as illustrated in Figure 1. This priority is what the electricity transmission network will need to do over the RIIO-T2 period in order to facilitate the ongoing transformation of the energy industry due to the trends of decarbonisation, decentralisation and digitisation. Stakeholders have encouraged us to plan and communicate more in this area:

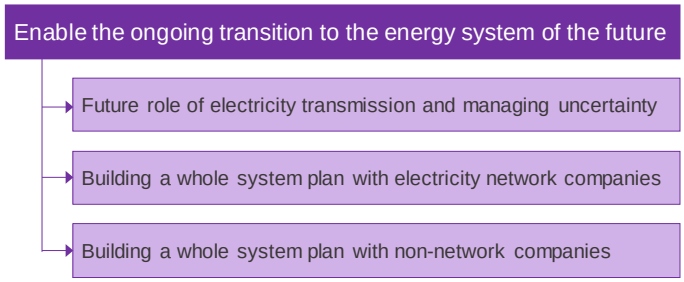


Figure 1 - Stakeholder priority and associated topics

This log is focussed on the ***future role of electricity transmission and managing uncertainty*** topic area. Whilst the outcomes of engagement on this topic area primarily influence *Chapter 7 – Enable the ongoing transition to the energy system of the future*, they also have a material impact on *Chapter 8 – Easy to connect and use the network, Chapter 9 – Provide a reliable network*.

Our proposals for the T2 period in these areas are influenced through a combination of (i) our licence obligations, annual processes and ongoing stakeholder engagement, as well as (ii) bespoke engagements undertaken in building our T2 business plan.

<u>Distribution Network Owners</u>

Regional distribution networks provide the connections between National Grid's transmission system and consumers. These networks are owned by Distribution Network Owners (DNOs).

There are 14 separate DNO areas across GB – twelve in England and Wales and two in Scotland, as shown in Figure 1, below.

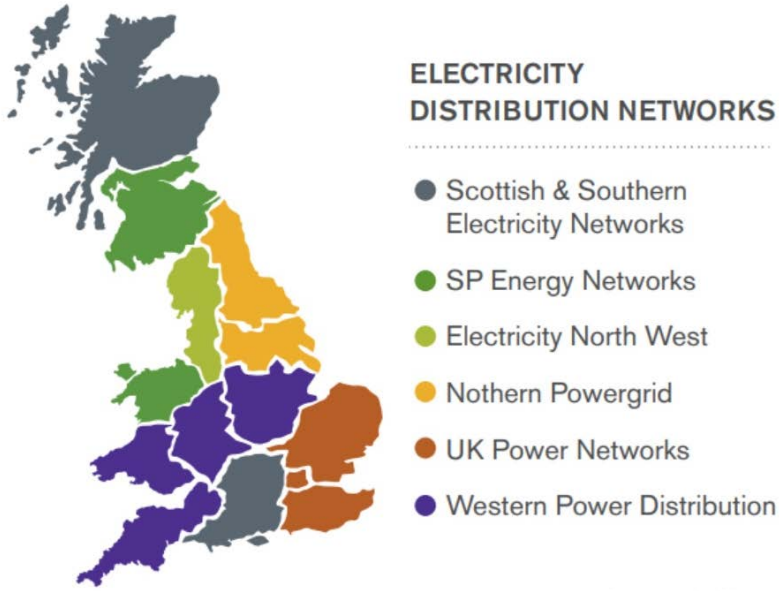


Figure 1 – Electricity Distribution Network Map

The substations that act as interface points between distribution networks and the transmission network are called Grid Supply Points (GSPs).

Historically electricity flowed from the transmission network into the distribution network to supply demand customers. However, the growth of Distributed Energy Resource (DER) has meant that some DNO areas can experience a surplus of local generation output at certain times. During these periods power is exported back into the transmission network. This ability of a GSP to export power gives DER customers access to the full GB electricity market.

As the country's energy mix continues to decarbonise and decentralise, a far greater proportion of our energy will come from DER embedded within distribution networks.

The growth of DER, and the flexibility services they offer, mean that DNOs and their customers will become increasingly important to the overall operation of the GB electricity network, far exceeding their historical role of meeting local demand requirements.

Therefore, ensuring that there is sufficient capacity at transmission / distribution interface points to continue providing a secure energy supply to consumers whilst also facilitating embedded generation growth is a key whole system objective for RIIO-T2 and beyond.

NGET has engaged directly with the 12 England and Wales DNOs to discuss the following areas:

No.	Topic area
1	Assumptions around future demand and generation growth
2	DNO's future capacity requirements at GSPs,
3	Our proposed investment plans
4	Whole system options and processes
5	Alignment of asset replacement / refurbishment plans

By engaging with DNOs on the specific investments and timings of our RIIO-T2 investment plan we can ensure that our proposals will meet the needs of both consumers and existing and future DER customers.

By providing the correct levels of capacity at the distribution / transmission interface points NGET can help the GB electricity market maximise the use of our decentralised renewable energy resources whilst keeping costs as low as possible for consumers.

Aligning our work schedules with DNOs can ensure network access requirements are minimised, reducing the costs the Electricity System Operator (ESO) incurs during planned network outages.

Failure to deliver appropriate reinforcements, in a timely manner, could result in delays in connecting new decarbonised and decentralised generation customers and could prevent the ESO (and in the future DSOs) from maximising the economic and environmental benefits that can be gained from embedded renewable generation sources.

Electricity System Operator

The Electricity System Operator (ESO) is responsible for the day to day operation of the GB electricity transmission system. As a Transmission Owner (TO) we are obligated by our licence and the requirements of the National Electricity Transmission System Security and Quality of Supply Standard (SQSS) to provide the ESO with and operable transmission network.

It is necessary that we engage with the ESO to ensure that our plans align with their expectation of future electricity system development, that the proposed structure of our T2 deal will facilitate future whole system working, that we can contribute to addressing future system operability challenges identified by the ESO, and that our plans are deliverable in terms of the network access required.

Engagement outcomes for these topic areas have a direct link to our baseline TOTEX plan for the T2 period. Therefore, it is deemed to have high materiality.

1.2 WHAT ARE THE DESIRED OUTCOMES FOR THIS ENGAGEMENT?

With the key RIIO-T2 areas highlighted for engagement in mind, the desired outcomes are:

Topic area		Desired outcome
1	Assumptions around future demand and generation growth	Ensure our assumptions align with those of DNOs for their local areas and with the ESO nationally. Identify any specific areas of local DNO customer activity that could influence investment plans.
2	DNOs' future capacity requirements at GSPs	Understand what capacity DNOs require, confirm that this aligns with our assumptions. This will ensure our plan is meeting our customers' needs.
3	Our proposed investment plans	With each DNO, agree the specific local investments that we will include in our plan. We are seeking confirmation from DNOs on the need case and appropriateness of each investment in their local area. From the ESO we are seeking confirmation that our plans for wider network reinforcement align with the recommendations of their NOA process.
4	Whole system options and processes	Identify any alternative solutions that could be provided by DNOs or their customers. Ensure that our proposed T2 frameworks can facilitate the whole system planning opportunities involving both DNOs and the ESO.

5	Alignment of asset replacement plans	By co-ordinating works with DNOs we can minimise network access requirements and potentially facilitate customer growth through making co-ordinated investment decisions. This will allow us to present the most efficient plan possible. We are seeking confirmation from the ESO that the network access required to deliver our plans is possible.

Successful engagement on the topic in this engagement strand, will be measured by:

1. The Independent Stakeholder Group guidelines expressed as the '18 engagement principles checklist (See Appendix 5.1 for details)
2. The AA10000 stakeholder engagement standard. In summary:
    - clearly defined scope
    - uses an agreed decision-making process
    - focus on issues material to the organisation and/or its stakeholders
    - creates opportunities for dialogue
    - is integral to organisational governance
    - is transparent
    - has a process appropriate to the stakeholders engaged
    - is timely
    - is flexible and responsive
    - adds value both for the organisation and its stakeholders
3. Formal written response from the ESO to our business plan publications
4. Endorsement of our engagement and business plan from the DNOs:
    - Obtaining formal confirmation of support from each DNO on the elements of our plan that affect them and their customers.
    - DNOs will also be asked to provide feedback on the engagement process itself.
    - By listening and collaboratively working with the DNO to get confirmation the whole system options that should be considered by NGET.

1.3 WHAT EXISTING INSIGHT HAS BEEN UTILISED?

Business as Usual Engagement

We have an ongoing relationship and interaction with the ESO and DNOs as part of our business as usual (BAU) planning activities. This includes formal data exchange and network analysis activities that must be carried out as a requirement of our Licence.

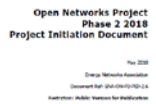
These interactions are now supported by emerging whole system planning activities such as the Regional Development Plan (RDP) process. RDPs have so far been completed with DNOs in the South-West (WPD) and the South-East (UKPN) the RDP process is likely to implemented in other regions in the near future.

In addition, the ESO is proposing to expand the Network Options Assessment (NOA) process to include assessment of DNO, as well as TO, solutions to network issues. These activities help to ensure that network issues and customer requirements are identified in a timely manner and that the most economic and efficient solution is delivered, agnostic of network owner.

NGET is a member of the Electricity Networks Association (ENA) Open Networks project. This project involves all DNOs, TOs, the ESO, Ofgem, and BEIS and is designed to facilitate the transition towards localised Distribution System Operators (DSOs) and to establish the processes and methodologies through which whole system planning of the electricity system can be achieved.

Our engagement process with DNOs and the ESO has sought to build on the BAU process already in place has also considered the emerging whole system methodologies and process currently in development.

Trade Associations



The ENA – *Open Networks Project: Work stream One*

Work stream 1, Product 1 seeks to enable a whole system approach utilising a range of investment and operability options across Transmission and Distribution.

LINK TO SITE

Government

HM Government – *Upgrading our Energy System; Smart Systems and Flexibility Plan*

This Plan shows how the Government and Ofgem are taking action alongside industry to deliver a smarter, more flexible energy system by: Removing barriers to smart technologies, including storage; Enabling smart homes and businesses; and Making markets work for flexibility.

LINK TO DOCUMENT

Distribution Network Owners

UK Power Networks – *Future Smart*

"Power flows are no longer uni-directional across our networks making the task of operating them and maintaining reliable supplies more complex, and potentially more costly in the absence of new innovative solutions. A coordinated approach to system operations and planning with National Grid, the GB System Operator, is needed to deliver value for consumers." LINK TO DOCUMENT

Distribution Network Owners

WPD – *South West Regional Develop Strategy*

The increased understanding of the interaction between the transmission and distribution networks gained via whole system network planning will ultimately enable an increased number of connections at minimal cost to customers and risk to network reliability. National Grid and Western Power Distribution are working together to provide a single-stage connection process for generators, this should result in quicker, more efficient connections for customers.

LINK TO DOCUMENT

System Operator

ESO – *Electricity Ten Year Statement*

The ETYS sets out what the requirements will be for the National Electricity Transmission System to transfer bulk power over the next decade – where capacity shortfalls might occur – so that as System Operator we can plan ahead to manage the network effectively and securely. The ETYS includes contributions from the GB transmission owners.

LINK TO DOCUMENT

System Operator

ESO – *Network Options Assessment*

The NOA describes the major projects considered to meet the future needs in GB's electricity transmission system as outlined in the Electricity Ten Year Statement (ETYS) 2017, and recommends which investments in the year ahead would best manage the capability of the GB transmission networks against the uncertainty of the future.

LINK TO DOCUMENT

System Operator

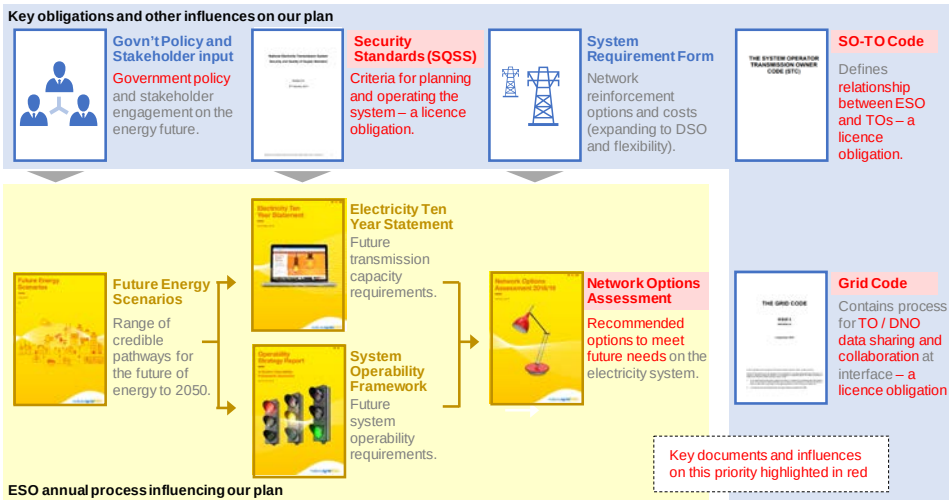
ESO – Operability Strategy Report

The OSR describes the future operability challenges and range of potential whole system solutions that may be required to meet future system needs such as facilitating a net zero network.

LINK TO DOCUMENT

System Operator

NGET / ESO Formal BAU Planning Processes

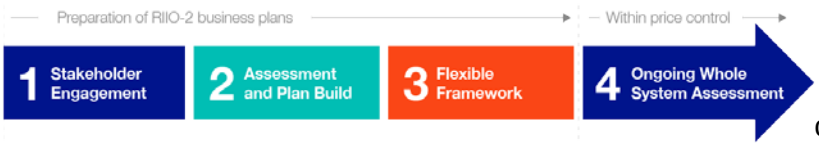


1.4 WHAT IS THE ENGAGEMENT APPROACH?

Distribution Network Owners

Due to the specific and technical nature of the required discussions NGET has undertaken a series of bilateral workshops with each individual DNO organisation, this is designed to involve, collaborate with or empower the DNOs in the process of building our RIIO-T2 business plan as per our engagement approach in appendix 5.4.

A two-phase approach was taken to allow initial plans and assumptions to be discussed and feedback obtained.

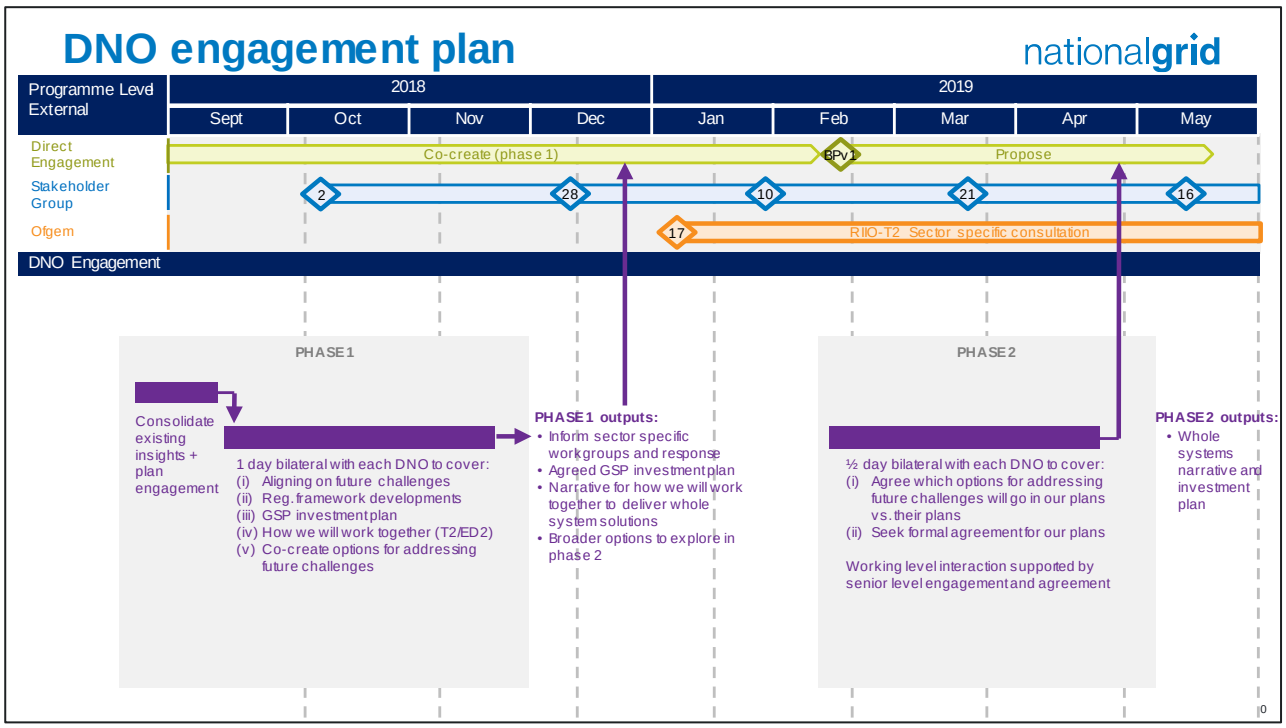


This engagement is designed to demonstrate that our plans are stakeholder led and have considered whole system options.

This two-phase approach allowed us to present initial assumptions and proposals to DNOs and then use their feedback to inform any required updates or changes. The updated version of the plan was then presented to DNOs in phase 2 to allow final comments and sign off.

Phase 1 was undertaken during September – November 2018 with Phase 2 took place over March – May 2019. We are currently completing actions raised before formally closing the engagement process and recording final feedback from each DNO.

The diagram below details the phase 1 and phase 2 engagement approach with the DNOs



The engagement sessions consisted of a one-day workshop with NGET presenting our planning assumptions, proposed investment requirements and our approach to ongoing whole system planning activities within the T2 period.

DNOs were supportive of the approach and provided representatives from their network design, regulatory, and future strategy business functions (or the equivalents within each DNO organisation).

A single organisation may own several regional distribution networks. Depending on the proximity of these networks it was appropriate to cover several areas in a single engagement session. The table below shows the engagement sessions that took place.

DNO	Engagement Session	Date	Supporting Material
Northern Powergrid North East and Yorkshire	Phase 1 session – NGET assumptions, investment proposals, whole system approach, ways of working	23 Oct 2018	
	Phase 2 session – updates from phase 1, load related investments, whole system options, alignment of non-load plans, final summary of NGET plan	1 Mar 2019	
	Senior level call – discuss objectives and key DNO areas of interest	12 Apr 2019	
Electricity North West	Phase 1 session – NGET assumptions, investment proposals, whole system approach, ways of working	2 Oct 2018	
	Introductory senior level call – discuss objectives and key DNO areas of interest	25 Feb 2019	
	Phase 2 session – updates from phase 1, load related investments, whole system options, alignment of non-load plans, final summary of NGET plan	17 Apr 2019	
Scottish Power Energy Networks	Phase 1 session – NGET assumptions, investment proposals, whole system approach, ways of working	19 Nov 2018	
	Phase 2 session – updates from phase 1, load related investments, whole system options, alignment of non-load plans, final summary of NGET plan	5 Apr 2019	
Western Power Distribution	Phase 1 session – NGET assumptions, whole system approach, ways of working	17 Sept 2018	
	Phase 1 session – South Wales region specific, NGET investment proposals	20 Sept 2018	
	Phase 1 session – South West region specific, NGET investment proposals	1 Oct 2018	
	Phase 1 session – East Midlands region specific, NGET investment proposals	19 Oct 2018	
	Phase 1 session – West Midlands region specific, NGET investment proposals	22 Oct 2018	
	Introductory senior level call – discuss objectives and key DNO areas of interest	27 Feb 2019	
	Phase 2 session – updates from phase 1, load related investments, whole system options, alignment of non-load plans, final summary of NGET plan	13 Mar 2019	
Southern Electric Power Distribution	Phase 1 session – NGET assumptions, investment proposals, whole system approach, ways of working	23 Nov 2018	

	Phase 2 session – updates from phase 1, load related investments, whole system options, alignment of non-load plans, final summary of NGET plan	21 Feb 2019	
UK Power Networks South, East, London	Phase 1 session – NGET assumptions, investment proposals, whole system approach, ways of working	25 Oct 2018	
	Phase 2 session – updates from phase 1, load related investments, whole system options, alignment of non-load plans, final summary of NGET plan	1 May 2019	

Feedback from the sessions was captured through detailed meeting minutes that were prepared by NGET and signed off by each DNO. Examples of these notes is attached in the table above.

Electricity System Operator

Due to our existing close working relationship with the ESO, our engagement with the ESO took the form of regular bilateral meetings to discuss relevant topics when necessary and more formal feedback received through written responses to NGET publications related to our T2 plans.

The table below summarises the engagement that took place and provides copies of the formal feedback provided by the ESO.

Engagement Session	Date	Supporting Material
ESO RIIO-T2 Launch Workshop – Opportunity to view and comment on ESO priority areas for T2.	17 Dec 2018	**N/A**
NGET / ESO bilateral engagement meetings – Meetings between relevant ESO and NGET subject matter experts to discuss specific elements of T2 proposals when necessary. Examples include: Reactive power requirements – meetings to discuss future system requirements and how the NGET proposals would interact with planned, ESO led, whole system assessments. Plan deliverability – meetings to discuss the level of network access required to facilitate NGET plans.	Feb 2019 – Nov 2019	**N/A**
ESO response to NGET 'Shaping the electricity transmission system of the future' consultation document– Written ESO response to our published summary (February 2019) of feedback received on our initial proposals	5 Apr 2019	
ESO response to NGET draft business plan proposals – Written ESO response to our July Business Plan proposals	23 Aug 2019	
ESO Network Options Assessment publication – annual publication by ESO providing investment recommendations for transmission system wider works.	Ongoing BAU process	Link

Electricity Networks Association – Open Networks Project

The Open Networks project is investigating the transition towards Distribution System Operators and how whole system planning can be developed and embedded across the electricity industry. We met with a group of representatives from the project to discuss our approach to developing a whole system T2 plan and how the emerging ways of working being investigated by the Open Networks projects could be applied during T2.

Engagement Session	Date	Supporting Material
NGET / ENA Whole System Workshop – NGET present proposal for developing whole system T2 plan	18 Feb 2019	

2. POST-ENGAGEMENT

2.1 WHAT WERE THE ENGAGEMENT OUTCOMES AND HOW HAS THIS INFLUENCED OPTIONS?

NGET's engagement with DNOs has revealed a number of common themes in the feedback we have received.

Theme / Stakeholder Priority Alignment	Feedback	Influence on NGET Plan
DNOs agreed that there was an ongoing need for transmission infrastructure. I want you to enable the ongoing transition towards the energy system of the future	It was acknowledged that even in a highly-decentralised energy system, there will still be periods when DNOs rely on their transmission connection to meet local demand requirements. No DNOs expressed the view that their local networks would become self-sufficient during the T2 period.	Confirmation of the need for ongoing investment in the transmission system
DNOs agreed with the overall assumptions made by NGET regarding the timing of electric vehicle growth and electrification of domestic heating I want you to enable the ongoing transition towards the energy system of the future	NGET assumes that while these technologies are beginning to emerge now, the material impact on transmission level demand will not be seen until the late 2020's and therefore no significant transmission system reinforcements will be required during the RIIO-T2 period to meet any increased demand.	Confirmation of our proposals to not include major investment to facilitate EV growth in our baseline plan
National level scenarios were not considered appropriate for identifying specific investment requirements at transmission / distribution interfaces I want you to enable the ongoing transition towards the energy system of the future	All DNOs expressed a preference for assumptions of future generation and demand growth to be taken directly from formal DNO data submissions or DNO produced local scenarios. The national level NGET 'central' scenario was considered too broad to be used to accurately identify local requirements	Our baseline plan was built around the formal submission provided by DNOs and aligned to the contracted investment position.

Some DNOs commented that the NGET plans did not cover all potential investment needs to facilitate growing demand in the T2 period. I want you to enable the ongoing transition towards the energy system of the future I want you to make it easy for me to connect to and use the electricity network	Our baseline plan reflects the investment requirements we believe have a high level of certainty. Future DNO demand growth that results in additional investment can be facilitated by our proposed uncertainty mechanisms	Investments to meet potential future DNO capacity requirements were not included in our baseline plan. We will work closely with DNOs to identify further investment requirements with our uncertainty mechanisms providing allowance where required.
DNOs believe that rising fault levels could trigger NGET investment in T2. However, there are no concrete need cases that can be identified at this time I want you to make it easy for me to connect to and use the electricity network	NGET's initial investment plan included costs for re-build certain GSPs due to rising fault levels. While DNOs agreed that fault levels are an increasing issue the prevailing view was that all whole system options had not yet been exhausted and therefore the works should not form part of the NGET baseline plan. However, it was acknowledged that there is a strong possibility that investment driven by rising fault levels could ultimately be required during RIIO-T2.	Investments to meet potential future fault level requirements were not included in our baseline plan. We will work closely with DNOs to identify further investment requirements with our uncertainty mechanisms providing allowance where required.
DNOs commented that there is uncertainty regarding roles and responsibilities in whole system planning processes, particularly following the TO / ESO split. This uncertainty affected DNOs' views on NGET proposed whole system working arrangements. I want you to enable the ongoing transition towards the energy system of the future	DNOs expressed concerns regarding NGETs proposals for collaborative whole system assessments between network companies. DNOs indicated a preference for a fully ESO led process due to perceived potential conflicts of interest.	Our proposal to manage investment in areas that have a high potential for whole system solutions through the use of uncertainty mechanisms was supported by DNOs as this will facilitate emerging whole system ways of working. As a result, we have removed ~£300m of investment, related to reactive compensation and fault level mitigation, from our baseline plan in favour of working with DNOs and the ESO during the T2 period to examine whole system options and proceed with transmission investment only when it is identified as offering the greatest level of value for consumers.

DNOs highlighted the importance of aligning asset heath related investment decisions with future customer needs I want you to enable the ongoing transition towards the energy system of the future I want you to make it easy for me to connect to and use the electricity network I want you to provide a reliable network, so that electricity is there whenever I need it.	NGET will be reviewing our non-load plans with DNOs to identify any opportunities to facilitate future growth through making co-ordinated asset replacement decisions. Several DNOs expressed concern that short-term decisions could result in a reduction in available transmission capacity. This could then restrict future customer growth	No specific examples were identified where our proposed T2 plans should be changed to facilitate future DNO growth. However, it was agreed to continue reviewing our plans throughout the T2 period to identify any opportunities that may arise.

Our engagement with the ESO identified the following key areas:

Theme / Stakeholder Priority Alignment	Feedback	Influence on NGET Plan
Reliability I want you to provide a reliable network, so that electricity is there whenever I need it.	The ESO commented that network reliability levels should be maintain "at least at the current levels" and was supportive of our proposal to consider secondary assets in our asset health assessments.	Confirmation of our proposed approach to asset health assessment
Customer Connections I want you to make it easy for me to connect to and use the electricity network	The ESO highlighted the importance of co-ordinating the service provided to customers across transmission and distribution connection processes	We engaged with Scottish TOs and the ESO to ensure consistency across our proposals for enhanced customer service in T2.
Whole System I want you to enable the ongoing transition towards the energy system of the future	The ESO supported our plans to work closely with DNOs, the ESO and other stakeholders during the T2 period to ensure whole system outcomes.	In investment areas where whole system options could play a large role (e.g. high voltage management and fault level management) we have proposed a low baseline position to allow further investment needs to be identified through whole system assessments. We have proposed uncertainty mechanisms to provide allowance when transmission investment is identified as offering the best value for consumers.
Whole System I want you to enable the ongoing transition towards the energy system of the future	The ESO requires TOs to provide system monitoring capability to provide a greater level of operational data and facilitate optimal decision making. This requirement has been formalised in the SO-TO-Code (STCP 27-1) the formal industry code that governs the relationship and obligations between the ESO and TOs	Our plan includes £48m CAPEX plus £2.33m OPEX to deliver and maintain system monitoring capability in line with the STC requirements.

Whole System I want you to enable the ongoing transition towards the energy system of the future	The ESO published its 2018/19 Network Options Assessment (NOA) report providing recommendations on future transmission wider works investments.	Our investment proposal for £507m of spending on transmission system wider works is guided by the recommendation made in the ESO NOA report.
Whole System I want you to enable the ongoing transition towards the energy system of the future	During bilateral meetings, the ESO commented on the potential need for TO investments to manage system operability issues. Specifically: stability, black start, and falling system inertia.	In response to this ESO feedback we have proposed an uncertainty mechanisms specifically to cover ESO driven investment requirements that may emerge during T2. This UM will allow NGET to provide investment options to the ESO that can be assessed and compared against alternatives as part of any whole system assessments carried out by the ESO.

2.2 WHAT WAS THE FEEDBACK ON THE ENGAGEMENT APPROACH?

Feedback has been collected for all engagements and acted upon in an iterative manner to improve the engagement approach as the programme of engagement for this topic area progressed. This section contains (i) specific stakeholder feedback, (ii) the Truth assessment of engagement on this topic area and (iii) Frontier Economics assurance of how stakeholder engagement was reflected in our July business plan.

(i) Specific stakeholder feedback

Distribution Network Operators

DNO's provided feedback that they have found the engagement sessions useful and welcomed the opportunity to comment upon and inform NGET's plans.

[redacted] – *"The format of the consultation and stakeholder engagement was very good and allowed us to understand the NG approach and share our thoughts on various aspects. We hope that this level of engagement continues throughout the process."*

A formal survey was sent to DNOs to record their views on the engagement process and outcomes the results will be included in our October submission materials. The results of this are summarises in the following tables (please note that responses from [redacted], [redacted], and [redacted] represent a single response covering the various individual DNO regions operated by these networks. No response was received from [redacted] or [redacted], an invitation was extended to these companies to provide further feedback but none was received.

How effective did you find NGET's approach to engaging with you on RIIO-T2 plans?

DNO	Very Effective	Effective	Not So Effective	Ineffective
[redacted]	X			
[redacted]	X			
[redacted]			X	
[redacted]	X			
[redacted]	No Response Received			
[redacted]	No Response Received			

Do you understand how NGET have identified the investments in your area proposed in our business plan?

DNO	Yes	No
[redacted]	X	
[redacted]	X	
[redacted]	X	
[redacted]	X	
[redacted]	No Response Received	
[redacted]	No Response Received	

Do you support the investments in your area proposed in NGETs business plan?

DNO	Yes	No
[redacted]	X	
[redacted]	X	
[redacted]	X	
[redacted]	X	
[redacted]	No Response Received	
[redacted]	No Response Received	

How satisfied are you that NGET considered your local requirements when developing their plan?

DNO	Very satisfied	Satisfied	Neither satisfied nor dissatisfied	Dissatisfied	Very dissatisfied	Don't know
[redacted]		X				
[redacted]	X					
[redacted]				X		
[redacted]	X					
[redacted]	No Response Received					
[redacted]	No Response Received					

Do you support the proposed approach to facilitating ongoing whole system assessments?

DNO	Yes	No
[redacted]	X	
[redacted]	X	
[redacted]		X
[redacted]	X	
[redacted]	No Response Received	
[redacted]	No Response Received	

How satisfied are you that NGET sought to identify and consider whole system options when developing our plan?

DNO	Very satisfied	Satisfied	Neither satisfied nor dissatisfied	Dissatisfied	Very dissatisfied	Don't know
[redacted]		X				
[redacted]		X				
[redacted]				X		
[redacted]	X					
[redacted]	No Response Received					
[redacted]	No Response Received					

How satisfied are you that NGET considered your feedback when developing their plan?

DNO	Very satisfied	Satisfied	Neither satisfied nor dissatisfied	Dissatisfied	Very dissatisfied	Don't know
[redacted]		X				
[redacted]	X					
[redacted]				X		
[redacted]	X					
[redacted]	No Response Received					
[redacted]	No Response Received					

[redacted] expressed dis-satisfaction with the engagement process, specifically regarding our proposed investments to facilitate their local customer growth, and our approach to identifying transmission system wider works in our plan.

With respect to local capacity requirements, [redacted] had provided us with forecast of possible future demand and embedded generation growth in their area. These forecasts indicated the potential need for investment in SGT capacity at existing NGET / [redacted] interface points and new Grid Supply Point substations, these investments were not included in our baseline plan.

The decision to not include these investments in our plan was taken due to the uncertainty associated with the [redacted] forecasts and the fact that no formal applications from [redacted] have yet been

received. As such, we could not be certain about the scope of works and cost of facilitating these potential future [redacted] requirements.

In response to uncertain requirements such as those raised by [redacted], we have designed our suite of uncertainty mechanisms to provide additional funding for these types of work once greater certainty exists. We believe this approach is in line with Ofgem's guidance around building our baseline plan and ensure consumers are protected by allowances only being provided once there is certainty around [redacted] requirements. This approach does not act as a barrier to us providing the required investments to meet [redacted] future local capacity needs.

With respect to transmission system wider works, [redacted] noted that we had proposed upgrades to the transmission system local to their distribution area. [redacted] were concerned that there had been no opportunity for whole system alternatives (specifically DNO investment options) to be considered.

We developed our transmission system wider works plan in alignment with recommendations the ESO's independent annual Network Options Assessment (NOA) process. The recommendations of this process indicate where investments should be progressed to provide greatest value for consumers. The ESO has expressed an ambition to widen the scope of their NOA process to include DNO (and other provider) options in future and we will work with the ESO and relevant DNOs to facilitate this process. Until this expanded NOA is implemented we believe it is in consumers' best interest to progress with the transmission investments currently recommended by NOA. As NOA is an annual process, these investments will be continually reviewed with our proposed Uncertainty Mechanism allowing for any changes in required investment.

Electricity System Operator

The ESO provided the following comment as part of their response to our draft business plan consultation publication:

"Thank you for the opportunity to comment on your draft RIIO-2 Business Plan. It is essential that the ESO and Transmission Owner business plans work effectively together to deliver consumer value, ensure a reliable energy system and enable the energy transition. It is good to see your business plan is being developed with a focus on the needs of your customers and stakeholders."

Electricity Networks Association

Our session with representatives from the ENA Open Networks projects discussed our approach to developing a whole system plan and facilitating the emerging ways of working being developed through the Open Networks project. Attendees were supportive of our approach.

ENA Open Networks – key findings applicable to RIIO-2

The work already undertaken by the Open Networks project has informed our proposed approach to facilitating whole system planning during the T2 period

Key ENA ON work and publications:

- WS1 P1 – Investment Planning Process, RDP learnings, NOA pathfinder projects, Future roadmap
  - Confirmed value in whole system planning approaches
  - Delivered initial methodology recommendations for carrying out RDP assessments
  - Pathfinder projects demonstrate basis for comparing T and D solutions
- Other workstreams that considered DER services and procurement will provide DNO/DSOs further options to input into RDP type processes – However, these areas are not directly applicable to the development of the NGET business plan

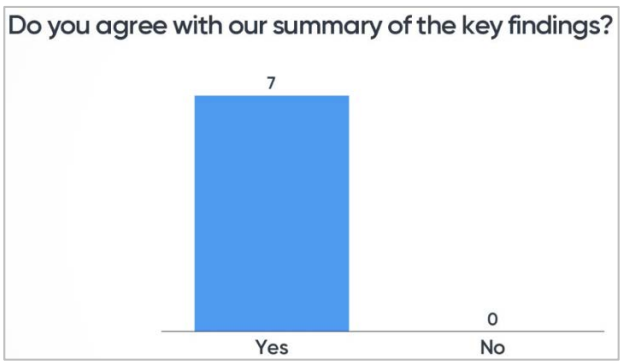
Key findings:

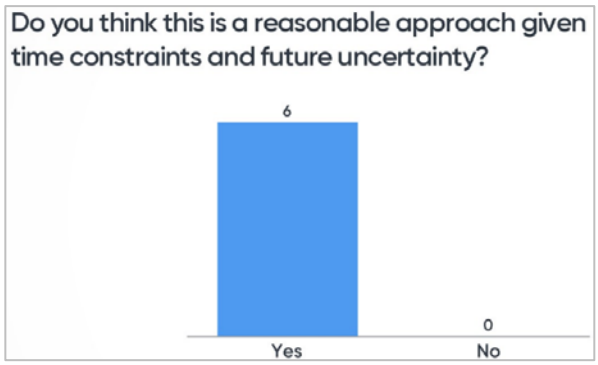
A need for extensive information sharing, collaborative modelling, accurate and consistent cost estimation, and significant resource identified as key to a successful whole system planning exercise.

Further work was recommended to refine and formalise an enduring Whole System process and methodology:
WS1 P1 RDP Learnings Report:

"The whole system analysis in these RDPs has been a learning activity and taken much time and resource.

A process is now required to be able to update the recommendations of the whole system study as backgrounds change."





(ii) Truth assessment – November 2018

Truth was commissioned to provide a comprehensive appraisal and debrief of the relevant knowledge/ insights National Grid already holds on stakeholders and to assess the robustness of engagement being undertaken. This work was undertaken in advance of the bulk of bespoke engagement activities undertaken for this strand of engagement and therefore does not include a detailed assessment for this strand. The full report of their assessment is included in *Annex A6.03 Truth Reports.*

(iii) Frontier Economics assurance – September 2019

We commissioned Frontier Economics to carry out an assurance of how our stakeholder engagement was reflected in our July draft business plan. The aim of the work was to identify whether the proposed actions in our business plan are supported by the stakeholder evidence from the engagement that we carried out. Frontier Economics also assessed how well the logic between stakeholder evidence and business plan actions is documented, and identified any gaps or areas for improvement, either in the engagement logs or in the draft business plan.

In their key findings for our plan overall, Frontier noted:

Broadly we found that the stakeholder evidence supported the actions proposed in NGET's draft July business plan. There were a relatively small number of areas where we feel that the stakeholder evidence itself could be strengthened, but we did not find any material areas of discrepancy between stakeholder views and the proposals in the business plan.

There are some areas where we feel the documentation of the key messages received from stakeholder evidence, the link between the evidence and the actions, or the actions themselves, could be improved.

Key findings for this stakeholder priority and how we have addressed these in our business plan are shown in the table, below. The full report of their assessment is included in *Annex A6.07 Frontier Gold Thread Assessment.*

Frontier's key findings for this priority	How we have addressed this feedback
General:	
Overall the engagement logs and evidence support the actions that are being taken. There are some clearly defined and strong priorities that emerge in the conclusions of the engagement log. These conclusions can be mapped to multiple actions and where this happens the link between the evidence and the proposed action is clear and intuitive.	No action
The mapping between the structures of the various engagement logs and this chapter is complex. There are three different engagement logs that are relevant for the chapter and there are some cases where there is evidence referred to in the business plan, but this does not seem to be in the engagement log. In general this chapter could have greater clarity if there was some explicit cross referencing to the relevant engagement logs to provide clear evidence of support for actions.	We have restructured *Section 3 – What our stakeholders are telling us* of the business plan narrative and the content of the engagement logs to align around 3 main strands of engagement and made a much clearer link with *Section 4 – Our proposals for the T2 period.* We have also developed 'Golden Threads' for each stakeholder priority to clearly show the linkage between engagement and proposed outputs on a page. These are provided in Annex ET.01 Golden Thread summaries and the thread for this priority is replicated on page 39 of this log.
Some actions are driven by factors other than engagement and it may provide more clarity if the business plan chapter is more explicit about where certain actions are motivated by other factors (e.g. license obligation, existing liability, etc.).	We have added narrative to the start of *Section 3 – What our stakeholders are telling us* to clearly show that our proposals are a product of both (i) licence obligations, annual process and ongoing stakeholder engagement as well as (ii) bespoke engagements undertaken in building our T2 business plan to make this clear.
Specific improvements identified:	
One of the engagement logs supporting this chapter is still incomplete and whilst it provides a detailed set of initial conclusions it was not always clear on the detailed evidence supporting these initial conclusions. Once the engagement log is completed it should provide a better evidence base.	All engagement logs have been fully completed, aligned to one of three strands of engagement and more clearly linked to proposals in the main business plan narrative as well as in the Golden Thread Annex
Some actions clearly address stakeholder priorities but the business plan write up does not reference this. NGET may wish to consider clearly referencing for each action which stakeholder priorities are addressed.	Proposals have been re-ordered and more clearly linked to a stakeholder priority within *Section 4 – Our proposals for the T2 period.* *Section 5 – The justification of our proposals* also more clearly references where a proposal addresses other stakeholder priorities, such as the ESO's target to be able to operate a zero system by 2025.
There are a number of whole system actions proposed. However, DNOs were clear that they preferred the ESO to lead the whole systems assessment. It would be good to have some explanation addressing this feedback. Currently it is not clear how or if this feedback was addressed.	The business plan is now very clear on where the ESO will lead whole system assessments, predominately through its Network Options Assessment Pathfinder projects, and where the process will be more trilateral in nature. In hindsight, our conclusion from engagement with DNOs in July that they had a, "preference for a fully ESO led process" was not representative of what we heard from all DNOs. This conclusion was therefore re-worded to read that DNOs, "stated a preference for a strong ESO role in whole systems,

	particularly through NOA expansion, and agreed an interim approach to building T2 plans". We believe this is more representative of what we heard from this group of stakeholders. This is further addressed within Section 5.3 (ii) of our business plan narrative.
Optimise with the ESO - the engagement log and business plan are both clear that this is about offering services to the ESO which may enable it to save money. However, the write up in both the business plan and the engagement log may be able to offer additional clarity if there is documentation of the ESO having requested support in these areas.	We have improved both the business plan narrative and relevant engagement log to be more clear in this area. In the business plan, the start of *Section 3 – What our stakeholders are telling us* has been re-written to be much more clear on the key role of the ESO in the industry and the annual process run by the ESO strongly influencing our plan. This ESO process involves publishing of future system requirements through both the Electricity Ten Year Statement and the System Operability Framework. *Section 5 – The justification of our proposals* of our business plan now also directly references and links to relevant ESO documents supporting our proposals. In the engagement log, we note the bilateral engagements we have had with the ESO in building our plans.
The business plan references evidence that stakeholders are willing to pay for investments that may not be needed to support decarbonisation. However, this evidence doesn't seem to be in the engagement log and it is not clear what evidence is being referred to. It would be helpful if this evidence could be clearly referenced.	The reference in our July draft business plan was only based on initial results of the willingness to pay study and did not include the results of our online slider tool survey. As a result, it is not worded in an ideal manner, given the final results across all consumer research undertaken. This has been rectified in our final business plan to ensure that there is no ambiguity / chance of misinterpretation.

……

3. STAKEHOLDER GROUP CHALLENGE & REVIEW

We circulated a draft of this engagement log in advance of the Stakeholder Group meeting on the 20th of June 2019. The Stakeholder Group were also provided with a version of our DNO engagement plan when it was originally included in one of the other engagement logs (before we acted on Frontier's feedback) for this priority for their meeting on the 29th of November 2018.

3.1 WHAT WAS THE OUTCOME OF THE STAKEHOLDER GROUP CHALLENGE AND REVIEW?

Topic specific challenges from Stakeholder Group discussion					
ID	**Date**	**Meeting**	**Challenge**	**National Grid Response**	**Status**
5	07/18	SG1	How does NG see its business plan supporting the big strategic decisions of the 3Ds?	Our 'baseline' business plan will be consistent with the common energy scenario, as stipulated by the RIIO2 Challenge Group. We propose that the funding to deliver this baseline will be adjusted by unit cost allowances, building on our experience of these mechanisms in T1. With the right funding mechanisms in place we are confident that our plans will ensure our business is ready to respond to facilitate the supply and demand impacts of the commitment to decarbonise. Combined with the development of a suitable anticipatory investment mechanism, our plan will allow us to proactively enable the more ambitious 'net zero' targets set out in the recent report by the Committee for Climate Change.	**Closed** (as per 5th June Sponsor report)

91.1	04/19	SG7	The business plan should set out clear explanations of the uncertainty mechanisms that are proposed with respect to connection uncertainty.	Discussed 24/5/19 -- Our plan will be clear on these mechanisms for the entirety of the customer driven elements of our plan. We are currently undertaking detailed analysis to design, calibrate and test our proposed uncertainty mechanisms for RIIO T2. We are also participating in a specific series of Ofgem working groups on load-related uncertainty mechanisms (first meeting 22th May 2019). The July draft plan will provide a detailed description of our approach to working up these mechanisms. A full explanation will be included, along with results of our analyses, in future iterations of our business plan submission, upon completion of the on-gong empirical work. 1/7/19 Update shared with SG8 Pre-Read -- Chapter 7 + 8 - Section 7 'How we will manage risk and uncertainty (new table of mechanisms added to make it very clear what is being proposed) + detailed annex shared late on the 5th of June; the annex describes the detail of how we will go about calculating the unit cost allowances that underpin most of the uncertainty mechanisms over the coming months. 17/09/19 Sponsor/Buddy session deep dive into unit cost allowance calculations.	**Closed** (as per 17th September Sponsor session)
92.1	04/19	SG7	What is NGET's definition of Whole systems? What are the boundaries?	Our definition of whole systems includes power, transport and heat as we think this is required in order to deliver the government's ambition to rapidly decarbonise at lowest cost to the consumer. It is broader than Ofgem's narrow definition of 'Regulated gas and electricity networks', but more narrow than what some stakeholders have called for (e.g. in response to Ofgem's RIIO-2 consultations) to include all infrastructure, such as water. We envisage that our proposition for a strategic network of ultra-rapid charging points at motorway service areas to overcome range anxiety and unlock one of the barriers to decarbonising transport is best delivered by both the TO and DNOs. Our proposal identifies a network of 54 sites that ensure the majority of the population are within 50 miles of an ultra-rapid charging point. Of these 54 sites, 60% are near existing National Grid substations and may therefore be best delivered by us. We are still working across all our stakeholders to ensure that our solution to this challenge can be delivered in whole system manner. We are not requesting baseline funding for this proposition, but proposing that it would be a good candidate for an anticipatory investment process.	**Closed** (as per 5th June Sponsor report)
92.2	04/19	SG7	Justify why the TO should be bearing the cost of roll out of motorway service area plan as opposed to DNO.	We envisage that our proposition for a strategic network of ultra-rapid charging points at motorway service areas to overcome range anxiety and unlock one of the barriers to decarbonising transport is best delivered by both the TO and DNOs. Our proposal identifies a network of 54 sites that ensure the majority of the population are within 50 miles of an ultra-rapid charging point. Of these 54 sites, 60% are near existing National Grid substations and may therefore be best delivered by us. We are still working across all our stakeholders to ensure that our solution to this challenge can be delivered in whole system manner. We are not requesting baseline funding for this proposition, but proposing that it would be a good candidate for an anticipatory investment process.	**Closed** (as per Sponsor email 28th October, subsequent to review of responses)
123	08/19	SG9	In practice, due to the pace of cost reduction in electric vehicles and offshore wind, anticipatory investment may well be necessary during the T2 period. NG to demonstrate how its framework will respond to an earlier need for investment, reflecting the changing needs of consumers.	Update provided 21/10/19 - The juxtaposition of the strong incentive Ofgem has put in place for network companies to only put the most certain costs in their baseline submissions (i.e. the business plan incentive that exposes companies to a 10% additional penalty for any costs Ofgem deem as uncertain) and the challenge of meeting net-zero targets require that the regulatory framework is flexible enough to provide funding within the T2 period when investments that benefit consumers are required. In response to this challenge we are creating our vision of a roadmap to net-zero that will map out what is required in this space. The onus is on all stakeholders to come together and ensure the Anticipatory Investment process can deliver the best whole system solutions to net-zero challenges in an agile manner.	**Closed** (as per Sponsor email 28th October, subsequent to review of responses)

126	08/19	SG9	NG to be clear about their leadership role in whole systems	Update provided 21/10/19 This will be reflected in our December plan; see Challenge 124	**Closed** (as per Sponsor email 28th October

4. CONCLUSIONS

4.1 WHAT IMPACT HAS THIS FEEDBACK HAD ON NATIONAL GRID AND THE RIIO-T2 BUSINESS PLAN?

The engagement carried out through this strand on building a whole system plan with the ESO and DNOs has had a material impact on our business plan, as noted throughout the log. The table below summarises the key impacts from across all aspects of the enhanced engagement process.

Stakeholder feedback	Proposals for the T2 period	Output type	Consumer benefit
The **Challenge Group** stipulated a requirement to work with other networks to create a Common Energy Scenario and to submit a baseline plan that is consistent with this scenario. They also challenged us to ensure our plan can flex to support the pathways to net-zero.	Our plan has been built around the requirements of the Common Energy Scenario. We have worked with DNOs and the ESO to examine if this approach meets their needs and expectation from NGET in the T2 period	N/A	Our plans align with the wider industry view of the Common Energy Scenario ensuring greater levels of efficiency across networks.
The **Independent Stakeholder Group** challenged our approach to uncertainty mechanisms and whether we are doing enough to ensure the price control is sufficiently flexible to allow net-zero 2050 targets to be met.	Our engagement with DNOs and the ESO demonstrated support for our approach to managing net-zero (and other uncertainty) via a suite of uncertainty mechanisms. In response to the challenge of our Stakeholder Group, we have broadened our suite of mechanisms and have undertaken extensive statistical analysis and probabilistic modelling of uncertainty to develop the detail.	PCD	UMs ensure NGET is only funded for the work we have to carry out
DNOs challenged us to facilitate whole system planning and ensure alternative options can be considered during the T2 period.	We have proposed a low baseline position in areas where whole system options may be most applicable (voltage and fault level management). This approach ensures we will work with stakeholders to determine the optimal whole system approach before transmission investments are delivered	PCD	Ensures best whole system option can be identified and delivered
The **ESO** challenged our approach to system operability investments	Our baseline plan does not investments designed to address ESO identified system operability issues. This is due to the uncertainty related to need and scope of investments at this time. However, we have proposed a dedicated UM to provide allowance for these investments should the need case arise during the T2 period.	Within Period Determination	Ensures TO solutions to operability issues can be progressed if they are identified as offering value for consumers.

The table below outlines how what our stakeholders have told us through this strand of engagement links to the proposals we are making to enable the ongoing transition to the energy system of the future and the consumer benefits – relevant proposals are highlighted.

Stakeholder feedback	Proposals for the T2 period	Output type	Consumer benefit
1) Provide a network that enables the transition to net-zero by 2050 at lowest cost to consumers	Innovate and invest in the network reinforcement to facilitate a changing energy market and keep costs down	PCD	Decarbonised economy Lower system operation costs
	Invest in protection and control coordination studies, changes required to maintain security of supply and identify future requirements for zero-carbon operation by 2025	PCD	Decarbonised economy Reliable supply
	Invest to facilitate closure of conventional generation and secure easements to maintain access and minimise costs	PCD	Decarbonised economy Lower network costs
2) Facilitate competition and new business models to minimise costs	Facilitate competition by highlighting projects meeting contestability criteria, consenting contestable projects and protecting consumers in incumbent delivery	PCD	Lower network costs Lower system operation costs
	Innovate by facilitating non-network solutions	Commitment	
3) Deliver electricity whole system solutions across network companies	Optimise with the ESO through a new mechanism to reduce whole system costs and installation of system monitoring to allow for zero- carbon operation by 2025	LO	Decarbonised economy Lower network costs
	Optimise with DNOs by identifying whole system opportunities, establishing an ongoing process and investing in [redacted] reactor units	ODI PCD	
What stakeholders are telling us	**Proposals**	**Output type**	**Consumer benefit**
4) Enable all energy whole system solutions	Seek to implement a suitable anticipatory investment mechanism that allows solutions to unlock rapid decarbonisation to net-zero 2050.	Commitment	Decarbonised economy Lower network costs and barriers to entry Clean air
	Provide strategic network options that have the potential to help overcome some of the challenges of decarbonising at lowest cost to consumers.	N/A	

4.2 BUSINESS PLAN OUTPUTS ALIGNED TO STAKEHOLDER ENGAGEMENT OUTCOMES.

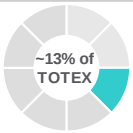
The golden thread is a concept developed to help stakeholders understand at a glance, the engagement we undertook for each stakeholder priority, the outcomes that were heard, how this translated into the outputs that NGET will deliver in the T2 period and the associated activities and costs. Our engagement with DNOs and the ESO encompassed both the ‘enable the future energy system’ and ‘connect and use’ priorities. The golden thread for each is shown, below.

Engagement

Consumer Priorities

- I want an affordable energy bill
- I want to use energy as and when I want it
- I want a sustainable energy system

Stakeholder priority and context



I WANT YOU TO ENABLE THE ONGOING TRANSITION TOWARDS THE ENERGY SYSTEM OF THE FUTURE

T2 Total £936m*

*excl. contestable projects

Topics

- Provide a network that enables transition to net-zero 2050 at lowest cost to consumers
- Facilitate competition/ new business models
- Delivery electricity whole system solutions with network companies
- Enable all energy whole system solutions

Obligations

- Facilitate aims of government energy policy
- Compliance with industry codes and standards including CUSC, SQSS and STC
- Plan and operate an economic and efficient system and implement ESO NOA recommendations

Stakeholders

Stakeholders with an outsized impact on our plans within this priority: The Government(s), the Electricity System Operator, Distribution Network Operators and Ofgem

Other stakeholders: High impact and interest - : political, network companies, large customers, new business models (e.g. flexibility & storage developers), supply chain

High impact or interest: Academics, think tanks and innovators, interest groups, consumer bodies, small/new customers, transport, and communities (directly affected)

Approach

Government, ESO & DNOs = **empower**; High impact and high interest stakeholders = **collaborate**; high impact or high interest = **consult or involve**

What we've heard

Engagement on long-term role of transmission and managing uncertainty

- Need for transmission in long-term clear, despite uncertainty
- We should play an active role in enabling the transition
- Delivering whole system solutions is important
- We should undertake timely reinforcement where required
- Our approach to setting an E&W scenario is reasonable
- Appropriate to review existing uncertainty mechanisms and consider new ones, especially targeted at whole systems
- Merit in developing an anticipatory investment mechanism

Engagement to build a whole system plan with electricity network companies

- Work to agree a Common Energy Scenario for RIIO-T2
- Agreed E&W view of EV growth and heating electrification
- DNO data submissions should inform investments at interface
- Voltage issues have large potential for whole system solutions
- ESO should play key role in whole system collaboration; particularly through the expanded NOA process
- Unanimous support for development of uncertainty mechanisms that allow for whole system solutions during T2

Engagement to build a whole system plan with non-network companies

- Technical challenges to overcome to realise full potential of flexibility in solving network issues
- Flexibility can delay Tx/Dx interface investment and complement boundary capability, but limited T2 opportunity to replace network capacity altogether
- We should think broadly about where we could provide solutions to net-zero challenges
- A whole system approach is required to minimise costs
- We should set out a roadmap to achieving net-zero

Key trade-offs and how engagement influence our plans

- Provided confidence in extending T1 approach to managing uncertainty and shaped future energy assumptions
- Concluded on a pro-active approach to enabling transition
- Expanded suite of uncertainty mechanisms and approach to their development in response to challenge
- Removed reactor costs from baseline (~£184m) and developed an uncertainty mechanism to allow whole system solutions to be identified and delivered within the T2 period
- Proposals based on a whole system approach involving ESO, DNOs and TOs
- Removed proposal to invest £2m to develop an economic modelling capability
- Expanded whole system thinking beyond network companies and broadened solutions to net-zero challenges

Outputs

Measure

Provide a network that enables transition to net-zero 2050 at lowest cost to consumers			Facilitate competition/ new business models	Delivery electricity whole system solutions with network companies		Enable all energy whole system solutions
Innovate and invest in network reinforcement Type: PCD Target: Deliver 22.5GW boundary capability Incentive: TIM	**Enable ESO zero carbon operation by 2025** Type: PCD Target: Complete modelling & identify future requirements Incentive: TIM	**Invest to maintain access and minimise costs** Type: PCD Target: Separate sites and secure easements Incentive: TIM	**Facilitate competition and new business models** Type: PCD Target: Deliver 4 consented projects + commitment Incentive: TIM	**Electricity whole system optimisation with DNOs** Type: PCD Target: MVar reactive capability Incentive: TIM, CAM	**Electricity whole system optimisation with ESO** Type: LO, PCD Target: Deliver STC requirements Incentive: TIM	**Enable whole system solutions to net-zero challenges** Type: Commitment Target: N/A Incentive: N/A
Deliver 22.5 GW of boundary capability recommended by ESO through the NOA process	Model secondary systems, identify future requirements and change settings where required	Proactively secure essential services at shared sites and convert wayleaves to easements	Deliver large (>£100m) consented projects ready for competition and work with flexibility providers to identify opportunities	Work with ESO/ DNOs to provide optimal solutions to network issues	Deliver STC system monitoring obligation ESO/TO optimisation mechanism	Process to facilitate investment ahead of clear need and options to overcome net-zero challenges

Comparison to T1

12.4 GW boundary capability	N/A	Work spans across multiple price controls	3 projects >£500m (T1 threshold) consented	[redacted] reactors delivered	Minimal system monitoring in T1	New measure

Costs

Cost at T1 (annual average)

£77m (excl. Western HVDC)	N/A (not a T1 activity)	£26m	£12m (projects >£500m)	£16m	£3m	N/A (not a T1 activity)

Work needed

• Uprate circuits, network reconfiguration, etc. to enhance boundary capacity by 22.5 GW • Respond to NOA recommendations and maintain compliance with SQSS	• Build model of all secondary systems • Undertake analysis to understand impact of low fault levels + inertia • Change settings • Identify future requirements (subject to determination)	• Continuation of programmes started before T1 period • Secure permanent easements to maintain access • Deliver site separations to allow conventional power station closures and continue site operation	• Help develop an early competition model • In lieu of a model for early competition, progress large (>£100m) projects with a NOA proceed signal to consents – ready for late competition • Work with flexibility providers to identify opportunities	• Work with DNOs and the ESO to deliver whole system opportunities • Invest in [redacted] reactor units for £31m to reduce system operation costs • New reactive uncertainty mechanism	• Offer range of flexibility services to ESO for market testing at no cost • Install system monitoring equipment required to comply with STC • New reactive uncertainty mechanism	• Extensive collaboration across stakeholders to continue to establish and participate in an anticipatory investment process • Continued development of potential solutions to net-zero challenges

Cost at T2 (total and annual)

Total: £507m **Annual: £101m**	**Total: £31m** **Annual: £6m**	**Total: £135m** **Annual: £27m**	**Total: £182m** **Annual: £36m**	**Total: £31m** **Annual: £6m**	**Total: £48m** **Annual: £10m**	**No expenditure proposed**

Approach to uncertainty

Boundary capacity unit cost allowance	Within period determination	(No volume uncertainty)	Consented route length unit cost allowance	Static reactive unit cost allowance	Dynamic reactive unit cost allowance	Anticipatory process and harmonic filter within period determination

Consumer benefit

• Facilitate decarbonisation of power, transport and heat – net-zero 2050 • Minimise cost of operating network and reduce wholesale energy costs by at least £250m/annum			• Minimise the cost of networks in RIIO-T2 period and beyond	• Facilitate decarbonisation of power • Minimise network costs		• Facilitate decarbonisation of power, transport and heat – net-zero 2050

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Engagement	Consumer Priorities	I want an affordable energy bill	I want to use energy as and when I want it	I want a sustainable energy system
	Stakeholder priority and context	~6% of TOTEX	I WANT YOU TO MAKE IT EASY FOR ME TO CONNECT AND USE THE NETWORK	T2 Total £417m
	Topics	Connections		Customer experience
	Obligations	Compliance with industry codes and standards including CUSC, SQSS and STC		Needs of customers
	Stakeholders	Stakeholders with an outsized impact on our plans within this priority: The Electricity System Operator (ESO) and all our customers have been involved on our plans within this priority **High impact and interest**: Network companies, large customers, small/new customers **High impact or interest:** New business models & consumers		
	Approach	High impact and high interest stakeholders = empower & collaborate; high impact or high interest = consult or involve		
	What we've heard	**Stakeholders have told us that they want us to:** • Provide a simpler, flexible, affordable and co-ordinated approach to connections • Work with network operators to identify optimal solutions to facilitate the decentralisation of generation and potential growth in demand • Quantitative acceptability testing showed strong support for our proposed investments, 92% of respondent's agreed with the proposed investment of connecting new power generators and 71% agreed with the proposed investment and impact on bill is		**Stakeholders have told us that they want us to:** • Provide more information and support upfront before they make an investment decision. • Make more of a commitment to connection dates and reducing lead times • Reduce the volatility and improve the transparency of our charges • Provide more information about planned network outages and minimise any changes • Create a customer experience where they are treated like a partner
	Key trade-offs and how engagement influence our plans	The Independent Stakeholder Group challenged us on how we could provide more certainty on connection dates for customers and take on more risk. Based on this feedback we have developed an ODI to encourage us to deliver earlier connection dates to benefit our customers and to bring forward the reduction in greenhouse gas emissions from low-carbon generators connecting to our network. A key trade-off was whether to include costs in our baseline to manage additional thermal capacity and fault level capacity to address the impact of embedded generation on the transmission network, where whole system alternatives could exist or whether to exclude these costs from our baseline and develop an uncertainty mechanism that would provide funding where transmission investment is the best solution for consumers. Based on the insights gathered through this engagement, we have decided to fully embrace the potential of whole system solutions to reduce costs for consumers, thereby reducing our baseline proposals by £105m.		
Outputs	Measure	**Generation connections** **Type:** LO, PCD and ODI **Target:** To deliver 15.3GW of connections and outperform the average delivery date for connection **Incentive:** Penalty only 0.5% & TIM Connection dates - we propose an annual cap of 1% of base revenue.	**Demand connections** **Type:** LO, PCD **Target:** To deliver [redacted] SGTs **Incentive:** Penalty only 0.5% & TIM	**Customer experience** **Type:** Common ODI & bespoke ODI **Target:** Quality of connections (target will be determined post trail) , satisfaction of outages - 7.7 in 21/22 increasing to 7.9 in 25/26 and Timely connections 100% of offers. **Incentive:** Quality of connection - ±0.6 % of base revenue, satisfaction of outages ± 0.4% of base revenue) and timely connections – No reward, penalty only -0.5% of revenue.
		Measures the capacity of generation connected.	Measures the number of supergrid transformers (SGTs) installed	Measures the satisfaction of our customers of their connection and outage management experience
	Comparison to T1 outputs	T1 forecast to deliver 12.6GW of generation and [redacted] new SGTs		Customer satisfaction score up from 7.4 at start of T1 to 7.93 so far in the T1 period and our connection customer satisfaction score has improved from 7.5 in 2015/16 to 8.0 in 2018/19 through the accelerated customer programme.
Costs	Cost at T1 (annual average)	£87m	£82m	£7m
	Work needed	Network investment to connect 15.3GW of new generation connections, consistent with the common energy scenario, including • CCGT • Offshore wind • Interconnectors • Batteries • Hinkley • Other generation developments	• Additional SGTs and GSP to support demand growth (working with DNOs). • Connect non-DNO customers (rail, data centres) directly to transmission network • Address rising fault levels due to embedded generation -- work with DNOs on a whole system solution, potentially requiring replacement of circuit breakers	Deliver people, systems and products for effortless end-to-end customer experience, including: • Investment across period to include more customer journey aspects within CRM • Investment in an online portal for our website, improve customer self-service capability • Continuation of customer connections team Make a step change in the system access experience through our customer journey work Address our contribution to volatility of customer charges by: • Improving the general design and operation of the existing mechanism • Developing unit cost allowances more cost reflective and develop new uncertainty mechanism for the RIIO-T2 period.
	Cost at T2 (total and annual)	**Total: £245m** Annual: £49m	**Total: £142m** Annual: £28m	**Total: £30m** Annual: £6m (£20m Connection team + £10m IT investment)
	Approach to uncertainty	Generation capacity connected unit cost allowance	Number of SGTs unit cost allowance + LV substation re-build unit cost allowance (for rising fault levels)	N/A (only certain costs included)
	Consumer benefit	• Lower wholesale electricity costs to benefit society as a whole • Enable decarbonisation of the electricity system and support the government CO_2 and health targets		• Allow our customers to effectively make decisions based on the need of their customers (i.e. consumers)

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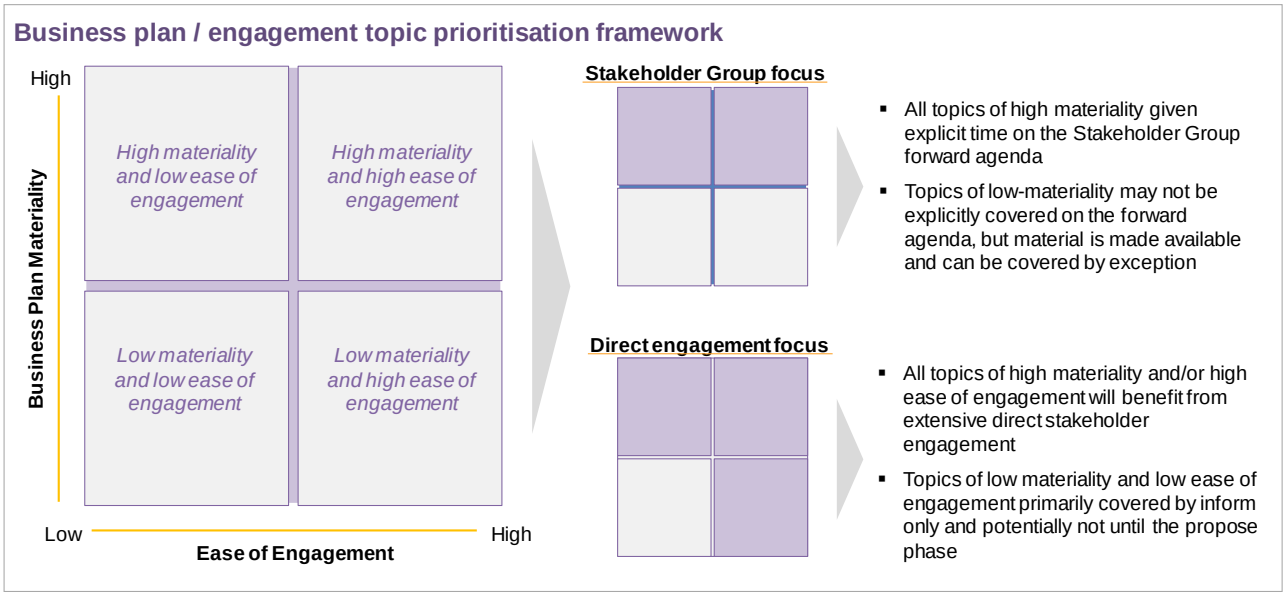
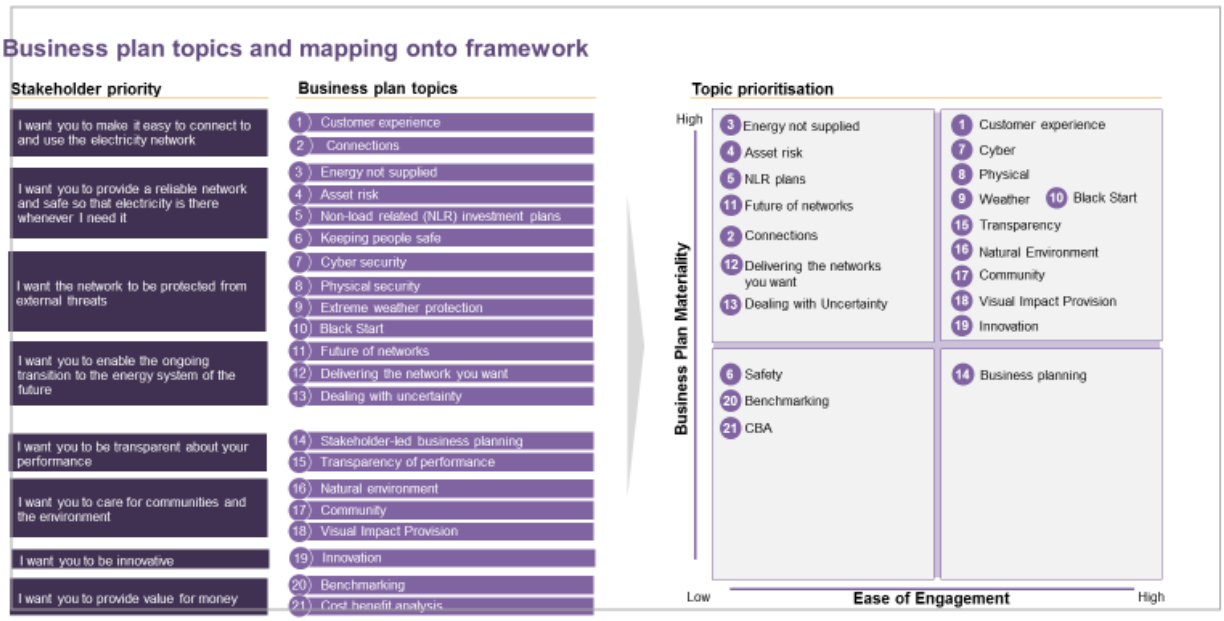
5. APPENDIX

5.1 ENGAGEMENT PRINCIPLES CHECKLIST

Principle		Check
1	Define and map your stakeholders - anyone who believes they are affected by your decisions. Recognising the different threads of the public interest – stakeholders, customers, consumers, citizens, communities (geographical and interest)	
2	Be clear what you want to achieve with "engagement" – have clear policy objectives and measures of impact; (incl. where you most need to engage)	
3	Understand the "spectrum of participation" and difference between each part of that spectrum: inform, consult, involve, collaborate, empower	
4	Engage early in the process, review and improve throughout	
5	Leadership – effective stakeholder engagement must be led from the top of the organisation	
6	Commitment – to listen to stakeholders' views and act on or respond to them	
7	Objectivity – an open approach to obtaining stakeholders' views and to interpreting them. Seek to understand views on a range of topics and on all aspects of the business plan, rather than pre-determining their priorities or seeking to endorse your own priorities	
8	Transparency – to build stakeholder trust and show that you take their views seriously (incl. how we've considered views, weighted and managed trade-offs)	
9	Be inclusive: work with stakeholder groups to gather the fullest range of interests. Understand and balance the differences between different segments. Understand and balance the differences between existing and future stakeholders	
10	Be aware that those who often participate i.e. the "usual suspects" are not always representative	
11	Be accessible to all (e.g. in consideration of the tasks, timelines, contact person, tech., locations, challenges of communication, etc.)	
12	Use targeted approaches to tailor engagement to suit the knowledge and awareness of different groups	
13	An ongoing process that is embedded across the business – not just a stand-alone business planning/price control review exercise.	
14	Evidence based – use a full range of available sources of info to identify priorities, views and challenges (e.g. operational insight, bespoke research,	
15	Gather evidence through a range of methodologies and tools including willingness to pay, qualitative research, surveys, complaints intelligence, market data	
16	Be responsive – seek to adopt a flexible process to engagement, responding to the information revealed as the process progresses	
17	Demonstrate impact of engagement – ensure that the engagement design process plans for and allows evaluation of success	
18	Innovation – trying new and innovative ways of engaging	

5.2 BUSINESS PLAN / ENGAGEMENT TOPIC PRIORITISATION FRAMEWORK





5.3 STAKEHOLDER SEGMENTS

Stakeholder Segments – Electricity

Segment	Description	Example organisations
Political	Elected officials and advisors; Westminster + Cardiff	MPs, SpAds, Assembly Members
Governmental	Civil service and committees	BEIS, DEFRA, NIC, CCC
Regulatory	Energy and safety regulators	Ofgem, HSE
Consumers	Members of the public, commercial & industrial	Members of public and businesses
Consumers bodies	Members of the public, commercial & industrial	Citizen's Advice, NEA, Which?, MEUC, CBI
Communities	Local councils, community representatives	Greater London Authority, Anglesey County Council
Large customers	Large, often vertically integrated and international	Big 6, Drax, Orsted, Network Rail
Small / new customers	Small, often specialist organisations or non-energy	OVO Energy, Robin Hood Energy, JLR
Network companies	Other regulated energy network companies	UKPN, WPD, NPG, ENW, SPEN, SSEN
New business models	New business exploiting the '3 Ds'	Pivot Power, Limejump
Think tanks & innovators	Elected officials and advisors; Westminster + Cardiff	Energy Systems Catapult, IET, EIC
Interest groups	Groups representing special interests	Green Alliance, Sustainability First,
Academics	Energy specialists and researchers in academia	Imperial College, Exeter Uni., Newcastle Uni.
Supply chain	Developers and suppliers of network assets	Siemens, ABB, Prysmian
Other	Stakeholders not defined in other segments	Media, Consultants, EU bodies, etc.

5.4 ENGAGEMENT APPROACH – SPECTRUM

Approach to engagement – spectrum

	INFORM	CONSULT	INVOLVE	COLLABORATE	EMPOWER
STAKEHOLDER ENGAGEMENT GOAL	To provide stakeholders with balanced and objective information to assist them in understanding the problem, alternatives, opportunities and/or solutions	To obtain stakeholder feedback on analysis, alternatives and/or decisions	To obtain public feedback on analysis, alternatives and/or decisions	To partner with stakeholders in each aspect of the decision including development of alternatives and the identification of the preferred solution	To place final decision making in the hands of the stakeholder
PROMISE TO THE STAKEHOLDER	We will: ▪ keep you informed	We will: ▪ Keep you informed ▪ Listen to and acknowledge concerns and aspirations ▪ Provide feedback on how you have influenced our decision ▪ Seek feedback on drafts and proposals	We will: ▪ Work with you to ensure that your concerns and aspirations are directly reflected in alternatives developed ▪ Provide feedback on how you have influenced our decisions	We will: ▪ Work together with you to formulate solutions and incorporate your advice and recommendations into the decisions to the maximum extent possible	We will: ▪ Implement what you decide

Adapted from the International Association of Public Participation – Public Participation Spectrum, 2007