

# **Appendix 7: RIIIO-2 User Group Challenge Log for National Grid Gas Transmission**

**December 2019**

## Note

This challenge log was established, and began to be populated, at the first meeting of the User Group in July 2018. It contains a list of challenges posed to National Grid Gas Transmission (NGGT), together with a record of NGGT's responses. It is a detailed log which contains the User Group's ongoing challenge audit trail and is an important, but one, part of the evidence base of the group's work. It was complemented by the intensive, and iterative, process of scrutiny and challenge which took place between July 2018 and December 2019. Previous draft versions of the NGGT business plan were submitted to the User Group, Ofgem and the Ofgem Consumer Challenge Group in July and October 2019. The User Group provided particular, and detailed, challenge, and written feedback to NGGT on each occasion. As the work of the User Group reached its peak between October and December 2019, the key challenges arose in response to the written feedback provided to NGGT in October and these challenges and the NGGT response form the basis of the conclusions in the User Group's final report.

# Stakeholder engagement

Challenge reference	User Group challenges	NGGT Response	User Group Status
1	What is the overall National Grid approach to stakeholder engagement.	There was a session at SG1 on 30/31 July to go through National Grid approach to stakeholder engagement and the pre-read from this meeting also provided details of our approach including information presented in the Stakeholder Engagement Incentive Submission (SEIS) document. Our approach to stakeholder engagement will also be presented in the Stakeholder Engagement chapter of our Business Plan, including our Stakeholder Engagement Strategy for RIIO-2.	Closed
2 and 3	<p>How has NGGT accounted for the perspective of future consumers in its stakeholder engagement approach? I'm especially interested in how climate risk is considered (from the perspective of mitigation, adaptation, avoided future costs, and stranded assets).</p> <p>and</p> <p>How has NGGT's approach to (present) stakeholder engagement taken up the latest psychological research into people's values about the energy transition? (the canonical report on this is available from UKERC at (<a href="http://www.ukerc.ac.uk/publications/paying-for-energy-transitions.html">http://www.ukerc.ac.uk/publications/paying-for-energy-transitions.html</a>)).</p>	<p>At the SG5 session we presented our consumer strategy including current and future. The stakeholder group members had a discussion about what good would look like in this area and there were no specific examples of good engagement with future consumers that members could advise. Likewise, there have been no specific examples shared by Citizens' Advice. However, we are seeking to use trend and public attitude research e.g. involving underlying public attitudes versus attitudes likely to change; identification of trends, how are consumers going to use what we are offering differently in the future. There are a number of workstreams ongoing in this area:</p> <p>Deliberative research - An ongoing workstream to work with consumer research experts, using deliberative research techniques, focus groups and consumer workshops as appropriate. These sessions will explore important and relevant topics in more detail, to provide more in-depth views than the quantitative channels. Specifically, on the topic of 'pay now, pay later' we are scoping a deliberative consumer session to explore pay now versus pay later which picks up who should pay for future costs of the network and takes into consideration impacts on future consumers.</p> <p>Cultural Analysis – We have also undertaken an innovative approach to understanding culture without direct engagement with consumers. This work is being undertaken with Canopy, a cultural insight and innovation consultancy, and seeks to understand broader consumer attitudes and trends, which are particularly useful when looking at the needs of future consumers. This work is assessing two areas - reliability and responsible and sustainable business. In each case the objective is to</p> <ul style="list-style-type: none"> <li>• Identify dominant (current) and emergent (future) codes and narratives in the UK</li> <li>• Map opportunity spaces for National Grid around the most salient and most emergent codes and narratives identified</li> </ul> <p>The output from this was presented at SG9 in August 2019.</p>	Closed
4	How does NGGT set its approach in the context of relevant legal requirements, for example meeting the 4th and 5th carbon budgets?	We welcome the publication of the Committee on Climate Change (CCC) Net Zero Report and the ambitious goals and direction within. We want to play our part in the decarbonisation of Great Britain's energy system and to make sure the transition to a clean energy system is fair and leaves no-one behind. And we want to achieve it all at the lowest possible costs for bill payers. Natural gas has an important role to play in	Closed

5	Given Nicola Shaw's very helpful comments about needing to move beyond a 'least worst regrets' approach toward something which takes strategic decisions, how does NGGT see its business plan supporting the big strategic decisions of the 3Ds?	supporting the transition to low-carbon power, heat, industry and transport. It provides the reliability and flexibility to support growth in renewable generation and it gives Great Britain options to decarbonise commercial vehicles and industry. Perhaps most importantly, gas can also help to decarbonise heat, the biggest source of UK carbon emissions, at the lowest cost and with least disruption to consumers. As per the Committee on Climate Change (CCC) report, we need to see much greater progress in making areas like heat and transport cleaner, with both government and industry stepping up action. Gas can support a fair transition to low-carbon power, heat, industry and transport and play a key role in meeting the GB environmental targets. Further development of this challenge will be linked to emissions compliance challenges (challenge #116-121).	
6	Business plans need to clearly focus on consumer outcomes.	We have worked to ensure consumer focussed outcomes are at the heart of our RIIO-2 business plan. The way in which consumers have been considered in setting the priorities was presented in SG1. The engagement log template has also been updated to include consumer outcomes, consumer value is a core part of our 'golden thread' approach and will also be presented in the draft business plan. Each chapter in the draft business plan lists the three consumer priorities and how they are supported by proposals in our plan.	Closed
7	Demonstrate how customer/stakeholder priorities (and how they are delivered) has changed over time.	Similar to challenge #5, this is described within the context chapter of the business plan. Over recent years we have seen a step change in how we engage with our stakeholders. This is reflected in the comprehensive programme of engagement to build our RIIO-2 business plan, and us being confident that we have a better understanding than ever before of the priorities of our stakeholders. Please also see the stakeholder chapter of our RIIO-1 submission which articulates the key messages from stakeholders at the time of building our RIIO-1 plan (specifically from page 12 "How stakeholders have influenced our March 2012 business plan").	Open
8	NGGT must evidence stakeholder engagement in line with best principles.	The challenges raised in this log and the actions delivered have driven alignment with the best principles. The list of best principles was included within the engagement log and used to test each topic as presented to the stakeholder group.	Closed
9	NGGT to articulate overall aims of their overarching stakeholder engagement approach (including benefits and value, timeline for decision making, making better decisions).	This is now presented in the stakeholder chapter of our business plan. We also outline our stakeholder engagement strategy for RIIO-2.	Closed
10	Stakeholder engagement is carried out business wide, not just within stakeholder engagement teams.	Our AA1000 reports that we undertake stakeholder engagement in pockets within the organisation. Our customer team have a map to build capability in this area which is a longer-term action. The RIIO-2 engagement is coordinated by a central team with business experts brought in as required. We acknowledge that we continue to be on a journey with regards to fully embedding stakeholder in our business, we expect to continue to make positive improvements in this throughout the remainder of RIIO-1 and into RIIO-2 as we strive to meet our stakeholder ambition.	Closed
11	NGGT to evidence who they are working with to benchmark proposed outputs.	Our approach to benchmarking was presented at SG7 and further challenges have been recorded specifically against that paper.	Closed

12	NGGT to provide a self-appraisal of performance (strengths, weaknesses and highlight where the group can add value).	This will be developed as part of planning the scrutiny phase of the work with the stakeholder group and linked to the planning and focus of the agenda and discussions. RIIO-1 performance is available through the RRP (Regulatory Reporting Pack) document shared with the group. RIIO-1 and TPCR4 performance is also detailed our response to the Challenge Group.	Closed
18	NGGT to demonstrate a golden thread of stakeholder input tracked through the business plan.	We have developed a template which describes how our business plan costs and proposals can be linked back to our engagement activities and insight. Each chapter in the business plan will have an associated 'golden thread'.	Closed
19	NGGT to feedback to Ofgem that there is no collaborative forum for smaller shippers.	Feedback provided to Ofgem in bi lateral meeting - 18th October 2018.	Closed
20	Consider education of stakeholders - how do NGGT educate so stakeholders know if they should or shouldn't get involved; in line with this get "informed consent" where they choose not to be engaged and record this.	<p>To reflect stakeholders' needs in our business plan, we do need to make sure a broad range of views. To tailor our engagement for each part of our business plan, we mapped our stakeholders based on their interest in the topic and the impact our work has on them in that area. During our engagements, we ask stakeholders to gauge their own level of interest and impact in a topic to further validate our approach and evolve our engagement to make it as effective as possible, based on three factors:</p> <ul style="list-style-type: none"> <li>• How stakeholders tell us they want to be engaged.</li> <li>• What we're talking to them about.</li> <li>• The type of insight we're seeking.</li> </ul> <p>As part of our response to this challenge, we issued a playback document in February 2019 as an opportunity for us to increase awareness and education of the impact of our RIIO-2 plan. We have attributed lessons to the process, based on the low response rate received and will apply these to our planned engagement on the July business plan. For topic-specific engagement this will be recorded based on the response to each invitation to engage. Depending on the stakeholders and the topic under consideration we flex our approach to targeting stakeholders. This is articulated across the engagement logs.</p>	Closed
21	NGGT to be clear who is key within targeted stakeholder grouping so it is clear if NGGT have reached them all.	We altered our approach to mapping of stakeholders to draw out the high impact/ high interest segments. We also worked with TRUTH to identify gaps and potential solutions for how to reach those we have not interacted with. We also updated our engagement logs to provide verbatim quotes assigned to specific stakeholder organisations where possible.	Open
22	NGGT to map and articulate future users.	Please see challenge 2 for our approach to future consumers. For other future stakeholders, we address this by seeking appropriate input from a broad range of stakeholders on a topic by topic basis. For instance, on whole energy system the independent research agency appointed were, amongst other targets, tasked with ensuring an appropriate representation of stakeholders that could be categorised as "new business models".	Open
23	Prioritisation and weighting of a topic – NGGT need to consider not just the £, but the impact.	In response to this challenge, a greater level of detail on the context was provided in the engagement logs and deep dive papers. The Stakeholder Group articulated their prioritisation in the closed session held in January 2019.	Closed
24	NGGT to provide contextual information around engagement (comparative, best practice and performance info where appropriate in engagement).	In response to this challenge additional context was provided in each engagement log including RIIO-1 output performance where appropriate. We have in additional shared specific RIIO-1 material with the Stakeholder Group including a webinar, SG6 presentation and response to the Ofgem Challenge Group request on RIIO-1 performance (uploaded to huddle).	Closed

25	NGGT to ensure they are exploring all opportunities for sharing learning/collaboration across industry.	<p>In developing our approach, we've looked at best practice from industries that had already used this approach. This has included speaking to Heathrow Airport and with several of the UK water companies. We also spoke to companies who had supported networks through these processes, to learn what had worked well and what lessons could be learned for our own business plan development, and used other published sources of information to help build our programme. We used this learning to build on our existing engagement approach, which we base on the principles of the AA1000 Stakeholder Engagement Standard.</p> <p>Each engagement log now includes existing interactions with other network licensees and third parties where appropriate. We are also participating in all the relevant Ofgem RIIO-2 working groups. We also regularly engage with the Electricity Transmission Owners to consider collaboration opportunities and through our active membership of the Energy Networks Association.</p>	Closed
26	NGGT to consider stakeholder/customer satisfaction benchmarking.	Whilst for NGGT there is no corresponding party with the same set of stakeholders against which we could be directly compared, our stakeholder and customer satisfaction can be benchmarked through the existing Customer and Stakeholder Satisfaction Incentives.	Closed
27	NGGT to provide more information on business as usual operational insights to inform the business plan.	As per challenge #24	Closed
28	NGGT to consistently demonstrate segmentation of views including regional variations.	As per challenge #21. In addition, we have expanded the engagement log template to include a section to articulate any potential regional implications of the specific topic under consideration.	Closed
29	NGGT to describe informed consent, where stakeholders tell you they don't want to engage - align to education challenge.	As per challenge #20	Closed
30	NGGT to think about new ways to govern and draw engagement differently and the mechanisms needed to deliver this.	In our submission, we include our proposed RIIO-2 stakeholder strategy, this includes how we plan to enhance our engagement approach across the business for RIIO-2.	Closed
31	NGGT have confusing stakeholder segments - consumers, communities, public interest.	In response to this challenge we provided a definition for each stakeholder segment in the environment engagement log.	Closed
32	NGGT to explain links to RIIO-1, any RIIO-1 pain points and associated allowance allocated at this time.	As per challenge #24. In addition, we will articulate the RIIO-1 comparison within each chapter of our business plan and this has been included in the golden thread template.	Closed
33	NGGT to demonstrate where engagement is best delivered in partnership e.g. Willingness to Pay.	We continue to work with third parties best placed to help us learn and deliver our stakeholder engagement - this includes the work with Truth and Frontier as well as on Willingness to Pay and collaboration with the Gas Distribution Networks on appropriate topics.	Closed
34	NGGT to engage independent audit research report to ensure engagement logs are an accurate reflection of customers, users and public interest views.	We also appointed Truth to undertake a gap assessment of our engagement as of December 2019, which was used to inform the next stage of our engagement activities. We are also working with Frontier to assess the conclusions drawn in key elements of our engagement, including Asset Health. The outcome of this is built into our business plan and shared with the stakeholder group. In addition, we are conducting an internal audit of our engagement activities to give further challenge to the overall engagement programme.	Closed

35	NGGT to facilitate sharing of good innovative partnership working on engagement across industry.	Primarily this will be delivered through our interactions with the various stakeholder segments, but specifically engagement with the gas distribution networks, electricity transmission owners and participation at the Ofgem working groups.	Closed
36	NGGT to demonstrate how we are capturing public interest in our engagement approach.	One of our stakeholder categories covers "interest groups" which picks up groups representing specialist interests, including environment. Where appropriate this category is targeted for engagement on specific topics.	Closed
37	NGGT to demonstrate that it has engaged with customers on what kind of business NG should be i.e. in the context of nationalisation to tackle the fiery questions, fat cat pay, worker's rights, fair profits.	NGGT commissioned Explain to deliver a workshop with household consumers as part of the RIIO-2 enhanced engagement programme wider business planning. The key topics covered in the session included; awareness of National Grid and their role, areas of focus for National Grid within its service provisions and wider business responsibility, and willingness to pay. The output from this will form the basis of our update at SG9 in August 2019.	Closed
38	NGGT to be clear on what is happening to address pain points in RIIO-1.	As per challenge #32	Closed
39	NGGT to include feedback from events in a consistent way.	We have standardised our approach to the engagement logs and describe how we facilitate consistent feedback. We have then typically provided feedback on engagement in newsletters and playback webinars.	Closed
168	NGGT to demonstrate the Stakeholder Engagement strategy reflects all the learning from RIIO-2.	The strategy is built on our approach to building our business plan, which included learning from others on enhanced engagement and RIIO-1 business as usual insight.	Closed
169	Stakeholder Engagement strategy - NGGT to demonstrate how they are using engagement to deliver business commitments.	Our strategy is based on engaging with stakeholders to develop not only our Gas Transmission priorities but also our UK priorities upon which we will deliver our business commitments.	Closed
170	Stakeholder Engagement strategy -Address all noted gaps [ambition, aims, plan for delivery, strategy for each of outcome area, key parties for engagement including staff, key projects and business as usual engagement, measures].	We have provided a further iteration of our strategy for December which has more on our vision and ambition and includes priority engagement and measures.	Closed
171	Stakeholder Engagement strategy – NGGT to demonstrate tangible plans for embedding engagement within the culture at all levels of the organisation.	Our strategy includes strategic and tactical engagement, and it builds on our current model of stakeholder engagement embedded across the organisation.	Closed
172	Engagement summary report - Further evidence required of how NGGT will feedback to stakeholders.	Similar to challenge #39, we have published February playback, July draft plan, newsletter in October and held playback webinars and stakeholder newsletters. We have developed a full range of engagement activities for stakeholders, employees and shareholders which are underway following publication of the December plan. Following any engagement activity, it's important we clarify what we've heard and confirm what we will be doing next. We have undertaken ten playback webinars covering nine topics to allow stakeholders to join and participate without causing too much disruption.	Closed
173	Engagement summary report - Further evidence required of third party insight and business as usual engagement.	We have now included where relevant any third party and business as usual engagement. For example, in the engagement report for each stakeholder priority we have included all the business as usual engagement channels, stakeholders and outcomes.	Closed

174	Engagement summary report - Further evidence of insight required from different stakeholder segments.	In our updated engagement report we summarise what we have heard from customers, consumers and other stakeholders for each priority.	Closed
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## Gas On and Off the NTS

Challenge Reference	User Group challenges	NGGT Response	User Group Status
65	NGGT to be clear how to address gaps in stakeholder engagement.	The engagement for the gas on and off the NTS chapter has been quite extensive across multiple phases and topics. Having begun with quite a broad approach as part of the summer 2018 events, this narrowed down to asset health options and investment at Bacton terminal (as presented in the asset health deep dive paper). We also had insight from our consumer engagement programme. The final stages of engagement have primarily focussed on the Network Capability and is contained in Annex A12.05	Closed
66	RIIO-1 context – NGGT to include Ofgem views and other views to make this more balanced. It currently feels like a sales pitch, NGGT need to provide diversity of views.	The 'critical voices' are similar to those in the Whole Energy System engagement log for this topic i.e. organisations who believe that gas, a fossil fuel, is not the energy vector to invest in. These organisations will not support further investment in a gas transmission network.	Closed

67	NGGT to articulate the quality of engagement e.g. feedback summary from events.	<p>We have provided below a summary of the type of feedback we received at our engagement events and the action we took to address the comments. The table below encompasses a range of topics, rather than being specific to gas on and off the NTS.</p> <table border="1" data-bbox="947 204 1951 930"> <thead> <tr> <th data-bbox="947 204 1480 228">Feedback Quote</th> <th data-bbox="1480 204 1951 228">National Grid action taken</th> </tr> </thead> <tbody> <tr> <td data-bbox="947 228 1480 296">"Very broad topics with a very broad group of stakeholders. 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68	NGGT to be clear on next steps - early sight for stakeholder group.	Following the issue of this engagement log, the following steps included completion of the engagement events presented in the engagement log and then the development of costed options. We held the 'deep dive' on the asset health elements of this chapter at the February meeting, in advance of the July business plan draft. Asset health is the most material aspect of this chapter and so the challenges from the stakeholder group form the areas of focus were acted upon prior to this.	Closed																				
69	More thought needed at end of consultation engagement.	See challenge response #65	Closed																				
70	Undersold consequences of failure including HSE implications, loss of pipeline.	Chapter 12 Network Capability explains the implications of insufficient levels of network capability and includes the EY costs to the gas and electricity industry of insufficient levels of network capability.	Closed																				

71	NGGT to look at good practice for risk/ probability in deliberative work.	We recorded in the SG5 consumer paper the health and safety related considerations for local communities: We were advised that this can be valued using government guidance on the value of human life / avoiding injury that informs health and safety investment appraisal. However, including safety attributes in a stated preference survey is not advisable: (A) customers may focus on it at the cost of ignoring other factors, and (B) individuals stated valuation of human life are (like GHG emissions, etc.) known to be unusable for CBA. Subsequent to this, whilst the deliberative work in this area has not gone ahead, within our Willingness to Pay programme, NERA have provided background to how they ensure stakeholder believe there is a genuine impact of any low probability high impact event.	Closed
72	NGGT to ensure innovative thinking is reflected.	At SG7 we presented a deep dive paper on our innovation proposals for RIIO-2. This included our portfolio approach covering three categories 'fit for the future', 'ready for decarbonisation' and 'decarbonised energy system'. Initially under 'Fit for the Future' we will look at innovation which can safeguard and prepare our assets for the challenges in operating for the next 50 years and towards a decarbonised future. Further challenges on innovation are recorded against that paper specifically.	Closed
73	NGGT to explain how users book and pay for capacity and how this is considered in this engagement process.	The Charging Review is ongoing and the final decision will not be made until May 2019. We will therefore not specifically take account of this within the July business plan. Also, the Access Review is currently being scoped and there is the opportunity for stakeholders to engage through this process.	Closed
74	Where do you stop with engagement?	See challenge response #65	Closed
75	NGGT need to think through overall strategic implications - articulate strategic options clearly and be more focused.	<p>To improve how we show that our plan meets customer needs, we have developed new metrics that show the intact capability of the network compared to customer needs under each of the four Future Energy Scenarios, and how these needs change with time out to 2050.</p> <p>More specifically, on asset health we developed and presented three key options in the Asset Health deep dive paper at SG6. These were as follows:</p> <ol style="list-style-type: none"> <li>1. Maintain spend at RIIO-1 level: Under this option, we hold the health and safety risk stable there would be a higher level of risk in other areas of availability and reliability and environmental.</li> <li>2. Risk level remains similar to that of RIIO-1: Under this option there is no reduction in the levels of service we provide across all key risk categories (health and safety, availability and reliability and environmental performance).</li> <li>3. Improve levels of availability and reliability risk by 10%: This option develops the additional costs required to improve availability and reliability risk e.g. the potential to reduce the risk of loss of supply outage by 10%.</li> </ol> <p>Subsequent challenges to these options and adaptation of our approach to meet recent Ofgem guidance will be recorded against the Asset Health paper and presented in the asset health section of the "Gas On and Off" the NTS chapter.</p>	Closed

76	Different requirements and needs of customer groups needs to be captured - i.e. those paying and those not paying.	Within subsequent engagement logs and the Asset Health deep dive paper, we used more verbatim quotes which were attributed to a stakeholder organisation. This helps differentiate between customer organisations and other interested parties.	Closed
<b>Challenge reference</b>	<b>Asset Health – User Group challenges</b>	<b>NGGT response</b>	<b>User Group Status</b>
109	NGGT to articulate their Asset Management Strategy and the relevant standards, such as ISO55000. The Stakeholder Group expects to see NGGT setting the scene regarding the asset groups being reviewed, and e.g. their purpose, consequence of failure etc. NARMS is an important element but should only be part of the compelling case.	<p>The key building blocks for are asset management strategy are:  ISO55001 Accredited  Strategic Asset Management Plan (SAMP)  Balancing Cost v Risk v Performance (Outputs)</p> <p>Our ongoing transition from primary/secondary asset classes to equipment units. This utilises industry standards (ISO) as the basis which enables benchmarking and higher potential for standard designs.</p> <p>On the sponsor call on the 17th May 2019, we also discussed the asset health build process covering the interactions between the decision support tool and the subject matter experts in completing the various cost benefit analyses which underpin our asset health proposals. The purpose and failure modes of each category of asset will be documented in the justification reports.</p>	Closed

<p>110</p>	<p>The plan appears to be a standalone document. The paper to the reader appeared very internally focussed, and straight into the engineering requirements. Demonstrate how asset management is interwoven into network capability, whole systems, decarbonisation (future of gas) and innovation.</p>	<p>To help address this challenge we presented the diagram below on the sponsor call on the 17th May. Subject to additional adjustments we will also include it in the business plan narrative as it seeks to draw together all the input elements to our asset health proposals.</p> <p>The diagram illustrates the integration of various factors into the RIIO-T2 Asset Health Business Plan &amp; CBAs. At the top, 'Future Energy Scenarios, Future of Gas, Decarbonisation Agenda, Gas Future Operability Planning' leads to 'Scenario Modelling and Network Analysis delivering high level options [Rules, Tools &amp; Assets] backed by CBA'. This informs 'New Capability', 'Existing Capability - Required', and 'Capability Reduction'. 'Existing Capability - Required' and 'Capability Reduction' are linked by a 'Risk Decision' arrow. Below these are 'Legislative Requirements', 'Monetised Risk &amp; Engineering Justification', and 'Obsolescence'. These factors feed into the 'RIIO-T2 Asset Health Business Plan &amp; CBAs', which includes 'Replace', 'Repair', 'Refurbish', 'Remove (Disconnect / Decommission)', and 'Do Nothing (Maintain potential capability at low cost)'. The final output is 'Projects (Including Bacton &amp; Kings Lynn)'. On the left, a vertical bar lists 'Asset Health Plan' and 'Standalone Projects' with arrows pointing to 'New Capability' and 'Projects' respectively. Text on the left side of the diagram asks: 'System Operator scenario and modelling processes identifying the network capability required', 'Assets needed to deliver the required Network Capability', 'Legally required to intervene?', 'Which assets are a priority?', and 'Are the assets still maintainable?'.</p>	<p>Closed</p>
<p>111</p>	<p>The RIIO-2 totex proposal is very significant compared to RIIO-1. Demonstrate and justify option development, cost benefit analysis and potential capex phasing, say over RIIO-2 and RIIO-3 due to the uncertainty of gas.</p>	<p>On the sponsor call on the 17th May, we discussed the cost profile asset health capex plan and need to give a stronger explanation of the transition between RIIO-1 and RIIO-2 and associated consumer benefit. Further work has been undertaken on this for inclusion in the business plan narrative. We also provided more detailed data on the cost breakdown between asset themes within each year of RIIO-2, and how this compares to the maximum annual RIIO-1 spend. We discussed the reasons behind the different levels of spend. We will provide a justification report and example cost benefit analysis to further address this challenge.</p>	<p>Closed</p>
<p>112</p>	<p>Clearly articulate and demonstrate innovation from RIIO-1 flowing into RIIO-2 and the respective benefits, both small I and large I, together with the ambition and efficiency stretch in RIIO-2.</p>	<p>As well as the innovation strategy paper presented at SG7, there are a number of specific innovation activities linked to our asset health proposals. The following were discussed in more detail on the sponsor call on the 17th May.</p> <p><u>National AGI Renovation Campaign (NARC) progress</u> – this has been expanded to include innovation work focussing on least cost interventions with a new Pipelines Maintenance Centre (PMC) team launched.</p> <p><u>Unit Costs</u> are used to forecast efficiencies</p> <p><u>Range of RIIO-1 innovations</u> continue to develop and embed (e.g. GRAID, Pit Walls, Shallow Dig)</p> <p><u>Richmond Transformation Programme</u> tackling our entire Asset Management approach including</p>	<p>Closed</p>

		condition, cost, one-plan, standards, business architecture and resource management. Also, includes new contracting strategies to deliver more effective rolling long term intervention plans through strategic partnerships being developed.	
113	Clearly demonstrate the “golden thread” of stakeholder engagement and the User Group best practice principles and demonstrate end consumers WTP against delivery options, outage scenarios and impact of failures - what it means in practice.	We have a TOTEX optimisation strategy combining system operator and transmission owner activities to create a plan focussing on least cost (whole cost) which considers cost to customers. Our monetised risk model includes impact on consumer and connected customers, and there is a full deliverability assessment check undertaken on entire RIIO-2 and RIIO-3 draft business plans. This emphasises the need for long term planning, across all assets and the importance of reliability of available assets. The golden thread is complete and will be presented at the 19th June meeting. We will also be covering the outcomes from the Willingness to Pay work at the stakeholder group meeting in July.	Closed
114	Demonstrate the distributional impacts and how the costs fall into different groups (and does this include overheads?).	On hold - clarification required on the meaning / context of this question.	Closed
115	Ofgem mention named projects and named programmes. The paper lacked named programmes of works and also explanation of whether NGGT are continuing with NARC (National Above ground installation Renovation Campaign). Please include this information in the next iteration.	On the sponsor call on the 17th May, we discussed whether to include a detailed delivery approach in our business plan. It was agreed that this would help 'bring the proposals to life'. We have a range of approaches that reflect the different themes and asset types. We have specifically drawn out the details of our Kings Lynn and Bacton investments in the business plan narrative.  We developed a rolling 10-year plan and new delivery mechanisms to take advantage of more forward looking asset intervention volumes, unit costs and standard asset interventions. We included more detail on this in the business plan narrative and through the associated justification reports.	Closed
184	NGGT must demonstrate how each of the four investment drivers is linked to consumer impact.	We have included a new section in the chapter on how these RIIO-2 proposals benefit consumers.	Closed
185	NGGT to provide clear justification underpinning all cost drivers, including ‘why now’ for monetised risk investments, risk tolerance, optioneering and triggers for investment under legislation.	There is a new description of each of the asset health drivers provided in the chapter.	Closed
186	NGGT to articulate their approach to meeting all external benchmarks on unit costs, including actions taken if/when NGGT costs are higher than benchmark.	Updated to provide the latest information in the December 2019 final business plan.	Closed

## Network Capability

Challenges Reference	Network Capability: User Group challenges	NGGT response	User Group Status
151	NGGT to articulate the narrative of financial consequences of network capability in delivering an efficient functioning of the gas market, incorporating direct and indirect costs.	<p>Our plan is supported by analysis from EY on the costs to gas and electricity industries of constraints on the gas transmission network (Annex A12.01) and this is referenced from the Exec. Summary and the Network Capability Chapter (Chapter 12).</p> <p>“This concluded that, even with perfect foresight and without taking account of an unexpected short-term shock, failure to maintain the existing capability of the NTS could have significant impacts on GB consumers, for instance by adding up to £877m per year to gas and electricity costs by 2035”.</p> <p>Our narrative in Chapter 12 also includes a summary of a previous response to a RIIO Challenge Group question on the impacts of the loss of a compressor on meeting pressure obligations and the need to curtail consumer demand.</p>	Closed
157	NGGT to demonstrate that stakeholders have received meaningful information and context and understood the implications of the proposals for them.	We describe our approach to engagement on network capability, in the network capability section, this is supplemented by the network capability engagement log for December.	Closed
158	NGGT to demonstrate third party assurance on the framing of the stakeholder engagement approach and questions.	In a similar way to our work on other topics, we have used Frontier to review our engagement material, and then also to verify and triangulate the output from the various interactions.	Closed
178	NGGT to articulate a structured, annual process for network capability, which takes account of current policy, net zero sensitivities and stakeholder engagement.	The network capability chapter describes how the annual process will be developed further.	Open
179	NGGT to ensure the RIIO-2 proposals for investment at Wormington compressor are clearly articulated (including links to Milford Haven flows) and the needs case is proven under the full range of sensitivities.	The proposed investment at Wormington is described in the network capability section. The detailed justification for Wormington, is provided in annex 24.10 (now 16.10) and 24.11 (now 16.11), alongside narrative in the business plan on page 117. Page 117 describes the operational nature of Wormington, and the options analysis undertaken.	Closed
180	NGGT to clearly articulate the proposed uncertainty mechanism (e.g. a reopener) and associated process for further compressor investments, including the triggers and evidence requirements.	Uncertainty mechanism reopeners are proposed for compressor investments at King’s Lynn, Peterborough and St Fergus. The mechanisms are set out in detail in terms of proposed triggers and phases of process in Annex A3.02 alongside narrative in chapter 16 to summarise.	Closed

181	<p>NGGT to clearly articulate the specific risk of not making compressor investment decisions in time to meet the Medium Combustion Plant deadline in 2030 if the net zero pathway is still unclear.</p>	<p>We have articulated within the chapter (16), the compressor emissions compliance strategy (CECS) annex 16.05 and the relevant justification papers (A16.10-A16.18).</p> <p>Where there is a long-term need for compressors to run over and above legislative limits, we will need to invest in our compressor fleet to ensure compliance. Several of our compressors will have to be replaced, which takes around six years to complete and there is only limited availability of network outages to accommodate the work. This means we can't wait until RIIO-3 to make a start and we need a programme that allows us to provide continuous use of the network from 2021 to 2030. Work is required during RIIO-2 to achieve the compliance date. In terms of the net zero pathway we have set out the challenges we face in moving to net zero emissions for carbon by 2050 with hydrogen compatible compressors as one potential route to facilitate this. We have set out in CECS that new technologies will be considered as part of FEED.</p>	Closed
182	<p>NGGT to demonstrate that engagement has been undertaken in a systematic way, and questions framed with meaningful context such that stakeholders are given sufficient information to make informed decisions.</p>	<p>Linked to #157</p>	Closed

183	<p>NGGT to provide evidence of, rationale for, and distributional impacts of trade-offs including those between current and future consumers.</p>	<p>As part of our enduring network capability process we will continually review stakeholder needs and requirements of the NTS and ensure that these requirements are factored into our modelling and investment decisions. Through this process and our engagement channels we aim to ensure that we maintain our networks to stakeholder requirements. We have also engaged with customers/ stakeholders/ consumers through our extensive engagement programme in building our stakeholder lead business plan to understand their requirements and ensure our plans deliver against these. With this in mind, Frontier Economics was commissioned by National Grid Gas Transmission (NGGT) to draw out robust messages from stakeholder research to inform the October Gas Transmission Business Plan. Below is a brief summary of their conclusions, and further information and a more detailed view can be obtained from the Frontier Triangulation Report Annex A10.04</p> <p><b><u>How should we balance the costs between current and future consumers?</u></b></p> <p>When asked about who should pay for the costs of the energy transition, a significant majority of stakeholders said it should be current consumers. Domestic consumers also have a strong preference for costs for asset demolition and new gas equipment to be borne by current consumers. They hold this view on the understanding that this would mean that gas bills today will go up, but gas bills in the future will go down. This could be interpreted as support for a reduced depreciation period. They cited fairness as a driver for this view. In contrast, major energy users expressed concerns about a potential shift of greater costs to current consumers. In particular, they were concerned about the impact that any reduction in the depreciation period could have, given that this would shift costs more costs on to current consumers.</p> <p><b><u>Is there a consensus?</u></b></p> <p>There is some divergence with respect to the ideal split of costs between future and current consumers. Major energy users had concerns about transferring more costs to current consumers. Other stakeholders and domestic consumers felt that current energy consumers should pay more for costs that are being incurred now.</p> <p><b><u>How have trade-offs been made in reaching these conclusions?</u></b></p> <p>Domestic consumers believe it is fair for them to bear the costs of current assets and the energy transition. While affordability concerns for major energy users should be considered, the views of domestic consumers could be given more weight on a question related to intergenerational fairness.</p>	Closed
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## Environment

Challenge reference	Climate Change and Supporting Communities Environment – User Group challenges	NGGT response	User Group Status
77	Framing of engagement needs clarity - consequences of options and context given in the questions. Questions felt forced and did not follow frontier advice.	This feedback was noted and alongside the Frontier guidance, we looked to improve on the framing of the question in the planning for the Edinburgh event held in December 2018. The questions were developed further and are included in the appendix of the engagement log.	Closed
78	More needed on societal impacts including third party comparators/sources and the different impact on customers, consumers and society.	We have seen a diversity of views between the three stakeholder segments mentioned and our consumer engagement will provide additional direct insight. We have seen for example, differences in views between customers and consumers with regards to environmental stewardship activities. Whilst for decommissioning and emissions management predominantly costs are incurred by customers and consumers and the environmental impacts are predominantly felt by local society. We have mapped the impact felt by the various groups into a table (see engagement log). We have asked Frontier to validate this mapping in their assessment of our engagement outcomes and 3rd party sources.	Closed
79	Environment felt like an add on – NGGT need to articulate 'the journey' with the stakeholder support and input. Why are you at an early stage? What is the compliance burden i.e. what NGGT need to do and what do NGGT choose to do? The bigger issue of sustainability needs to be articulated.	Additional detail has been provided in the engagement log detailing the legal frameworks and regulations National Grid must comply with. Whilst we have certain legislative drivers, there is often a number of ways in which we can achieve compliance with the legislation and stakeholder engagement on these options is a key element of the 'journey'. We have also developed the gas transmission environment action plan to map our strategy aspirations, tactics and measurements for all aspects of the environment topic. The chapter seeks to articulate some of these bigger issues, articulating them in a way that draws this far-reaching subject together. We have explored further with stakeholders what our role should be with regards to activities that go beyond legislative requirements; whether there is an appetite for stakeholders to pay for this, or expect National Grid to include it within the business plan.	Closed
80	Not enough detail on innovation and options to manage the environmental impacts.	We have added additional detail on the innovation projects undertaken within RIIO-1 in the chapter and annexes. Output from these projects will be included in our future options analysis for managing environmental impacts. For example; within RIIO-2 Selective Catalytic Reduction will be an option for compressor investment as a potential alternative to new units.	Closed
81	NGGT to define 'environment'.	The UN use the Organisation for Economic Co-operation and Development (OECD) definition for environment as being, "the totality of all the external conditions affecting the life, development and survival of an organism." In relation to National Grid Gas, this is considered to be living element of the planet, for which our activities can have an impact on.	Closed

82	NGGT to define key stakeholders and ensure these are the full range - where are the green gas, bio methane stakeholders?	The Environmental events described in this log have not managed to gather insight from the green gas and bio methane stakeholders. We have primarily engaged with these organisations on the topic of connections, through our innovation Project CLoCC and through operational forums.	Open
83	Overlapping and conflicting – EU ETS (European Union Emissions Trading System) and the difference between compliance and other expenditure.	See challenge response #79	Closed
84	Wider CSR (Corporate and Social Responsibility) doesn't link to business plan- difference in views and integral part of reflecting societal views.	See challenge response #79	Closed
<b>Challenge Reference</b>	<b>Demolition- User Group challenges</b>	<b>NGGT response</b>	
85	NGGT to include third party sources - international parties and truth recommendations.	<p>We have undertaken work to review the additional recommended third party reports:</p> <ul style="list-style-type: none"> <li>Netherlands masterplan for decommissioning and re-use</li> <li>Highlands and Islands enterprise – Oil &amp; Gas decommissioning plan</li> <li>Blueprint for marine science Western Australia – decommissioning offshore infrastructure: a review of stakeholder views and science priorities.</li> </ul> <p>These have helped shape the development of our demolition prioritisation matrix and will also help inform the scope of works for our contractors within the RIIO-2 period.</p> <p>The Truth report recommended taking a more targeted approach to engagement with specific stakeholder segments including stakeholder groups: environment interest groups, consumer bodies, consumers, communities and local authorities. We have responded to this with further direct engagement with the environment agencies. After further discussion, it was decided that we would not prioritise additional engagement with consumers above the consumer engagement already documented in our consumer engagement strategy. As part of our ongoing consumer engagement programme, we are including a question on the 'pay now vs pay later' issue and the associated consumer impact. Engagement with local authorities has been prioritised to high value sites. For RIIO-2 this is specific to local engagement at Theddlethorpe terminal.</p>	Closed

86	NGGT to explore options and ideas for repurposing-imaginative on partnership, engagement and cost benefit analysis not just in monetary terms. Explore regarding use value in waste including procurement approach.	<p>Following further assessment of options and ideas, repurposing will primarily be a consideration for pipeline assets (rather than redundant valves for example). The main challenge is the proximity of other live, high pressure assets in the majority of instances limits the options for repurposing. We have a five sections of pipeline (98km) pipeline proposed for decommissioning in our RIIO-2 proposals. This is likely to be a much greater consideration within RIIO-3. Hence developing options and alternatives for repurposing pipelines will form part of our RIIO-2 innovation portfolio, rather than our RIIO-2 business plan.</p> <p>The re use value of waste is a key consideration. In particular, the demolition activities will contribute towards the current National Grid Group Environmental Strategy “Our Contribution”. This strategy details the following targets which we shall ensure that our approach to redundant assets also adheres to:</p> <ul style="list-style-type: none"> <li>• Reuse or recycle 100% of recovered assets by 2020</li> <li>• Send zero waste to landfill by 2020.</li> <li>• Recognise and enhance the value of our natural assets on at least 50 sites by 2020.</li> <li>• 50% waste reduction by 2020 from 17/18 baseline.</li> </ul> <p>Our chosen procurement option will depend on the tender process but we have examples from RIIO-1 where the contractor is responsible for the complete job, and will sell on the scrap metal and that value is taken off the price of the works. Alternatively, we will remove any high value items prior to contracting the works.</p>	Closed
87	NGGT to reference to environmental legislation framework and plans to adhere to this.	<p>Following legal review, of the relevant legislation and we concluded that, as long as there are no issues of contamination or pollution, there does not appear to be any legal obligation requiring us to decommission our redundant assets. Waste is not produced until most of the activities relating to decommissioning has been completed. More information including process flow chart was included in the engagement log.</p> <p>The focus of our recent activity has been to develop a broader framework including a prioritisation matrix which encompasses the range of issues from individual assets and large sites. However, we are exploring more localised elements where there is highest value for stakeholders. The main area for this is at Theddlethorpe terminal. we have begun an engagement programme to explore options on the ‘environmental’ aspects of the site. This will be ongoing between now and the end of the year.</p>	Closed
88	NGGT to consider more localised stakeholder strategy.	See response to challenge 87	Closed
89	NGGT to describe what is driving redundancy of assets (mindful of asset stranding).	<p>Changing operational requirements are the primary driver behind the demolition proposals with the RIIO-2 business plan. This has occurred over a period of time where NTS flow patterns have changed, assets are no longer required and there is no foreseeable use. Stakeholder insight has been valuable in helping assess the future requirements. Customer activities are the second main driver i.e. NGT assets that are linked to customer connections. If the downstream activity closes, we need to ensure the assets on the National Grid side are removed.</p>	Closed
90	NGGT to provide clarity on scope - articulate legal requirement and what is discretionary with timing implications.	See response to challenge 87	Closed

91	NGGT to describe the key decision gates (mothball, repurpose etc.).	In developing the scope of works within the responsible demotion topic we consider if repurposing assets or mothballing is an alternative option to decommissioning. Once it is established that decommissioning is required then the prioritisation matrix can be used to compare the relative value of the different assets and sites in order to deliver the work effectively. Our base assumption for the assets and sites within this topic assumes decommissioning is required. This is because these assets and sites have been evaluated over the RIIO-1 period and other options are not viable or cost effective. Mothballing in particular, can be problematic. For compressor sites, this would mean losing the permit to operate as the unit could not undergo regular emissions testing, and advantage of retaining future optionality would be lost.	Closed
<b>Challenge Reference</b>	<b>Emissions Compliance- User Group challenges</b>	<b>NGGT response</b>	<b>User Group Status</b>
116	NGGT to articulate whether the eight units proposed for replacement in RIIO-2 would require further investment in a 'net zero' world.	The Committee on Climate Change recently recommended a new emissions target for the UK of net zero greenhouse gases by 2050. We expect an asset life of around 25 years which means new compressors in RIIO-2 and RIIO-3 are likely still to be being used in 2050. Further investment could therefore be required and given the nature of the increasingly tight targets, it is likely that some of our other older units would require further investment first. To mitigate the impact of this, we will continue to invest in innovation work and assess market options for carbon capture and adapting compressors to hydrogen blends. We have also proposed a greater use of uncertainty mechanisms - investment in two new compressors in RIIO-2, and starting works on the solutions for three other sites with only initial works funding in the baseline and the remainder through a RIIO-2 reopener.	Closed
117	NGGT to provide a narrative to explain how these long-term compressor investments account for a plausible view of future policies, and include all explicit assumptions.	Compressor equipment manufacturers are continuing to invest in new technology and innovate to reduce emissions from compression. We will seek to include all commercially available technologies in our tender and BAT (Best Available Technique) process. Using this approach minimises the risk of new compressors being caught out if legislation is tightened further.	Closed
118	NGGT to describe the innovation projects you will undertake in order to develop a range of cost-effective ('commercially viable') options for RIIO-2 and RIIO-3 compressor investment.	Our innovation projects for compressors are quite varied but predominantly sit within the "Ready for Decarbonisation – 2025 – 2050" theme. Several examples are as follows: <b>Compressor Strategy</b> - Making full use of the existing compressors to handle the changes in flow of gasses around the NTS and looking towards mobile compressors. <b>Artificial Intelligence (AI) &amp; Machine Learning (ML)</b> - Using machines to automate tasks and making smart devices (AI) and for them to learn from the initial input of commands or information so they can make ongoing decisions without human intervention (ML). <b>Augmented Reality (AR)</b> - Accessing a virtual data source whilst carrying out a task by wearing a device the user can interact with. <b>Smart networks</b> - Build on the sensor, robotics and new material industries to create a network that is aware of itself in terms of its operation and integrity. <b>Carbon Capture and Storage</b> - The process of capturing waste carbon dioxide, transporting it to a storage location and safely locking it away to prevent the release to the atmosphere. <b>Printing Parts</b> - 3D printing of parts for the NTS both in workshops and out in the field.	Closed

119	NGGT to describe how the emissions investments will be impacted by the network capability, the Ofgem single scenario and upcoming policy changes. Indicate the materiality of the expected changes.	We are working across the industry to identify and develop innovations that would support the range of potential decarbonised futures. The gas turbine suppliers are developing their product lines, for example by exploring how to develop existing combustion technology within their machinery that is compatible with fuel gas containing high hydrogen content; at this stage one OEM has a commercial offering capable of running on a fuel mix that's 68% hydrogen. Investing in this technology future-proofs our network by ensuring that we will need to do nothing to adapt our equipment as hydrogen becomes more widely used. Our emissions will reduce by default as the proportion of natural gas in our systems reduces over time.	Closed
120	NGGT to explain how the next phase of EUETS is impacting on the business plan proposals.	There is a known uncertainty around the EU Emissions Trading Scheme (EU ETS); the UK government is consulting on the future of the scheme in light of uncertainties around Brexit. These costs are factored into the cost benefit analysis for compressor investments. However, it is unlikely that these changes would be significant enough to change a proposed build solution.	Closed
121	NGGT to explain how the decision is made to select gas versus electric drive units for compressor replacement in RIIO-2.	Investing in electrification of non-emissions compliant compressors would reduce our primary carbon emissions. However, our analysis of the costs of building and running these units means investment is only cost-effective when the compressors run for more than 5,000 hours per year. This is many hours more than we expect from the currently non-compliant units. What's more, the importance of being able to move gas around the network to enable black start if the electricity network fails means it isn't feasible to move to a fully electrified compressor fleet just yet.	Closed

# Whole Energy System

Challenge Reference	Whole Energy System- User Group challenges	NGGT response	User Group Status
92	Clearer narrative required on how gas distribution network uncertainty will impact transmission work and maintenance.	We will continue to work more collaboratively than ever with the gas distribution networks (GDNs) in order to facilitate any changes post RIIO-2 as they develop their infrastructure for hydrogen or alternative forms of heat etc. In addition, our network capability metrics will play a key part in our assessment of transmission requirements, considering a range of supply and demand scenarios. This will include the Future Energy Scenarios high hydrogen scenarios as well as the range of demand and supply variables defined in the 'common view'. We can therefore define our associated network capability options to meet demand as the uncertainty around the GDNs evolves. Current insight from our stakeholder engagement with the GDNs indicates the volume of gas associated with embedded generation will not make a material impact to the forecast flows through the NTS offtakes during the RIIO-2 period, i.e. we are not making provision to alter or decommission offtakes. Our work on network capability will also improve the way we meet customer needs, we are developing a more holistic articulation of the measures and metrics that define 'Network Capability'. The new Network Capability framework will allow us to talk more meaningfully to stakeholders about the effects of the available options and to say clearly, for example, that we would not be able to meet certain supply demand patterns on X% of days, not be able to accommodate certain flow profiles on Y% of days or accept changes to flows on Z% of days	Closed
93	What is the NGGT leadership role in setting the whole energy system narrative.	We believe our role in the energy transition is about working with industry to decarbonise and enable whole system solutions through cross sector collaboration. In the business plan chapter, we have described our role in leading and collaborating on our whole energy system and market facilitation proposals. Described below are two of the main activities: a) The Gas Markets Plan is key to our role in moving to a low carbon energy system to this. As part of this work, we are proactively considering how the gas NTS frameworks may need to evolve to facilitate change over the 2020's. b) Collaboration with GDNs, BEIS and others on an agreed hydrogen work plan through the Hydrogen Programme Development Group, leading on two workstreams linked to the options for gas transmission.	Open
94	More explanation required of the impact on transmission of local networks developing.	See #94	Closed
95	NGGT to be more collaborative across industry to ensure they are all asking the questions effectively.	Collaboration is the key premise of the 'whole energy systems' chapter in our RIIO-2 business plan. Gas Transmission will play a key role in enabling the transformation to a sustainable energy system and ensure the delivery of reliable, affordable energy for all consumers. We are committed to drive industry debate to understand the most efficient options for future whole gas system networks, markets & frameworks; and to explore responsibilities across boundaries and timeframes to deliver consumer benefit. We will champion efficient and effective governance, as we believe that it underpins the rapid change required to meet UK 2050 targets. We are proposing a regulatory framework that enables and incentivises networks to work together and make changes easily when policy decisions are made. Similar to the answer above we will carry out this commitment through the Gas Markets Plan and our work with BEIS and the Energy Networks Association Open Networks Workstream. National Grid are sharing this working group which covers collaborative working on five 'products' - customer connections, Investment planning, Seasonal forecasting, Day ahead forecasting / operations, Data sharing process and governance. Our stakeholder engagement strategy	Closed

		ongoing for RIIO-2 will also specify that we will seek appropriate collaboration with stakeholders to ensure joined up answers and maximise effectiveness of engaging with our stakeholder community.	
96	NGGT to clarify what is meant by regional - different to other network findings but is transmission talking more high level (or, is that ok?).	<p>For Gas Transmission, the term 'regional' refers to a geographical location linked to a particular local distribution zone (LDZ). There are 12 LDZs which cover Great Britain– Scotland, North, North West, North East, East Midlands, West Midlands, Wales, Eastern, North Thames, South East, South, South West. Within each LDZ there are between 4 and 13 offtake points which connect the transmission to the distribution systems. These offtakes are above ground sites encompassing the pipework, valves, metering required before the pressure reduction point. Our operations teams cover the whole of the UK and work over an even larger area, grouped into three teams - West, East and Scotland. The NTS control room into just two, north and south. This means each LDZ covers a very large geographical area – both physically and from a societal urban/ rural perspective. However, the infrastructure which connects the transmission and distribution systems is relatively small in number but high in energy flow.</p> <p>This approach means regional variations the GDNs discuss are often not applicable to gas transmission – and even significant variation within any LDZ might not sufficiently impact flow through one offtake to make material difference to the investment required in that asset. Our face to face stakeholder engagement has been conducted to reflect the wide geographical spread of our stakeholders in terms of both regional issues on the network and regional variation in stakeholder insight. With the early events being held in Scotland, London and Cheshire, we have subsequently followed up with events at Bacton and St Fergus. We have also run our willingness to pay focus groups across a range of geographical locations.</p>	Closed
97	NGGT to define whole system collaboratively.	Following Ofgem's sector specific consultation earlier this year, we responded to say we support Ofgem's ambition around whole system solutions and supported a wider definition of whole energy systems in order to account for the impacts of the heat and transport sectors. Getting whole energy system approaches working well can bring significant value to existing and future consumers. For our business plan proposals, an important element of delivering our commitments is the training and retention of skilled staff in these areas. In particular, it is important we invest in the skills of our people so that we can respond effectively regulatory change including development of new technologies and how these might impact our network.	Closed

98	NGGT to review 'framing of questions' for willingness to pay research - define outcomes and should consumer work be done more collaboratively.	<p>This challenge can be broadly applicable to the full business plan, rather than this specific chapter.</p> <p>The gas willingness to pay survey contained questions on five attributes, followed by a further question on customers' preferences for different heating technologies i.e. switch from boilers to alternative heating technologies. The attributes tested are as follows:</p> <ul style="list-style-type: none"> <li>Risk of Supply</li> <li>Interruptions</li> <li>Improving the environment around transmission sites</li> <li>Supporting local communities</li> <li>Investing in innovation projects to create future benefits for consumers</li> <li>Supporting consumers in fuel poverty</li> <li>Customers' preferences for different heating technologies</li> </ul> <p>We gave a full update on the results at the July meeting of the stakeholder group with the report provided a part of the business plan annexes.</p>	Closed
99	NGGT to clarify golden thread of engagement (be clear how this is applied, review existing work, articulate themes different parties would like to see, trade off views)	The golden thread for the Whole Energy Systems chapter was developed and presented within the engagement log.	Closed
100	Small customers and stakeholder organisations – NGGT to review what might help them to engage, access and inclusivity.	<p>We have utilised a range of engagement methods to assist with developing insight from on small customer and stakeholder organisations. This includes webinars rather than face to face of workshop events, National Grid offering to attend other meetings/ forum and making use of existing relationships e.g. through Xoserve. The efforts have not been completely successful to date. Our engagement through Xoserve is described in more detail in the Future Balancing and Capacity Engagement Log where the small customer voice is particularly important. Initially we were seeking to using Xoserve and their contacts in smaller shipper organisations. This was of limited success due to GDPR (General Data Protection Regulation) restrictions but also an ability to reach out to stakeholder who want to engage. We attended a number of Xoserve meetings to provide some introductory face to face contact but could not establish the necessary follow up.</p> <p>This challenge is also linked to the engagement undertaken for Information Provision. With that topic, we have used our RIIO-1 collaboration site and established a data enhancements community. At the time of writing, the site has 250 stakeholders registered; 7 of which we've never engaged with before. The tool is tailored to be accessible to smaller organisations, for example we present data in a much more modern and accessible way, the screens are self-configurable which is ideal for smaller companies with smaller resource pools. The success of this platform for Information Provision is an approach we want to build on in other areas for our enduring engagement with smaller organisations.</p>	Closed
101	NGGT to demonstrate engagement proportionate to cost to customers- seek to reach diversity of views.	Throughout our RIIO-2 engagement process, we have been seeking to make sure the latest version of our plans clearly reflects what stakeholders have told us. The AA1000 standard that we follow includes steps to make sure we have accurately captured what we have heard, check this with stakeholders, and then act on it in the right way.	Closed

102	NGGT to show transparency of costs where whole energy systems investments have an interface into other sectors and so may cause other sector costs to go up/ down.	<p>As part of our business as usual activities within RIIO-1 we routinely discuss investment requirements with the gas distribution networks relating to issues of reinforcement at offtakes etc. We also have monthly discussions with the Gas Distribution Networks (GDNs) regarding innovation projects on whole energy system topics (e.g. hydrogen), whereby we establish opportunities to collaborate and ensure projects are complementary. There were not however defined strategies for collaboration in other areas of investment.</p> <p>Whilst we are not currently proposing a large range of Whole Energy System investments in the business plan our aim for RIIO-2 is to develop the right strategies and frameworks to ensure collaboration on whole energy system solutions across all network companies, specifically through our work with the ENA. Two case studies, one from RIIO-1 and one for RIIO-2 were provided to the stakeholder group illustrating the consequences of different solutions across energy sector - GDN offtakes supplied by a single pipeline and the electric drive compressor example</p>	
103	NGGT need to justify investments against the narrow definition and then develop incentives or articulate uncertainty around the wider definition.	See #97	Closed
106	NGGT to articulate Whole Energy Systems on an ongoing basis not just during business plan development.	See #95	Closed
187	NGGT to define leadership in a clear and unambiguous way.	Within the chapter, we describe the activities we will undertake as part of the leading each workstream. The leadership activities are somewhat bespoke to the specific output from each workstream.	Closed
188	NGGT to articulate for all of their leadership and collaborate proposals, how these match with stakeholder expectations, and what the consumer benefit is.	We updated the chapter to detail our collaboration proposals with the commitment, output type and consumer benefit.	Closed
<b>Challenge Reference</b>	<b>FUTURE BALANCING AND CAPACITY SERVICES: User Group Challenges</b>	<b>NGGT response</b>	<b>User Group Status</b>

55	NGGT to be clear on users and future users - mapping stakeholders to support in next phase on design (so not by committee).	<p>At the SG5 session we presented our consumer strategy including current and future consumers. The stakeholder group members had a discussion about what good would look like in this area and there were no specific examples of good engagement with future consumers that members could advise. Likewise, there have been no specific examples shared by Citizens' Advice. However, we are seeking to use trend and public attitude research e.g. involving underlying public attitudes versus attitudes likely to change; identification of trends, how are consumers going to use what we are offering differently in the future.</p> <p>There are a number of other workstreams including deliberative research to work with consumer research experts, using deliberative research techniques, focus groups and consumer workshops as appropriate. These sessions will explore important and relevant topics in more detail, to provide more in-depth views than the quantitative channels.</p> <p>Specifically, on the topic of 'pay now, pay later' we are scoping a deliberative consumer session to explore pay now versus pay later which picks up who should pay for future costs of the network and takes into consideration impacts on future consumers. We have also undertaken an innovative approach on cultural analysis – understanding culture without direct engagement with consumers. This works seeks to understand broader consumer attitudes and trends, which are particularly useful when looking at the needs of future consumers.</p> <p>Regarding specific users of the Gemini system, insight has been taken from Project CLoCC on future connections and future customers seeking to transport different sources of gas. We also undertook an assessment of impact of the future energy scenarios. Whatever the gas sources, there will still be an enduring requirement to book capacity and balance commercial positions.</p>	Closed
56	NGGT to articulate future users to ensure a wider sounding board.	See challenge response #55	Closed
57	In designing system NGGT to look to what good looks like for future system outside of the sector.	The work to date has not identified an immediate comparative system. In order to demonstrate costs efficiency, we would look to use other benchmarks (labour rates, hardware costs etc.) rather than costs from another utility or network operator's system.	Closed
58	NGGT to be clear on level of engagement planned for determining end solution.	The engagement after the presentation of the engagement log in September 2018 focussed on continuing to engage with smaller shippers through direct calls, and access through other representative bodies. We then tried to use Xoserve as a means to access these smaller organisations, through a joint Xoserve/ National Grid workshop planned for the end of February. Xoserve have a 'small shipper lead' - Customer Advocate - who was our main point of contact for this engagement. Unfortunately, the workshop did not result in the necessary attendance and hence insight. So, we have now developed the solution for the business plan taken a different approach, whereby the engagement for the detailed services for the replacement solution will then be part of the solution development with the RIIO-2 period.	Closed
59	NGGT to collect evidence on level of difficulty to use system (especially for new parties).	When a new user enters the market, Xoserve currently provide a pack of information to help the user set-up. This includes offering e-training on the Gemini system which consists of modules on an overview to the UK Gas Business and Gemini, Module Orientation, Entry Capacity, Energy Balancing and Exit Capacity. They are also provided information on setting up an Application Programming Interface (API) and provided a list of FAQs. There is also a helpdesk where users can raise queries or issues to be resolved in a timely manner.	Closed

60	There is missing engagement with gas distribution networks.	We attended an Xoserve constituency meeting (on the 6th December 2018) with the topic of future capacity and balancing services on the agenda under 'any other business'. This was a good opportunity to share the proposals and work to date with the GDNs, however the attendees were not the right individuals within their organisations to give the required feedback and insight. Following this meeting we therefore sent an email to the chair to pass onto all the attendees for onward circulation but no responses were received. We then attended the Energy Networks Association Gas Regulation Group on the 5th February in order to have further discussion. Focus of this discussion reinforced the need for a change in approach; the more detailed engagement would be more effective and better received once the overarching approach to replace is agreed and underway. Gas Distribution Networks are supportive of engagement on the specific services the system delivers.	Closed
61	NGGT to make clear they are ensuring we capture enhancements needed throughout process.	As part of the Gemini re-platform work carried out in RIIO-1, a series of enhancements to the current system will be carried out. Users of the system identified 66 "pain points" with the current system. Enhancement work to be carried out in RIIO-1 will address a portion of these "pain points". However, 17 "pain points" will require a system replacement to address (as they impact the applications layer of the system) and therefore will be fed into the requirements for the replacement system.	Closed
62	NGGT to include implications of EU requirements and possible Brexit implications.	At this stage in the Brexit process we do not envisage there to be any implication of Brexit on the future capacity and balancing services and system. In any Brexit scenario, we do not foresee any changes substantial enough to vastly alter the market which would require any amendments to the way capacity and balancing services are provided. More broadly, in our business plan assumptions we state: the form of Brexit has a neutral impact on our activities and costs. There are uncertainties about our post-Brexit trading arrangements that could impact RIIO-2 activity, such as industry code change workload.	Closed
63	NGGT to articulate additional value delivered to the market through the system upgrade?	Through the work done to date, it has not been possible to articulate the financial value to the market of the system upgrades. However, the system upgrade is required to supporting the gas market changes and the gas markets plan. In response to the question on the "impact of system change not keeping pace with industry change", stakeholders gave the following insight: 'inability to manage [commercial] position and balance properly' 'opportunity lost' 'shipper licence lost' 'Investment goes to Europe' 'UK falls behind other Euro markets' 'labour intensive as systems are not user friendly'	Closed
64	NGGT to articulate risk of scope reduction if funding isn't in place <i>(i.e. if funding isn't in baseline but as part of a UM and then we don't get anything as part of UM)</i>	Ofgem's Sector Specific Methodology document confirmed this aspect of the business plan proposals can be funded under baseline allowance. Therefore, our RIIO-2 business plan assumes a level of baseline funding with supporting justification of costs.	Closed
189	NGGT to demonstrate that the cost benefit analysis that underpins the Gemini proposal is value for money across RIIO-2 and RIIO-3.	The Gemini Justification report and Cost Benefit Analysis was provided as part of an annex to the business plan – A17.04 and A17.05	Closed

# Innovation

Challenge reference	INNOVATION: User Group Challenges	NGGT response	User Group Status
104	Innovation – NGGT to provide lessons learnt from NIA governance in RIIO-1	This information is provided in the SG7 pre-read in the innovation paper covering our RIIO-1 innovation activities and RIIO-2 proposals. It is proposed challenges raised against that paper will supersede #104 and #105.	Closed
105	Innovation - NIA needs to be redefined and renamed (could be linked to the ambition in the business plan). NG is to suggest process, test with stakeholders and present to stakeholder group. Be clear on barriers to coordination and collaboration. Funding of third party access- is this within our capability, consider governance	This information is provided in the SG7 pre-read in the innovation paper covering our RIIO-1 innovation activities and RIIO-2 proposals. It is proposed challenges raised against that paper will supersede #104 and #105.	Closed
134	What is the ambition NGGT would wish to see for the future of gas, the value it delivers for energy customers and future energy customers particularly in a net zero carbon energy system? What would be NGGT's leadership role in this?	Gas plays a critical role in the energy system of the future and whether the National Transmission System (NTS) transports natural gas, hydrogen or a blend, its future is vital. Our innovation portfolio is essential to ensure UK energy consumers can access affordable green gas, such as hydrogen in the same way we have provided access to natural gas for over 50 years. The development of hydrogen and carbon capture utilisation and storage (CCUS) technologies need innovation and demonstration projects to help overcome the technical, commercial and implementation challenges and to enable commercial rollout in the 2030s. We have a unique role in the energy sector and are committed to our role in leading innovation projects for the gas transmission network. We are also committed to work closely and collaboratively with the Gas Distribution Networks (GDNs) to ensure all learning is effectively shared where applicable. Working closely with the Energy Networks Association and Gas Distribution Networks through the Gas Futures Group (including the Gas Decarbonisation Pathways Project) and the recently established Hydrogen Transformation Group we are able to ensure a coherent and cohesive approach to the decarbonisation challenge. Coordination with the electricity networks allows further innovation opportunities to identify the best possible route for decarbonisation across the energy system as we transition into a lower carbon future.	Closed

135	What are the tangible outcomes of collaboration with international transmission networks that could support and inform this debate?	Our subject matter experts (SMEs), who focus on a specific assets or activities within our business are linked directly to international transmission companies and other industries that operate with similar assets. National Grid are currently members to a variety of international forums and committees such Pipeline Research Council International (PRCI), European Pipeline Research Group (EPRG) and European Gas Research Group (GERG). These committees allow National Grid to be a part of international discussions regarding the topics of decarbonisation, decentralisation and digitalisation, learning from the lessons of others and utilising best practice in the projects we are implementing. Safety is a key area of focus where we benefit significantly from international collaboration through the open channels of engagement including safety bulletins and standards to full scale safety driven projects such as our PE Slabs project and engagement in work with the HSE such as the Composite Repair Project which includes companies from other sectors in the UK as well as international transmission networks.	Closed
136	Currently the innovation activity is focussed on safety and reliability. Given the future strategic challenges for the gas sector and the need for innovation why isn't there a more even distribution across these business priorities?	Safety and reliability of our network for our customers is a key priority for NGGT in everything we do. In previous years, these themes have been an important focus of our innovation activities and they will continue to be a key part of the portfolio as we build a safe, affordable and reliable decarbonised network of the future. The IFI mechanism was primarily asset focused and as such as when we when transitioned into NIA, initially the focus remained more on asset innovation. Our innovation projects in this area have resulted in tangible safety improvements. For example, PE Slabs and Removable Composite Transition Pieces which improve levels of safety for our field workers and reduce the risk associated with third party interference. The portfolio has improved reliability of our network through new inspection tools such as Project GRAID, the Mini Grouted Tee which avoids valve replacement and the 3D Laser Scanner for pipeline inspection. These examples illustrate how these asset focused innovations have helped develop tools and techniques to ensure our network is fit for our stakeholders' future needs. However, as we've moved through RIIO-1 we have seen an increasing focus on innovation projects driven by decarbonisation. A key project over the past few years has been Project CLoCC. Project CLoCC addresses the need of our customers for more flexible connection options, with a primary focus on connecting alternative low carbon sources of gas. We also now have a number of projects under our HyNTS programme considering the impact of hydrogen on our network, trialling hydrogen on representative pipes and assets alongside identifying opportunities for regional hydrogen hubs. As we come towards the end of RIIO-1 and transition into RIIO-2 there remains a strong need for asset focussed innovation as we address the challenges that new decarbonised sources of gas such as hydrogen can pose to the network. Alongside this will be a significant increase in focus on innovation that addresses the decarbonisation of our network, with a coordinated effort across the portfolio to ensure we can achieve UK decarbonisation targets.	Closed
137	NGGT need to demonstrate how their stakeholder engagement has directly contributed to the plan. What is the process for systematic engagement?	Throughout RIIO-1 we have engaged with our stakeholders, reaching out through both formal and informal challenges to ensure that our innovation priorities and activities have remained aligned to our stakeholder needs. This includes direct email and telephone calls, calls for ideas via email and social media and engagement through the Energy Networks Association. We've remained committed to being open to our stakeholders to be accessible and reach out at key moments, whilst endeavouring not to overburden our stakeholders with excessive requests to engage and respond. We issued our Stakeholder Survey in September 2016 to more than 100 of our external innovation partners and internal project leads to help us understand our innovation performance and where we can improve. This helped us focus on areas to improve including our processes for onboarding third parties and transitioning projects into business as usual. In addition, we have attended a number of conferences including LCNI, Utility Week and smaller trade events such as the IGEM (Institution of Gas Engineers and Managers) Affiliates and Energy and Utilities Alliance events to meet our stakeholders and understand how we can work better together This	Closed

		<p>has allowed us to improve throughout RIIO-1 and has provided specific focus for continued development into RIIO-2. We developed the Gas Network Strategy in conjunction with the Energy Networks Association and the Gas Distribution Networks which was heavily focused on engaging with our stakeholders to deliver a vision for innovation across the industry that meets the needs of our stakeholders. In developing our RIIO-2 business plans, we as the wider NGGT business have engaged with our stakeholders to understand their priorities and challenges to how we operate. We have actively engaged across the industry with key consumer and industry bodies, Ofgem, BEIS and our Independent Stakeholder User Group. The outputs of this have fed into our specific innovation engagement. Through the development of the Benefit Measurement Framework we've engaged further with Ofgem, BEIS, Sustainability First, EnergyUK and Ofwat to inform our innovation plans and how we drive out the greatest value to our customers. Throughout RIIO –1 there is a certain level of 'systematic' engagement linked to the annual funding cycle, however, we also remain committed to being flexible and open to new ideas and opportunities.</p>	
138	<p>How does the innovation activity link through to customer outcomes and priorities within the business plan?</p>	<p>The RIIO-2 business plan comprises of eight chapters reflecting our stakeholder key priorities. Innovation is embedded in each chapter whilst the overall innovation approach and strategy sits within 'I want you to facilitate the whole energy system of the future, innovation to meet the challenges ahead'. Innovation is a line on each of the golden thread summaries for each chapter. Our innovation proposals also directly support the three underpinning consumer priorities:</p> <ul style="list-style-type: none"> <li>• "I want to use energy as and when I want" – Innovation is essential to support the security of GB gas supply across the RIIO-2 period. Through focussing on delivering and embedding innovative solutions which improve the performance of the network we, will ensure we are minimising consumer bills.</li> <li>• "I want you to facilitate delivery of a sustainable energy system" – There are a range of views over the long-term role of the gas transmission system. Until the exact pathway for gas is more certain it is in consumers' interests, explore a range of different, and innovative solutions and keep future energy options open.</li> <li>• "I want an affordable energy bill" – Our innovation proposals support an affordable energy bill. Innovation is important to ensure connected parties (including new market entrants) can operate efficiently. Any restrictions on the network can lead to inefficiencies for our connected customers, which means their increased costs will ultimately be passed on to end consumers. Innovation to improve asset reliability is also important in keeping energy bills low for domestic and industrial consumers, enabling the lowest cost gas supplies to enter the UK.</li> </ul>	Closed

139	How do NGGT ensure that their stakeholders are representative and attracting new innovators and third parties and stakeholders beyond the usual boundaries?	<p>Throughout RIIO-1 we have developed our capabilities to ensure that we reach a much wider representation of stakeholders than we had previously. In doing this we want to ensure we have access to the most appropriate third parties with the most suitable ideas that meet the challenges of our customers and business as a whole. We recognise there is always room to improve and that initially within the first few years of RIIO-1 it took some time to access new third parties and build the necessary relationships to deliver successful projects. It was noticeable that the asset experience and expertise for a high-pressure gas pipeline system were relatively niche, and outside of the experience of many third parties, even those who had worked with the gas distribution networks. However, our efforts over the past few years have led to a significant shift in the profile of third parties that we work with. A number of new small organisations who have developed their own ideas and technologies which we have supported through our innovation activities.</p> <p>An example is our 'Open Source SCADA' project with Lagoni Engineering, which aims to eliminate the complexity and cost that's inherent in SCADA systems, whilst improving our cyber security. This has brought a new perspective and has revolutionised how we can consider cyber security at our compressor sites. Working closely with NGGT Lagoni have been able to develop their capabilities in the gas sector, gaining a greater understanding of the challenges facing us and the other networks. This has resulted in another innovative solution focusing on cyber security at our above ground installations known as Secure AGI. A key element to diversifying and expanding our range of the parties that we work with has always been through engagement such as conferences and other events, calls the ideas through formal channels such as the Energy Networks Association and more informal such as the use of LinkedIn and other social media and existing mailing lists. We remain committed to being as accessible as possible to third parties and a key component of this is a follow up survey from our 2016 stakeholder survey which will focus on understanding from our stakeholders how we can improve further to enable new and existing third parties to further innovate with us.</p>	Closed
140	Given the RIIO-1 allowances were not fully utilised over the RIIO-1 price control period, NGGT are asked to justify their proposal to increase their innovation funding to £12m which is a significant increase in expenditure. NGGT are asked to include in their response:	<p>As we progress into RIIO-2, Gas Transmission is expecting to increase its investment in innovation from approximately £5m per annum, to ~ £10m. This step up in spend is significant but represents a clear upward trend of spend with an increasing number of suitable innovation ideas within the pipeline. This increase echoes the increasing need to accelerate innovation particularly in the Decarbonisation and Whole System sector. With our Innovation Strategy in place and buy-in across the business, we are now in the process of mobilising our experts, aligning processes and educating both internal and external stakeholders of our vision for the five years of RIIO-2 and what their role in this is. We are seeking to broaden our reach and increase our ideas pipeline through new and existing channels.</p> <p><b>Accelerated innovation investment and ideas pipeline</b></p> <ul style="list-style-type: none"> <li>•As the team and organisation has matured, we've identified more opportunities for innovation whilst also educating the supply chain on our issues and opportunities to collaborate. Currently we have a strong pipeline of ideas which in recent years has seen the value surpass our available allowance.</li> <li>•For example, in 2018/19 we had an allowance of £4.8m and having ~£700k of new projects in the pipeline which were over the allowance so not progressed, these were subsequently fed into the project pipeline for 19/20.</li> <li>•In this current financial year 2019/20, we had already maximised our allowance of £4.8m by October with another five months of the year to go.</li> </ul>	Closed

		<ul style="list-style-type: none"> <li>• We've just completed an assessment of our entire ideas pipeline to the end of RIIO-1 and this current pipeline would require at least £1m more than we have available in our £5.5m allowance for 2020/21. Any new innovation challenges received in the next 12 – 18 months would be in addition to this £1m.</li> <li>• In addition, in RIIO-2 we expect significantly larger projects (&gt;£1m, field trials and demonstration projects, rather than desk based work) particularly around hydrogen, following on from the Hydrogen Injection Feasibility Project and other decarbonisation projects just as the Captivate Field Trial.</li> <li>• We are also seeing more development in the business as usual funded innovation space, with a number of initiatives designed to promote new ideas underway as described below:</li> </ul> <p><b>Mobilising our Innovation Strategy across the business and engaging our internal and external stakeholders to build a strong ideas pipeline</b></p> <ul style="list-style-type: none"> <li>• With our Innovation Strategy fully developed we are accelerating the implementation of our strategy across the business in advance of the start of RIIO-2 in 2021.</li> <li>• We are currently assigning each sub-topic to a specific owner within the innovation team and also identifying the relevant business expert(s) to be the champion for this sub-topic. This will allow for clearer articulation of the problems and opportunities within this space, allow for faster and more effective assessment of relevant ideas and acceleration of these ideas into active innovation projects.</li> <li>• We are focusing on educating internal and external stakeholders publishing the full Innovation Strategy but also high level summaries, presentations and other materials to ensure everyone is clear on our innovation focus.</li> <li>• Over the next few months we are speaking to all of the Gas Transmission teams to refocus on innovation, telling the story to date and the opportunities for RIIO-2. The first activity will be going to each one of the team meetings across Gas Transmission to engage the teams and set expectations.</li> <li>• Within the next couple of months we plan to formally launch our innovation strategy, with an event open to all stakeholders where they can learn more about our plans, the opportunities and share their ideas with us.</li> <li>• In the months to follow we plan to run internal showcases for innovation and focused sessions on key topics such as Hydrogen and also plan to set up permanent Innovation Hub and Showcase, alongside a Hydrogen Hub, which give a dedicated physical space in the Warwick office to provide more detail on our current activities and set new challenges, ask questions and get people thinking about innovation.</li> <li>• Externally we've already made progress this past year, with the much-improved Gas Innovation Showcase at Utility Week Live and hosting the first ever Network Innovation Collaboration Event. In addition, the recent launch of our external newsletter and our plans for the upcoming editions are providing a more focused view.</li> <li>• We are also planning several supplier engagement days, providing the opportunity to meet with our experts and focus on specific innovation areas of interest. • This increase external focus is supported by our trial of membership with the Energy Innovation Centre (EIC) to reach a wider range of third parties and further accelerate the growth of innovation ideas in our pipeline. We are launching three innovation calls focusing on specific challenge areas, with the goal of identifying suitable candidate projects and working to develop an accelerated process to shorten the length of time from initial idea to live innovation project.</li> <li>• We also now have an innovation charter signed off at board level, and therefore will be providing updates through to the board on how we are delivering against our ambition and to ensure full buy in at senior level.</li> </ul>	
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140a	Outline how the financial benefits in RIIO-1 have accrued to customers and end consumers	Whilst National Grid Gas Transmission do not supply gas directly to people's homes, several of our innovation projects provide financial benefits which impact our customers and consumers directly. The Customer Low Cost Connection (CLOCC) NIC project aimed to minimise the cost and time of gas connections, a typical example could take over 2 years and cost £2m, following the CLOCC project this is envisaged to be less than 1 year and £1m. Another similar project was for customer ramp rate studies which are used to understand the impact of a new connection. Costing around £30k and around 3 months per study, the innovation project developed an intelligent tool utilising an algorithm to speed up the ramp rates process reducing the cost by an average of 50%. Whilst the innovation projects relating to Building Information Modelling (BIM) do not have a direct impact financially on customers and consumers it can be noted that a more efficient design process reduces waste and the overall cost of a project and digitally rehearsals can significantly reduce the impact a large-scale construction project can have on the local communities. It is our ambition to continue developing innovation that provides a financial benefit to customers and end consumers throughout RIIO-2.	Closed
140b	How this increase aligns with the customer's willingness to pay for the proposed increase in RIIO-2?	The gas willingness to pay survey contained questions on five attributes, followed by a further question on customers' preferences for different heating technologies i.e. switch from boilers to alternative heating technologies. The attributes tested are as follows: <ul style="list-style-type: none"> <li>o Risk of Supply</li> <li>o Interruptions</li> <li>o Improving the environment around transmission sites</li> <li>o Supporting local communities</li> <li>o Investing in innovation projects to create future benefits for consumers</li> <li>o Supporting consumers in fuel poverty</li> <li>o Customers' preferences for different heating technologies</li> </ul> Whilst results are indicative of a support for innovation, we are proposing to give a full update on the WTP results at the July meeting of the stakeholder group.	Closed
140c	What is the business doing differently which will enable NGGT to invest £12m efficiently and effectively in innovation over RIIO-2 compared to its performance in RIIO-1?	Building on the lessons learnt over RIIO-1, the matured team structures, developing relationships with external contacts across a large variety of sectors and embedded processes and behaviours which are championed from the senior leadership team at National Grid. All these factors will contribute to the efficient and effect investment of innovation in RIIO-2. A notable area where lessons have been learned and implemented effectively is in our process to vet ideas within our innovation pipeline. This has not only allowed us to ensure quality project ideas are within the pipeline, but also to educate third parties on what is required. This in turn has resulted in a greater number of quality ideas from a wider range of third parties than previously seen. Our governance process has benefited from several iterations throughout RIIO-1 and the business is aware of the pre-requisites and vetting process that a project goes through in order to get sanction. Our financial processes have also been streamlined giving the team a better view of when payment milestones are due and effective tracking across multiple financial years. We have identified several projects throughout RIIO-1 which have unfortunately reached a point where are the expected outcomes are no longer achievable. With our processes in place to review the performance of projects throughout their life cycle we have been able to identify these early on and terminate them, allowing us to recover planned expenditure to be reinvested in other innovations in our pipeline. By encouraging innovation into the personal objectives of the staff at all levels within the business there will be a greater desire to suggest possible projects which in the past might have been forgotten. Investment in innovation towards the energy system transition will require acceleration throughout	Closed

		RIIO-2 coupled with the work on ensuring our network is fit for the future. Both factors will lead to a greater number of overall projects and so the amount we invest needs to reflect this leading to our current proposals.	
141	The total proposed innovation investment for NGGT is 1.5% which is significantly less than the average investment made by other companies which is between 3% - 4% ( <i>PWC Comparison of Innovation Spending across 1000 companies</i> ). Given the scale of the whole system energy challenge does this level of investment really reflect what is needed by UKplc?	When considering our proposed innovation spend against companies in other sectors, we recognise that our proposal of 1.5% of revenue is lower than organisations that top the PWC list. However, we must consider our business purpose against those companies who invest the most. These highest spenders are focused in areas such as pharmaceuticals, automotive, retailing, software and advanced technology development. These organisations can have a quicker turnaround ('fail fast') and greater rate of return in a fast-moving, high value consumer market. Our innovations are typically bespoke, niche technological areas with a longer lead time to embed results in network, often exceeding our regulatory period. The overall impact of the consumer bill is a key factor for gas transmission. We do however recognise the availability of other funding streams including InnovateUK and BEIS funding competitions, alongside bespoke commercial arrangements which could see third parties investing their own funds as part of the NGGT innovation projects. This will result in higher investment innovation throughout RIIO-2 than the baseline commitments made within our strategy. Thirdly, another important consideration is the level of uncertainty in how Great Britain will ultimately achieve a net zero carbon target. We therefore remain pragmatic about the total level of investment in innovation across all possible pathways to decarbonisation. We must ensure we remain ambitious and driven to achieve these targets whilst remaining flexible to adapt to changing needs of GB to achieve its carbon targets. The proposed 1.5% balances these considerations to derive the right level of expenditure for the next five years.	Closed
142	Given the proposal to have both a regulated innovation allowance and an NGGT innovation investment fund, the Panel would like to understand the governance for each fund and the proposed criterion for each approach.	<ul style="list-style-type: none"> <li>• Currently our proposed process for sanctioning innovation projects builds on success of our existing sanctioning committee (GTIGG) used in RIIO-1. This process is still a work in progress and as we continue engagement with Ofgem through Summer 2019 we will refine the allowance-based funding mechanisms and update the process accordingly.</li> <li>• To ensure the most efficient and effective innovation process there will not be a differentiation at the outset of the innovation process whereby we gather ideas and engage with our staff.</li> <li>• There will be an ongoing process will engage with third-party to generate a diverse selection of innovative ideas and opportunities that meets our strategic aims set out in our strategy.</li> </ul> <p>Our proposed process as follows:</p> <ol style="list-style-type: none"> <li>1. Received: upon receipt of an idea, an assessment will be carried out within the innovation team to identify whether it fits within our strategy and at this point identify whether this is an idea that would be funded via business as usual or allowance funding.</li> <li>2. Project Proposal: the required project proposal, plan and associated financial and cost-benefit assessments will be mirrored for project under either funding root.</li> <li>3. Sanction via GTIGG or GTIC: the Gas Transmission Innovation Governance Group (GTIGG) will remain as sanctioning body for allowance funded projects and have visibility of those to be funded via business as usual funding. However, these business as usual funded projects will have to go through our standard Business Sanctioning Committee (GTIC) that decides on all business as usual funding across the organisation.</li> <li>4. Project Initiation: pending approval via either route, the projects will be initiated with contracts and associated</li> </ol>	Closed

		<p>financial and procurement activities completed.</p> <p>5. Project Delivery: the portfolio of innovation project funded by either route will be coordinated as one with all standard project management milestones adhered to.</p> <p>6. Project Closure: complete close out reporting and assessment of the outcomes against expectations to determine the success of the project. Reassess the cost benefit analysis (CBA)</p> <p>7. Implementation Assessment: analysis of updated CBA and report back to our Business Sanctioning Committee (GTIC) regarding next steps and plans for implementation.</p>	
143	<p>It can be argued that the future of gas agenda and innovation will secure the longevity and sustainability of the NGGT business. The Panel would like to understand why this activity isn't being funded by NG corporate funds rather than as regulated activity.</p>	<p>Unlike a conventional commercial business, our financial returns are set for a defined price control period which has typically lasted between 5 and 8 years. The lifecycle of an innovation project for NGGT is around 3 years from ideation to implementation or significantly longer for more complex projects. As an example, it took 3 and a half years to develop the Composite Pipe Transition Piece project from an idea to installation on a NGGT site. As an example, the net benefits of this project have been calculated as being £230k per transition piece across the entire design life of 50 years. This benefit will start to accrue after the first inspection is carried out after 10 years of being installed. The transition piece will pay back the installation and unit cost following the first inspection showing the benefit of such an innovation on the network, extrapolated across all the transition pieces the total benefit is expected to be in the 10s of millions.</p> <p>At the start of a new price control, any efficiencies identified through the innovation portfolio would be incorporated in setting the costs for the upcoming period, a process called 're baselining'. This tends to mean that short, lower risk innovation can be delivered through a business as usual process where a return can be foreseen before the end of the price control period. Longer term, more risky work, which could nevertheless have high potential value for consumers, would not be funded as no benefit would ever accrue to the company. For example, work on facilitating hydrogen on the NTS would not complete and be embedded into business as usual in time to drive performance within a single price control period. This was the situation through the majority of the 'TPCR' price control periods, where following the sale of British Gas research, relatively little innovation was carried out by network companies. RIIO-1 was a step change away from this in order to accelerate the development of a low carbon energy sector as well as deliver financial benefits to consumers. RIIO-2 is a period of even greater change, and innovation funding is at the heart of delivering consumer value through the energy transition. The RIIO-1 innovation allowance criteria specify network companies to must draw our customer benefits for projects to be eligible as the funding is not there to facilitate the longevity of the NGGT business.</p>	Closed
144	<p>NGGT are asked to provide clarity regarding the cost and value of innovation to current and future consumers.</p>	<p>Our Value Tracking Process developed throughout RIIO-1 provides clarity and transparency around how we assess the value that has been delivered to date by our innovation projects. We are clear to only include value that we can demonstrate has actually been achieved through assessing the assumptions, judgements and recorded data to form a value assessment. To date we have reported an £8.6m saving from £2.1m spend, equating to a 4:1 ratio on implemented projects from the portfolio. The majority of these benefits are achieved through individual uses of a new tool, a technique or technology that has been delivered within the innovation project. As such it is difficult forecast the future benefits to be achieved from the utilisation of a specific project as this may be unknown. Due to the complex and costly nature of operating our business it can often only take a limited number of uses for significant benefit to be achieved. As we move through the final years of RIIO-1 we expect to see a greater number of projects implemented resulting in a higher benefit figure, which we would expect to further grow throughout RIIO-2 as</p>	Closed

		completed projects continue to be utilised further, whilst further projects are complete and are available for use within the business. We plan to publish a report late 2019 which outlines our updated position on the benefits realised across our RIIO-1 portfolio of projects, alongside our proposals on how to track these benefits moving forward, building on the work of the Benefit Measurement Framework.	
145	What are the innovative initiatives undertaken in NG USA business which have been successful and what can be adopted in the UK?	Throughout RIIO-1 we have developed our methods to engage across our business areas in order to share best practice and any potential projects or ideas that could be of interest. This has meant working with our electricity business within the UK, our gas business within the US and our non-regulated business National Grid Partners which been recently formed. Prior to the formation of National Grid Partners, we had in place in knowledge sharing forum to link our UK and US businesses together to share innovative developments, identify common areas of challenge and understand how we can work better together. Our gas business in the US is distribution focused and therefore the number of the challenges they face do not translate across to the NGGT in the UK. However, we have focused on areas of crossover such as robotics, notably when developing Project GRAID. We worked to share knowledge, linking on the CISBOT robot which has also been utilised in the UK by Cadent and SGN. In addition, we should knowledge on the robotic development of Pipetel ( <a href="http://www.pipetelone.com/">http://www.pipetelone.com/</a> ) in the US to ensure any potential best practice was shared. With the launch of National Grid Partners, we have a more focused view of innovation across the National Grid Group, with a Centre of Excellence for Innovation under development. The team are working across all business entities to understand the challenges we face within innovation and identify common areas where we can collaborate to gain the greatest value for stakeholders.	Closed
146	NGGT are asked to demonstrate how efficiencies achieved in RIIO-1 are embedded in the business plan for RIIO-2. The Panel would like to see an aggregated figure relating to the tables in page 21 of the report.	Throughout the Asset Health business plan, we have referred to how efficiencies achieved in RIIO-1 are proposed to be implemented in RIIO-2. Under each category, we have supplied an explanation of where innovation from RIIO-1 is being utilised in RIIO-2. A good example of this is the NIC Project GRAID, a robotic inspection device for unpiggable pipework on Gas Transmission sites. The project delivered through RIIO-1 proving the technology was viable and so the rollout and use of GRAID has been put forward into the RIIO-2 business plan so that inspections can continue aiming to reduce the number of unnecessary excavations and lead to more proactive maintenance in the future. We are currently undergoing a comprehensive review of our innovation portfolio to identify where there is applicability for use within RIIO-2. Following the recent updated guidance from Ofgem identifying the opportunity for funding to support this rollout, we will be considering specific rollout opportunities and will provide a more comprehensive plan in our October submissions.	Closed
147	NGGT are asked to provide a realistic assessment as to how innovation is being embedded within the business where members of staff are empowered to propose changes and innovation flows through the business.	Embedding implementation within the business is by far one of the biggest challenges we face within innovation. It was identified in our stakeholder survey as the lowest scoring area and we've been working hard to understand how to improve this and implement changes that enable innovation is to be embedded within the business. Within certain areas of our business we have found a cluster of innovation has occurred. This may be due to a mix of reasons including: a number of challenges within this area, a wider range of third parties with feasible ideas and colleagues with a greater focus at ability to work on innovative programmes. We have learned from how these successful clusters of innovation have developed in order to help areas of the business with little or no innovation to engage further to develop successful projects and identify new opportunities to innovate. We are embedding innovation within existing business processes to ensure that successful projects are implemented wherever relevant. For example, the Composite Transition Pieces project is now set for installation at our Peterborough and Huntingdon sites as part of planned capital expenditure works. As we move to the final years of RIIO-1, our recent organisational restructure has seen the creation of a Senior Innovation Manager role which allows us to continue our focus to	Closed

		embed innovation within our business operations and empower our staff across the whole organisation to bring change and real innovation.	
148	What external learning from other international transmission networks has impacted NGGT operations for the better. What international benchmarking is used to increase value for energy customers?	National Grid are currently members to a variety of international forums and committees such Pipeline Research Council International (PRCI), European Pipeline Research Group (EPRG) and European Gas Research Group (GERG). These committees allow National Grid to be a part of international discussions regarding the topics of decarbonisation, decentralisation and digitalisation, learning from the lessons of others and utilising best practice in the projects we are implementing. One such example is communication between National Grid Gas Transmission and SNAM based in Italy who have successfully injected hydrogen into their transmission network to be used by two of its customers. The lessons learnt from this project will help to lead our own hydrogen injection project. As an organisation, we have been actively involved in European gas benchmarking since 2004 through the Gas Transmission Benchmarking Initiative (GTBI). Participation in this initiative allows us to share and gain knowledge across Transmission System Operators (TSO), identifying and learning from best practices. Within this group, we have shown that we hold a leading position in terms of operation and maintenance. An example involves the current River Humber pipeline replacement project. GTBI membership allowed the opportunity to learn from the experience of another TSO undertaking a similar construction project. Several lessons learned were shared and we adjusted our project following this that resulted in significant avoided costs.	Closed
149	Is collaboration with other networks maximised to reduce costs to the energy customer and end consumer? Do NGGT have a systematic approach to keep this under review avoiding duplication of costs to energy customers?	NGGT has developed a strong working relationship throughout RIIO-1 across the various network sectors, incorporating the Electricity Transmission and Distribution Networks. The Energy Networks Association (ENA) has remained a pivotal part of this relationship, allowing the coordination of activities and representing the energy vectors. In particular, the Gas Innovation Governance Group (GIGG) is a forum that helps drive efficiencies and maximise value to the work we do. GIGG meets monthly to share knowledge on current innovation projects and discuss how we can work together to meet future challenges. The group represents innovation across the gas industry and has strong links into the equivalent electricity group. Within GIGG there is a regular agenda slot each month to discuss new projects and consider any potential overlap and also to report of progress of key project which do have collaborative interest and value. Some highlights from collaboration with the group include the delivery of the Gas Network Innovation Strategy, several events such as the IGEM (Institution of Gas Engineers and Managers) Affiliates Event in 2017 and the development of the Implementation Log to track innovation projects that are being rolled out. Collaboration across the group is discussed on a case by case basis, ranging from being a full funding partner through to involvement in key strategic workshops and supporting specific outputs of a project. This aspect of the forum is one we would seek to strengthen particularly if there are multiple funding streams in RIIO-2 and the number of complexity of projects becomes greater. Other forums and groups such as the Gas Futures Group which has recently launched the Gas Decarbonised Pathways Project and the Hydrogen Transformation Group which brings together the Gas Networks to focus on the challenges and opportunities that hydrogen presents. We continue to seek new ways to collaborate and develop our efforts to ensure that there is no duplication not only in the projects that we do, but in the associated works to identify new ideas, reach new partners and engage with our stakeholders.	Closed

150	The User Group would like greater clarity on the additional resource and associated costs required to manage the proposed increase in innovation funding and activity.	The current resource plan for the Business as Usual and Allowance Funded Innovation was provided to the user group.	Closed
191	NGGT need to illustrate how the consumer outcomes fit against each of the innovation themes / topics.	A new graphic displaying this relationship was provided in the innovation strategy, linking our three consumer priorities to the Innovation themes and topics	Closed
192	Overall NGGT should develop a more systematic and strategic narrative, rather than rely on 'project based' evidence.	Overhauled the strategy to rework the story from a RIIO-1 backwards look and RIIO-2 plan to be an inclusive strategic narrative that assesses our current culture performance across the innovation landscape and identify where further RIIO-2 activities are planned. Re-worked executive summary, and documents structure to help with this. Edited document to remove duplicate/ unnecessary detail.	Closed
193	NGGT should expand on the ideas generation process in more detail. This should include how the business works day in day out, to increase participation and the ideas coming through.	Within chapter 3 there is now reference to a variety of methods for generating ideas both internally via staff objectives, new disruptive business roles and agile workplace environments to help develop new ideas. Externally we have committed to being present at a variety of events allowing 3rd parties to approach us with new ideas.	Closed
194	On stakeholder engagement NGGT should explain how the innovation engagement approach fits within the broader RIIO-2 stakeholder engagement strategy. NGGT should also clearly articulate their plan to engage with stakeholders into RIIO-2 including events which are solely focussed on innovation and lead by innovation teams (e.g. network collaboration event/gas utility week) and also explain how the rest of business does things.	We will continue to use our innovation team to collaborate through a range of events as described in the chapter 'driving collaboration'. But essentially this team are a support to all the business experts who will also attend the range of business as usual stakeholder engagement activities (as described in the various engagement logs). The combination of both is essential to making sure there is the necessary expertise and forward looking approach to our RIIO-2 innovation work. The innovation strategic themes and sub-topics are being mapped across business areas to allow further development of capabilities and identify where a cross sector of the organisation can engage with external parties interested in these areas.	Closed
195	NGGT need to clearly bring together the cultural aspects of innovation both throughout the strategy and in the business plan narrative. Currently the innovation described is focussed on assets but doesn't feel like a cultural thread from board level.	In revamping the strategic narrative, we have brought a stronger focus on culture and the commitment to innovation across the organisation. Key features added include more focus on innovation with Electricity, the US and National Grid Partners alongside a National Grid Board Commitment to Innovation. This is providing a greater focus on the cultural aspects of innovation across the organisation. See page 22 – 24 of the Innovation Strategy v12	Closed

196	NGGT should propose a methodology of benefits reporting including consideration of the importance of an independent group to monitor innovation performance. NGGT should clearly define how the RIIO-2 innovation benefits will be tracked through the TOTEX mechanism.	Benefits Measurement Framework is now detailed in the strategy – following final agreement and publication of the Energy Networks Association Benefits Measurement Approach the strategy will be updated to fully reflect this.	Closed
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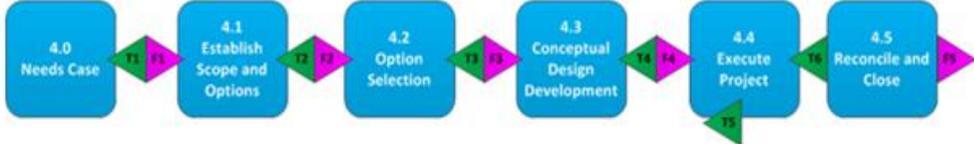
## Information Provision

Challenge Reference	INFORMATION PROVISION: User Group Challenges	NGGT response	User Group Status
40	NGGT to demonstrate that high impact stakeholders have been self-defined and not just by National Grid	Additional information on the impact scores stakeholders assigned themselves provided in the engagement log on page 14.	Closed
41	NGGT to articulate cyber security impact	There is no specific interaction in the business plan between the proposals in the 'information provision' chapter and those within 'external threats'. Any new systems must meet current standards for cyber security hence no additional funding is required elsewhere in the business plan proposals. However, any new data requirements extracted from our core IT systems would require full alignment with CNI (Critical National Infrastructure) requirements. Any additional cost of interfacing into the CNI systems would be accounted for the assessment of providing that new data.	Closed
42	NGGT to articulate core service (minimum expected) and what is 'value add'.	<p>The information we provide supports the efficient functioning of the gas market by allowing market participants to make informed commercial decisions and allows connected parties to optimise their activities based on network conditions.</p> <p>We provide data, information, knowledge and insight and over a range of time horizons (from within day to 30 years +) and the provision of this information is defined within a number of regulations and license obligations. However, we also provide transparency in the operational &amp; commercial decisions we make. This is supplementary to the service of providing data sets and is a valued addition for the industry to understand National Grid's actions. This is an added layer of circumstances and context for the industry to utilise to assess market reactions in the future. Further information on our baseline and additional options is provided in the engagement log.</p>	Closed
43	NGGT to articulate how they framed questions to ensure that stakeholders were responding appropriately	<p>Primarily, the appropriate framing of our questions has been driven through our learning process with Frontier Economics. We engaged with Frontier Economics to test our planned engagement ahead of engaging with stakeholders. There were several areas where we changed our approach, the framing and format of the questions including:</p> <p>Willingness to Pay was initially considered to inform our proposals on Information Provision. However, following the development of our specific consumer engagement strategy and discussion with the third party delivering the Willingness to Pay work, Information Provision did not fit within the boundaries of the Willingness to Pay scope and question structure.</p> <p>We therefore continued to focus on the type of data stakeholders are most interested in and on the insight the engagement will</p>	Closed

		<p>generate.</p> <p>Use of independent facilitators and mixed up stakeholder groups to obtain balanced opinions and participation across all stakeholders in the carefully facilitated sessions.</p>	
44	<p>NGGT to articulate and deliver consistent strategy for hard to reach stakeholders</p>	<p>We continued to try to engage smaller shippers within our Future Balancing and Capacity topic [challenge #58] - we undertook a range of direct engagement methods – direct telephone calls, LinkedIn message and online contact forms. We also tried to make use of other contacts into small shipper organisations through the RIIO-2 Stakeholder Group. These attempts were not successful and then we looked to use Xoserve to access these smaller organisations. Through their ongoing relationships with smaller shippers, Xoserve’s Customer Advocate contacted a range of smaller shipper organisations through emails out to their distribution lists. They also had bilateral discussions with the ambition of holding a joint National Grid /Xoserve workshop in February. Due to data protection restrictions, we could not directly see the parties Xoserve were engaging with (i.e. we were blind copied into the various email invitations). In spite of these efforts, only two shippers registered for that workshop (one of whom was a large shipper organisation) and so the workshop was not viable.</p> <p>For this particular topic, we determined that the customer segment was key to developing proposals and therefore continued our engagement making use of our RIIO-1 interactions and the development of the online community described in detail on page 21.</p> <p>Our consumer engagement is being undertaken through a dedicated strategy (including Willingness to Pay) , the results of which will be discussed with the Stakeholder Group at the consumer update in July 2019.</p>	Closed
45	<p>Some stakeholder groups are missing (consumer, Xoserve, small, other forums)</p>	<p>See challenge response #44</p>	Closed
46	<p>NGGT to articulate further pull/push requirements from different stakeholder groups</p>	<p>We have continued our stakeholder engagement activities by making further use of our RIIO-1 engagement interactions. In particular, the Gas Operational Data Community, with over 150 users through an online platform here. Although primarily set up to inform our RIIO-1 information provision activities the insight also been used to inform our RIIO-2 business plan proposals. Insight from our large customers is available in the engagement log and shows how directly our proposals work to deliver clear customer outcomes.</p>	Closed
47	<p>NGGT to make clear the link in engagement log the link between running the physical network and the information provided</p>	<p>We have provided additional information on the link between operations and information in the engagement log. However, it is important to note, that there is information on the network operation which is commercially sensitive so not all data is in the public domain.</p>	Closed

48	NGGT to provide more quantitative data to explain the background of the topic (stats on usage etc.)	The 'MIPI' system is the primary means by which our customers interface with our operational data. MIPI as a system sustains multiple hits per day (circa 2m average) due to volumes of API (Application Programming Interface) pulls. This is attributed to customers looking for competitive advantage over their competitors. The scale of interaction with MIPI was verified at the stakeholder events held.	Closed
49	NGGT to start with recommendation and articulate evidence based to reach this	Whilst we understand the recommendation for the structure of the proposals, for the purposes of consistency we have continued to use the engagement log format. For our deep dive papers and business plan chapters we have looked to follow a different approach.	Closed
50	NGGT to draw out consumer outcomes more	Our information provision activities provide value for consumers by primarily by ensuring that the gas market runs smoothly. It also promotes competition in the wholesale market – allowing participants to plan, prepare and operate effectively. This is described through the Golden Thread diagram for this chapter.	Closed
51	NGGT to explore best practice/attitude to open source data across other sectors and build into conclusions	We have not fully explored options for open source data in relation to information provision. We are however aware of a number of externally driven milestones such as the work being carried out by the operational data task force being sponsored by the energy systems catapult. Examples of proposals from this work include distribution networks suggesting NGGT should publish data for them. Whilst the scope of this is not built into the baseline of our RIIO-2 proposals, as a result of the work at the energy systems catapult, we do have an ambition to have open data where possible.	Closed
53	NGGT to clarify next steps on this topic	Following the October version of this engagement log, we decided to split the consumer engagement from with the customer segments. We have undertaken to generate further insight from the business as usual collaboration portal. We have subsequently developed our baseline and additional options which will form the costed proposals in our business plan submission.	Closed
54	Focus is on commercial information NGGT also need to engage with other stakeholders (e.g. government) on what they value.	The scope of this topic is the commercial and operational information relating to the network. However, academics and interest groups have a wider interest in this information which may lead to value for future consumers. Stakeholders with this longer-term perspective are also encouraged on our online community and the value they place on the data is also valid. Our wider reporting requirements will be picked up with the 'efficient and affordable' chapter.	Closed

## Efficient and affordable

Challenge Reference	EFFICIENT AND AFFORDABLE: User Group Challenges	NGGT response	User Group Status
128	NGGT to present both the RIIO-2 cost proposals in the July business plan submission and the NGGT best view of efficient costs. This should be considered at both a total business plan level and where possible at a topic level.	At a total business plan level, we are embedding savings in our opex costs to reduce them by 15% from 2018 to 2026. Our RIIO-2 opex productivity of 1.1% per annum is more than three times current UK levels. We have also a 4% efficiency in our asset health capex programme delivering on our RIIO-1 IT investments. For the purposes of the July business plan submission, these efficiencies are not presented at topic level.	Closed
129	NGGT to articulate how the project management process is different across the spectrum of project size and provide assurance around the project management structure applied and support costs (around the number of people involved to deliver project). <u>- carried over from NGET discussion</u>	<p>The gas transmission end-to-end investment management process is presented below:</p>  <pre> graph LR     4.0[4.0 Needs Case] &lt;--&gt; 4.1[4.1 Establish Scope and Options]     4.1 &lt;--&gt; 4.2[4.2 Option Selection]     4.2 &lt;--&gt; 4.3[4.3 Conceptual Design Development]     4.3 &lt;--&gt; 4.4[4.4 Execute Project]     4.4 &lt;--&gt; 4.5[4.5 Reconcile and Close]     </pre> <p>The project management structure and support costs are scaled according to the size and complexity of a project. Projects can be delivered either through gas construction, with regional delivery teams with centralised support functions (such as Procurement and Project Controls). Each is headed by a Senior Project Manager, and the boundaries and numbers of project engineers flex according to geographic workload changes year-on-year. A project engineer will normally look after one large/major complex project, or several smaller, more straightforward projects at any one time. Alternatively, a project can be delivered through GT Operations; a subset of our field force who are available to deliver minor capex projects alongside maintenance and repairs. For these smaller, less complex activities, we use our own skilled resources to do the work rather than contracting out to third parties. This removes the overhead associated with engaging and managing contractors. In deciding which is the best way to deliver work, we consider:</p> <ul style="list-style-type: none"> <li>• Resource availability: The core purpose of GT Operations is to inspect, maintain and repair our network so there is a limit to how much replacement work they can manage.</li> <li>• Lowest total cost: Even small projects can sometimes be bundled to give a more economic package of work for delivery by third parties. We have seen this work effectively in RIIO-1 with our “campaign” approach. We track delivered unit costs to understand the best route, which may change over time.</li> </ul>	Closed

130	Looking at the comparable programme of work, can NGGT articulate which ones are better in the UK compared to the US and vice versa. Articulate the learning and how what has been learnt is subsequently applied. NGGT to be more explicit on where there are any caveats - <u>carried over from NGET discussion</u>	<p>The US gas business is a gas distribution business. It is therefore, not possible to directly compare specific programmes of work e.g. there is no direct equivalent to our major compressor projects as we do not own any compressors in the US.</p> <p>However, we do engage across some business activities in order to share best practice and any potential projects or ideas that could be of interest in minor works and other asset categories. In particular, this applies to our innovation activities where we have focused on areas of crossover such as robotics, notably when developing Project GRAID. We worked to share knowledge, linking on the CISBOT robot which has also been utilised in the UK by Cadent and SGN. In addition, we shared knowledge on the robotic development of Pipetel in the US.</p>	Closed
131	NGGT to articulate how efficiency savings will be baked in.	See challenge response #128	Closed
132	NGGT to explain assumptions around actions taken, where international comparisons are deemed challenging or not possible. - <u>carried over from NGET discussion</u>	<p>National Grid are currently members to a variety of international forums and committees such Pipeline Research Council International (PRCI), European Pipeline Research Group (EPRG) and European Gas Research Group (GERG). These committees allow National Grid to be a part of international discussions on a wide range of topics, learning from the lessons of others and utilising best practice in the projects we are implementing. As an organisation, we have been actively involved in European gas benchmarking since 2004 through the Gas Transmission Benchmarking Initiative (GTBI). Participation in this initiative allows us to share and gain knowledge across Transmission System Operators (TSOs), identifying and learning from best practices. Within this group, we have shown that we hold a leading position in terms of operation and maintenance. An example involves the current River Humber pipeline replacement project. GTBI membership allowed the opportunity to learn from the experience of another TSO undertaking a similar construction project. Several lessons learned by that TSO were shared. We adjusted our project following this that resulted in significant avoided costs.</p> <p>Where international comparisons or benchmarking are not possible we follow a competitive tender process. This utilises the capabilities we have developed across our procurement and Capital Delivery functions. This approach ensures we achieve the most economic and advantageous price that the market can offer for the scope of works to be delivered. We then drive value from these contracts through strong contract management and our commerciality.</p>	Closed
133	NGGT to provide more information on benchmarking safety as little mention is made in the paper. -- carried over from NGET discussion.	In RIIO-1 we asked independent experts DNV GL to benchmark our process safety management performance using its International Sustainability Rating System. Our performance was rated in the upper quartile within a comparator group of over 200 worldwide oil and gas sites. This objective assessment has helped us to be clear on what it means to be 'industry leading'. It has given us a better picture of our strengths and weaknesses and sharpened our focus on areas to improve in future.	Closed

# RIIO-1

Challenge Reference	RIIO-1 – User Group challenges	NGGT response	User Group Status
107	As part of every topic being presented to the User Group, NGGT are required to show the efficiencies generated in RIIO-1 and how that forms a baseline for stretch in RIIO-2 to show evolution of spend. This should include any cost synergies or experience being shared between the UK and US businesses and innovations from RIIO-1 into RIIO-2.	Response linked to benchmarking challenge #128	Closed
108	What is the cost culture in National Grid? Does it have an objective of delivering the same outputs at lower cost? Does it have a “lean” programme to deliver cost efficiencies, including from innovation?	<p>During 2018/19, we commenced a multi-year restructuring programme which covered a range of initiatives, including developing flatter, leaner organisational structures, simplifying our processes and ways of working and making more efficient use of IT and back-office activities. The review undertaken, called “Performance Excellence (PEX) Value”, was a bottom-up process which built on the implementation of lean methodologies across our organisation at the start of the RIIO-1 period. This ambitious programme is a coordinated set of ‘bottom-up’ improvements which is re-shaping our UK business in response to the changing needs of our customers and driving efficiencies to help ease cost pressures on our customers and - ultimately - end consumers. The key areas of change are:</p> <ul style="list-style-type: none"> <li>• Building new skills and capabilities in preparation for future challenges, e.g. cyber resilience;</li> <li>• Aligning core business processes around customer outcomes;</li> <li>• Reducing hand-offs and consolidating activities through process and organisational design;</li> <li>• Digitising and automating processes.</li> </ul> <p>To achieve the long-term benefits of these initiatives, we provided for costs of £127m in the first half of 2018/19, which we expect will help generate savings of £50m in 2019/20 and at least £100m annually from 2020/21. We have undertaken Transformation Programmes during RIIO-1 to improve capability and drive efficiency.</p> <ul style="list-style-type: none"> <li>• Through the Gas Asset Information Systems (GAINs) programme we delivered improved field capability (through refreshed application of field devices, improved mobility and connectivity), new analytical capability leading to better informed asset management decisions in operations, process safety and work management and new Enterprise Content Management (ECM) solutions for better document management and control.</li> <li>• GAINs provided the platform for Richmond – our Gas Transmission Change Programme. The key focus of Richmond is to establish a robust operating model across the Gas Transmission business covering efficient and effective asset management strategies, policies, processes, data, technology, capability and organisational structure. Richmond will improve our asset management capability by aligning our processes and systems with ISO 55000 best practice to ensure we</li> </ul>	Closed

		<p>provide value to customers and stakeholders. This programme will deliver enhanced asset management, investment management and data analytics capabilities whilst assuring verified data from the asset data enhancement activity is successfully uploaded into core asset management systems. These developments are partially system related Non-Operational Capex and partially Opex business change activities. The benefits of these projects will begin to be realised in 2018/19. These projects will support the development of our NOMs methodology, development of our future business plans and provide insight into the management of network risk at least cost.</p> <ul style="list-style-type: none"> <li>• The UK Operating Model (UKOM) review was undertaken in 2013 implementing a new organisational design setting the business up with a more efficient structure, aligned to delivering our requirements under RIIO and those of an ever-changing external environment. UKOM had an impact on both divisional structures and resources with the implementation of the new staff organisational design taking effect from December 2013. The benefits of this review can be seen in the lower workforce in place at the start of the RIIO-1 period as well as our performance in delivering the new outputs implemented as part of RIIO.</li> </ul>	
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## Consumer

Challenge Reference	Consumer: User Group Challenges	NGGT response	User Group Status
152	NGGT needs to ensure that triangulation and the appropriate use of willingness to pay valuations is evident comes more to the fore in the October iteration of the business plan.	We included more information on triangulation in both the October and December business plan narratives. Our approach to triangulation was robust, including secondary research as well as primary where possible. We worked with Frontier Economics to ensure the conclusions from our consumer work draw on all the various strands of direct consumer engagement and secondary material.	Closed

## Business plan overview

Challenge Reference	Business Plan Overview – User Group Challenges	NGGT response	User Group Status
153	NGGT to undertake a comparison of other transmission network business plans (and any gas distribution proposals publicly available), incorporating best practice in the October submission.	Undertaken as per action SG09-G02	Closed
154	In their approach to net zero, NGGT should demonstrate not only their role in the whole energy system but the role of and impact on, their own assets. This should include assessing the impact on compressor assets under a range of hydrogen futures.	Linked to response #181	Closed
156	NGGT should address gas quality and demonstrate the extent to which they have included options for accepting a wider range of gases.	This challenge is addressed through on whole energy system commitments “Using our transmission pipes workstream” - This workstream will examine the question “is a new hydrogen NTS required or is it more cost-effective to transition the existing NTS to carry hydrogen?”. The projects will look at a feasibility study to determine the capability of the NTS to transport hydrogen and review relevant assets, pipeline case studies and gap analysis for materials and standards. The projects will also explore blending opportunities within the NTS, both with hydrogen and with a blend of different gases. This will include looking at how gas quality parameters would need to be changed. We will continue to feed outputs from our projects into the IGEM (Institution of Gas Engineers and Managers) gas quality group, which is currently reviewing the specifications. We will develop a full programme of works to gather evidence and understanding to enable the NTS to transition from natural gas to hydrogen.	Closed

# Incentives

Challenge Reference	Incentives – User Group Challenges	NGGT response	User Group Status
	NGGT must demonstrate each incentive value over and above the baseline.	<p>The detailed information on each of the ten proposed incentives in the ODI annex (A3.03). We have also held four offline discussions with user group representatives on the system operator incentives to provide an explanation of the principles behind each incentive and the outcomes from the stakeholder engagement relevant to each.</p> <p>In our role as the Gas System Operator (GSO), we operate the high-pressure Gas National Transmission System (NTS) in Great Britain. We operate to licence obligations and several financial and reputational incentive arrangements that are important in delivering the objectives of the regulatory framework. Their purpose is to unlock consumer benefits, align customers interests with our own and replicate competition. Each incentive has different properties and drivers, but all deliver value to end consumers whilst some are also integral to the activity they underpin. They focus on minimising the overall cost of system operation, mitigating the environmental impacts of our activities and on operating the wholesale gas market efficiently. Options for each incentive are included in the annex and we have engaged with stakeholders on the options for the incentives, most recently sharing two proposals for the constraint management incentive. These ODIs were also included in our Consumer Value Proposition assessment (annex 10.05)</p> <p>Our stakeholder engagement and customer satisfaction incentives apply to our whole gas business comprising of the GSO and the Transmission Owner (GTO). Cross sector ODIs only apply to the customer satisfaction ODI which is in line with Ofgem's proposals. Our bespoke ODIs (stakeholder experience and community engagement) are reputational only incentives, reflecting the change to embed stakeholder as a cultural change.</p>	Closed
160	For all incentives, demonstrate why NGGT should be incentivised over and above business as usual and incorporate this as one of the criteria in the incentives framework.		
161	NGGT to demonstrate optioneering and stretch for each proposed incentive.		
162	NGGT to extend incentives framework to include RIIO-2 consumer value proposition.		
163	NGGT should demonstrate why incentives are still relevant if the incentive area has been embedded as a cultural change.		
164	NGGT to explain the connection between GT/ ET environmental incentives, in particular the natural capital around sites and land.		
165	NGGT to demonstrate meaningful stakeholder engagement on cross sector ODIs.		
190	NGGT to provide a clear and detailed explanation of each proposed incentive including: why the incentive activity is not business as usual, stakeholder evidence to support the incentive, evidence of benchmarking to support the target, structure and measures before and during RIIO-2.		

## Price Control Deliverables

Challenge Reference	PRICE CONTROL DELIVERABLES – User Group challenges	NGGT response	User Group Status
166	NGGT to provide evidence, benchmarking, optioneering and value for money to underpin the environmental action plan.	We have added additional information within our Environmental Action Plan on how we have developed our proposals. This includes information on benefits that will be delivered, optioneering and benchmarking with additional information on environmental and supply chain sustainability benchmarking in the business plan annexes..	Closed
167	NGGT to demonstrate how RIIO-2 investment proposals take into account a range of hydrogen futures for the NTS, including explanation of where risk lies if assets are stranded under hydrogen flows (e.g. costs to current and future customers if new compressor investments are not hydrogen proof).	See response to challenge #181	Closed

## Workforce Planning

Challenge Reference	Workforce Planning - User Group challenges	NGGT response	User Group Status
175	NGGT to evidence of broader business vision – including direct and contractors as part of the workforce.	The workforce planning annex was re-worked to address these challenges.	Closed
176	NGGT to address all of the gaps above, including cost, turnover, diversity, horizon scanning and innovation, staff feedback and insight.		
177	NGGT to develop diversity elements of the strategy.		