

# I want the gas system to be safe



£14m per year  
3% totex

Engagement

**Stakeholder priority and context**

This priority is about what we do to keep the public, our employees and other people who work on or around our assets safe from the hazards inherent in our business. Our activities in this area encompass people to carry out safety strategy and assurance, including our role as Network Emergency Coordinator. In addition to safety compliance, operational training, asset protection measures to protect from third party interference to our pipelines to make safe and repair any pipeline damage and work on our operational properties.

**Topics**

Safety

**Obligations**

We currently have a licence obligation to comply with applicable health and safety legislation, monitored and enforced by the Health and Safety Executive (HSE). As a gas transporter, and in our role as Network Emergency Coordinator, we must comply with written "safety cases" accepted by the HSE. These set out how we manage the safety of the gas network in accordance with the Gas Safety (Management) Regulations, and manage our top tier sites, Bacton and St. Fergus, which fall under Control of Major Accident Hazard regulations (COMAH). For RIIO-2 we will continue to be obligated to comply with the HSE legislation but will no longer have a licence condition.

**Stakeholders**

Regulators (HSE), connected customers (terminal operators), supply chain (contractors), interest groups

**Approach**

Safety and reliability were included in events, webinars, one-to-ones and consumer engagement.

**What we've heard**

Safety is a top priority. Stakeholders expect us to meet legislative compliance and keep the public safe.

**Key trade-offs and how engagement influenced our plan**

We will continue to keep safety as a top priority. Given safety investment is driven primarily by the need to comply with legislation there are no trade-offs to be made. We have taken on board feedback from the independent stakeholder user group, for example, ensuring this priority clearly articulates the activities we undertake related to the cost, we have clarified our ambition on first class safety performance and included more on behavioural safety.

Outputs

**Measure**

There are no specific PCDs or ODIs for the safety topic. We currently have a licence obligation to comply with the relevant health and safety legislation which is monitored and enforced by the HSE. Ofgem's proposal is not to have a specific licence obligation for RIIO-2. We will continue to be bound by the relevant legislation. We will maintain our first-class level of safety whilst continuing to pursue the highest level of safety culture maturity to protect the public, our assets and people. To deliver this our baseline funding in this area comprises primarily of opex costs to support corporate health and safety activities, capex work to improve the condition of our operational properties and other activities to protect the pipeline assets from third party accidental damage.

**Comparison to RIIO-1 outputs**

We had a licence obligation for RIIO-1.

**Efficiency**

We are committed to continual process improvement to help drive efficiencies this area. This includes utilising our management information to manage training schedules more efficiently and support a more flexible, agile workforce. We will also seek the most efficient means to deliver the improvements required to our operational properties.

**Innovation**

We will continue as we have for RIIO-1 investing in innovation projects such as the impact protection slabs for pipeline protection. Our innovation projects related to safety will play a key role in ensuring we continually improve our safety performance.

**Whole system**

- Our emergency preparedness activity in RIIO-2 includes the increased operational challenges of more diverse supply/demand patterns and potential changes to network gas supply emergency framework associated with whole energy system trends in decentralisation and decarbonisation (e.g. introduction of increasing bio-gases or hydrogen blend).
- We will also continue to develop and adopt new tools and systems to accurately simulate a network emergency, and the need for emergency planning co-ordination with other gas transmission operators across Europe.
- We also recognise the potential for these new requirements and regulatory demands to drive additional requirements and training challenges for our workforce

**Competition**

**Uncertainty**

**De-carbonisation**

Totex

**Cost at RIIO-1 (annual forecast)**

£17m per year

**Work needed**

We will carry out our safety strategy and assurance roles and our corporate health and safety commitments.

We will provide 24/7 standby cover, emergency planning and training. We will also undertake our activities associated with our Network Emergency Coordinator role.

Third Party Interference – we will minimise the risk of others causing damage to our pipeline network by carrying out regular surveys and consider new technological options to become more effective and efficient. We will maintain an emergency response and repair service for our pipework systems across Great Britain.

Operational properties – 22 sites during RIIO-2 to be refurbished or replaced so they are in a state to protect our people and assets from damage and weathering.

**Cost at RIIO-2 (annual)**

£14m per year

**Approach to uncertainty**

N/A

**Consumer benefit**

Through managing down the likelihood of low frequency, high impact incidents; we protect society from potential disruption and damage to public health, business, transport and the natural environment that could be associated with gas transmission failure events. Our commitment to safety-related inspections, maintenance and asset replacement avoids disruption to continuity of gas supply. This also affects industry and electricity supply.

# I want to take gas on and off the transmission system where and when I want



£280m per year  
51% totex

		Engagement			
		Asset health	Efficient system operation and asset management	Network and environmental resilience	
Engagement	Stakeholder priority and context	Our stakeholders value being able to flow gas without restriction. This priority is about ensuring we have the right gas transmission system, maintained to the right level alongside a complimentary commercial framework to meet stakeholder and consumer needs. This topic covers multiple critical activities including: asset health, efficient asset management and gas system operation (having the right resources, tools, utilities and systems); network and environmental resilience			
	Topics	Asset health	Efficient system operation and asset management	Network and environmental resilience	
	Obligations	Gas Safety (Management) Regulations, Control of Major Accident Hazard Regulations, Pressure Systems Safety Regulations, Pipeline Safety Regulations, Dangerous Substances and Explosive Atmospheres Regulations, IGEM/TD/1, Maintain 1 in 20 demand capability, Workplace (Health, Safety and Welfare) Regulations, Gas Transporter Safety Case			
	Stakeholders	Gas Distribution Networks (GDNs); Customers – connected; Customer – shippers; Consumers (domestic and major); Regulators; Academics; Supply chain; trade bodies; local authorities; European TSOs; interest groups	GDNs; Customers – connected; Customer – shippers; Academics; Supply chain; trade bodies, interest groups	Environmental regulators, consumer groups Customers – connected, interest groups	
	Approach	High impact and high interest stakeholders = <b>collaborate</b> ; high impact or high interest = <b>consult or involve</b>			
	What we've heard	Network reliability, and therefore asset health, is a critical area. Stakeholders aren't prepared to tolerate any reduction to reliability or safety risk. Stakeholders have validated the critical importance of the Bacton terminal both locally and nationally.	Stakeholders continue to expect and value flexibility from the network and the services we provide	Feedback on environmental resilience was split between a proactive and a risk based approach, We have adopted a risk based approach.	
	Key trade-offs and how engagement influenced our plan	We tested the acceptable level of reliability with stakeholders (keeping cost the same, reliability level the same, improving reliability by 10%). Overall, there was marginally more support for increasing reliability by 10% compared to keeping risk the same as RIIO-1. However, stakeholders who pay the bills slightly preferred keeping risks the same. We traded off the higher supported option to the one which was supported more by those who paid the bills, which at the time was 40% cheaper than improving reliability by 10%.		We have worked with the relevant GDN on the network resilience proposals. They support construction of a new short transmission pipeline at the Blackrod offtake.	
Outputs	Measure	<b>Type:</b> PCD on Network Risk. <b>Target:</b> Maintain level of risk. <b>Type:</b> LO to maintain 1 in 20 peak day demand capability. <b>Target:</b> Level of demand capability. <b>Type:</b> PCDs for delivery of Bacton and King's Lynn projects.	<b>Type:</b> Maintenance ODI: use of days ( <b>target 11 days</b> ) and changes ( <b>target 7.25%</b> ); Constraint mgmt. ODI: limit capacity constraints. <b>Target: -£22.1m</b> ; Residual balancing ODI: price and linepack. <b>Targets:</b> 5.6mcm shoulder months, 2.8mcm non shoulder months, 1.5% SAP	<b>Commitments:</b> network and environmental activities	
	Comparison to RIIO-1 outputs	Our Network Asset Risk Metric methodology, uses monetised risk as a common currency for safety, reliability and environmental measures. For RIIO-2 we are committing to remove £2.96m of monetised risk value, delivering a long-term risk benefit of £296m. Specific delivery of Bacton terminal requirements. Address subsidence at King's Lynn compressor site.	Our asset management activities continue to be led by good asset management principles and we will continue our external accreditation to ISO55001. We will build new capabilities. We will continue to drive efficient operation of the system. We will maintain IT systems.	Proposals for works at the Blackrod and Tirley sites to increase network resilience.  Environmental resilience: pipeline monitoring and maintenance of watercourse crossings.	
	How we will deliver	Efficiency	13 RIIO-1 reliability and availability outputs, we remain on track to meet all by the end of RIIO-1. No specific asset health allowance for Bacton, in the RIIO-1 period.	Retain existing incentive schemes, with tougher targets. Enhancement to asset management and system operation activities.	No specific RIIO 1 output
		Innovation	Maintain campaign approach for efficient & increased delivery during existing outages. Improve capability and efficiency building on RIIO-1 transformation programmes.	Application of RIIO-1 restructuring benefits; 5% procurement efficiency commitment for equipment, spares & consumables	Driving efficiencies and allowing increased work delivery during existing outages.
		Whole system	Apply existing innovation such as GRAID and shallow dig and undertake extensive new innovation activities, such as modular construction, smart network tools, new materials and robotics.		
		Competition	10 year delivery programme managing outage reqts. to meet customer/consumer needs.	Network operation will reflect a WS approach e.g. through linepack and pressure management.	Collaboration with GDNs to deliver solutions which best meets the needs of consumers.
		Uncertainty	Projects at King's Lynn and Bacton, subject to competitive tendering.	Maintain efficient delivery and operation of the network, ensuring competitive functioning of the gas market.	Facilitate competitive functioning of the gas market by minimising planned or unplanned disruption to critical pipelines.
		De-carbonisation	Most significant risk is an unexpected asset failure or need to isolate due to an unacceptable safety risk. We need the ability to trade off risk across our asset categories, to deliver the best outcome for consumers. Utilise UM where cost uncertainty exists.	Maintain an appropriate resource profile to manage attrition and bring new skills in to mitigate the retirement profile.	Through effectively facilitating the market we support the broader management of uncertainty.
	Totex	Cost at RIIO-1 (annual forecast)	Totex: £109.3m/yr	Totex: £96.4m/yr	Totex : £0.5m/yr
		Work needed	To reduce the compressor emissions outages are prioritised & coordinated over 10 years period.	Replace 80 commercial fleet with alt. fuel vehicles; invest in 45 electric vehicle charging points across our network.	Maintaining resilience in support of the energy transition as external factors change network requirements change.
Cost at RIIO-2 (annual)		Our planned work volumes will deliver the same level of reliability in RIIO 2 as we achieved in RIIO 1. The exact combination of work we will do on the network can be adjusted throughout the price control period where this is the most cost effective solution. Bacton - Building of a new terminal ( <i>NB decommissioning costs for the existing terminal are included in the environment and community chapter</i> ). Kings Lynn – AGI rebuild due to subsidence.	Efficiently deliver our customers' requirements with the right level of resources, trained with the right capabilities, supported by the tools, vehicles and IT systems. All gas system operation related activities, including commercial and regulatory change of capacity processes; delivery of safe NTS access to allow maintenance; deliver operational strategy to maximise operational flexibility and service. Maintain core IT systems and build new capabilities.	Construction of a new pipeline to increase resilience at the Blackrod offtake. Installation at Tirley to allow maintenance without restriction to gas flow from South Wales.  Condition based monitoring surveys of pipeline watercourse crossings, work to assess buoyant lift on NTS pipelines in the event of flooding, control of animals on our sites and pipelines and maintenance of watercourse navigation markers.	
Approach to uncertainty		<b>Asset Health (excluding projects): £133m per year. Bacton: £28m per year. Kings Lynn: £6m per year</b>	<b>Asset Management: £66m per year System Operation Total: £42m per year</b>	<b>Network Resilience: £2m per year Environmental Resilience Total: £1m per year</b>	
Consumer benefit		Utilise UM for FEED for Bacton redevelopment and Kings Lynn subsidence	Availability of appropriately skilled and trained people in the right geographic areas is uncertain. Our plan manages attrition, retirement and training.	Any environmental risks identified will either deferred to RIIO-3 or risk traded during RIIO-2 under the asset health methodology	
	Consumers value safety & reliability. Bacton ensures security of supply & effective functioning of the GB gas market.	The right resources with the right tools to do their job, is vital to maintain the safety and reliability consumers demand. Building on previous and developing new innovations improve efficiency.	Will protect consumers in specific areas from disruption to supply and mitigate the impact of environmental events. Our proposed investment at Blackrod forms a CVP valued at £173m.		

# I want you to protect the transmission system from cyber and external threats



£118m per year  
21.5% totex

UK infrastructure is subject to a multitude of security threats, which are increasing in sophistication and persistence. The gas National Transmission System is part of Great Britain's Critical National Infrastructure (CNI), providing an essential service for society. Government sets the requirements for the appropriate levels of protection to be achieved in the national interest. Our RIIO-2 plan is to deliver the security hardening that has been mandated by Government, as efficiently as possible.

Stakeholder priority and context
Topics
Obligations
Stakeholders
Approach
What we've heard
Key trade-offs & how engagement influenced our plan

Physical Security	Cyber Resilience
We are obliged to implement a Physical Security Upgrade Programme (PSUP) at our CNI sites, governed by BEIS. We are obliged to comply with the arrangements for policing at gas facilities in accordance with the Counter-Terrorism Act 2008, sections 85 to 90.	We are an Operator of Essential Services and must comply with the requirements of the Network and Information Systems (NIS) Regulations 2018. The aim is to coordinate and raise overall levels of cyber security across the EU.
Our key stakeholders for this topic are: the government through the Department for Business, Energy and Industrial Strategy (BEIS), its security agencies the Center for the Protection of National Infrastructure (CPNI) and the National Cyber Security Centre (NCSC), Ofgem (in its joint role with BEIS as Competent Authority for the NIS Regulations), HSE, other energy companies that are also Operators of Essential Services, and our upstream/downstream customers.	
Bi-lateral meetings with BEIS e.g. setting requirements, monitoring and reporting regarding progress of the PSUP programme. Bi-lateral engagement with NIS Competent Authority regarding cyber resilience. Collaboration with NCSC & GDNs e.g. through the Energy Emergencies Executive Committee (E3C).	
Stakeholders say they way we manage security threats should be a priority. We've heard (through our events) that they support the need for protection from cyber and external threats because they identify with the increasing threat to society and their own businesses. Loss of gas supply for communities and/or loss of control of critical safety systems could lead to loss of life.	
We work closely with government who provide assessment of the changing nature of threats and with the security agencies who provide advice on best practices for risk mitigation. There are significant restrictions on the detail we can disclose for reasons of national security. Like other Operators of Essential Services, we have been engaging during 2019 with the Competent Authority on our NIS Self Assessment and Improvement Plan. These set the focus for our near term cyber resilience mitigation actions during the remainder of RIIO-1 and set the context for our programme of work in RIIO-2.	
No trade-offs – the scope of work is to meet government requirements. Our approach to cyber resilience has been shaped by engagement with NCSC and the NIS Competent Authority. For example, acting upon feedback we have standardised our approach to the assessment of cyber risk and criticality across our IT, OT and CNI systems.	

Measure
Comparison to RIIO-1 outputs
How we will deliver
Efficiency
Innovation
Whole system
Competition
Uncertainty
De-carbonisation

PSUP Programme Type: Price Control Deliverable Target: implement PSUP at designated sites	Policing Type: Counter-Terrorism Act obligation Target: comply with requirements, cost pass-through	Cyber Resilience Plan Operational Technology Type: Price Control Deliverable Target: Cyber resilience improvements	Business IT Security Plan Information Technology Type: Price Control Deliverable Target: Cyber resilience improvements
Specific (confidential) output measures for PSUP programme delivery will be included in PCD agreed with Ofgem. Specified volumes of work to be delivered.	Specific (confidential) output measures for PSUP programme delivery will be included in PCD agreed with Ofgem. Specified volumes of work to be delivered.	Specific (confidential) output measures for cyber resilience programme delivery will be included in PCDs agreed with Ofgem. Specified volumes of work to be delivered.	Specific (confidential) output measures for cyber resilience programme delivery will be included in PCDs agreed with Ofgem. Specified volumes of work to be delivered.
Quarterly security performance reporting to BEIS, Annual Regulatory Reporting Pack to Ofgem and Annual Strategic Performance Overview report – public report on website.	Quarterly security performance reporting to BEIS, Annual Regulatory Reporting Pack to Ofgem and Annual Strategic Performance Overview report – public report on website.	Subject to monitoring and audit by the Competent Authority for NIS Regulations.	Subject to monitoring and audit by the Competent Authority for NIS Regulations.
No outputs included at start of RIIO-1 because number of sites and scope not confirmed. Subsequently, scope confirmed by BEIS and regulatory cost allowance / outputs were subject to re-opener decision by Ofgem in 2015		No outputs included at start of RIIO-1 because requirements were not yet clear. Enhanced Security re-opener process in May 2018 resulted in additional cost allowances for a defined set of schemes	
Our physical security capex plan locks in 15% cost reductions so far attained in RIIO-1. We have embedded an additional efficiency ambition so that the allowance we are requesting is £7.5m lower than our view at the time of the May 2018 reopener. We proactively identify sites where lower cost operational solutions may be deployed instead of costly physical measures and other sites where PSUP is no longer required.		Key to driving efficiency of our programme is our use of risk based assessment to determine priorities. Factors considered include: age and condition of existing systems, the network capability needed by our customers, and known vulnerabilities. We always consider least functionality options. Our RIIO-2 plan embeds innovation from our Network Innovation Allowance (scheme NGGT0114) strengthening security with our SCADA systems.	
Delivery is outsourced through competitive procurement events to ensure value for money. Engineering Justification Papers (confidential) set out the costs and benefits of alternatives considered. Our cyber assessment methodology and costs have been subject to external benchmarking		Key to driving efficiency of our programme is our use of risk based assessment to determine priorities. Factors considered include: age and condition of existing systems, the network capability needed by our customers, and known vulnerabilities. We always consider least functionality options. Our RIIO-2 plan embeds innovation from our Network Innovation Allowance (scheme NGGT0114) strengthening security with our SCADA systems.	
We have proposed uncertainty mechanism proposed for Physical Security, Cyber Resilience, Policing.		We have proposed uncertainty mechanism proposed for Physical Security, Cyber Resilience, Policing.	
The cyber threat landscape is rapidly evolving and it is important that we should be able to flex our response accordingly.		The cyber threat landscape is rapidly evolving and it is important that we should be able to flex our response accordingly.	
The reopener uncertainty mechanisms should cater for changes in: the level of threat, the required response, the criticality of sites/assets/processes, and technology or supply chain capability.		The reopener uncertainty mechanisms should cater for changes in: the level of threat, the required response, the criticality of sites/assets/processes, and technology or supply chain capability.	

Cost at RIIO-1 (annual forecast)
Work needed
Cost at RIIO-2 (Annual)
Approach to uncertainty
Consumer benefit

£25m p.a.	£0m p.a. (Policing cost is pass-through)	£2m p.a. (note £16m annual for related OT asset classes is reported in Asset Health section)	£9m p.a. (includes 2018 enhanced security reopener scope)
Deliver new PSUP solutions at required sites. Typically including: high security perimeter fence, controlled access points, intruder detection, CCTV & lighting, civil works, cabling. Maintain & replace existing PSUP assets in accordance with CPNI high level security principles (first generation security assets need replaced due to age and obsolescence). Our PSUP programme is well defined (no regret) so full funding should be included in our baseline price control allowance. Comply with policing requirements of Counter-Terrorism Act 2008.		A prioritised programme of replacement or security hardening of our Operational Technology (e.g. industrial control systems, telemetry, metering, gas analysers and boundary control) for our compressor, terminal and Above Ground Installation sites. A suite of initiatives and investments to improve our ability to identify, protect, detect, respond and recover to cyber threats on our IT systems. Scope of work is informed by a risk based approach, in line with HSE Guidance, and 'defence in depth' architecture in line with IEC 62446 standard, and NIS requirements. Around 80% of our scope is well defined (no regret) so should be funded in our baseline price control allowance.	
£26m p.a.	£0m p.a.	£83m p.a.	£9m p.a.
We propose two reopeners for our physical security plan: one at mid-period and one at the end of RIIO-2		We propose that both our Cyber Resilience Plan and our Business IT Security Plan are subject to two reopeners, one at the beginning of RIIO-2 and one at mid-period.	
<ul style="list-style-type: none"> <li>Consumers want to be able to use energy as and when they want. Our plan supports this by improving the safety and resilience of the transmission system to ride through and recover from malicious events that threaten to disrupt continuity of GB energy supplies</li> <li>Consumers want us to facilitate the energy system transition whilst minimising disruption to their lives. Our plan supports this by delivering the security enhancements that the government has identified as being in the national interest. This reduces the risk of actual events that could have severe societal consequences for GB consumers</li> <li>Applying innovation to enhance the resilience of our SCADA systems is a <b>Consumer Value Proposition</b> valued at £9.2m</li> </ul>			

# I want you to care for the environment and communities

£55m per year  
10% totex

Engagement	Stakeholder priority and context	Driven by the needs of our stakeholders and legislative requirements, we will: deliver compressor emissions legislation compliance; make our climate change commitment (including emissions from other assets, our commitment to sustainability and leadership for change); articulate our activities to support the communities we work in.				
	Topics	Compressor emissions	Redundant Assets	Climate change commitment, inc. natural environment	Supporting the communities in which we work	
	Obligations	Meet compressor emissions legislative requirements	Government climate change policy targets, modern slavery legislation			
	Stakeholders	Interest Groups, Customers, Regulators, Consumer Bodies, Communities, Network Companies, Supply Chain				
	Approach	Collaborate & consult				
	What we've heard	Clear strategy needed to 2030 to ensure we meet legislative requirements. Stakeholders value a robust and reliable network as this keeps the UK market attractive. We need to account for wider 'cost' of network constraints beyond the financial costs incurred by NGGT.	Prioritise projects based on risk and re-use assets where possible. Consider societal fairness and future consumers as well as all possible options. Return land to a good state when we have finished with it.	Environmental stewardship is important. Support for incentives targeting decarbonisation. Need to focus consistently on all types of emissions.	60% of respondents told us we should do more with local communities. 40% said to continue as we currently are.	
	Key trade-offs and how engagement influenced our plan	Major energy users stressed the importance of keeping options open, in relation to compressors, so we are using uncertainty mechanisms. We simplified compressor information following feedback and improve our deliverability.	We asked if current or future consumers should pay for demolition of assets. 87% said we should prioritise on a risk basis and maintain remaining assets until removal.	There is willingness to pay for improvements but a greater level of granularity on metrics is needed. We have set out more in our Environmental Action Plan (EAP) annex A16.01.	Disagreement across stakeholder community around who should pay. We are not requesting additional funding for this work.	
Outputs	Measure	<b>Type:</b> PCDs & UMs <b>Target:</b> To deliver compressor outputs relating to emissions legislation compliance over RIIO-2 and RIIO-3	<b>Type:</b> PCD <b>Target:</b> Address 80 redundant assets, asset groups and sites during RIIO-2	<b>Type:</b> ODIs & commitments <b>Incentives:</b> GHG emissions, shrinkage, EAP	<b>Type:</b> Commitments Specific community commitments	
	Comparison to RIIO-1 outputs	Deliver 2 new units at Wormington. Start work on units at 3 sites (Kings Lynn, Peterborough, St Fergus) PCDs to reach FEED. Post-FEED PCD subject to UM.	Deliver decommissioning as identified by risk priority assessment.	Methane monitoring, 100% low carbon vehicles where market alternative available in 2019, onsite renewable generation, carbon neutral construction.	Positive impacts on biodiversity. Continue working with communities and good causes. Sustainable and ethical procurement activities.	
	How we will deliver	Funding for compliance at Peterborough, Huntingdon, Aylesbury and Wisbech. Re-opener UM recently concluded relating to St. Fergus & Hatton.	RIIO-1 spend broadly similar to anticipated. However, spend reprioritised due to additional customer driven change.	GHG and shrinkage incentives existed in RIIO-1. Amendments to these proposed for RIIO-2.	Charitable giving, partnerships with civil society organisations employee volunteering & social mobility projects.	
		Efficiency	Focus on deliverability (construction time and outage planning) to maximise efficiency across the programme of work	Efficient delivery of decommissioning activity.	Efficient system operation and energy procurement minimises cost of shrinkage. .	Discretionary spend to support skills development & communities not affected by major projects.
		Innovation	Extensive innovation themes including investigation of mobile compressors; AR.	Explore innovative solutions for reuse of redundant assets.	Enables better methane leak detection & monitoring.	Develop national and local skills development partnerships.
		Whole system	Delivery programme focused on coordinated planning of outages to minimise disruption.	Investigate pipeline re-use to support WS solutions.	Share best practice & take a WS approach to emissions reduction.	Share best practice & take a WS approach to community work.
		Competition	Maintain competitive procurement processes.	Maintain future optionality for GB gas market (competitive procurement).	Maintain competitive procurement processes.	Operating as a socially responsible business.
Uncertainty	Phasing of activity to meet legislative requirements & facilitate delivery, use UM where uncertainty in need or cost.	Any new unanticipated sites emerging in RIIO-2 to be reprioritised.	Potential black box flaring technology, uncertainty of EU-ETS emissions (Brexit).	Develop national and local skills development partnerships.		
De-carbonisation	Compliance with environmental legislation to reduce emissions from our compressor fleet.	Reduce impact where assets are re-used or repurposed. Environmental net gain when sites returned to natural state.	Focus on all carbon emissions (compressors, transport, construction, onsite generation)	Carbon targets for 75% of top 250 National Grid suppliers embedding decarbonisation in supply chain.		
Totex	Costs at RIIO-1 (annual forecast)	£33.9m	£2.7m	No specific RIIO-1 allowance (spend ~£1.6m pa)	Funded via discretionary spend.	
	Work needed	Deliver two new compressor units at Wormington (to support flows of 80 mscm/d equivalent rated power to existing capability). Deliver two new MCPD compliant compressor units at King's Lynn and one unit at Peterborough. PCDs to reach FEED in RIIO-2. Deliver one new unit at Hatton (agreed in RIIO-1).	Address 80 redundant assets, asset groups and sites during RIIO-2. <b>Non-operational sites</b> -remove assets so that the site can be used for other purposes. <b>Operational sites</b> – remove any redundant assets to ground level. <b>Pipelines</b> – keep in place and make safe reviewing alternative uses.	Develop science based target by 2023. Monitor methane leaks and increase use of recompression to reduce methane emissions. Reduce emissions from our fleet through alternative fuel vehicles. Install solar panels on operational sites for own use electricity. Minimise shrinkage volume and cost at which shrinkage gas is procured.	Develop national and local skills development partnerships and initiatives. Promote equal opportunities in the supply chain. Continue human rights and supply chain diligence. <b>Major projects</b> 0.3% of spend to support communities.	
	Cost at RIIO-2* (annual)	£31.3m	£16.5m	£2.8m	No additional funding requested for these activities in RIIO-2.	
	Approach to uncertainty	UMs to cover post-FEED solutions and costs at King's Lynn, Peterborough and St Fergus.	Propose deferral of work to RIIO-3 if costs not covered by customer.	Use methane emissions monitoring to establish baseline.	N/A	
Consumer benefit	Ensure that we have a compressor fleet with sufficient capability to ensure that our customers can take gas on and off the system as and when they want. Reduce our carbon footprint, improve air quality.	Societal fairness in addressing redundant assets avoids costs being passed on to future consumers. RIIO-2 redundant sites strategy increases biodiversity, controls the risk of ground and water contamination and promotes environmental net gain.	Societal benefits by reducing our carbon footprint and reduce our impact on global warming. Carbon neutral construction is a CVP valued at £0.3m. Natural environment improvements is a CVP valued at £1.75m. Methane emissions reduction could provide a CVP in the order of magnitude of £2.2m.	Support of the community over and above our baseline allowances. Consumers will benefit from the direct improvements being made within the community. Assigning 0.3% of major project funding to community improvements provides a CVP valued at £0.6m.		

\*Additional cost associated with legacy agreements (£3.8m per year)

# I want you to facilitate the whole system of the future, whilst innovating to meet the challenges ahead



£17m per year  
3% totex

Engagement	Stakeholder priority and context	This is about how we can lead the gas industry through the energy transition in a way that delivers benefits to consumers. It looks at how the industry can decarbonise heat to contribute to Great Britain's pathway towards meeting its 2050 targets, and it explores our role within that process. In particular it looks at how we can innovate and drive the decarbonisation of the energy system.				
	Topics	Markets	Decarbonisation of the gas transmission system	Innovation	Systems	
	Obligations	Ensuring GB market compliance with legislation	Developing options to enable decarbonisation of heat using whole systems approaches	Embedding innovation with the organisation	Providing an interface to allow shippers to book capacity, allowing us to balance the NTS safely	
	Stakeholders	Interest Groups, Regulators, Consumer Bodies, Network Companies, Supply Chain, Academics, Innovators, Government policy groups, European TSOs				
	Approach	Inform, collaborate, consult.			Inform, involve, consult.	
	What we've heard	There will be a significant amount of industry change as we move through the RIIO-2 period. We should continue to lead the facilitation of industry change within the gas sector.	Decarbonisation of heat is an area of particular challenge and we should support it. Stakeholders would be interested in us playing a stronger role in driving the debate over the future of the UK system.	Networks should provide information to policy-makers through innovation projects or horizon-scanning. Decarbonisation of heat is an area we should be supporting.	Do the basics well, make it easier for stakeholders through greater automation and increased reporting functionality whilst minimising the impact of change	
	Key trade-offs and how engagement influenced our plan	We have engaged extensively with stakeholders to inform the development of the gas markets framework. This has led to the formation of an independent steering group of stakeholders that will drive the outputs of the Gas Markets Plan (GMaP)	Understood and tested what we should be leading, collaborating on during RIIO-2 with stakeholders and provided more information as requested.	Worked with stakeholders on 'how' we innovate and this information is feeding into our RIIO-2 strategy and our innovation culture.	We have worked with stakeholders to understand their requirements to help us determine if what was most economical for consumers, is either replacement or re-platforming.	
Outputs	Measure	Type: Commitment We will continue to comply with our obligation to provide code administration for the gas market subject to the outcome of the Energy Code Review. We will continue to lead the formation of the gas markets framework, including a steering group to prioritise a programme of works.	Type: Commitment We will lead on developing the options for gas transmission in relation to the decarbonisation of heat. We will collaborate with GDNs, BEIS and others on an agreed hydrogen workplan.	Type: Commitment Our proposal is to invest in BAU innovation. We also feel it is appropriate to have a Innovation Incentive allowance, in particular focussed on energy transition projects.	Type: Commitment We will invest in our Gemini system as it needs to be refreshed due to lifespan ensuring it continues to function and also deliver the enhancements our stakeholders want.	
	Comparison to RIIO-1 outputs	Ensuring GB market compliance with legislation.	No specific RIIO-1 output for this activity.	Two allowances; NIA-Network innovation allowance, NIC-Network Innovation Competition	Ex-ante allowance for replacement of Gemini. Regulatory change timelines resulted in re-platformed rather than replace.	
	How we will deliver	Efficiency	Focus on being flexible to change and delivery of programmes in an efficient manner. Use the Gas Markets Plan (GMaP) to drive delivery.	Efficient delivery of whole systems solutions.	Working with suppliers to ensure the best value for money is achieved.	EJP & CBA ensure costs are robust including assessment of RIIO-1 expenditure.
		Innovation	Delivering regulatory change solutions, we will look for innovative ways of doing this.	Use innovation to drive understand and deliver the solutions for decarbonising heat and industry.	Invest in BAU innovation as well as work with third parties to drive forward energy transition projects. We will further embed a culture of innovation across the business.	Innovative solutions will be investigated for delivery of this
		Whole system	Whole system collaboration will be at the heart of driving benefits for consumers.	Whole system collaboration will be at the heart of driving benefits for consumers.	Project will focus on energy transition.	The system will be adaptable to future change, working with customers.
		Competition	Maintaining future optionality for efficient functioning of the GB gas market, competitive procurement processes	Maintaining future optionality for GB gas market, competitive procurement processes.	GT/GDN competitive solutions will be implemented	Use competitive procurement process for delivery of solution.
		Uncertainty	Use GmaP to drive what needs to be delivered. It will be a live plan that so will account for changes in direction of travel	We are proposing a reopener relating to net zero to respond to policy.	Any changes in external environment will be considered through governance for our innovation strategy.	The system will be adaptable to future change. We will review periodically if requirements change.
		De-carbonisation	Implement market and regulatory change that are required for a decarbonised market to function.	We are looking at the options for decarbonising the gas network.	Invest in projects that will look at the options of decarbonisation.	Supporting the energy transition through delivering regulatory change.
	Totex	Costs at RIIO-1 (annual forecast)	£6.9m	No baseline funding Pass through cost, NIA:£5.3m	£6.3m	
		Work needed	Lead the development of options associated with gas transmission to facilitate the decarbonisation of heat, industry and transport, specifically hydrogen, supported by an uncertainty mechanism. Lead the development of the gas markets framework by collaborating with others to enable the pathway to net zero. Collaborate across the industry on a hydrogen workplan and on innovative solutions	Collaborate across the industry to lead innovation and deliver solutions for whole energy and net zero.	Invest in skilled people and IT systems so we can lead regulatory change, anticipate future regulatory developments and understand how these might affect stakeholders and our network.	
Cost at RIIO-2 (annual)		£7.4m	No baseline funding Pass through cost, NIA: £6.2m	£10m		
Approach to uncertainty		We are proposing a reopener relating to net zero to ensure we are able to respond quickly to work towards net zero goals. This would be triggered at end of year 2. Additionally we will work with Ofgem on designing the whole system 're-opener.	Use NIA and the new strategic energy funding pot to deliver energy transition projects.	N/A		
Consumer benefit		Supporting and delivering market changes and solutions will continue to deliver the future energy system	Taking a leading role in decarbonisation of heat for gas transmission could provide a consumer value proposition of £2.2m.	Delivering innovative solutions to deliver the energy transition, will minimise consumer bills	Investing in the digital systems so the gas market and industry is able to continue providing energy to consumers	

# I want to connect to the transmission system



£3m per year  
0.5% totex

Engagement	<b>Stakeholder priority and context</b>	We connect, modify or disconnect new and existing sources of gas supply and demand as customers' requirements change.		
	<b>Topics</b>	<b>Connections</b>	<b>Customer &amp; stakeholder satisfaction</b>	<b>Incremental capacity</b>
	<b>Obligations</b>	Under section 10.2(a) of the Gas Act 1986 we are obliged to connect customers to our network. Condition 4B of our Gas Transportation Licence obliges us to determine and comply with a connection charging methodology that facilitates competition in the supply of gas. In accordance with the Uniform Network Code (UNC) we must respond to connection requests within designated timescales		We make available baseline entry and exit capacity in accordance with our licence. We apply the PARCA process, including publication of relevant industry notices.
	<b>Stakeholders</b>	Our key stakeholders for this topic are the customers, including Gas Distribution Networks, Shippers and directly-connected customers such as gas storage sites and gas-fueled power stations. Ofgem is another important stakeholder. Other stakeholders include third parties like rail companies asking us to divert our assets to facilitate development of their networks.		
	<b>Approach</b>	Business as usual customer relationships through multiple channels including: one-to-one meetings, "Customer Journey" discussions, Gas Operational Forum, and UNC Modification Panel. Customer satisfaction and Net Promoter Score surveys supported by business and executive level meetings. Tailored workshop events e.g. through project CLoCC.		
	<b>What we've heard</b>	Stakeholders want it to be quicker and cheaper to connect and for us to be more transparent in our processes, they welcome the changes we are already implementing. Stakeholders want our connection service to enable decarbonisation, decentralisation and future energy systems transition	Customers value that we are listening more intently to their needs Our levels of engagement are improving as evidenced by increasing customer and stakeholder satisfaction scores We need to keep listening and making improvements.	The RIIO-2 framework needs to allow for differing levels of work on the network to be both determined and undertaken during the RIIO-2 price control period
	<b>Key trade-offs &amp; how engagement influenced our plan</b>	There is consensus that more smaller unconventional parties will be seeking connection to the transmission system From our acceptability testing exercise: 76% of consumers support our plans and related costs. 16% support the proposed actions but not the related costs.		

Outputs	<b>Measure</b>	<b>Type:</b> Licence Obligation <b>Target:</b> Meet UNC timescales for connection offers	<b>Type:</b> Customer Satisfaction ODI <b>Target:</b> CSAT score 7.8/10 <b>Incentive:</b> proposed cap and collar 0.5% revenues	<b>Type:</b> Incremental Capacity Reopener <b>Target:</b> meet UNC, PARCA process etc	
	<b>Comparison to RIIO-1 outputs</b>	We have met UNC timescales for all connection offers during RIIO-1 (with the exception of one with the agreement of the customer)	Customer Satisfaction increased from 7.2 at the start to RIIO-1 to 7.8 currently. Stakeholder satisfaction increased from 7.8 at the start of RIIO-1 to 8.0 currently	So far in RIIO-1 all customer requests for additional capacity have been met by substitution of unused capacity from elsewhere.	
	<b>How we will deliver</b>	<b>Efficiency</b>	We will embed the improvements arising from project Customer Low Cost Connections (CLoCC) Standard design connections to the network for less than £1m in less than 12 months, application fees reduced, quicker route through PARCA for green light locations and acceptance of higher oxygen content gas from bio-methane producers	Deployment of modern digital systems (connections portal and Customer Relationship Management (CRM) system) cuts down paperwork, reduces administration and saves time	Optimise existing assets by substituting capacity where possible rather than by building incremental capacity We propose that the process for regulatory approval of capacity substitution is simplified for improved efficiency
		<b>Innovation</b>	Take learning from 'self-connect' trial for customers who prefer to deliver local connection works.	Continue to improve and develop our engagement, in particular evolving our approach to meet the needs of new types of connected customers (e.g. 'green gas' customers).	Network reinforcement will be subject to competitive procurement events
		<b>Whole system</b>	Local connection work and third-party diversion work is customer funded via cost pass-through		We support Ofgem's proposal to assess changes on a case-by-case basis and the incremental capacity reopener Costs will only be incurred subject to customer commitment and the rules for PARCA
		<b>Competition</b>	Make it easier for new entrants e.g. "green gas" and CNG refuelling to connect to our network		
		<b>Uncertainty</b>			
<b>De-carbonisation</b>					

Totex	<b>Cost at RIIO-1 (annual forecast)</b>	£1.2m p.a.	£1.3m p.a.	£1.4m p.a.
	<b>Work needed</b>	Manage the commercial processes that cover the application, negotiation and agreement of offers and contracts. Be proactive in marketing of connections, actively looking for new low carbon connection customers and continue to support the liquidity of the energy market by providing an efficient process for connection and capacity applications and making process and policy improvements	Deliver systems and people capability for an effortless end-to-end customer experience Improve customers digital experience through their "journey": Web based connections customer portal providing self-service capability and transparency of application status	RIIO-2 work required is inherently uncertain as it depends upon future customer requirements A customer PARCA application at Milford Haven has reached phase 2 triggering indicative network reinforcement in south Wales. The resultant work could straddle RIIO-1,2 and 3 period. We are currently undertaking desktop studies and cost benefit analysis to narrow down strategic options and costs
	<b>Cost at RIIO-2 (annual)</b>	£1.1m p.a.	£1.4m p.a.	£0m p.a.
	<b>Approach to uncertainty</b>	Local connection work and third party diversion work is customer funded on a cost pass-through basis Uncertainty mechanism for costs which can not reasonably be recovered from parties requesting the diversion		Incremental Capacity Reopener. We support Ofgem's proposal to assess changes on a case-by-case basis
	<b>Consumer benefit</b>	Our efficient connections and capacity processes facilitate liquidity in the competitive wholesale energy markets. Our processes support decarbonisation of the whole energy system. We make it viable for new types of gas customers to connect to our network. Embedding project CLoCC could provide a <b>Consumer Value Proposition (CVP)</b> with an order of magnitude of £33m (note this is not a fully quantified CVP)		Where possible we provide capacity without building new assets. This keeps costs down and avoids uncertainty about the enduring value of new assets in decades to come.

# I want all the information I need to run my business and understand what you do and why



£8m per year  
1% totex

Engagement	Stakeholder priority and context	Transparency and information are fundamental to stakeholders being able to operate their businesses efficiently and effectively. Our data and insights provide value for consumers by ensuring that the gas market runs smoothly. Our work in this area also promotes competition – allowing participants to plan, prepare and operate effectively. We recognise that our stakeholders need us to provide good quality information and data to inform their business decisions.	
	Topics	Operational Information	Transparency
	Obligations	Compliance with Gas Transport License Obligations – Special Conditions 8F, UNC Section V 5.9.1 – Operational and Market Data and System Management Principles Statement obligations	Annual Regulatory Reporting Requirements
	Stakeholders	Connected customers (terminal operators, storage operators, power stations), Traders, Shippers, industry groups, academics	
	Approach	Connected customers, shippers = <b>collaborate</b> , traders, industry groups, academics = <b>consult or involve</b>	
	What we've heard	Stakeholders value information and data at a greater frequency, preferably as near real time as possible; The ability to pull data from our systems, less interested in having data pushed; Use of Application Programming Interfaces to manipulate raw data; more consistency and accuracy of data, more pressure and gas quality data; more in-depth analysis and transparency around National Grid balancing actions.	Transparency is a key requirement for network companies, particularly those with a System Operation obligation. Users of the network should have access to data which allows efficient and timely decision making. We should make data available as soon as possible, i.e. in an agile way, and not necessarily wait for systems and platforms to be fully specified and delivered.
	Key trade-offs and how engagement influenced our plan	From our RIIO-1 business as usual engagement, we have continued to engage and improve our information offering based on the key feedback to ensure accuracy and meeting the new information requirements of our stakeholders.	

Outputs	Measure	Type: ODI Incentive : Quality of demand forecasting Target: D-1: -8.5 mcm/d , D-2 to D-5: 13.7 mcm/d	Commitment Target: Comply with output obligations	Commitment Target: Comply with output obligations
	Comparison to RIIO-1 outputs	The quality of demand forecasts incentive ensures that our interests are fully aligned to those of our customers to produce accurate forecasts.	Ex-ante allowance to deliver our obligations and continue to meet the needs of our customers and stakeholders. Provides for the system and people costs for all information provision systems and processes.	RRP reporting and stakeholder performance reporting
	How we will deliver	Retain existing demand forecasting incentive, with tougher targets; recognising accurate demand forecasts are becoming harder to achieve	Element of 'Market Facilitation' within RIIO-1 allowances	Requirement to report performance to our regulator and make accessible for stakeholders
	Efficiency	Meet the changing stakeholder needs and maximise the customer value delivered from IT system investment. Efficient delivery of information provision services through optimising internal and external resources.		
	Innovation	Continue to develop innovative approaches to stakeholder engagement and the gathering of meaningful and detailed requirements. Utilise new technologies to improve capability in the provision of information.		
	Whole system	Champion open data sharing and governance across the energy industry. Collaborate and share data with network companies to build a whole system view.		
	Competition	The efficient and transparent provision of information allows market participants to plan, prepare and operate which effectively promotes market competition. Transparency is particularly important, allowing stakeholders to understand what we do and why, in order to optimise their own operations.		
Uncertainty	Our online community development approach enables us to be transparent in selection and prioritisation of changes to our information provision services. We will use the customer community to inform where we will flex or trade our effort and investment through the RIIO-2 period.			
De-carbonisation	Linked to Whole Energy System, we will champion open data sharing across the energy industry in support of the energy transition.			

Totex	Totex at RIIO-1 (annual average)	Totex annual: £11.0m	
	Work needed	Champion open data sharing across the energy industry, working with network companies to build a whole system view Commit to establishing a transparent governance structure, agreed with the industry, to admit and publish new data items with greater speed and flexibility than ever before Invest in our people and IT systems, taking advantage of technology to develop new capabilities allowing us to share information in better ways.	Review and refresh our annual performance reporting to reflect RIIO-2 outputs and priorities Continue to use independent experts, including the independent stakeholder user group, to challenge us and ensure that our actions match our intentions of greater stakeholder involvement in our planning process. Align leadership team's remuneration with delivering outputs for stakeholders.
	Cost at RIIO-2 (annual)	£8m	
	Approach to uncertainty	We propose that allowances for these activities be fixed upfront. On an annual basis, utilising the community collaboration platform to engage with stakeholders, we will prioritise the developments that we will pursue over the coming year.	
	Consumer benefit	Our information and insights provide value for consumers by ensuring that the gas market runs smoothly. It also promotes competition in the wholesale market – allowing participants to plan, prepare and operate effectively.	Our plans to improve transparency will benefit consumers through building trust in us as a responsible and fair business. Providing greater transparency on our performance.

# I want you to be efficient and affordable

## Our plan is deliverable



Engagement	<b>Stakeholder priority and context</b>	We strive to keep our impact on domestic and industrial consumer bills low and we work with our customers to keep energy affordable. In a time of rising energy bills, it is vital that we play our part in keeping costs down for all consumers, especially those who are vulnerable. Overall, we will continue to focus on carrying out our activities as efficiently as possible for the benefit of our customers and end-consumers.		
	<b>Topics</b>	<b>Efficient and affordable</b>	<b>Our plan is deliverable</b>	
	<b>Obligations</b>	Licence condition to be economic and efficient	Deliver the outputs across our entire business plan	
	<b>Stakeholders</b>	Consumers, Consumer groups, Network companies, Regulators, Academics, Industry trade bodies, Supply chain, Shippers, Customer Entry, Customer Exit, Interest groups, other non-energy,		
	<b>Approach</b>	Consumer groups, Connected customers, shippers = <b>collaborate</b> , Consumers, supply chain, industry groups, academics = <b>consult or involve</b>		
	<b>What we've heard</b>	Stakeholders tell us that we have a part to play in keeping energy affordable for domestic and commercial consumers. They expect us to manage costs and risk in the interest of our direct customers and wider consumers. We should be as efficient and affordable as possible, explain our performance and what causes changes in cost.	We should be more collaborative with our supply chain to drive greater value and innovation in construction. Working more transparently with customers to develop outage plans has improved the service we deliver, but there's still work to be done on this. There are significant financial impacts to major energy users of any disruption. This could be minimised by engaging differently with customers.	
	<b>Key trade-offs and how engagement influenced our plan</b>	Independent triangulation of our engagement found the fact that consumers (domestic, and small and large non-domestic consumers) are willing to pay more across a range of service areas, suggests that our proposals are affordable. It is clear on the one hand that consumers and stakeholders are very concerned about affordability, and on the other hand that they are generally happy with our performance in this area. The overall conclusion is that consumers and stakeholders are accepting of our proposals in this area.		
Outputs	<b>Commitments</b>	<ul style="list-style-type: none"> <li>Sustain a £30m per year operational cost efficiency from our RIIO-1 efficiency programme</li> <li>Deliver a further £6m per year operational cost efficiency across RIIO-2</li> <li>Deliver a further £11m per year efficiency on our direct capital investments across RIIO-2</li> <li>Continue to benchmark, market test and use native competition</li> </ul> <p>Resulting in our plan being £47m lower each year than it otherwise would have been, representing an 8% efficiency ambition</p>	<p>Delivering the overall RIIO-2 package of outputs for stakeholders. Delivering investments in ways that minimise the disruption to our customers, enhance the value we deliver and protect the functioning of the gas market.</p> <p>Our plan is fully assessed against people (including future workforce resilience), system access, delivery model, and supply chain. We will continue to assess the potential impact on our customers of delivering our planned investment. Our people and process that underpin our investment planning will ensure we are agile and flexible to the changing needs of stakeholders.</p> <p>Business support functions provide services such as IT, property management, HR and finance to all the National Grid businesses. They help with the delivery of our core activities, by procuring materials, helping us to find, develop and retain our people, and managing the IT systems used by our businesses. Our support functions also perform key business activities such as financial control, health and safety and legal compliance.</p>	
	How we will deliver	<b>Efficiency</b>	All RIIO-1 efficiency has been embedded. Shared service business support model with external benchmarking. Periodic benchmarking of staff and manager pay. IT opex and replacement policies benchmarked and improvements areas being progressed. Participate in Gas Transmission Benchmarking Initiative.	
		<b>Innovation</b>	Continue to live our values of finding a better way in all that we do. Pursuing innovation internally and with external partners. We have embedded RIIO-1 funded innovation. Engage in national and international industry best practice sharing associations.	
		<b>Whole system</b>	Work with other networks to realise opportunities to deliver least cost to consumer solutions across existing sector boundaries	
		<b>Competition</b>	We will use native competition when procuring for our investments. 82% of capital spend is procured in this way and we will run tenders in the open market wherever it is possible to do so.	
		<b>Uncertainty</b>	We run an agile investment process that can efficiently manage change when it occurs. Commit to defined outputs and mechanisms to adjust them when change occurs. Flexible supplier relationships to support changing requirements. Proposals to change depreciation treatment to begin managing uncertainty around the future usage of the network.	
		<b>De-carbonisation</b>	Continue to choose contractors and supply chain partners that demonstrate they will be more sustainable and deliver lower carbon projects by including sustainability in our tenders. We include two types of uncertainty mechanism to protect consumers from uncertainty relating to cost and/or the need of work.	
<b>Consumer benefit</b>	One of our key priorities is keeping energy affordable for current and future consumers. Our bill impact in to RIIO-2 is staying broadly flat. We strive to keep our impact on domestic and industrial consumer bills low and we work with our customers to keep energy affordable. By facilitating the effective functioning of the gas market we have a positive impact on the wholesale energy cost for consumers.			