Electricity Transmission

Annex ET.01: Golden thread Summaries

- **Transition to Energy System of the Future**
- **Connect and Use the Network**
- **Safe & Reliable Network**
- **Protection from External Threats**
- **Environment & Communities** (including VIP)
- **Innovation**
- **Transparency**

December 2019

As a part of the NGET Business Plan Submission

nationalgrid

Consumer Priorities	I want an affordable energy bill	I want to use energy as and when I want it	I want a sustainable energy system	
Stakeholder priority and context	~13% of TOTEX	I WANT YOU TO ENABLE THE ONGOING TRANSITION TOWARDS THE ENERGY SYSTEM OF THE FUTURE		**T2 Total £936m*** *excl. contestable projects
Topics	**Provide a network that enables transition to net-zero 2050 at lowest cost to consumers**	**Facilitate competition/ new business models**	**Delivery electricity whole system solutions with network companies**	**Enable all energy whole system solutions**
Obligations	• Facilitate aims of government energy policy • Compliance with industry codes and standards including CUSC, SQSS and STC • Plan and operate an economic and efficient system and implement ESO NOA recommendations			
Stakeholders	Stakeholders with an outsized impact on our plans within this priority:The Government(s), the Electricity System Operator, Distribution Network Operators and Ofgem Other stakeholders: High impact and interest - : political, network companies, large customers, new business models (e.g. flexibility & storage developers), supply chain High impact or interest: Academics, think tanks and innovators, interest groups, consumer bodies, small/new customers, transport, and communities (directly affected)			
Approach	Government, ESO & DNOs = **empower**; High impact and high interest stakeholders = **collaborate**; high impact or high interest = **consult or involve**			
What we've heard	***Engagement on long-term role of transmission and managing uncertainty*** • Need for transmission in long-term clear, despite uncertainty • We should play an active role in enabling the transition • Delivering whole system solutions is important • We should undertake timely reinforcement where required • Our approach to setting an E&W scenario is reasonable • Appropriate to review existing uncertainty mechanisms and consider new ones, especially targeted at whole systems • Merit in developing an anticipatory investment mechanism	***Engagement to build a whole system plan with electricity network companies*** • Work to agree a Common Energy Scenario for RIIO-T2 • Agreed E&W view of EV growth and heating electrification • DNO data submissions should inform investments at interface • Voltage issues have large potential for whole system solutions • ESO should play key role in whole system collaboration; particularly through the expanded NOA process • Unanimous support for development of uncertainty mechanisms that allow for whole system solutions during T2	***Engagement to build a whole system plan with non-network companies*** • Technical challenges to overcome to realise full potential of flexibility in solving network issues • Flexibility can delay Tx/Dx interface investment and complement boundary capability, but limited T2 opportunity to replace network capacity altogether • We should think broadly about where we could provide solutions to net-zero challenges • A whole system approach is required to minimise costs • We should set out a roadmap to achieving net-zero	
Key trade-offs and how engagement influence our plans	• Provided confidence in extending T1 approach to managing uncertainty and shaped future energy assumptions • Concluded on a pro-active approach to enabling transition • Expanded suite of uncertainty mechanisms and approach to their development in response to challenge	• Removed reactor costs from baseline (~£184m) and developed an uncertainty mechanism to allow whole system solutions to be identified and delivered within the T2 period • Proposals based on a whole system approach involving ESO, DNOs and TOs	• Removed proposal to invest £2m to develop an economic modelling capability • Expanded whole system thinking beyond network companies and broadened solutions to net-zero challenges	

Outputs

	Innovate and invest in network reinforcement	**Enable ESO zero carbon operation by 2025**	**Invest to maintain access and minimise costs**	**Facilitate competition and new business models**	**Electricity whole system optimisation with DNOs**	**Electricity whole system optimisation with ESO**	**Enable whole system solutions to net-zero challenges**
Measure	Type: PCD Target: Deliver 22.5GW boundary capability Incentive: TIM	Type: PCD Target: Complete modelling & identify future requirements Incentive: TIM	Type: PCD Target: Separate sites and secure easements Incentive: TIM	Type: PCD Target: Deliver 4 consented projects + commitment Incentive: TIM	Type: PCD Target: MVar reactive capability Incentive: TIM, CAM	Type: LO, PCD Target: Deliver STC requirements Incentive: TIM	Type: Commitment Target: N/A Incentive: N/A
	Deliver 22.5 GW of boundary capability recommended by ESO through the NOA process	Model secondary systems, identify future requirements and change settings where required	Proactively secure essential services at shared sites and convert wayleaves to easements	Deliver large (>£100m) consented projects ready for competition and work with flexibility providers to identify opportunities	Work with ESO/ DNOs to provide optimal solutions to network issues	Deliver STC system monitoring obligation ESO/TO optimisation mechanism	Process to facilitate investment ahead of clear need and options to overcome net-zero challenges
Comparison to T1	12.4 GW boundary capability	N/A	Work spans across multiple price controls	3 projects >£500m (T1 threshold) consented	[illegible] reactors delivered	Minimal system monitoring in T1	New measure

Costs

Cost at T1 (annual average)	£77m (excl. Western HVDC)	N/A (not a T1 activity)	£26m	£12m (projects >£500m)	£16m	£3m	N/A (not a T1 activity)
Work needed	• Uprate circuits, network reconfiguration, etc. to enhance boundary capacity by 22.5 GW • Respond to NOA recommendations and maintain compliance with SQSS	• Build model of all secondary systems • Undertake analysis to understand impact of low fault levels + inertia • Change settings • Identify future requirements (subject to determination)	• Continuation of programmes started before T1 period • Secure permanent easements to maintain access • Deliver site separations to allow conventional power station closures and continue site operation	• Help develop an early competition model • In lieu of a model for early competition, progress large (>£100m) projects with a NOA proceed signal to consents – ready for late competition • Work with flexibility providers to identify opportunities	• Work with DNOs and the ESO to deliver whole system opportunities • Invest in [illegible] reactor units for £31m to reduce system operation costs • New reactive uncertainty mechanism	• Offer range of flexibility services to ESO for market testing at no cost • Install system monitoring equipment required to comply with STC • New reactive uncertainty mechanism	• Extensive collaboration across stakeholders to continue to establish and participate in an anticipatory investment process • Continued development of potential solutions to net-zero challenges
Cost at T2 (total and annual)	**Total: £507m Annual: £101m**	**Total: £31m Annual: £6m**	**Total: £135m Annual: £27m**	**Total: £182m Annual: £36m**	**Total: £31m Annual: £6m**	**Total: £48m Annual: £10m**	**No expenditure proposed**
Approach to uncertainty	Boundary capacity unit cost allowance	Within period determination	(No volume uncertainty)	Consented route length unit cost allowance	Static reactive unit cost allowance	Dynamic reactive unit cost allowance	Anticipatory process and harmonic filter within period determination
Consumer benefit	• Facilitate decarbonisation of power, transport and heat – net-zero 2050 • Minimise cost of operating network and reduce wholesale energy costs by at least £250m/annum			• Minimise the cost of networks in RIIO-T2 period and beyond	• Facilitate decarbonisation of power • Minimise network costs		• Facilitate decarbonisation of power, transport and heat – net-zero 2050

Engagement

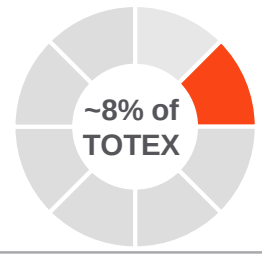
Engagement	Consumer Priorities	I want an affordable energy bill	I want to use energy as and when I want it	I want a sustainable energy system
	Stakeholder priority and context	~6% of TOTEX	I WANT YOU TO MAKE IT EASY FOR ME TO CONNECT AND USE THE NETWORK	**T2 Total £417m**
	Topics	**Connections**		**Customer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

	Consumer Priorities	I want an affordable energy bill	I want to use energy as and when I want it	I want a sustainable energy system
	Stakeholder priority and context	~60% of TOTEX	I WANT YOU TO PROVIDE A SAFE AND RELIABLE NETWORK	**T2 Total £4.29bn**
Engagement	**Topics**	**Reliability**		**Safety**
	Obligations	NGET licence stipulates compliance with the Security and Quality of Supply Standard (SQSS). This sets out how we should plan and operate the transmission system including the reliability requirements. We also have a statutory requirement to comply with safety obligations set by the Health and Safety Executive (HSE).		
	Stakeholders	Primary stakeholders engaged in this priority area are: • High impact and interest: Network companies, generators & directly connected demand, The Electricity System Operator (ESO) , regulatory bodies, supply chain • High impact or interest: Academics, emerging customers, consumers, consumer bodies, electricity suppliers		
	Approach	High impact and high interest stakeholders = empower & collaborate; high impact or high interest = consult or involve		
	What we've heard	Stakeholders have two clear priorities related to this topic: • Priority 1: Reliable network, both now and in the future, to provide security of supply. No. 1 priority in a survey of over 2,000 consumers; and • Priority 2: Value for money In delivering stakeholder priorities they have told us that they: • Do not want to see reliability decrease, even if it would reduce bills, • Would like us to maintain the same levels of network reliability, at a fair cost. Some stakeholders were willing to pay more for increased reliability. • We have responded to stakeholder challenges by reducing our costs by 2%, and proposing a tougher ENS incentive	Safety is non-negotiable, and the work we do is mainly driven by legislation and standards which must be followed. We therefore don't believe that there are options to offer stakeholders in this area and are not intending on engaging in-depth on safety specifically. We are however actively engaged in many groups and forums so that we can continually improve our company and industry performance.
	Key trade-offs and how engagement influence our plans	We have made three key trade-offs in response to stakeholders feedback • There were mixed views on whether reliability levels should increase or decrease, depending on whether networks would be less centralised in the future. We will maintain current levels of reliability, in order to retain optionality for a variety of future network scenarios. • Stakeholders challenged our costs, wanting more granularity in our plans. We have provided this in our formal submission, and reduced our NLR plan by 2% • In order to balance the two issues above, we are proposing a tougher ENS target, which better reflects the most recent performance of our network.		
Outputs	**Measure**	**Network risk** Type: PCDs (price control deliverables) Target: maintain at current level (end of T1 risk position) Incentive: over & under-delivery is penalised unless justified in exceptional circumstances • In line with what stakeholders want we have built our plan to keep network risk at current levels. • 'Lead assets' are measured using a common methodology known as the Network Asset Risk Metric (NARM). • 'Non-lead' assets are those not covered by the NARM methodology (e.g. protection & control). We have proposed PCDs for 80% of our non-lead plan in our October submission	**Energy not supplied (ENS)** Type: Financial ODI (output delivery incentive) Target: Weighted recent performance (50/30/20%) Incentive: No Cap (Max / Collar at 3% of revenue (~£50m) • Measures the volume of energy to customers that is lost as a result of faults or failures on the network. • Our proposed target for T2 is 45% tougher over T1 (based on current performance). Stakeholders supported the weighted approach at the October engagement event. • Proposed weighting is 0-5 years(50%), 5-15 years (30%), 15+ years (20%) • Target is set at the end of T1 (will be approx. 175MWh based on current performance)	**Injury Frequency Rate (IFR)** Type: Internal Target: Zero harm Incentive: Reputational • Maintain current IFR output which counts the number of injuries sustained for every 100,000 hours worked. • IFR in 2017/18 was 0.12 and we are striving to improve this. • To lower IFR we must improve asset safety (safe design, maintenance, hazard identification, etc.), behavioural safety (safe choices etc.) and organisational safety (processes etc.).
	Comparison to T1	Risk metrics on lead assets were based on separate measures of asset health and criticality. (Network Output Measures – NOMs). In all categories we are on track to meet or exceed our output targets.	T1 Target : 316MWh/year. Incentive : +£3.7m -£50m On track to meet T1 target	In the first two years of T1 the average was 0.16, going down to 0.12 in 2017/18.
Costs	**Cost at T1 (annual average)**	Lead assets: £323m	Non-lead assets: £98m	Maintenance: £178m	IT: £17m	Safety: safety costs are built into all operating costs
	Work needed	We need to renew and modernise the ageing network to keep it healthy and reliable for future generations • We need to do 75% less CBs in T2 compared to T1 • We need to do more OHLs in T2 as more of the network is reaching it's end of life • Other areas of spend are Transformers, Reactors & Underground cables	We need to do more compared to T1 because the number and type of assets that we predict will reach the end of the operational lives in this plan period are different to the current regulatory period. • Protection & control assets increase due to type and age • Other areas of spend are in other substation equipment (LVAC, condition monitoring, spares, CT/VTs, Civils, bushings etc.)	In T2 we will maintain our assets in line with asset policy and licence obligation at a lower cost, including: • Emergency repairs • 365/24h standby • Replace & Refurbish smaller assets • Managing safety of our sites • Maintenance • Inspections & condition monitoring	• Separate Control centre and network management systems into ESO and ET specific components • Replace our asset registry and work management systems as they reach the end of life • Refresh condition monitoring and analytics platforms to cater for an increase in the amount and diversity of data we capture	We will improve our safety record by: • Simplifying and improving work procedures; • Committing to embedding a 'just' culture, where: • High standards are set and attempt is made to exceed them • Failure is used to improve, not to blame • People try to be well informed as it prepares them for the unexpected.
	Cost at T2 (total and annual)	**Lead assets** **Total: £2,251m,** **Annual: £450m**	**Non-lead assets** **Total: £1,096m,** **Annual: £219m**	**Maintenance** **Total: £763m,** **Annual: £153m**	**IT** **Total: £176m,** **Annual: £35.2m**	**Safety** Safety is embedded in everything that National Grid does, so safety costs are built into all operating costs
	Consumer benefit	We will maintain our current high levels of reliability so that electricity is available whenever and wherever current and future consumers want it.		Minimise the cost of replacing our assets, ensure we maintain low levels of ENS, and keeping ESO operational costs low.	Continue to be able to manage assets safely and make better asset management decisions that lower costs for consumers.	The public will be protected from harm relating to our assets, and the work we carry out on our assets

Consumer Priorities

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

Stakeholder priority and context



I WANT YOU TO PROTECT THE NETWORK FROM EXTERNAL THREATS

T2 Total £555m

Engagement

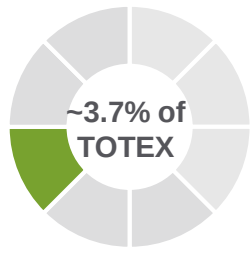
Topics	Physical Security	Extreme Weather	Cyber Security	Black Start	Operational Telecommunications
Obligations	In addition to our obligations to deliver a safe and reliable network; we have further obligations under the Network and Information Systems (NIS) regulations for cyber security, BEIS prescribed CNI site Physical Security Upgrade Programme standards, ENA Engineering Technical Report (ETR)138 guidance for flood resilience and a future BEIS driven Black Start standard.				
Stakeholders	Primary stakeholders engaged in this priority area are: • High impact and interest: Specialist agencies that have the expertise and/or authority to direct investment on protection from threats, including the Department for Business, Energy and Industrial Strategy (BEIS), the Centre for the Protection of National Infrastructure (CPNI), the National Cyber Security Centre (NCSC), Office of Gas and Electricity Markets (Ofgem), the Energy Networks Association (ENA) and relevant Environment Agencies, UK Transmission Owners • Low impact or interest: Academics, consumers, consumer bodies, electricity suppliers, DNOs				
Approach	High impact and interest stakeholders = empower & collaborate; low influence or interest stakeholders = consult or inform				
What we've heard	• Implement the revised standards set out in ETR138 by the end of the T2 period • Implement required levels of physical security on designated PSUP sites • Implement agreed cyber security enhancements based on risk against our network and ensure these are aligned to NIS Regulations • Ensure rapid restoration in a Black Start scenario in line with BEIS proposals				
Key trade-offs and how engagement influence our plans	• We have prioritised OT cyber enhancement works on several sites within the T1 period to implement appropriate levels of security on our most critical sites. This allows us to drive efficiencies, trial available solutions and adapt our longer-term plans to protect all sites if the threat or requirements change within the T2 period. • Our key stakeholders have had a major influence on our T2 business plans. Our engagement has informed what we do when protecting against cyber-attack, physical security and extreme weather. • We currently do not plan to protect all sites within flood risk zones against surface level flooding. Our estimates for required works have been based on learning from sites requiring work within T1. We expect some sites to have appropriate landscape or infrastructure in place which reduces this threat. We also expect that alternate solutions can be delivered.				

Outputs

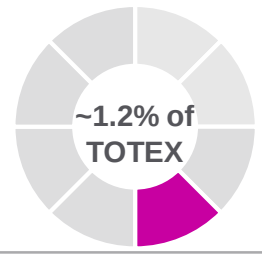
	Physical Security	Flood defence	Cyber Security	Black Start	OpTel refresh
Measure	**Type:** PCD (price control deliverable) **Target:** Installation of required security controls at agreed PSUP sites • CPNI maintain a list of CNI sites and designate Physical Security Upgrade Programme (PSUP) sites, which require enhanced physical security controls. We will implement required security arrangements at planned and newly designated PSUP sites. • [redacted]	**Type:** PCD (price control deliverable) **Target:** Required surface level flooding mitigations implemented at sites in flood risk zones. • We maintain an industry agreed level of flood resilience at our sites. (compliance with ETR138). • We are required to implement guidance within ETR138. • [redacted]	**Type:** PCD (price control deliverable **Target:** Agreed risk-based investment plan aligned to NIS Requirements • We have developed a risk based methodology to assess and prioritise cyber threats to our network. This has informed our investments to address priority risks and reduce the overall cyber risk on our IT and OT networks. • [redacted]	**Type:** PCD (price control deliverable) **Target:** Enhanced Black Start capabilities to provide 'a high level of confidence' in achieving the new standard • BEIS are planning to implement a new Black Start restoration standard to drive faster restoration times. Details of the target restoration levels are still tbc. • [redacted]	**Type:** PCD (price control deliverable) **Target:** [redacted] • Telecommunications network between sites are secure against cyber threats and have sufficient capacity to support current and future resilience and reliability related, PSUP and Black Start requirements.
Comparison to T1	• Number of sites reduces as effectively protected as a result of the PSUP Programme. • Complete 33 PSUP sites by the end of T1.	• Sites effectively protected from tidal and river flooding • Enhanced flood resilience on 49 sites by the end of T1 (37 completed)	• No agreed T1 target for ET. • Effectively protected from immediate threats within T1.	• Managing an acceptable level of asset reliability and capability • Trained staff to complete manual interventions in a Black Start scenario.	• Replaced telecoms assets at 300 substations. • Migrated legacy third party services • Implemented a new telecoms network management centre

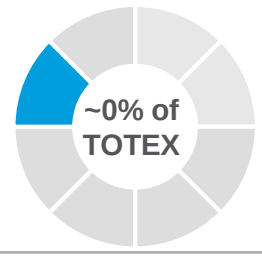
Costs

	Physical Security	Flood defence	Cyber Security	Black Start	OpTel refresh
Cost at T1 (annual average)	• PSUP Enhancements: £32.4m	• Flood defences: £15.6m	• Cyber: £8.3m	Black Start: N/A	OpTel: £5.4m
Work needed	Our T2 investments will aim to maintain PSUP defined security standards through; • [redacted] • [redacted]	• Improving our flood resilience to comply with the latest industry guidance from BEIS as specified in ETR138. • [redacted] • [redacted]	• Enhance our cyber security across our IT and OT networks ensuring an overarching risk based approach to mitigating cyber risk. We will be investing in; • [redacted] • [redacted]	• Enhanced system and people capabilities to ensure an efficient and effective response in a Black Start scenario. • [redacted]	• [redacted] • [redacted] • [redacted]
Cost at T2 (total and annual)	Total: £44.6m, Annual: £8.9m	Total: £59.8m, Annual: £12.0m	Total: £184.4m, Annual £36.9m (uncertainty of £376.9m not in our baseline)	Total: £22.2m, Annual: £4.4m	Total: £241.0m, Annual: £48.2m
Consumer benefit	Protecting consumers from the risk of loss of supply of electricity due to a physical attack at key sites.	Protecting consumers from the risk of loss of supply of electricity due to flooding at key sites.	Protecting consumers from the impact of a loss of supply of electricity arising from a cyber incident.	Faster restoration times, ensuring consumers have their supply of electricity restored as soon as possible following a BS incident.	Critical to ensuring a safe and reliable network that is resilient to external threats.

Consumer Priorities	**I want an affordable energy bill**	**I want to use energy as and when I want it**	**I want a sustainable energy system**
Stakeholder priority and context		I WANT YOU TO CARE FOR THE ENVIRONMENT AND COMMUNITIES	**T2 Total £255m**

	Topics	**Environment**	**Communities**
	Obligations	National Grid Electricity Transmission have many environmental obligations pertaining to; the control of emissions to air, land and water, protected species and habitats, management of waste, use of hazardous materials, management of land, resource use & provision of environmental information. These obligations are embedded in 100+ individual pieces of legislation which are regulated by the Environment Agency, Natural Resources Wales, the Information Commissioners Office, English Heritage, Cadw, HSE, Natural England and Local Authorities. The UK government has now also legislated for net-zero.	
Engagement	**Stakeholders**	Primary stakeholders engaged in this priority area are: • High impact <u>and</u> interest: Government(s) , organisations dedicated to conserving and enhancing the landscape(National Parks, Rural England, Protection of Rural Wales, National Association for AONBs, Natural England, Landscape Institute), tourist organisations (Visit England, Visit Wales), community residents (close to major works or existing assets) – we impact communities through construction works, where our assets are permanently located and wider society through leadership • High impact <u>or</u> interest: Academics, consumers, and large customers	
	Approach	High impact and high interest stakeholders = **empower & collaborate**; high impact or high interest = **consult or involve**	
	What we've heard	A N**et Zero UK** has now been legislated which we fully support. Preventing further climate change is so important to us and our stakeholders as well as putting more back in to the natural environment than we take away and working towards zero- waste. Citizens Advice have said '**vulnerable consumers** can't keep up with changing technologies and benefits…. and will suffer the worst impacts of climate change' • **Decarbonisation** is the 2nd highest consumer priority in our Populus study in 2018 and the challenge group wanted clear proposals for reduction in greenhouse gas emissions • Feb Consultation Responses – 52% of people commented about the environment specifically to **address climate change**, designing out carbon, "reducing **waste** and clean energy are more important than visuals", "stronger commitment to **biodiversity**" , "NG should have high levels of ambition…be an industry leader". • Stakeholders want us to **protect the landscape** in AONBs and see how we can extend this beyond AONBs to support more deprived communities. Although views on visual impact are mixed, the majority support the robust stakeholder-led approach.	• Citizens Advice: '*think about how it is that you impact consumers'.* • Ofwat: *'don't impact bill payers or jeopardise shareholder value but do bring commercial discipline to public service through your activities' 'it should be about going above and beyond what you already do to achieve societal benefit.'* • Through engagement on major projects we know that as well as improving the natural environment - **education and local employment** are common requests from local councils - but communities **also want freedom to tailor solutions to their needs**. • Stakeholders have indicated they are willing to pay a material amount for us to carry out more **local community activities, but these still register as medium to low priority overall.** They are keen for us to spend an amount of money on improving our existing assets or public spaces in **disadvantaged communities as some people 'can't choose where they live'**. • Stakeholders have suggested we would be well placed to provide resilience expertise to services serving people in vulnerable circumstances, like hospitals, which fits with our b2b organization and skills.
	Key trade-offs and how engagement influence our plans	There is a wide mixture of views on **visual impact** from those most impacted stakeholders who feel that we should do anything possible to avoid negative visual impact, and are willing to pay for this to those who are less impacted and don't want to pay. Whilst the views are mixed, stakeholders feel that the current stakeholder-led approach, assessing visual impact on a case-by-case basis, is robust, therefore the decision to continue the T1 approach in to T2 is valid and supported by nationally representative consumer data. We are developing a proposal for assessing the best course of action against a particular SF_6 leak which will assess and trade-off between investment cost and the expected intervention life. Consumers have said £150m is acceptable to achieve a permanent 34% reduction, we expect to do further testing on acceptability beyond this.	Most engagement supports doing more for local communities, and minimising the impact on **local communities is a priority**. However, there are some organisations (particularly those with direct interests in new connection projects) that are more ambivalent about community impacts. The individual view of these organisations has been largely downgraded against national consumer research overall, which strongly supports our community proposals. Supporting specifically the fuel poor and vulnerable attracts opposing opinions. Some feel it should be a given whilst others feel it's not our role. We have addressed this by making 'affordability' a key pillar of our business strategy and for local communities we have prioritised education and employment with shared funding of our community commitments via both consumers and our business which is supported by the consumer testing.
Outputs	**Measure**	**Environment** **Type:** Commitments and financial and reputational ODI (output delivery incentive) **Targets:** A minimum of 34% reduction in carbon for a net-zero pathway, 60% fleet replacement to alternative fuel, 100% renewables for purchased electricity and 20% increase in office energy efficiency , +10% in environmental value, +10% net gain on all construction projects, 20% water and waste reduction, net-zero carbon construction (as per PAS 2080), 0% waste to land fill and 60% office and operational recycling, 75% top 250 suppliers with carbon reduction targets, implementing circular economy principles, continue the VIP scheme **Uncertainty Mechanism (UM) and Incentive**: SF_6 Net Zero UM & environmental scorecard ODI • Work with Ofgem to calibrate the target and incentive rates for the SF_6 emissions incentive and for the SF_6 Net Zero Pathway programme. • Define the targets and incentives for an environmental scorecard ODI including waste, controllable carbon, embedded carbon and natural environment improvements. • Other price control deliverables and measures defined by the environmental action plan	**Community** **Type:** Commitments and Uncertainty Mechanism **Target:** Access to training for 6,000 people focusing on low income communities, £7.5m for community-led focus on local employment and state school engagement for major schemes, verifying real living wage in low risk areas, 5% technical headcount in supply chain trained annually, £20k/£10k grant fund for communities, Urban improvement provision for improving assets or public space in disadvantaged communities (through Uncertainty Mechanism). **Uncertainty Mechanism:** Urban Improvement Provision – Uncertainty Mechanism • Real living wage, STEM engagement and local employment annual reporting • Ethical procurement reporting including EU skills accord reporting for skills training Other internal community commitments will be measured and tracked through an annual reporting processes.
	Comparison to T1 outputs	SF_6 emission incentive, environmental discretionary reward (EDR) and provision of £500 million for electricity transmission owners to mitigate the visual impact of existing electricity infrastructure (£120m confirmed to date).	N/A
Costs	**Cost at T1 (annual average)**	**Environment:** Embedded in BAU operations and non-load spend, operational fleet and environmental team £67.20m (£8.40m annualized) + VIP £144.40m (£18.05m annualized)	**Community:** Included in our construction projects costs, applied as required as well as discretionary spending for grant schemes and other charity work
	Work needed	• Majority of actions defined in the environmental action plan and deliverability assessment required to ensure plan for delivering the SF_6 Net Zero pathway programme. • VIP: 12 projects under consideration - the stakeholder engagement and selection defined through VIP process will determine which projects will be taken forward	• Policy changes to extend our stakeholder, community and amenity policy to be more explicit about education and employment • Procurement actions defined in our ethical procurement action plan • Partnership with local training and educational support groups (as required) • Gap analysis on coverage of existing resilience forums • Create stakeholder group for prioritizing projects in the - urban improvement provision
	Cost at T2 (total and annual)	**60% Low Carbon fleet** **Total: £47.49m, Annual: £9.50m** **Net-zero construction (offsetting)** **Total: £2.50m Annual: £0.50m** **SHS Team** **Total: £2.54m, Annual: £0.51m** **Visual Impact Mitigation Projects from T1** **Total: £202.36m, Annual: £40.47m**	**Community** **Total: £0m included in the baseline.**
	Consumer benefit	Social & environmental benefits from clean air, reduction in climate change and lower costs to run our fleet in T3 Reduction in contribution to climate change The overall environmental benefits can only be realised with competent team Tourism provides economic benefit, improved visual spaces within the national parks contributes to this. People on the lowest incomes use designated landscapes for holidays	Local community prosperity increased through additional educational and employment opportunities supporting more diverse citizens to take part in the green transition and improved community spaces – helping to build pride and wellbeing in the local area. Access to opportunity, fair pay and skills development can support social mobility. Wider social benefits through real living wage support, inspired engineers to work on the green transition and improved resilience for national services.

Engagement	**Consumer Priorities**	I want an affordable energy bill	I want to use energy as and when I want it	I want a sustainable energy system
	Stakeholder priority and context	 I WANT YOU TO BE INNOVATIVE  **T2 Total £84m**		
	Topics	**BAU Innovation for T2**	**Whole System, T3 & Beyond**	**Strategic Funding Innovation Pot (SFIP)**
	Obligations	• The need to transition to clean energy, and drive down current and future costs are driving rapid changes in the energy system • Our innovation plans deliver on our long-term ET strategy to provide a safe, reliable & resilient network, delivering consumer value, decarbonising future networks and creating positive societal impact.		
	Stakeholders	Primary stakeholders engaged in this priority area are: • High impact and interest: Government(s),The Electricity System Operator (ESO) , regulatory bodies, supply chain, SME, catapults, trade associations, start-up's etc. • High impact or interest: Academics, consumers, and large customers		
	Approach	High impact and high interest stakeholders = empower & collaborate; high impact or high interest = consult or involve		
	What we've heard	• We need to share our challenges with you earlier. This will allow our suppliers to propose innovative solutions earlier in the process delivering better solutions • We need to be more accessible, and more consistent • You want us to be more collaborative, be more transparent and share our outputs. Pro-actively collaborating with a wider group of partners will deliver greater benefits. • We need to share more data. Getting the balance right between security and transparency is crucial in allowing our stakeholders to understand our challenges and propose better solutions • You want us to make it easier for SMEs to collaborate with us • We should focus our innovation on the wider societal priorities of clean energy, driving down current and future consumer costs and opportunities for digitization as well as the integration of the whole energy system and clean energy solutions for other sectors • We should improve our innovation culture through out BAU activities, and invest more NIA funding on decarbonisation		
	Key trade-offs and how engagement influence our plans	• Embedding a culture of innovation across the business is a key topic for the independent stakeholder group. We are fully committed to delivering this in T2 however our stakeholders informed us that we should be undertaking this activity as part of our BAU activities. We have therefore removed our proposed NIA funding for this area. • Our stakeholders have informed us that we should be investing more innovation stimulus funds on decarbonization, hence we have increased our proposals in this area, balanced with reduced spend in other areas.		
Outputs	**Measure**	**BAU Innovation for T2** Type: Embedded into Totex Target: N/A Incentive: Totex Incentive Mechanism • Embedding a culture of innovation • Rolling out proven T2 innovation • Improving collaboration and attracting 3rd parties • Monitoring progress and outcomes • Being more transparent	**Whole System, T3 & Beyond** Type: NIA Target: Common monitoring framework Incentive: Totex Incentive Mechanism • Reducing our carbon footprint • Facilitating whole systems energy innovation • Facilitating decarbonisation of wider industries • Digitisation • More responsive & agile for our customers • Addressing vulnerable consumers • Step change in Health & Safety	**SFIP** Type: TBC Target: TBC Incentive: TBC Focused on nationally significant challenges • Future of transport • Heat • Network Resilience • Net Zero
	Comparison to T1	N/A	N/A	N/A
Costs	**Cost at T1 (annual average)**	No direct comparison, £110.5m spent on NIA / NIC / Direct Partnerships		
	Work needed	Investment to find alternatives to SF6, reducing reliance on cement and finding novel materials to lower carbon footprint. Opening up the Deeside Centre for Innovation to other networks & SMEs to trial EV charging and alternatives to gas. Implementing the governments Clean Growth Strategy and explore opportunities to support and work with other industries.	Investment to investigate tools and techniques to allow digitization of all our work and equipment, and artificial intelligence so that the whole energy system can share data and find whole system solutions. Develop new tools and installation methods to allow us to respond to customers more quickly. Collaborate with parties closer to end consumers to develop further understanding of how we can support vulnerable consumers.	Investment to meet our goal of 'zero harm' to the public and our staff. Reducing our reliance on innovation funding to make it more self-sustaining in the future. Responding to our stakeholders feedback that we need to be more collaborative and transparent. Having the ability to roll-out innovation projects across the business, and embed the culture of innovation into our DNA.
	Cost at T2 (total and annual)	**Total: No additional allowance**	**Total: £84m** **Annual: £16.8m**	**Total: Ideas only**
	Consumer benefit	These proposals provide considerable benefits to consumers. • Further embedding a culture of innovation, • Providing a safe, reliable & resilient network. • Innovating to support vulnerable consumers • Decarbonising future networks • Creating positive societal impact		

Engagement	**Consumer Priorities**	I want an affordable energy bill	I want to use energy as and when I want it	I want a sustainable energy system
	Stakeholder priority and context		I WANT YOU TO BE TRANSPARENT IN YOUR PERFORMANCE	 **T2 Total £1m**
	Topics	**Transparency of performance**		
	Obligations	• Licence Obligations (Regulatory) • International accounting standard - FTSE100 company (Annual report) • Needs of our Stakeholders		
	Stakeholders	Stakeholders with an outsized impact on our plans within this priority: • High impact and interest : Regulator, Consumer bodies, • High impact or interest: . Network companies, large customers, small/new customers		
	Approach	Network companies and Customers = **Collaborate**; High impact and high interest stakeholders = **Consult;**		
	What we've heard	Stakeholders have told us that they: • Want a clear line of sight between activities, operational performance and financial reward which is easy-to-understand and easily accessible; • Want to understand the difference in allowed costs and actual costs with narrative focussed on the 'why' not just the 'what'; • Want us to align the remuneration of our teams to delivery of the outputs for the T2 period.		
Outputs	**Measure**	**Regulatory Reporting** Type: LO Target: Comply with obligation Incentive: Penalty	**Independent Stakeholder Group for T2** Type: Commitment Target: N/A Incentive: N/A	**Alignment of Remuneration** Type: Commitment Target: N/A Incentive: N/A
		Up to 10% penalty of revenue	N/A	N.A
	Comparison to T1	Annual reporting - An increased number of business plan data tables for T2.	N/A	No change
Costs	**Cost at T1 (annual average)**	£0.2m	£250k (Stakeholder Group activity commenced in 2017/18)	N/A
	Work needed	• Enhance our reporting by making a stronger link between the activities we carry out, our performance, key societal metrics, and the financial reward we receive. • Deliver the regulatory reporting requirements for Ofgem based on the enhanced business plan data table requirements. • Plan to invest £1.2m in our insights platform to structure our data to support Ofgem's energy data exchange service.	• Retaining an independent Stakeholder Group to provide continuous challenge of our engagement activities, scrutinise our business plans and verify our annual reporting. • On a periodic basis that members of the Group will have to change, this allows the continued independency and the opportunity to bring fresh perspectives.	• Our short-term bonus plans incentivise the delivery of both financial, strategic and operational measures and the demonstration of our leadership qualities and living our values; measures are subject to change to ensure we reflect the right focus on our priorities.
	Cost at T2 (total and annual)	**Total: £1.2m** **Annual: £0.2m**	**Total: £0.8m*** **Annual: £0.16m**	**N/A**
		*allocated to our business support & operating costs		
	Approach to uncertainty	N/A	N/A	N/A
	Consumer benefit	Ensure consumers only pay for the work we must carry out and have a better understanding of the role, we play in the industry and society.		