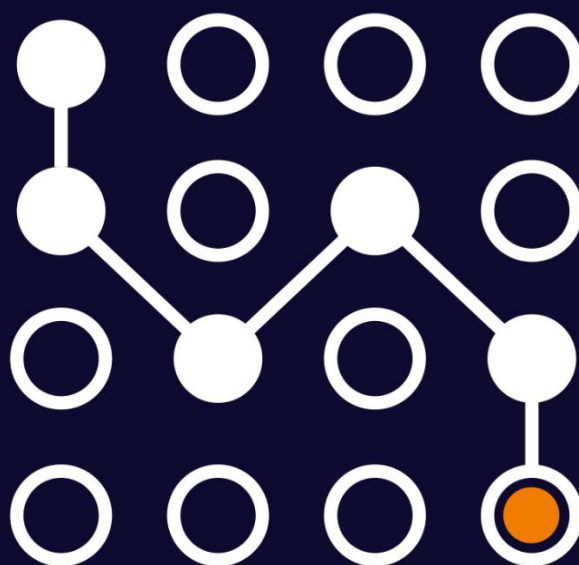


RIIO-GT1 Annual Report 2020-21



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Executive Summary

Output and Incentive Performance

National Grid Gas Transmission (NGGT) has largely delivered its outputs target. Incentive performance is broadly in line with previous years.

Total Expenditure Performance

NGGT had an overspend of £252 million against its total allowance of £2,988 for RIIO-GT1. The majority of the overspend is the result of costs associated with asset health on the National Transmission System.

Return on Regulatory Equity

Return on Regulatory Equity was calculated at 6.6% across RIIO-GT1.

Customer Bill Impact

It is estimated the average GB customer in 2021-22 will pay £6.3 in real 2020-2021 price terms for the gas transmission costs on their energy bill.

This report is in line with Standard Special Condition A40¹ as well as the Regulatory Instructions and Guidance (v 1.12)², and gives a high-level overview of the National Grid Gas Transmission's (NGGT) output delivery and financial performance over RIIO-GT1 (for more information, see "Background to RIIO-GT1" below). It summarises NGGT's performance in 2020-21, the final year of the RIIO-GT1 price control which started in April 1, 2013, and came to an end in March 31, 2021. All financial values are in the 2020-21 prices unless otherwise stated.

¹ [Standard Special Condition - PART A Consolidated \(ofgem.gov.uk\)](https://www.ofgem.gov.uk/standard-special-condition-part-a-consolidated)

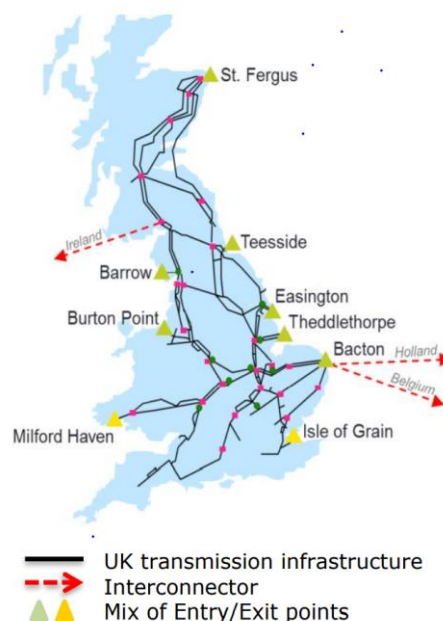
² [RIIO-GT1 Regulatory Instructions and Guidance Version 7.2 \(ofgem.gov.uk\)](https://www.ofgem.gov.uk/riio-gt1-regulatory-instructions-and-guidance-version-7.2)

1. Background to RIIO-GT1

1.1. NGGT is the sole owner and operator of the National Transmission System (NTS) in Great Britain with operation split between transmission owner (TO) and system operator (SO). The TO is responsible for ensuring the reliable and secure delivery of gas across Great Britain while the SO has overall responsibility for ensuring that the supply and demand of gas are balanced within the NTS.

1.2. We regulate NGGT through periodic price controls. The price controls we set determine the amount of revenue NGGT can earn from users and stipulate the level of performance NGGT was funded to deliver.

1.3. To set our³ price controls we use the RIIO (Revenue = Incentives + Innovation + Outputs) framework. The first RIIO price control for Gas Transmission, RIIO-GT1, started in April 2013 and lasted for a period of eight (8) years until March 2021. The information contained in this report is for 2020-21, the eighth (final) year of RIIO-GT1.



³ The terms 'we', 'us', 'our' refer to the Gas and Electricity Markets Authority. Ofgem is the office of the Authority.

2. Output and Incentive Performance

Output Performance

2.1. NGGT must deliver a range of outputs during the RIIIO-GT1 as stated in the Special Condition 9.3⁴, Part A, which are grouped into five output categories shown below. NGGT's performance for each output category is also shown:

Reliability and Availability	Environment	Safety	Customer Satisfaction ⁵	Connections
Minor issues see below	Minor issues see below	No issues	No issues	No issues

Key

Red – Missed an annual output and/or our eight-year output commitment

Amber – Missed annual output but met our eight-year output/successful achievement of annual output but missed our eight-year output

Green – Successful achievement of an annual output and our eight-year output commitment

2.2. There were issues experienced in 2020-21 performance in two of the five output categories. Those two categories are:

- Reliability and Availability
- Environment

Further information on the issues arising from each category is provided below.

Reliability and Availability
<ul style="list-style-type: none"> • System issues impacted a minority of auctions

⁴ [National Grid Gas Plc - Special Conditions Consolidated - Current Version.pdf \(ofgem.gov.uk\)](#)

⁵ [Energy network indicators | Ofgem](#)

- 2.3. Entry and Exit capacity give shippers⁶ an entitlement to flow gas onto and off the NTS. To flow one unit of energy, a shipper needs to buy one unit of capacity. This is known as the 'ticket to ride' principle. Units for both capacity and energy are in kWh/day.
- 2.4. National Grid Gas have a responsibility⁷ to meet the shipper's entitlements where they have secured the capacity. During 2020-21, there was a minor issue with meeting this obligation, where system issues in the area of capacity obligation, affected a small number of auctions hence it has missed 2020-21 annual output.
- 2.5. Taking steps such as improving its planning process and minimizing the use of maintenance days⁸ has helped NGGT improve performance over RIIO-1 period.

Environment

- New programme for compressor station underway with completion in 2023 in-line with emissions compliance requirements. Project delivery delayed.

- 2.6. Gas compressor stations help increase pressure to move gas around different parts of the network in order to meet demand hence are a vital part of the NTS. The delivery of works at Peterborough and Huntingdon in accordance with Compressor Emissions Compliance Strategy (CECS)⁹, has been subject to delay due to the impacts of COVID-19 and negotiations that has led to the recent mutually agreed exit from the contract with the provider.

⁶ A company with a Shipper Licence that is able to buy gas from a producer, sell it to a supplier and employ a transporter to convey gas to consumers.

⁷ NGGT is obliged to provide the capacity committed under the Capacity Market Rules

⁸ Where a single maintenance activity affects multiple NTS Exit Points on a day, this is construed as a single day for the purposes of the Maintenance Incentives.

⁹https://www.ofgem.gov.uk/sites/default/files/docs/2019/06/compressor_emissions_compliance_guidance.pdf

Incentive Performance

2.7. NGGT is subject to a number of performance incentives on both its Transmission Operator (TO) and System Operator (SO) parts of its business in order to imitate the commercial pressures that companies experience in a fully competitive market. During 2020-21, the transmission owner (TO) earned £5.40 million (47%) out of a possible £11.49 million; the system operator (SO) earned £16.70 million (33.07%) out of a possible £50.50 million. This is a decrease in performance for the TO's and SO's incentive compared to the previous year.

	Earned¹ (£m)	CAP (£m)
Transmission Owner		
Stakeholder satisfaction output	5.40	11.49
<i>comprises:</i>		
- stakeholder engagement	0.00	3.83
- customer and stakeholder satisfaction survey	5.40	7.66

¹ There is a 2 year lag for earned incentives so 2020-21 performance will be paid in 2022-23

	Earned¹ (£m)	CAP (£m)
System Operator		
Capacity constraint management	11.20	20.00
Demand forecasting	1.00	20.00
National Transmission System (NTS) shrinkage	3.10	7.00
Residual balancing	1.00	2.00
Maintenance	0.40	1.50
Greenhouse gas emissions ²	0.00	0.00
Total incentives	16.70	50.50

¹ There is a 2 year lag for earned incentives so 2020-21 performance will be paid in 2022-23

² Penalty only. 2020-21 allowance was 2,897 tonnes with 2,500 tonnes emitted. Penalty over allowance is £1,487 per tonne.

2.8. The majority of the SO's incentive earnings were from capacity constraint management and NTS shrinkage although the drop compared to previous years' performance is driven by a drop NTS shrinkage.

Capacity constraint management

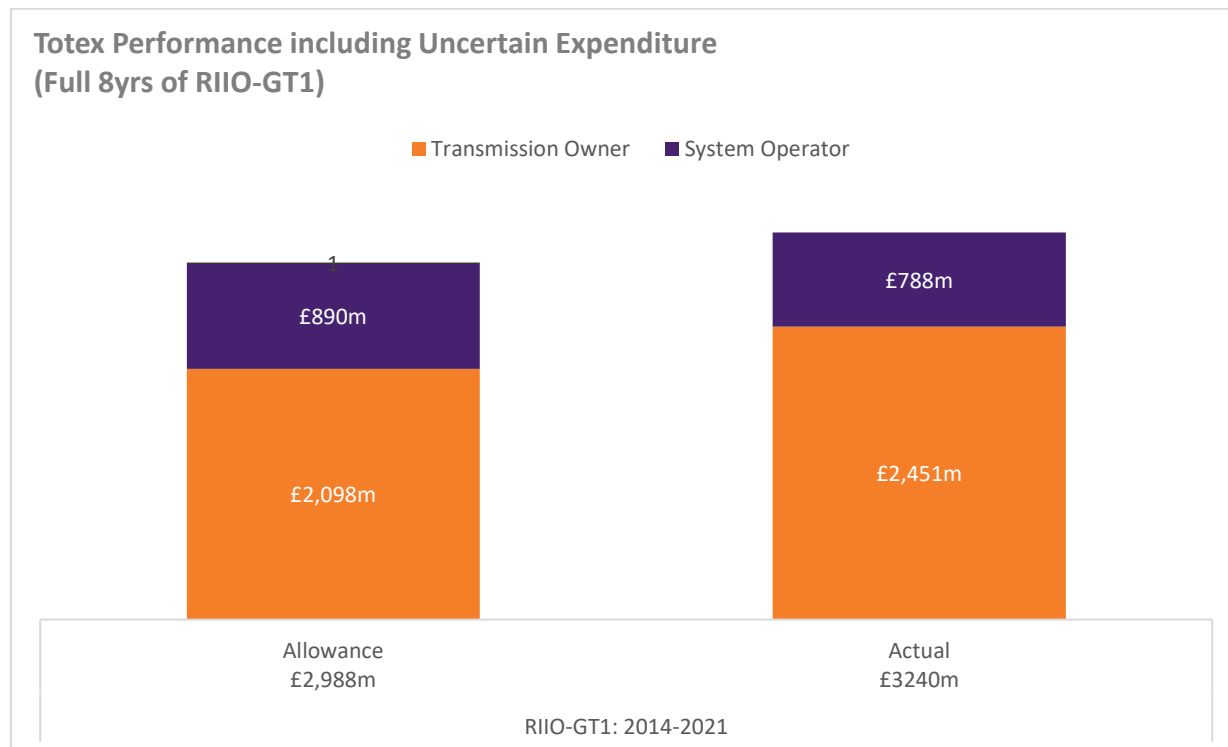
- 2.9. Sources of gas and the points of demand for gas are not always located in the same place. This can lead to capacity bottlenecks on the NTS. Gas that is restricted in its ability to flow between two points is referred to as a constraint.
- 2.10. The capacity constraint management incentive encourages NGGT to reduce constraints. NGGT achieves this by working towards efficient system operation, optimisation of strategies, and taking a balanced approach to risk versus reward decisions, all of which help optimise their constraint management actions.

NTS Shrinkage

- 2.11. NTS shrinkage energy is a product of the daily operation of the NTS. It is categorised as energy used to run compressors (Compressor Fuel Usage), energy that does not satisfy the Calorific Value standards (Calorific Value Shrinkage), and energy that is lost or unaccounted for (Unaccounted for Gas).
- 2.12. NGGT is the NTS provider of shrinkage energy and is responsible for managing the end-to-end service of forecasting, accounting for, procuring, and supplying energy to satisfy the daily NTS shrinkage components. The shrinkage scheme incentivises NGGT to minimise the cost of shrinkage energy associated with NTS operation.

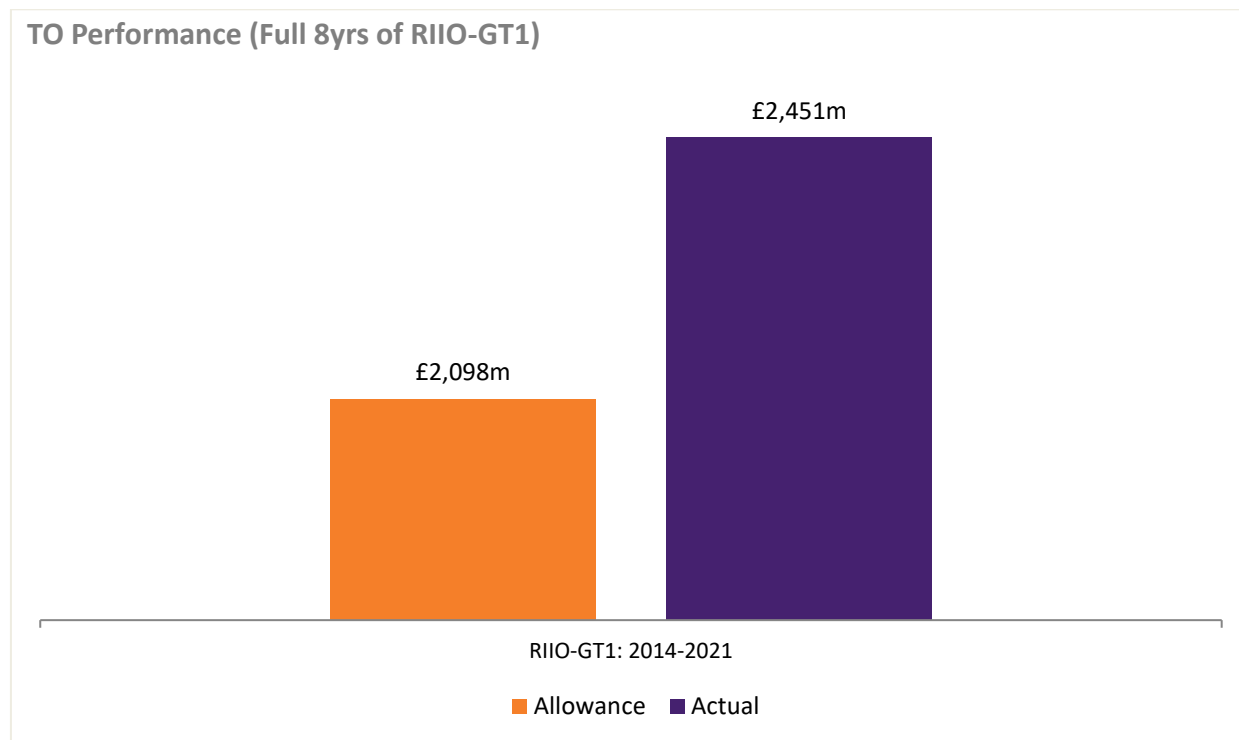
3. Total Expenditure (Totex) Performance

Totex



- 3.1. Totex consists of both capital expenditures driven by the TO and operating expenditure driven by the SO. The approach applied under RIIO-GT1 is to set price controls based on an up-front view of efficient totex. It aims to incentivise companies to deliver solutions at the lowest total cost and to choose the most efficient solution regardless of whether it is a capital expenditure or an operating expenditure solution.
- 3.2. NGGT Totex over the RIIO-T1 period is £3,240 million which is an overspend of £252 million (8%) against its full allowance of £2,988 million for RIIO GT1. This is an improvement in performance of £16m compared to 2019-20. The majority of this overspend is from its TO business and is associated with the impact of COVID-19 with delays to asset health works, revisions to the timeline of Peterborough and Huntington compressor programme and associated Opex reduction.

Transmission Owner (TO)



3.3. The TO overall Totex for the eight years is £2,451m compared to an allowance of £2,098m which is an overspend of £353m (16.8%) against its allowance.

3.4. Compared to 2019-20, overall spend decreased by £20m while adjusted allowance decreased by £4m due to a reduction in additional Industrial Emissions Directive^{10,11} (IED) allowances forecast, from £9m to £6m in 2020-21 for the Hatton compressor emissions work.

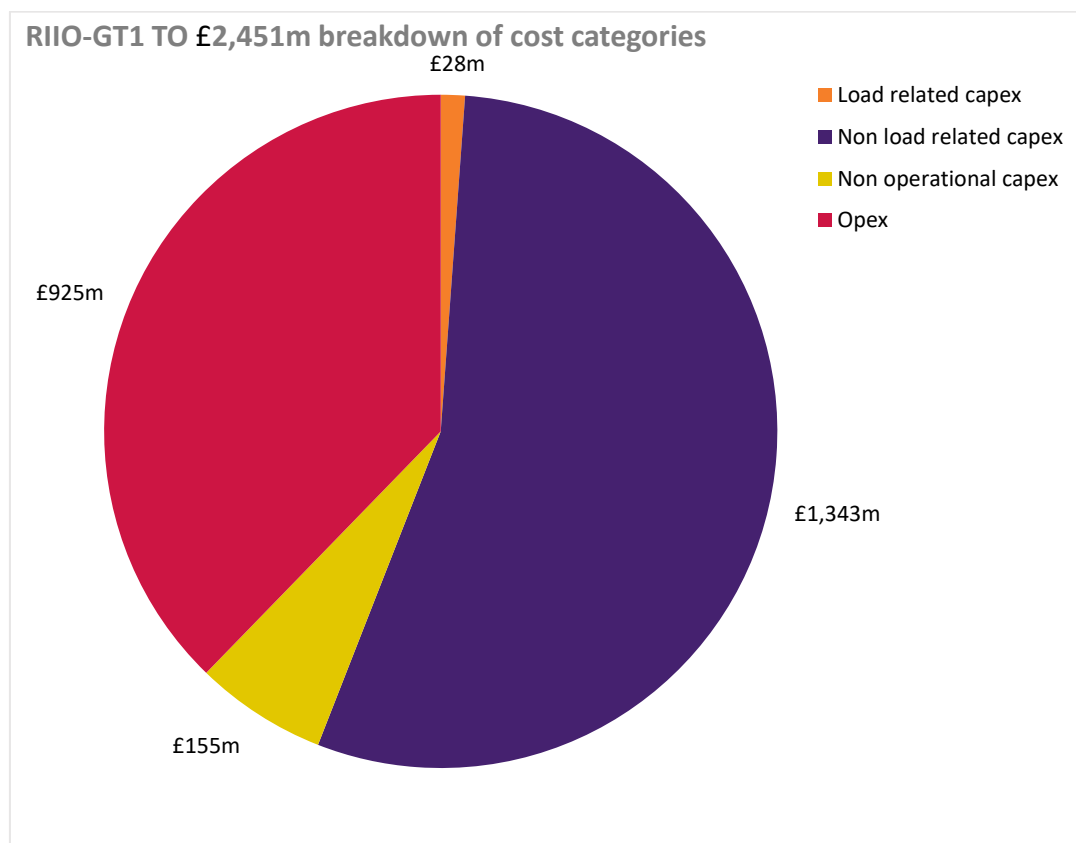
Asset Health over RIIO-GT1

3.5. NGGT spent £55m on asset health work in 2020/21, compared to £66.60m in 2019/20. This spend is £24.3 million lower than the forecast of £79.30m. Over RIIO-GT1 period, NGGT spent £694.70m on asset health which is £81.90m above the RIIO-T1 allowance of £615.80m. This forms part of Totex and NGGT are

¹⁰ Industrial Emissions Directive (IED) brings together the previous Large Combustion Plant (LCP) and Integrated Pollution Prevention and Control (IPPC) directives.

¹¹ [The Industrial Emissions Directive - Environment - European Commission \(europa.eu\)](https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32010L0036)

incentivised to spend below Totex through the Totex Incentive Mechanism (TIM) discussed below.



Load related capital expenditure (LRE)

3.6. Investment required to connect gas loads coming to, and off, the NTS from customers and to ensure that the NTS can cope with the changing pattern of flows on the network.

Non load related capital expenditure (NLRE)

3.7. Principally comprised of expenditure required to replace or refurbish existing primary (e.g. pipelines, compressor sites, entry/exit points, etc) and secondary (e.g. gas generators, exhausts, pig traps, isolation valves, etc) assets on the network. It also includes expenditure relating to areas such as the reduction of direct emissions from the operation of the NTS, network resilience, and physical security.

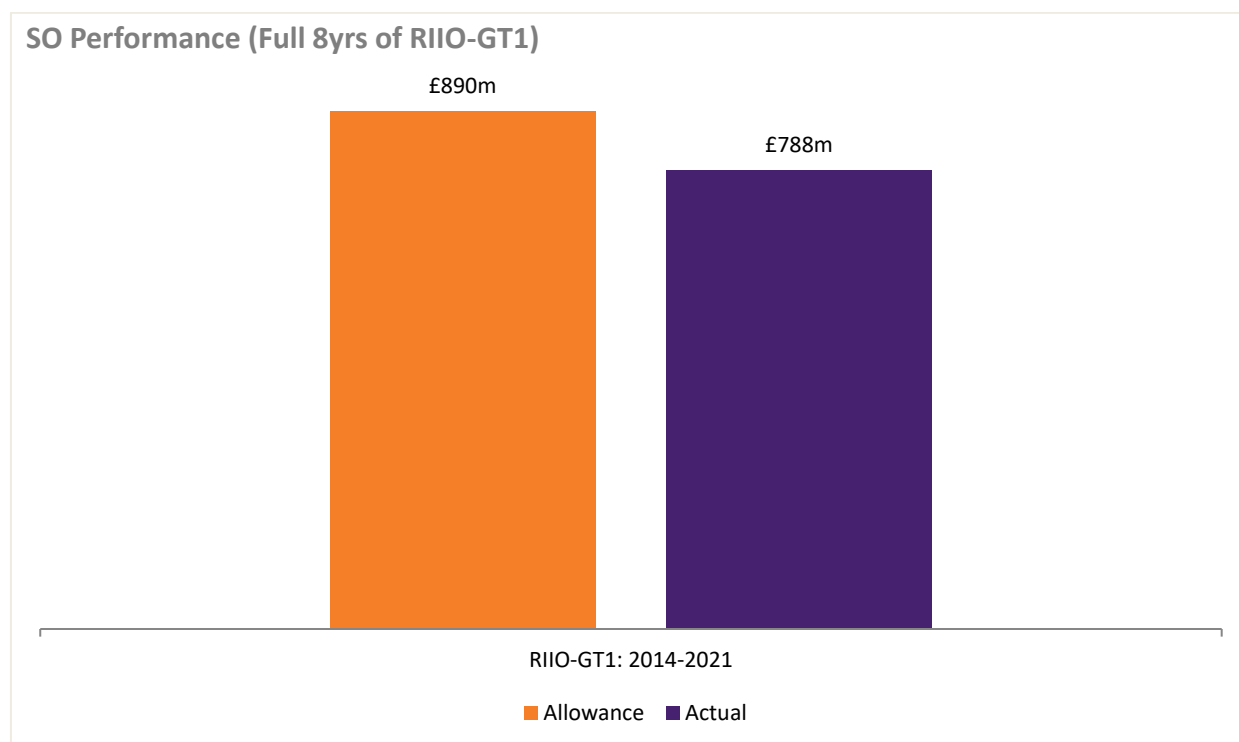
Non-operational capital expenditure

- 3.8. Capital expenditure that is not covered by LRE and NLRE. Expenditure on IT is the main contributor to this type of expenditure but it is also made up of smaller costs associated with vehicles, office refurbishment, and plant, tools and equipment (e.g. gas testing equipment, calibration equipment, and tooling).

Operating expenditure (Opex)

- 3.9. The ongoing cost of running the business. Business support costs are the main contributor and comprises expenses including shared group costs (e.g. group management, finance, regulation, etc) and support services; for example, various engineering services. Smaller costs under this type of expenditure relate to areas including planned inspections, maintenance, and fault diagnosis.

System operator (SO)



3.10. The GSO overall Totex cost for RIIO-GT1 is £788m which is an underspend of £102 million (11.5%) against an allowance of £890m. This underspend is broken down into £65m SO Capex and £37m of SO Opex. Compared to 2019-20, the 2020-21 SO Capex cost performance reduced by £4m while its SO Opex improved by £4m.

3.11. This was primarily driven by lower forecast spend on Xoserve¹² and telemetry. The lower Xoserve investment is driven by a change in strategy for the suite of web applications for managing the transportation of gas through the NTS known as Gemini and a lower level of EU driven Gemini change work.

3.12. Also, the underspend to allowances for Opex is largely driven by a higher proportion of Xoserve allowances being allocated to direct Opex following the outcome of the review of agency costs.

RIIO-GT1 Spend and Allowances

3.13. A summary of the various spend categories for the eight years RIIO-GT1 against cost allowance is shown below. All IED spend and IED allowances (£99m) are captured within the Non-Load Related Capex category.

¹² Xoserve is the Central Data Service Provider for Britain's gas market.

Activity	Spend (£m)	Allowance (incl. uncertainty mechanism) (£m)	Cost vs Allowance (£m)
TO Load Related Capex	28.3	47.4	(19.1)
TO Non Load related Capex	1,342.9	1,089	(253.9)
TO Non Operational Capex	155.1	74.6	(80.5)
TO Opex	924.9	887.2	(37.7)
Total TO	2,451.2	2,097.8	(353)
SO Capex	279.5	354.2	(74.7)
SO Opex	508.8	535.7	(26.9)
Total SO	788.3	889.9	(101.6)
TOTAL	3,240	2,988	(252)

Totex Incentive Mechanism (TIM)

3.14. TIM is designed to incentivise NGGT to outperform its totex allowance. Any underspend or overspend compared to totex allowance is shared between NGGT and consumers. NGGT is exposed to 44.36% of any overspend and consumers are exposed to the remaining 55.64% (subject to tax).

2020-21	Transmission Owner (£m)	System Operator (£m)	Total (£m)
Total allowed expenditure	200.51	105.51	306.02
Actual expenditure	258.41	97.70	356.11
Overspend (underspend)	57.90	-7.81	50.09
Totex incentive mechanism (company share)	25.68	-3.46	22.22
Allowed expenditure after sharing	-1,228.59	70.64	-756.75

4. Innovation

4.1. NGGT undertook thirty-two Network Innovation Allowance (NIA)¹³ projects in 2020-21 spending £4.90million and carrying two projects forward into RII0-2. Across its innovation portfolios, NGGT built on the feasibility studies carried out in 2019-20 to assess the suitability of hydrogen as a cleaner alternative to natural gas as well as the changes required for this across the NTS. It includes:

- Roadmap to FutureGrid which looks at the design of the facility and the master test plan. It focusses on the pre-work supporting the FutureGrid¹⁴ NIC¹⁵.
- Gas Transport Transition Pathways to provide insight into potential technical challenges from transition to hydrogen future for transport.
- HyScale which is a feasibility study to examine the technical and commercial issues associated with the application of Liquid Organic Hydrogen Carriers (LOHC) for the capture, storage, transportation and release of hydrogen at bulk scale in the UK.
- HyTechnical is a review of hydrogen pipelines in order to repurpose existing networks.
- Zero 2050 South Wales designs a pathway that meets South Wales net zero targets to adopt a whole system view using experts across different sectors.

4.2. NGGT was awarded £9.70 million of funding through the Network Innovation Competition (NIC) to build an offline hydrogen test facility. It is part of the first phase of the FutureGrid programme. The project assesses the performance of a range of decommissioned assets used to create a representative transmission network for up to 100% hydrogen blending.

4.3. Other projects seeks to increase the efficiency of the day-to-day maintenance and operational activities, carried out by NGGT by utilising innovative tools

¹³ <https://www.ofgem.gov.uk/electricity/transmission-networks/network-innovation>

¹⁴ [HyNTS FutureGrid Phase 1 – National Grid Gas Transmission | Ofgem](#)

¹⁵ [Version 3.1 of the Gas Network Innovation Competition Governance Document | Ofgem](#)

and methods. Further information on Ofgem's approach to network innovation can be found on our website¹⁶.

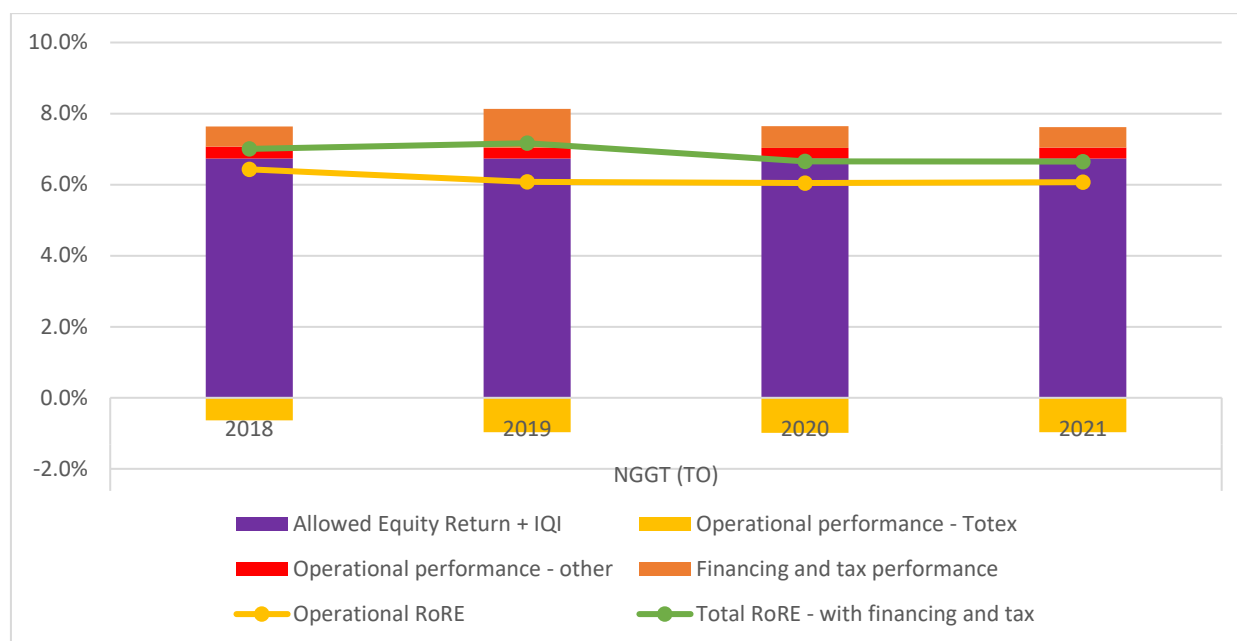
5. Return on Regulatory Equity (RoRE)

5.1. We assess the financial performance of network companies using the RoRE measure based on a notionally geared company (i.e. a company with a capital structure of 62.5% debt and 37.5% equity). We have calculated NGGT's RoRE during RIIO-GT1 to be 6.6%. RoRE is made up of several components:

- The allowed equity return, which is the return on equity that a company would earn if their expenditure and allowance matched and there were no other incentives.
- Operational performance (totex), which compares the totex allowance to a company's actual totex expenditure and any underspend or overspend is then shared between the company and consumer through the totex incentive mechanism.
- Operational performance (other), which accounts for a company's overall incentive performance.

5.2. Putting these three component parts together produces operational RoRE. Financing and tax performance are finally added to produce total RoRE. NGGT's RoRE is for TO performance only. Decisions made on financing and tax affect NGGT's actual RoRE and can cause it to change during a price control Period.

¹⁶ <https://www.ofgem.gov.uk/regulating-energy-networks/current-network-price-controls-riio1/network-innovation>



RoRE breakdown (TO)

	RIIO-GT1: Full 8yrs (%)
Notionally geared company	6.6
NGGT's actual	5.8

<i>Notionally geared company</i>	<i>Breakdown</i>
Allowed equity return (incl. IQI)	6.7
Operational performance (totex and incentives)	-1.0
Operational performance (other)	0.3
Operational RoRE	6.1
Financing and tax performance	0.6
Total RoRE	6.6

5.3. Accompanying this report is a regulatory financial performance annex that sets out our assessment of network companies' RIIO-1 regulatory financial performance. Our assessment is based on information the companies have provided using the regulatory financial performance reporting (RFPR) process.

6. Consumer Bill Impact

- 6.1. Our tariff methodology provides an estimate of the overall cost of domestic energy bills. This includes estimates of the proportion of the overall cost of energy which is related to gas transmission. The methodology uses an average gas demand applied uniformly across all regions and over time.
- 6.2. Our latest bill assessment using this methodology estimates that the average GB consumer in 2021-22 will pay £6.30 per annum in real 2020-21 price terms for gas transmission costs. Charges differ depending on the region in which a consumer resides, ranging from £2.30 in Scotland to £11.84 in South Western England.

7. COVID-19

- 7.1. The COVID-19 pandemic affected staff and material movements and availability, as well as gave rise to a risk averse approach from some stakeholders in relation to outages and financial commitments. There was disruption in asset health operations during this time.
- 7.2. All Remote Valve Operation (RVO) activities were cancelled prior to the 2020/21 maintenance season hence zero Maintenance Days¹⁷ were called in 2020/21 (as in 2019/20), the delivery of works at Peterborough and Huntingdon has been subject to delay partly due to the impacts of COVID-19.
- 7.3. It is important to mention that several arrangements helped to maintain security of supply and high levels of system reliability in order to deliver essential services to consumers as well as seeing an unprecedented step change in how organisations engage and serve their consumers and stakeholders.

¹⁷ Maintenance Days is incentivised to minimise impact on customers aligning maintenance activities wherever possible. Its part of the maintenance incentive only included days for Remote Valve Operations (RVO).

This report highlights National Grid Gas Transmission's key performance results for 2020-21 which is also the final year of the RII0-GT1 price control period. If you require additional performance data please refer to the supplementary data file published with this report.