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RIIO-2 Electricity Transmission Annual Report: 2023-24

Executive Summary

The energy system's path to achieve the government's Clean Energy Superpower mission, including Clean Power by 2030 and accelerating to net zero by 2050, presents both significant challenges and opportunities for the sector.

Delivering the electricity networks at both transmission and distribution levels, which will underpin this transformation, requires a substantial increase in investment in network infrastructure.

To facilitate this complex transition at pace, the current round of price controls (RIIO-2[1]) has established a comprehensive investment and incentive package. We[2] designed the package to enable network companies to deliver a lowest cost, decarbonised energy system, while maintaining world-class levels of system reliability and customer service.

The scale of consumers' investments is substantial. Collectively, the transmission businesses expect that funding over the five-year period will reach £15 billion.[3]

The RIIO-2 framework, being outcome-focused, is designed to assist companies in clearly coordinating the system consumers need in advance, minimising investor uncertainty, and ensuring that new infrastructure is built quickly and at a reasonable cost.

Since we set RIIO-2, we have continued to advance our regulation to bring about the network investment needed. This includes introducing a new Accelerated Strategic Transmission Investment (ASTI[4]) framework to deliver infrastructure at pace, and progressing connections reform to ensure projects that are ready and needed can connect to the system. We are also introducing a new Advanced Procurement Mechanism (APM[5]) so that onshore electricity transmission owner (TO)[6] businesses can secure future procurement far in advance of typical timelines.

Price Control Monitoring

As the sector progresses through the RIIO-2 period[7], we continuously monitor that companies are advancing as expected in delivering their agreed plans and outputs.

Just as we have adapted our regulation to meet the challenges in the sector, we need a focus on delivery from the network companies, and we will be holding them fully to account on that delivery. Consumers are funding the network investments, and it is essential that these networks continue to provide reliable service and meet the diverse needs of network users.

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[1] This is the second electricity transmission price control using the Revenue = Incentives + Innovation + Outputs (RIIO) model.

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

[3] Excluding 'ASTI'.

[4] https://www.ofgem.gov.uk/decision/decision-accelerating-onshore-electricity-transmission-investment

[5] https://www.ofgem.gov.uk/decision/electricity-transmission-advanced-procurement-mechanism

[6] National Grid Electricity Transmission, Scottish Power Transmission and Scottish Hydro Electric Transmission.

[7] New price controls for gas and electricity transmission and gas distribution will be implemented from April 2026.

This report provides a comprehensive overview of how each of the three onshore TOs are delivering against the outcomes and metrics over the price control period.

Key messages

Annual Incentive Targets: TOs continue to perform strongly against annual incentive targets. All networks have maintained world-class system reliability, exceeding 99.99%. However, NGET reports lower than expected performance in two areas (timely connections and the quality of connection surveys) reflecting the challenging nature of the current connections landscape.

Innovation: Progress continues in advancing innovation projects. In the third reporting year, all TOs have registered additional projects for funding under the innovation streams.

Outputs: Variations in customer-driven activities impact output delivery and performance. All companies are responding to these changing requirements and the price control mechanisms are functioning as intended, to ensure that consumers are only paying for the actual volume of activity.

RIIO-2 total cost performance: Over the three-year period (2021-2024), all TOs report total costs below their allowance. However, over the five-year period (2021-2026), all TOs currently forecast that spending projections will increase and more closely align with their adjusted allowance. The scale of the activity needed to address the current projected underspends, along with the TOs' expectation of delivery challenges, remains our primary concern and the main focus of our future monitoring.

This report looks at trends in performance for the first three years of RIIO-2 and evaluates the TO's current performance expectations across the five-year period. In doing so it examines the drivers for the performance and how the TOs expect to proceed (based on information presented in the 2023/24 reporting year) towards achieving their end-of period performance ambitions.

Looking ahead, we will use performance data to collaborate closely with stakeholders, learn lessons from RIIO-2, and develop the next set of network price controls that will ensure companies remain accountable.

Structure of this report

- **Chapter One** provides brief summary information on the three TO businesses and the annual reporting process.

- **Chapter Two** explains how the TOs have performed against their incentive commitments over the first three years of the RIIO-2 period. It also indicates the incentive payments earned.

- **Chapter Three** summarises the level of output delivery the TOs have achieved over the first three years of the RIIO-2 period through the volume driver mechanisms, and the current expectations to the end of the five-year price control period.

- **Chapter Four** presents an overview of expenditure in relation to the innovation incentives.

- **Chapter Five** provides a brief summary of the total cost (totex) and adjusted allowance position across all three TO businesses. It provides our view on the TOs' expected cost performance across the five year period based on their current delivery effectiveness, the scale of the delivery challenge their ability to successfully navigate the challenges of the current delivery environment.

All financial values in the report are in 2018-19 price base unless stated otherwise.

Information on our current assessment of the Return on Regulated Equity[8] was separately published in February 2025.[9]

Two subsidiary documents have been published along with this report.

- a document presenting further detail of the areas of TOs' performance discussed in this report, and

- a supplementary datafile containing additional performance data.[10]

[8] The financial return achieved by shareholders in a licensee during a price control period from its outturn performance.

[9] This report is separate to the 14 February 2025 publication which provides a view of regulatory financial performance: https://www.ofgem.gov.uk/publications/riio-2-regulatory-performance-data-2024.

[10] Please note that this report does not provide any information on the Network Asset Risk Methodology outputs which is provided through a separate regulatory submission.

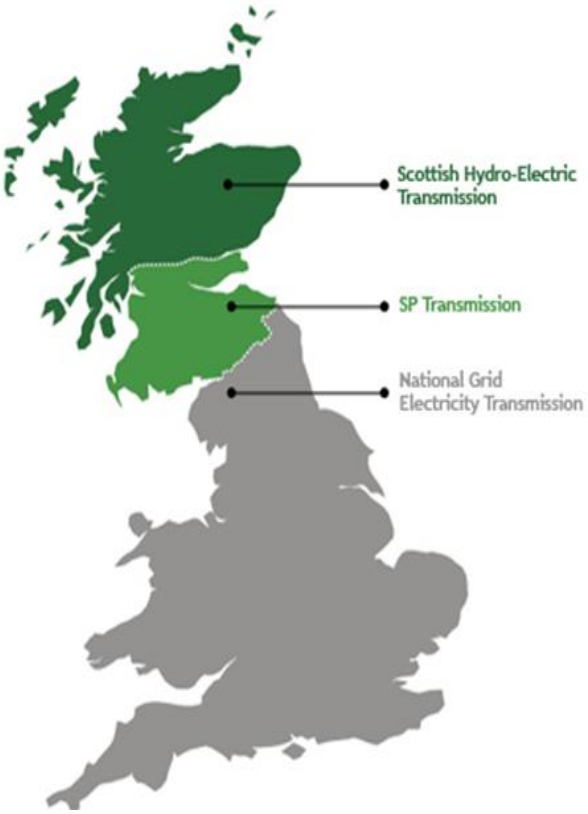
Chapter One: Introduction

The electricity transmission network in Great Britain consists of the high voltage electricity wires and cables, which convey electricity from power stations to local distribution networks and large-scale customers directly connected to the system.

There are three onshore providers of electricity transmission services.

- National Grid Electricity Transmission (NGET) across England & Wales
- Scottish Hydro Electric Transmission (SHET) across the North of Scotland and the Scottish island groups
- Scottish Power Transmission (SPT) across the South of Scotland.

Figure 1: GB transmission areas



Owners of the networks must build or refurbish the transmission infrastructure to ensure the network is capable of transporting electricity at all times. The costs of building and maintaining the network are paid through consumer bills.

The owners also play a key role in facilitating the Government's net zero ambitions by ensuring that:

- infrastructure can be built and ready ahead of when it is needed,
- robust plans are in place and being used to make effective decisions on capacity and location of major new supply and demand,
- the delivery of an environmentally sustainable network is being fully supported and is contributing to lowering the cost of the net zero transition for consumers in the future.

RIIO-2

To protect consumers we set limits on the network expenditure that can be added to bills, and what must be delivered by the network companies. Our price controls use the RIIO (Revenue = Incentives + Innovation + Outputs) framework. The current electricity transmission price control spans a five-year period from 1 April 2021 to 31 March 2026.

Annual Reporting

TOs are required to report on their performance in relation to their expenditure and the outputs we set under the RIIO-2 price control framework.[11]

We analyse this information and examine any variations in TO performance against their annual output targets, as well as the expected under and over-spend across specific activities and cost categories.

Additionally, we engage with each TO to discuss the technical aspects of their submissions, known as Supplementary Questions, or SQs, and participate in direct discussions via annual company visits on specific points. This process helps us gain a deeper understanding of the factors influencing the delivery of the RIIO-2 settlement and their perspectives on future performance.

[11] The Regulatory Instructions and Guidance (RIGs) requires TOs to provide information to Ofgem. We used the information provided in the RIGs in preparation of this Annual Report.

Chapter Two: Incentives

In this chapter, we examine outputs that are subject to incentives, including the value of rewards and penalties where applicable.

Our assessment of TO's output delivery incentive (ODI) performance

Through the RIIO-2 settlement, we established stretching ODI performance commitments for the network companies. Three years into the period, we observe that while the TOs are rising to the challenge across the majority of incentive areas, there are incentive areas proving more problematic for some TO's.

Table 1 provides an overview of performance across all categories in 2023/24.

Table 1: Measures of performance (2023/24)

Green means 'Met': performance on target / ahead of target or above score.
Orange means 'Near': partially missing target / partially behind target or below score.
Red means 'Not met': performance missing target / behind target or below score.
Note 1: there is no target associated with the SO-TO mechanism.

Incentive area	RIIO measure	SHET	SPT	NGET
Safety	To meet all safety legislation requirements.	Met	Met	Met
Reliability of service	Minimise how much electricity is lost to customers because of failures of the assets on the network. Energy not supplied (annual MWh target)	Met	Met	Met
Quality of connections survey score (QoCSS)	To measure and improve the customer experience throughout the connections journey. Target annual survey score (7.7 out of 10)	Met	Met	Not met
IIG emissions	Annual target leakage rates (Tonnes per CO_2 equivalent)	Met	Met	Met
Timely connections	Number of connection offers provided in accordance with licence timescales	Met	Near	Near
SO-TO optimisation	Collaboration to identify and deliver services that have a positive impact in assisting in minimising costs on the GB Transmission network.	[Note 1]	[Note 1]	[Note 1]
Environmental Scorecard	Percentage change in impact areas to annual reward/penalty thresholds	N/A	N/A	Met

If you require further information, subsidiary document published alongside this report presents further detail of TOs' performance against the full range of annual incentive targets.

ODI reward and penalty performance summary

Table 2 summarises the cumulative revenue rewards and penalties accrued by each TO over the first three reporting years for each incentive area. Key points include:

- all three networks have maintained world-class system reliability, exceeding 99.99%, and have been rewarded accordingly.
- the SO-TO optimisation mechanism is a significant source of reward for each company throughout the RIIO-2 period to date.
- NGET and SPT have shown progress and reward positions in the IIG emissions mechanism.
- SHET have made notable progress, achieving its lowest IIG leakage rate since 2018/19. However, during the RIIO-2 period, they have faced unique challenges in controlling IIG emissions due to a higher proportion of their network using sulphur hexafluoride[12] than in 2018. This, combined with a relatively lower target and a reduced maximum reward, has resulted in a relatively lower reward.

Table 2: ODI indicative cumulative revenue rewards & penalties (2021-2024) [13]

Mechanism	NGET	SPT	SHET	**TOTAL**
Energy not supplied	2.8	3.1	2.3	**8.18**
IIG emissions	3.6	4.2	0.7	**8.39**
Timely Connections	(0.5)	(0.0)	-	**-0.48**
QoCSS	(6.0)	1.8	4.0	**-0.20**
SO-TO Optimisation	15.9	9.0	5.1	**29.97**
Environmental scorecard	2.5	-	-	**2.49**
TOTAL	18.3	18.0	12.1	**48.4**

There are three incentive areas that illustrate the range of TOs' performance activities.

- **Reliability** shows robust performance across all TOs
- **SO:TO optimisation** shows that all TOs are currently achieving strong financial rewards

[12] Known as 'SF6'. This is a gas that is commonly used in the electricity industry in electrical switchgear.

[13] Values have been extracted from the Revenue workbook and, in some instances, may reflect calculations post 31 July 2024.

- **Connections** shows that some TOs are currently facing challenging annual performance trends.

Reliability

RIIO-2 supports the delivery of a high-quality and reliable service to all network users and consumers. It encourages TOs to efficiently improve network reliability by managing short-term operational risk.

The Energy Not Supplied (ENS) incentive improves the reliability of electricity supply and reduces the negative impacts of disruption on customers. Each TO has a bespoke target (also referred to as an 'incentive neutral point') for the volume of ENS each year.

Our view: Three years into the period, all TOs are reporting exceptionally strong levels of network reliability and surpassing their annual targets to minimise electricity loss due to asset failures on the transmission network. World-class levels of network reliability are being maintained, demonstrating that TOs are effectively responding to the incentive design and continuing to prioritise the critical importance that consumers place on system reliability.

SO:TO optimisation

There are parts of the network that are constrained, meaning there is not always enough network capacity to match the electricity generation in that area. This leads to additional costs. One way to minimise these is better coordination so that complex infrastructure investments can be advanced swiftly whilst addressing access and outage issues. Historically, these have been difficult for all TOs to identify and execute.

This incentive is designed to encourage collaboration between the TOs and the NESO to identify and provide additional solutions beyond business-as-usual activities to help have a positive impact in assisting in minimising costs on the transmission network.

Consumers benefit from the incentive mechanism by reducing constraint costs. It does this by comparing how much the uncertainty is minimised between forecast actual constraint costs savings[14].

Across the third regulatory year (2023/24), all the TOs made constraint savings and have been rewarded under the mechanism accordingly.

Table 3: SO:TO incentive annual reward (2023/24)[15]

£million, 2018/19 prices	NGET	SPT	SHET	**TOTAL**
Reward	5.9	6.51	3.63	**16.04**

Our view: The optimisation incentive has been successful in increasing coordination and collaboration among the relevant parties, leading to significant cost savings and enhanced operational efficiency of the GB transmission network. These enhancements

[14] Constraint payments, which are managed by the NESO, are paid to generators when they unable to export their power to the market, including during planned outages on the system, with the cost of these constraint payments impacting consumer bills.

[15] Values have been extracted from the Revenue workbook and, in some instances, may reflect calculations post 31 July 2024.

significantly benefit consumers compared to a scenario without active incentives in this area, underscoring the importance of well-targeted incentives.

Connection

Table 4: Connection incentives (2023/24)

	NGET	SPT	SHETL
QoCSS (target 7.7 out of 10)	7.2	8.3	8.6
Untimely Connection offers (#)	3	1	0

The table above highlights that some TOs are falling short of expectations in some aspects of the connection journey. This is due to a range of factors which are currently leading to undesirable connection dates being offered and an associated deterioration in the feedback received by some TOs on elements of the connection journey it is responsible for.

The primary driver is the current 'queue' to connect to the transmission network. The queue is the result of several issues:

- High Demand: There's a significant demand for Transmission Entry Capacity. All TOs have experienced a significant increase in the volume of connection offers[16], leading to a backlog of projects waiting to connect.

- Uncertainty: Many projects in the queue modify their capacity and connection dates, causing uncertainty and delays for other projects. The expansion of the networks has also seen the proportion of requests from new energy sources (in different locations to traditional thermal generation centres), leading to additional design and preparation work to prepare offers.

- Other factors: TOs face challenges in progressing and delivering network reinforcement within system access constraints. Additionally, the current queue management system may hinder effective competition among generators.

These forces are exerting increasing pressure on the current process for responding to connection requests across GB.

To ensure robust network connections, each project may also require enabling works beyond the immediate construction of infrastructure. The need for and phasing of these works can significantly impact a project's connection date, partly depending on the requirements to accommodate other projects seeking to connect.

These factors also contribute to and modify forecast patterns of generation and demand that underpin the connection process of each TO. These assumptions have undergone significant changes since the RIIO-2 settlement was reached in 2019.

[16] NGET, for example, reports that the number of requests for new transmission connections and modifications for projects increased in 2023/24 on the total applications in 2022/23, with applications showing no sign of reducing

Changes in background conditions, along with customer-driven adjustments in the scope and location of connection activities, have introduced a broader range of interacting variables for TOs to manage within their current processes.

From an annual performance perspective, we recognise that the evolving connection environment has led to some delays as TOs adapt their processes. Despite recent internal process improvements (such as NGET's webinar events), the oversubscription in the connection pipeline has led to expectation gaps on connection times, impacting customer satisfaction and related performance metrics.

Measures are currently being developed to address and mitigate the challenges observed in the connections area thus far. These steps aim to lay the foundation for improved TO performance throughout the remainder of RIIO-2.

A major development is the ongoing reform of the GB connection queue led by NESO, aimed at driving crucial measures to improve connections and customer service. These reforms seek to move away from the 'first come, first served' connections' process and moving to a 'first ready and needed, first connected' process. This shift would establish a streamlined connections queue.

There are three key features of the reform work:

- Viability – by prioritising 'ready' projects, the confirmed queue is made up of projects that are demonstrably viable and well progressed (having land rights and sufficiently progressed their planning status).

- Needed – projects that meet the Clean Power 2030 (CP30) Action Plan, and any future strategic alignment criteria set by the Government, can more confidently retain or obtain confirmed terms and a queue position.

- Efficiency – the right mix of projects in the confirmed queue is preserved, with projects that drop out being replaced by projects with the same technology.

We consider this would lead to two key benefits:

- More efficient network planning – Network companies would have clarity on the projects that are 'ready' and 'needed' for the 2030 and 2035 pathways as defined in the CP2030 Action Plan. This would lead to more efficient network planning and build, with an estimated saving of £5 billion of notional investment costs for network build which may no longer be required. More focused, efficient network build mitigates network costs ultimately payable by consumers, and should better enable timely delivery.

- Increased investor confidence – New entrants would have a clear signal about what to invest in and where to locate. This should support economic growth; investors would better focus their resources on the projects that are needed by the system and allow these projects to be realised sooner. Existing projects with firm "Gate 2" offers should have increased confidence that the required network will be built and their project will be able to connect on time.

Our view: Efficiently prioritised connections means that viable projects are able to connect sooner (than would otherwise have been the case), where the system needs them, without unnecessary cost to consumers. This should better enable the efficient realisation of the CP30 Action Plan, thereby accelerating the reduction of our reliance on fossil fuels, improving security of supply and protecting consumers from exposure to any future gas price spikes.

We acknowledge the challenging nature of the current connection landscape. However, we consider that the reform measures outlined will enhance the experience for customers seeking connection to the transmission networks. While ongoing challenges in the early stages of the connections journey are expected to continue impacting overall feedback until reforms are fully embedded, we remain confident that moving forward, many of the factors that may have hindered the TOs' ability to achieve performance improvements in this incentive area will be reduced and eventually removed.

Chapter Three: Outputs

In this chapter, we provide an overview of TOs' activity related to various volume driver mechanisms throughout the RIIO-2 period.

Delivery performance under the applicable volume driver mechanisms

Volume driver mechanisms adjust a TO's baseline cost allowance to its actual volume of network services provided over RIIO-2.[17]

RIIO-2 has volume drivers for two areas:

- Delivering new connections to the transmission network (driven by new demand and generation user requests)
- Strengthening network boundaries in England and Wales (driven by changing patterns of generation and demand), referred to as incremental wider works.

The output delivery for each of these mechanisms is significantly influenced by the scale of change in customer-driven activity experienced during RIIO-2.

Table 5 provides an overview of TOs' expected output activity related to the applicable volume driver mechanisms across the five-year RIIO-2 period. We note that forecasted connection dates can be subject to change.

Table 5: Volume driver output, actual and forecast over the five-year period

Expected output delivery through the volume driver mechanism only, MW or MVa.

Mechanism	SPT	NGET	SHET
New Generation Connections (MW)	6,503	15,696	362
New Demand Connections (MVa)	282	4,316	n/a
Boundary strengthening work (MW)	n/a	8,814	n/a

The next section provides an overview of the TOs' reported activities over the first three reporting years for each mechanism, along with their current delivery expectations for the five-year price control period. We present a five-year overview to offer a straightforward and comparable perspective across all TOs.

We note, however, that the mechanisms apply to qualifying works anticipated to deliver within the five-year period and in year 1 and year 2 of the next price control period (referred to as the 'T2+2 period'[18]). Further information on the TO's current forecast of

[17] A summary of the RIIO-2 volume driver mechanisms can be found in chapter four of: https://www.ofgem.gov.uk/sites/default/files/docs/2021/02/final_determinations_et_annex_revised.pdf.

[18] To avoid "cliff edge" funding within a finite price control period and to mitigate concerns with projects transitioning between periods, the UMs have been calibrated to fund projects commencing in T2 and delivering outputs during 2026/27 and 2027/28.

output delivery across the T2+2 period (reporting years 2026/27 and 2027/28) is separately presented in the subsidiary document published alongside this report.

NGET: Generation volume driver

NGET's delivery progress is broadly on track compared to the levels initially anticipated after the third reporting year.

Across the five-year period, NGET's current expectation is for output delivery to be 15.7 GW, which is higher than the initial level anticipated for this period. This is primarily driven by changes in the energy landscape since the RIIO-2 baseline allowances were set and a larger than expected rise in requests for new transmission connections.

Excluding the impact of PCD delivery, NGET's expects the delivery of a further 38 projects in the next two years, driving a significant rise in output capacity (7.28 GW) expected by the end of March 2026 through the volume driver mechanism.

Table 6: Generation connection output capacity (MW) in NGET's network

MW	2022	2023	2024	2025	2026
actual / forecast	5262	150	3000	3476	3809
baseline	5262	300	2277	2499	3150

The values in the table above do not include projects that are currently expected to provide outputs in the T2+2 period.

NGET: Demand volume driver

NGET is broadly on track when compared against expect levels after the third reporting year.

Across the five-year period, NGET's current expectation is for output delivery to be significantly more than the baseline targets – connecting 4.3 GVa of demand capacity compared to an expected level of 2.7 GVa across the five-year RIIO-2 period.

Excluding the impact of PCD delivery, NGET currently anticipates the completion and delivery of a further eight projects by the end of March 2026, driving a further rise in connected demand capacity (2.5 GVa). NGET's current forecast for the full 5-year period is for 4.32 GVa of additional capacity to be delivered through the volume driver.

Table 7: Demand connection output capacity (MVA) in NGET's network

Note: A zero value was assumed for the volume of connected capacity in the final reporting year of RIIO-2 when the mechanism was set.

MVa	2021/22	2022/23	2023/24	2024/25	2025/26
actual / forecast	1,020	292	500	1,544	960
baseline	1,020	700	480	480	0

The activity values in the table above do not include projects that are currently expected to provide outputs in the T2+2 period.

NGET: Wider Works volume driver

The mechanism dedicated to strengthening work on network boundaries across the network in England & Wales, is currently below the delivery trajectory initially anticipated. This is the result of wider changes to the Network Assessment Options (NOA) process led by the NESO and the impact of these changes on a number of investments. However, NGET expects the scale of delivery to recover and for the delivery position to exceed the anticipated level across the full five-year period.

In 2023/24 NGET delivered two projects to strengthen network boundaries through the volume driver mechanism, adding 0.72 GW of boundary capacity. This brings the total projects delivered within the first three years of the RIIO-2 period to three, and the total boundary capacity uplift delivered to 0.85 GW.

NGET's currently expects delivery to significantly increase over the remaining two years of the five-year period – a further boundary capacity increase of 8 GW is anticipated from the completion and delivery of a further nine projects across this time period.

Excluding the impact of PCD delivery, NGET's current forecast for the five-year period is for 8.8 GW of additional boundary capacity to be delivered through the volume driver.

Table 8: Cumulative boundary capacity (MW) in NGET's network.

MW	2021/22	2022/23	2023/24	2024/25	2025/26
actual / forecast	0	130	846	7,582	8,814

SPT: Generation volume driver

SPT's delivery progress is below the expected trajectory initially anticipated after the third reporting year (2.33 GW expected against 1.95 GW delivered).

Across the five-year period, SPT's current expectation is a significant increase in the delivery of new generation capacity. SPT's currently expects to connect a further 27 projects with an additional 6.5 GW of generation capacity before the end of the five-year RIIO-2 period.

Table 9: Generation connection output capacity (MW) in SPT's network

Note: A zero value was assumed for the volume of connected capacity in the final two reporting years when the mechanism was set.

MW	2021/22	2022/23	2023/24	2024/25	2025/26
actual / forecast	605	415	927	1,373	3,183
baseline	1015	1120	191	0	0

The activity values in the table above do not include projects that are currently expected to provide outputs in the T2+2 period.

SPT: Demand volume driver

SPT's delivery progress is below the expected trajectory initially anticipated after the third reporting year (6.52 MVa expected against zero delivered).

This is the result of changes to the original baseline plan driven by changes to demand customer-driven schemes (e.g. Network Rail) and the broader updates through the NOA and Holistic Network Demand (HND) processes.

Across the five-year period, SPT's current expectation is for output delivery to be below the level initially anticipated when the mechanism was set – connecting two projects (both in the third reporting year) with a total capacity of 282 MVa.

A further six projects are currently expected to connect and deliver an additional 412 MVa of demand capacity in the T2+2 period (694 MVa in total across the seven-year period).

SHET: Generation

The activity progressed is currently on track with the delivery trajectory anticipated when the mechanism was established.

Forecasted generation is based on SHET's internal Likely Outturn Assessment (LOA).

We note that SHET has received a larger number of new generation connection requests to its network since the beginning of RIIO-2 than initially expected, a trend that is expected to continue. Across the five-year period, therefore, SHET's current expectation is for output delivery to connect 362 MW of new generation capacity.

Table 10: Cumulative generation connection output capacity (MW) in SHET's network

Note: The anticipated level of capacity was set at zero across RIIO-2 when the mechanism was set.

MW	2021/22	2022/23	2023/24	2024/25	2025/26
actual / forecast	0	0	50	156	362

The activity values in the table above do not include projects that are currently expected to provide outputs in the T2+2 period.

Our view: The connection landscape is evolving, with more customers seeking connections to the transmission network than initially assumed when the RIIO-2 baseline plan was set. Consequently, over the five-year period, all TOs currently expect a substantial rise in the connection capacity to be delivered under these mechanisms. We note that TOs consider themselves to be on-track to increase capacity in each electricity transmission network and to meet the strategic goals set for 2030 and 2050.

Overall, we currently hold the view that the delivery expectations throughout the price control period confirm that the volume driver mechanisms are functioning as intended, even in a challenging environment.

Chapter Four: Innovation

In this chapter, we provide a brief overview of the expenditure related to the innovation activities for each company.

Innovation

The RIIO-2 innovation package encourages TOs to do more than business as usual when it comes to finding a better, cheaper, smarter or more agile way of doing things. The package includes one mechanism continued from RIIO-1: the Network Innovation Allowance (NIA) and one new mechanism for larger schemes, the Strategic Innovation Fund (SIF).

A further mechanism, the Network Innovation Competition (NIC), ran during the RIIO-ET1 price control period to fund innovative low carbon or environmental projects. Although the initiative stopped at the end of RIIO-1, a condition exists in the RIIO-2 framework to make provision for arrangements relating to the administration and governance of projects in receipt of NIC funding.

NIA performance

The purpose of NIA funding is designed to enable companies to take forward innovation projects that have the potential to address consumer vulnerability and/or deliver longer–term financial and environmental benefits for consumers, which they would not otherwise undertake within the price control. The FD set the following allowance amounts for RIIO-2 NIA (£million, 2018/19 price base).

- NGET: £49.3m
- SHET: £8m
- SPT: £13.5m

This year all TOs have registered additional projects for funding under the NIA funding streams. The position of each TO is as follows:

- SPT have spent £1.22m across 16 NIA projects in the third reporting year (all either in progress or were closed in during the reporting year). The cumulative spend over the first three years has reached £3.3m.
- SHET have spent £1.55m progressing 12 NIA projects in 2023/24, and a cumulative spend £2.5m over the first three years of RIIO-2.
- NGET have spent £9.7m progressing 57 NIA projects in 2023/24 (27 NIA projects this year). The cumulative spend incurred by NGET over the first three years has reached £16.3m.

Strategic Innovation Framework (SIF)

The SIF is a new mechanism introduced in the RIIO-2 framework which seeks to provide flexibility to respond to innovation challenges as they arise, and potentially secure additional innovation funding for eligible SIF Projects (under SpC 9.19 of the licence).[19]

The SIF adopts a three Phase Project approach to mitigate the risk associated with innovation: Discovery Phase, Alpha Phase and Beta Phase. The Discovery Phase focuses on feasibility, the Alpha Phase on experimental development, and the Beta Phase on deployment and demonstration. We note that the SIF reporting timeframes (calendar year) cross over the RRP timeframe boundary (financial year).

NGET has received funding for six projects so far through the SIF mechanism. Two projects have been stopped as the initially expected benefits have not materialised, and development work is progressing on the third project (e.g. 'Look NorthH2' project) to examine the potential economic feasibility of developing offshore energy hubs. Three SIF projects remain in the Discovery Phase.

Overall, NGET reports a total spend of £1.1m in 2023/24 across the SIF portfolio (£2.1m cumulative spend across the first three years).

SPT has received funding for five projects so far through the SIF mechanism. The projects are progressing through the phases of development as RIIO-2 progresses. For example, the 'Energy Hub' project completed a successful application for Beta funding.[20] SPT's total spend across its SIF projects in 2023/24 is £1.3m (£3.2m cumulative spend across the first three years).

SHET has received funding for ten projects so far through the SIF mechanism. Projects being progressed include:

- the 'Network-DC project' which used the Discovery phase to simulate the use of DC Circuit Breakers in onshore HVDC hubs. The project has since completed a successful application for Beta funding.
- The INCENTIVE project, which is attempting to develop technology solutions to allow offshore wind farms to provide stability services to the grid.
- The System Strength Measurement and Evaluation (SYSMET) project, started in March 2024, is looking to create a pathway to improve visibility of system strength status.

Overall, SHET's total expenditure in 2023/24 across the SIF project portfolio is £2.13m (£3.04m cumulative spend across the first three years).

[19] Details on the fund and project decisions can be found here: Strategic Innovation Fund (SIF) | Ofgem

[20] The project seeks to use power electronic technologies to establish rail stations as flexibility hubs, with the aim of accelerating the decarbonisation of Network Rail (the largest electricity consumer on SPT's network).

NIC funding

- SPT has developed and deployed hybrid synchronous compensators (Project Phoenix). SPT's cumulative spend over the first three years is £0.16m[21].
- SHET has developed and completed both projects that were awarded NIC funding, the Multi-Terminal Test Environment and a New Electricity Suite of Transmission Structures (NeSTS). Total spend across the first three reporting years on these projects is £1.57m.
- NGET have spent £15.4m on NIC projects over the RIIO-2 period. The portfolio consists of six projects in progress, including work to convert an existing 400kV substation into a high voltage innovation centre and a project aiming to develop a novel method of uprating Overhead Lines.

Looking forward

The network companies are responsible for enabling innovation, which will help to drive down costs and result in new products and services for consumers. It is important that the right regulatory regimes are in place to encourage innovation and support investment in the most efficient solutions. We are continuing to consider improvements to how networks report on their innovation work.

[21] The innovation project "Phoenix" was completed in April 2022 and was transferred to business as usual.

Chapter Five: TO's cost and allowance performance

Our assessment of Totex performance

Table 11 summarises the TO's current view of totex expectations against the adjusted totex allowance position through to the end of the current five-year price control period.

Table 11: Current view of five-year expenditure and allowance

£ billion, 2018-19 prices	NGET	SHET	SPT	TOTAL
Current forecast of T2 expenditure	7.4	4.2	2.6	**14.2**
Current forecast of T2 allowance	7.5	4.2	2.7	**14.4**
Performance[22]	- 0.1	- 0.01	-0.02	**-0.6**
Performance (%)	1.6	0.1	1.3	**1.1**

All TOs currently anticipate underspending relative to their expected totex allowances across the five-year price control period, with forecast underspends ranging between 0.2% and 1.6% across RIIO-2.

The primary drivers of the totex underspend are associated with costs incurred in load-related (LR) activities (new assets) and non-load related (NLR) activities (monitoring, maintaining, and replacing existing assets).

- **National Grid Electricity Transmission** expect total cost to be below allowance, primarily due to changes in intervention strategies on existing assets. This is concerning given there is work on outstanding NLR activity that still needs to be carried out. On the LR side, customer-driven changes in the investment portfolio are driving a forecast underspend.

- **Scottish Hydro Electric Transmission** anticipate a small underspend across the entire RIIO-2 period. This is due to expected reductions in LR activities and the timing and internal processes to progress the necessary NLR activities. These reductions are offset by a projected overspend in the indirect cost category, attributed to organisational growth and the increased costs required to deliver Pathway to 2030 commitments.

- **ScottishPower Transmission** expect total cost to be marginally below allowance, primarily due to external challenges in progressing and delivering the capital program, such as re-profiling activities to manage system access issues. These cost reductions are offset by expected overspend in the indirect cost category, mainly due to the delivery of ASTI projects.

[22] Negative performance numbers represent an expected underspend position across the price control period.

Our view

All TOs have fallen behind their expected delivery schedules. This delay is particularly noticeable in the work program focused on existing network assets, primarily due to the TOs rescheduling intervention strategies.

While it is not uncommon to see increasing levels of activity throughout a price control period, a significant boost in activity is essential to meet the asset-health related delivery goals and to reach a total spend by March 2026 that aligns with the TOs' current performance estimates.

Although all TOs expect an increase in the scale of delivery, along with a corresponding rise in spending, achieving this will be challenging. It will require the robust execution of credible plans, rapid progress, and stringent cost control in an environment of ongoing cost pressures.

Success, therefore, will be driven by effective management of the following factors:

- **Constraints both for internal and external specialised resource.** Resourcing is recognised to be a significant constraint. With the increased workload across the international supply industry, it is a "seller's market". This makes it more challenging to secure external resources that align with internal constraints.
    - The challenge of resourcing is a critical strategic issue and one that any well-run business must manage and respond to proactively. We expect TOs to be taking decisive steps to stay ahead of these challenges.
- **Competing priorities.** It is naturally difficult to increase activity rates when there is increasing levels of other important work (e.g. ASTI and Net Zero goals) competing for the same resources. The expected increase in activity rates will also place an additional burden on TO's internal decision-making processes to accommodate the increase in total capacity.
    - While we recognise that the energy landscape has significantly changed since RIIO-2 was initially set in 2019, effectively prioritising actions and decision-making processes when faced with competing priorities is crucial for success. TOs' structures must be flexible to adjust priorities as new challenges arise, and to accommodate changes in the business environment.
- **Availability manufacturing capacity.** Assumptions made at the time of the RIIO-2 business plan regarding equipment lead-times have been incorrect and opportunities to recover the delivery plan have been limited.
    - Divergence from initial assumptions is common in the energy sector. However, it is essential that TOs ensure strategic goals are met and stakeholder confidence is maintained by proactively identifying and addressing delays, optimising processes and managing risks.
- TO's have limited control of **system access**, and it is subject to change at short notice. As the network decarbonises, this volatility will increase. The ability to respond flexibly to outage constraints and cancellations will be crucial.

    - We expect TOs to take decisive steps in maintaining transparent communication with key stakeholders and to continue to develop robust contingency plans to address potential changes, and ensure flexibility in project schedules to accommodate sudden shifts.

- **The effectiveness of the TOs' planning process** to economically bundle work and optimise system access remains unproven at the scale required. The anticipated activities are complex and will require coordinating outages, which have historically been challenging for all TOs to identify and execute.
    - We expect further progress to be made in establishing and developing a stronger framework to enhance coordination and collaboration among key stakeholders.

Looking forward

We are dedicated to enhancing our network regulation to address the challenges posed by the rapid shift to clean energy. It is crucial that the transmission businesses demonstrate the same level of commitment to delivery, and we will ensure they are fully accountable for their performance.

One example of our proactive investment strategy is the recent launch of the £4bn Advanced Procurement Mechanism (APM)[23]. This initiative allows TOs to place deposits for future equipment and services without tying the procurement to specific projects. As a result, TOs can secure future supplies well ahead of traditional timelines.

The success of the TO's strategies, especially in the delivery of the remainder of the RIIO-2 plan, will be dependent on making a positive impact across three main interrelated constraints: supply chain capacity, resource prioritisation and system access availability. To deliver the significant upturn in activity expected, TO's need all of these to be available at the same time.

The upcoming challenges are clear and well-understood. TOs' ability to tackle these challenges successfully, along with the progress made towards achieving the end-of-period goals, will be subject to ongoing scrutiny through the future annual reporting information provided.

[23] https://www.ofgem.gov.uk/decision/electricity-transmission-advanced-procurement-mechanism