SGN

Cost Assessment and Benchmarking

December 2024

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Section A Introduction and Purpose

This document sets out our approach to building our efficient cost base, including the approaches we have used to determine efficient expenditure and proposals to assess efficiency across the sector.

1. Our business plan ensures that our share of customer bills remains affordable through efficient and value-driven investment, delivers our core safety obligations and responds to our customers' requests for us to do more to reduce our impact on the environment and to support our most vulnerable customers.

2. To present this appropriately, we have structured this document to ensure it covers the requirements outlined by Ofgem in its Business Plan Guidance, as set out in the table below:

Table 1: Document Alignment with Ofgem Business Plan Requirements

Section	Areas Covered	Link to Ofgem Requirements
Section B - Executive Summary	• We summarise our cost proposals and thinkings on efficiency from the current position to our GD3 plan	
Section C - GD2 Efficiency	• Our GD2 performance against both allowances and industry actual performance within the first three years of the current price control, • The approach Ofgem carried out for cost assessment in GD2 and some observations with latest performance data, • How Real Price Effects (RPE) and Ongoing Efficiency (OE) have outturned within the GD2 period compared to originally set levels.	**6.7.1** - we discuss our historical efficiency position with is the basis of our future efficiency **6.7.3** – we present our clear rationale for cost considerations within our activity level efficiency assessment **6.12.3** - RPE GD2 performance **6.14.2 to 6.14.4** - OE GD2 performance
Section D - Our Efficient GD3 Plan	• Explain our part of the utility bill impact • How Cost Benefit Analysis (CBAs) have been used to justify investment choice and demonstrate Value for Money • An overview of the cost movements between GD2 and GD3, including the committed savings within our plan	**6.2** - we explain our CBA process used to justify investment choice as well as demonstrate the efficiency within our GD3 plan **6.5** - we discuss CBA approach and summarise outputs **6.7.1** - explain our GD3 efficiency commitments

Section E - Assessing Efficiency	• Suggested approaches to assessing efficiency within GD3 • Discussion on regional and company-specific factors, covering requirements and evidence • The cost drivers to be considered for determining efficiency • The use of multiple models in determining a robust efficiency assessment • What is a suitable efficiency challenge to apply • Ongoing Efficiency approach • Real Price Effects approach	**6.2** - we discuss the cost drivers that Ofgem should consider for assessing efficiency within models **6.7.3** - we put forward the approaches and rationale we believe should be considered for comparing efficiency, including information on regional and company-specific factors **6.8** - we discuss the application and justification of Regional and Company Specific Factors **6.12** - we explain an updated Real Price Effects methodology **6.14** - we justify our Ongoing Efficiency commitment
Section F - Our GD3 Cost Proposals	• We explain our cost areas in detail, including the factors that drive costs and how we have embedded efficiencies in particular areas • We put forward our approach to uncertainty	**6.2** - we discuss cost drivers for our GD3 plan as well as discussing where justification information can be found in our plan and cost profiles **6.4** - for each area we put forward the key driver for expenditure **6.7.1** - we discuss where appropriate our internal / external benchmarking assessments used to support our GD3 proposal **6.7.3** - for each cost area we explain if there should be a regional or company-specific adjustment consideration **6.7.4** - we detail the costs that are directly Totex funded **6.7.5** - we explain our approach to uncertainty and how it manages risk for customers

3. To ensure openness we will trace position from our GD2 allowances to delivered performance and the factors that affected historic performance and will affect future performance. We may pull out key information from other documents but will sign post for further information in respective areas where it will aid in the understanding of our cost efficiency proposal.
4. All monetary figures quoted within this document are presented in a 2023/24 real CPIH basis unless otherwise stated. This document should be read in conjunction with our main business plan and has a high inter-linkage with other key documents such as the Network Asset Management Strategy, Workforce and Supply Chain Resilience as well as others.
5. Finally, we thank you for taking an interest in our view of cost assessment and benchmarking – our customers and stakeholders are at the centre of what we do, and we fully recognise the need to ensure our cost proposals offer value for money to all in society.

Section B Executive Summary

We recognise the impact our business plan has to consumers, both on our part of their utility bill and the value for money our investments can provide to society. We have worked throughout our business plan setting to ensure that our processes and costs are efficient to ensure the investments we make drive value for customers. We present our plan that builds on our improving efficiency position in GD2, offering clear value for money with our investment decisions and a long-term stable bill.

6. Our baseline total investment proposal for the GD3 period is £4,457m after our proposed commitment of ongoing efficiency.

Figure 1 Our GD3 Baseline Cost Proposal

Baseline Totex £m (2023/24 prices)		High Quality Service	Secure and Resilient Supplies	Infrastructure fit for Low cost Transition	System Efficiency	Our GD3 Plan
SGN	Opex	78	801	0	72	951
	Capex	0	546	19	27	591
	Repex	0	2,030	0	0	2,030
	Total	**78**	**3,377**	**19**	**99**	**3,572**
					+ General Running Costs	**974**
					- Less Ongoing Efficiency	**-89**
					Baseline Cost Position	**4,457**

Source: SGN analysis on GD3 BPDT submission

7. Our plan is primarily focused on maintaining secure and resilient supplies, with our investment targeted to replace nearly 5,000km of metallic mains with plastic pipes, responding to over a forecasted 800,000 publicly reported escapes as well as improving the safety of over 120,000 risers in our Multiple Occupancy Buildings (MOBs).

8. We also plan investments to drive (i) System Efficiency through our Data and Digitalisation plans, (ii) High Quality Service through our industry leading customer service performance and (iii) Infrastructure fit for Low-cost Transition through our preparation for biomethane blending and environmental focussed upgrades to our properties.

9. To enable this investment, we have a core set of running costs to ensure our frontline operatives are focussed on the core activities our customer require and can work as efficiently as possible, consisting of our IT, property and fleet costs.

10. Within our main business plan we discuss our 21 commitments which are directly linked to the funding we request within our submission.

11. Within this document we discuss mostly our baseline ex-ante funding ask for the GD3 period, but to ensure an efficient management of uncertainty, we have put forward costs within uncertainty mechanisms where there is future uncertainty on workload or costing, discussed within section F.6 .

12. When including those costs that are expected to be triggered within the GD3 period, our best-view cost proposition is £4,736m, which includes elements such as VCMA[1] and NZARD[2] investments that are treated as a Use It or Lose It funding, to ensure the expected societal value from such investments are delivered. We list out in more detail the elements we have marked as best-view Totex in section F.6 .

[1] Vulnerability and Carbon Monoxide Allowance

[2] Net Zero and Reopener Development Fund

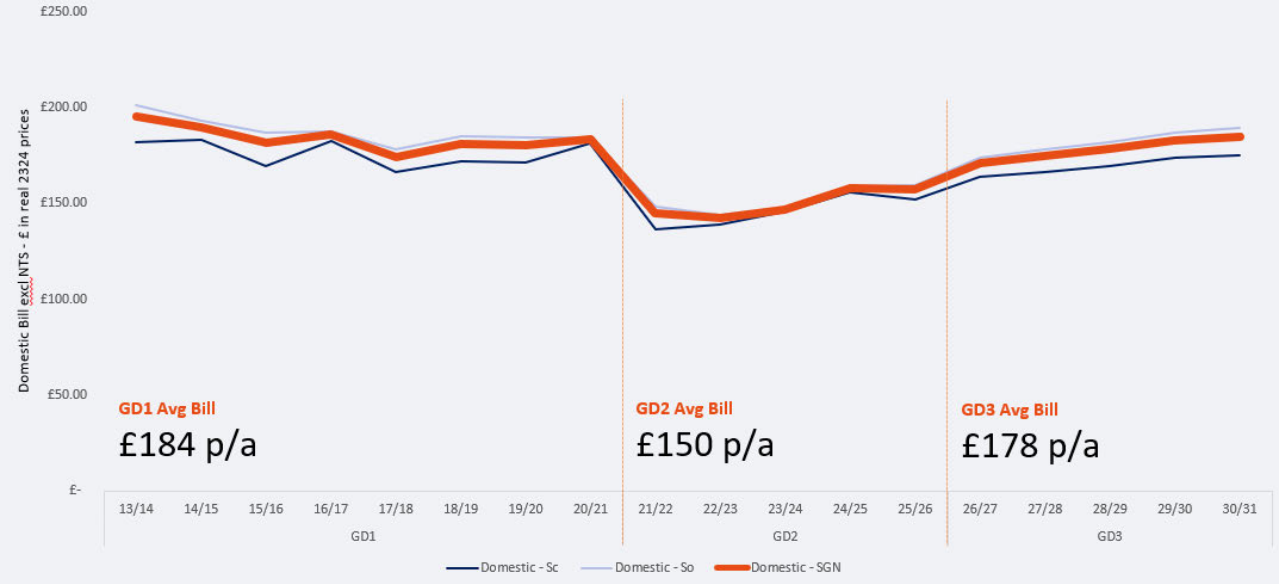
13. We believe the balance of the ex-ante and ex post funding requests in our plan to ensure customers and stakeholders have a balanced risk profile within the next price control, ensuring costs are fair and required to deliver our outputs.

B.1 Bill Impact

14. Our best-view business plan proposal is expected to drive a GD3 average bill at £178[3] per annum for domestic customers. This figure is based on the same Ofgem financial parameters for depreciation and the Weighted Average Cost of Capital (WACC) as per the GD2 period. We note that Ofgem is proposing adjustments to areas such as semi-nominal WACC and accelerated depreciation. These are excluded from the bill impact above and discussed in more detail in Chapter 10 of the business plan and within our finance document (SGN-GD3-SD-09).

15. Based on the assumptions set, our average annual bill for GD3 will be £27 (18%) higher in real terms than our average GD2 bill, but still £7 (4%) lower in real terms than our average bill for GD1.

Figure 2: Long-term Trend of SGN Domestic Bill Impact in real 2324 prices



Source: SGN analysis

16. It can be seen from the figure above that while bills will increase over GD3, we have managed to reduce our contribution to customer utility bills over the long term. We put forward in section D further detail the actions we have taken to keep our bills as low as possible.

B.2 Our Current Cost Efficiency

17. Costs in the GD2 period have been higher than expected when the GD2 allowances were set.

18. For the full GD2 price control we expect to over-spend allowances by £135m (3.8%) with the main challenge in our Southern network of an over-spend to allowances of £188m (8.1%). This reflects the latest view of expenditure and includes recent re-opener submissions over and above our RRP submission.

19. Under-performance within our Southern network against allowances is driven by challenges with delivering our Repex programme for the GD2 allowed funding, as well as increasing cost pressures experienced within network Opex.

20. Within Southern, due to challenges in aligning the supply chain in the southern region with the Ofgem allowances, our Tier 1 Repex programme is behind schedule and we have reduced our workload forecast for delivery in the GD2 period by 220km. While we remain fully committed to delivering the original target, and more importantly managing the safety risk of our network, we have ensured we put forward a realistic target to manage any risk of over-recovery of funds from customers within the GD2 period.

[3] We present the domestic bill 2023/24 real price base to exclude the impact of CPIH inflation. The Local Distribution Zone (LDZ) element of bill excludes National Transmission System (NTS) charges as well as any GD3 wider financing proposal changes. We assume customer numbers are as per SGN view which is aligned with the FES 24 counter-factual.

21. We are using the lessons learnt from the challenging start to GD2 to build our supply chain for the increasing workloads projected within GD3, and as such we are continuing to strive to meet the original Tier 1 workload target within GD2, but also are confident we will be right sized for the GD3 workloads required.
22. Our network Opex costs have also experienced cost headwinds for the GD2 period against allowances, with repairs being a main area of overspend to allowances in this area due to weather and updates to processes and procedures that have arisen from safety-related events.
23. As discussed throughout this document, we note the overall industry over-spend to allowances is 5% with a noticeable trend of under-spends within networks in the northern parts of Great Britain and over-spend for those networks in the southern parts of Great Britain.
24. In GD2 we were extremely concerned that the outcome of the cost assessment approach appeared to have the greatest catch-up efficiency for the southern areas of Great Britain and this was such an outlier that it did not pass a 'sense-check' that gave a level of confidence or credibility. With hindsight, it has been clear that the actual out-turn of costs has been significantly higher than the cost assessment approach implied. This is discussed in more detail in section C.3
25. Within this document we list out some challenges of the GD2 cost assessment models, including over-reliance on a single Totex model and concerns with some cost driver choices.
26. Within the GD2 price control and due to the significant overspend that we are forecasting, we have been taking all reasonable measures to reduce costs while not compromising the safety of the network. We are focusing the organisation on delivering for the frontline while reducing costs and driving improved performance through the business.
27. Through a rigorous process of improvement and change we have identified productivity improvements that, when fully implemented in the next year will deliver a total benefit of c. £47m per year. These improvements are embedded within the end point of our GD2 cost base position and give us confidence that we are entering in GD3 from a position of efficiency.

B.3 GD3 Cost Efficiency position

28. We have carried out extensive stakeholder engagement works[4], listening directly to our customers to understand what is important to them within the GD3 period and onwards. Understandably in the current macro climate, a key consideration was bill impact and the consistent impression that utility bills across all areas are increasing.
29. Taking this feedback on board, we have carried extensive work across all parts of our business plan starting from our efficient GD2 position and testing each of our main investment areas to ensure we offer value for money to customers for our investments. We measure the quality of our plan through three different areas which are summarised below.

1. Value for Money

30. We aim to demonstrate that our investments offer value to customers in the long term by using CBAs to show the societal value to customers.
31. The CBA approach we use is in alignment with Ofgem's guidance, using the provided template to ensure alignment between the calculation of the net present value that our investments offer. The CBA is focused on societal value and considers the direct savings our investments make to our cost base as well as the environmental and safety benefits that can be derived.
32. We have analysed our investments on a 16-year payback period from the start of the GD3 period, meaning we target a 2043 date for our societal net present value to be positive. We believe this is a stretching target of generating value for money for infrastructure-based investments, as we interpret Ofgem's guidance is to use 16 years from the first year of investment during the GD3 period[5].
33. We calculate our investments are net present value positive by 2043 by £10,422m.
34. Within section D we discuss our approach to assessing value for money.

[4] Stakeholder Engagement and Decision Log - SGN-GD3-SD-12

[5] RIIO-3 Business Plan Guidance – Annex 1: Investment Decision Pack Guidance (Sept 2024) – para 4.32 to 4.33

2. Affordability

35. In B.1 above, we demonstrate that, across the longer term from 2013, excluding the movement of CPIH-real terms, our bills are projected to be lower for our customers while we generate positive value for money for customers up to and beyond 2047.

36. We consider that our GD3 plan offers good affordability to customers by returning the Gas Distribution Network's (GDN) component in bills to a level comparable to GD1 in absolute, CPIH-real terms. Our share of the total bill will also be lower than in GD1.

3. Efficiency

37. We have embedded committed efficiencies of £327m across the GD3 period, through both catch-up efficiencies and an Ongoing Efficiency commitment of 0.5% per annum, both of which are further explained within section D.3 .

38. A brief summary of some of the strategies employed to deliver these efficiencies is highlighted below.

Workforce Resilience

39. Within GD3 we are implementing new working practices to keep our people and customers safe and ensure high levels of productivity from a larger workforce. We also need to meet our employees' expectations of work-life balance, to retain motivated and committed people who deliver more for our customers. As such, our workforce resilience strategy for GD3 focuses on (i) enhancing workforce flexibility, (ii) prioritising safety and wellbeing, (iii) providing competitive and equitable compensation, and (iv) promoting career development and progression. Notably, we are committed to:

    - Ensuring no-one works for longer than 12 hours at a time, complying with the new Fatigue Management Requirements;
    - Recruiting and training more than 150 early career routes; and
    - Continually striving to reflect the communities that we serve.

40. The requirement we have to implement new Fatigue Management Requirements from the Health and Safety Executive (HSE) will create headwinds to our cost base, and as part of the externally validated analysis, the impact of these changes will have a disproportionally higher impact on Scotland than to Southern, due to greater sparsity in our Scotland area.

41. We recognise these challenges drive challenges in keeping costs low for our customers, and as such we have used industry best practices and innovative approaches to support the way we recruit. With our recent large recruitment drive within our Southern network in GD2, we have used more volume based approaches to onboarding to help bring our employees within SGN quicker.

42. We have worked hard to streamline the training process and routes to competency, as it is not enough to simply source and train frontline staff, we need to ensure they demonstrate competency in performing our safety critical activities.

43. Further information regarding our strategies around our workforce resilience can be found within the SGN-GD3-SD-03 Workforce and Supply Chain Strategy.

Supply Chain Strategy

44. We strive to create an efficient and sustainable supply chain. The correct contracting strategy and a streamlined supplier base can lead to improved quality control, improved risk mitigation and flexibility to meet business demand. Through our supply chain resilience strategy, we will address the key issues for GD3, such as (i) the increasing complexity in the work that needs to be delivered, (ii) increasing contractor costs, and (iii) limited internal and external labour.

45. Specifically, to ensure efficiency and long-term value for money for our customers, for GD3 we have made the following commitments:

    - We will be ranked in the top 3 for efficiency for both our networks in a well-calibrated cost assessment that reflects the efficient costs of working in our network areas; and
    - We will deliver more than £89m of operational savings through core innovation across GD3.

46. Our strategy focuses on improving supply chain resilience, reducing inefficiencies, and optimising cost management, all of which are critical components of our transformation efforts. We aim to do so by creating long-term capacity and maintaining maximum competitive tension.

47. Further information regarding our strategies to drive efficiencies within the supply chain can be found within the Workforce and Supply Chain Strategy (SGN-GD3-SD-03).

Competition

48. We are looking to continually promote competition and build a more secure and resilient supply chain with a greater ecosystem of companies and contractors able to deliver the workload that we need. It is widely evidenced that securing the correct procurement strategy alongside a streamlined supplier base can bring multiple benefits including increased quality control, improved risk mitigation, and flexible arrangements to meet business demand. We therefore dedicate significant time and resources to working with the supply chain helping them build and looking to give them confidence to invest and build their business.

49. In GD3, we anticipate that this will become increasingly challenging as a result of the Repex programme coming to an end and the negative headlines that are presented by the National Energy System Operator (NESO) and the Regulator on the role of gas going forward. If the gas networks become defined as a 'sunset' industry, and other utilities – water and electricity distribution – continue to increase the pace of their investment then it will become increasingly challenging to encourage new entrants and competitive tension across suppliers.

50. Further information regarding our strategies to drive efficiencies through competition can be found within the Workforce and Supply Chain Resilience Strategy (SGN-GD3-SD-03).

Innovation

51. We believe consumers should be at the heart of Great Britain's energy transition and engaging with both domestic and business consumers to deliver decarbonisation is critical to success.

52. We have set out an ambitious £51m plan, which is in line with our investment in GD2, to sustain the trajectory to net zero, while maintaining a network that will benefit consumers now and, in the future and is aligned with Ofgem's Sector Specific Methodology Decision (SSMD). Specifically, our commitment to innovation and the proposed funding will enable us to focus on three key areas which are underpinned by understanding our consumers' needs:

    - **Today's network**: Delivering core (Business as Usual (BAU)) innovation and adopting new technologies enabling us to be more efficient, for example: building on keyhole repair techniques, safer with projects like 'real time risk assessments', and more sustainable through zero-emission construction. Key to this is developing a detailed understanding and responding to the changing needs of our consumers, especially those in vulnerability, through the transition to net zero.

    - **Network Transition**: Establishing a whole system approach to the energy system transition with new regional engagement and interface functions to support the NESO and Local Authorities (LA). Greening the network, through; maximising biomethane injection; converting two of our Statutory Independent Undertaking (SIUs) to biomethane; and developing hydrogen blending, in support of the UK Government's decision. Developing a major programme of optioneering and delivery of MOB decarbonisation through a whole system approach. In addition, we plan to develop a potentially world-leading blending project in Edinburgh, building on our Local Transmission System (LTS) project.

    - **Future Network**: Support decarbonisation of the whole energy system through effective and productive re-purposing of our assets, moving away from natural gas transportation. Understand the impact of network decommissioning on our customers, network operation, policy, and Regulatory frameworks as part of a credible plan for a viable net zero transition.

53. Further information can be found within our Innovation Strategy document (SGN-GD3-SD-05).

Digitalisation

54. Within the GD2 period we have invested in our Data and Digitalisation approach and have this open and transparent with annual reporting, with our latest publication released in March 2024[6].

55. We have invested in our people, processes, and technology to establish the foundations for governing our critical data assets. Through this investment, our Enterprise Data Management team are developing their expertise, embedding our governance framework, and cataloguing our critical data sets. We have also implemented our Open Data Portal and published four open data sets with more in the pipeline, providing the mechanism to share those data assets required by our data consumers and support the journey towards net zero solutions.

56. Our investments within Data and Digitalisation are a critical enabler for wider societal value, opening our vast information to assist those in delivering to net zero by improving the whole system efficiency. We anticipate with the NESO and

[6] SGN Digitalisation Strategy, March 2024

Regional Energy Strategy Plans (RESP) functions becoming operational in the next seven years the need for collaborative planning to greatly increase, providing value to consumers.

57. Further information can be found within our IT and Telecoms Strategy document (SGN-GD3-SD-07).

B.4 Our Efficiency Commitment

58. We are confident the proposed GD3 cost forecasts are efficient for the information that is currently available, therefore we have made a commitment for both networks to be ranked within a top 3 position for comparative efficiency in a well-calibrated model.

59. This commitment includes an important aspect of having a well-calibrated model. It is clear with the industry overall over-spend to allowances, primarily within networks around London, that the GD2 model was not necessarily well-calibrated with some clear weaknesses that can be improved upon for the GD3 period.

60. We discuss within Section E the key improvements to cost modelling we put forward, which include:

    - Improvements on Regional Wage normalisations, including suitable acknowledgement of the differences between in house labour and contractor labour, for which networks are exposed at different proportions through exogenous factors and incur differing regional variances.
    - Approaches to normalisation for Repex complexity factors across networks, for which we believe the differences will be material towards the end of the IMRRP.
    - Appropriate drivers to be used for determining the efficiency of costs, including the use of repair workloads to determine repair costs as well as the suitability of MEAV as a cost driver.
    - The benefits of utilising multiple modelling approaches, through both differing drivers and also different model types such as the consideration of disaggregated models, which add clarity and transparency to cost assessment for both Ofgem and companies.
    - The evidence for setting an appropriate Ongoing Efficiency challenge, with our position steeped in following the data to ensure a stretching but achievable challenge is set.
    - The importance of setting suitable calibrated Real Price Effects, which have consideration of regional differences, suitable materiality thresholds set and appropriate indices.

61. With the above listed plus other aspects within our paper we believe a well-calibrated model can be achieved, ensuring suitable adjustments are made for regional and company-specific differences, drivers that appropriately explain costs across networks as well as models that are flexible enough to reflect different companies acknowledging that one way of working is not appropriate across Great Britain.

62. We have and will continue to be committed to work with Ofgem to ensure there is a suitable cost assessment modelling suite to accurately reflect the nuances of company cost forecasts. Only by being transparent across network companies and the Regulator will we be able to ensure a fair and appropriate allowance settlement is put forward to enable companies to complete vital safety and resilience workloads.

Section C GD2 Efficiency

We are confident that the expenditure SGN incurs on behalf of customers is efficient and drives value for money across both networks through the management of bill impacts, societal benefits, and the work we do with our vulnerable customers. Against allowances that Ofgem set using GD2 modelling approaches, we have experienced challenges for our Southern network but note the industry as a whole is also overspent. Once a suitable consideration of regional and company-specific factors, as well as other modelling issues are corrected, we believe Southern to be efficient at the end point of GD2. We are especially proud of our continued drive to keep costs down considering the considerable headwinds within the current climate in Great Britain.

C.1 GD2 Business Plan Accuracy

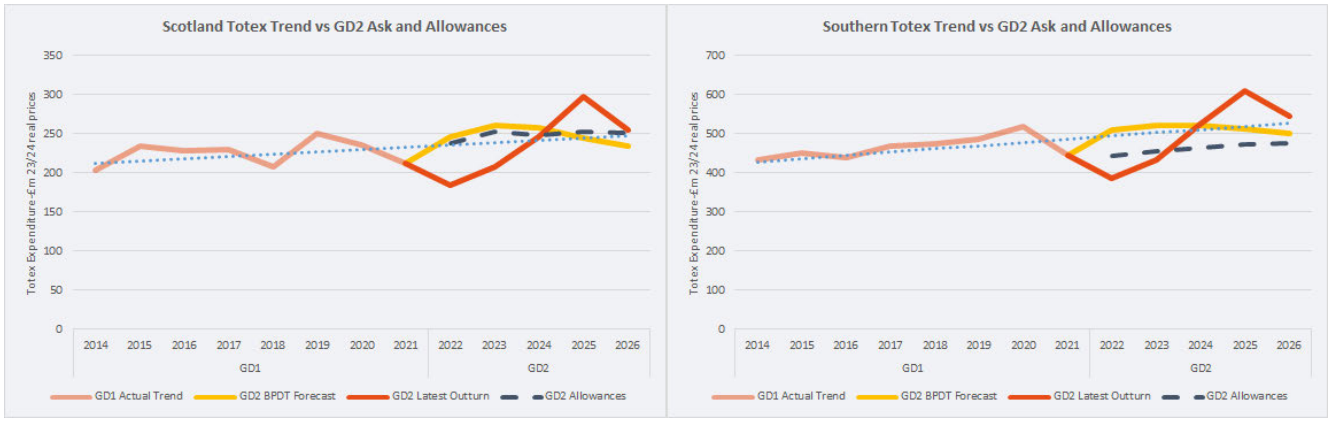
63. **We discuss comparisons of our original GD2 business plan submission against the Regulator derived allowances and final outturn for the period, highlighting our track record for our forecast submission accuracy and challenges with the GD2 allowance settlement.**

64. A key aim for regulation of monopolies is to ensure that each network operates as efficiently as possible. While benchmarking allows for comparison between networks, the Regulatory framework incentivises networks submitting open and truthful business plans, that companies feel represent their most efficient costs of operating.

65. Prior to discussing our GD3 business plan, it is useful for SGN to reflect on whether our previous business plans accurately reflected the true costs we would face in GD2, or whether the outputs of the GD2 benchmarking exercise was closer to the true costs we experienced.

66. Figure 3 shows our long-term Totex expenditure trends (dotted blue) against our original GD2 ask (yellow line) and the eventual allowances Ofgem determined (dashed line). We have then overlayed actual expenditure (orange line) which is distorted in part by the impact of Covid-19 at the end of GD1 and beginning of GD2.

Figure 3: Comparison of Totex in SGN GD2 Submissions with Allowances (£m)



Source: SGN analysis using GD2 Final Determination and GD3 BPDT submission

67. Our actual out-turn (orange line) shows a different phasing compared to our original forecast (yellow line) but across the GD2 period we are in line with our original forecasts in both Scotland and particularly our Southern network. We can see that our long-term trend of costs (dotted blue) traces both our original forecasted costs (yellow line) as well as how our actual out-turn (orange line). We have shown consistency in both networks for our cost forecasts across the price control period.

68. For Scotland, the allowances awarded (dashed line) were in alignment with our proposed forecasts for GD2, but for Southern the allowances awarded (dashed line) implied an expectation of a drop against both our forecasts (yellow line) and our long-term trend (dotted blue).

69. The differing allowances awarded in GD2 between Scotland and Southern are more challenging to understand when accounting for workload, which for the GD2 period across the core workload area of Repex had a similar movement in workload across Scotland and Southern. Despite this, the Southern allowances did not trace our historical trend in the same way Scotland did.

70. SGN management and shareholders work within both our Scotland and Southern regions, and while we do have some region-specific aspects overall our approach to core policies and management are consistent. It would seem unreasonable to expect a management team that can generate a frontier performance network (i.e. Scotland) to also be in control of a network that is deemed to be lower within the efficiency rankings (i.e. Southern). We believe this clearly highlights a bias within the modelling that does not appropriately account for the unique regional factors within the south of Great Britain.

71. The above graph further demonstrates that the outturn costs for both networks have stayed at the broad level we had forecast at the start of GD2, as well as following our longer-term cost trend movement. SGN believes this demonstrates a track record of providing accurate forecasts to the Regulator. While our costs may not reflect what the GD2 costs assessment procedures predicted, we believe that our historic and future costs presented in this business plan are an accurate assessment of the (efficient) costs each of our networks will face, considering each network's local pressures.

C.2 SGN and Sector performance against Allowances

72. Below we discuss the GD2 performance against allowances for our Scotland and Southern regions along with how our commitments and outputs for the GD2 period have been delivered. We also reference the GD sector performance against assessed allowance, to highlight the current imbalance of risk between company and customer which within the GD2 period creates a further burden to financeability through Totex performance.

73. The latest forecast of expenditure against allowances for SGN is an over-spend of £135m / -3.8% with Southern under-performing against allowances by £188m / -8.1% and Scotland slightly out-performing by £53m / +4.3%.

74. This is against a backdrop of industry under-performance against allowances of £591m or 4.5% which is currently displaying high variance in performance across all networks, even within the same ownership groups.

Southern GD2 Performance

75. We recognise against allowances our performance in Southern is challenging, seeing an 8.2% / £191m overspend in real 2023/24 prices. We do note, against our original submitted business plan for GD2 (after normalising for our recent Tier 1 Repex adjustment) we are on track to our committed business plan.

76. After GD2 Final Determination it was evident that the allowances provided did not appropriately fund us to complete the work we had committed to within our business plan, [redacted]

78. We discuss our learnings and how we are approaching our supply chain now in more detail within our Workforce and Supply Chain Strategy (SGN-GD3-SD-03). We have invested in ensuring we have the right support for our supply chain, building their trust and starting to see contractors come back to us for the GD3 period, ensuring we have an efficient workforce to deliver the required Repex workloads.

79. The other significant change in GD2 has been repair volume. Typically, and as we forecast in our GD2 business plan, we would expect repair volumes to reduce over time as the volume of Tier 1 is replaced through the Repex programme. In

GD2 however, we have seen a marked pick up in the volume of repairs for Tier 1, Tier 2 and Tier 3 mains. As discussed with Chapter 5 of our main business plan, [redacted] the rate of Tier 1 replacement, rate of Tier 1 mains deterioration and extremes of temperatures across a year. For Tier 2 and Tier 3 we are seeing a clear trend of increasing repair workload driven by increasing rates of deterioration. We discuss in section E.2 our challenges with the current approach for setting repair allowances, and combined with higher workloads than were forecast within our GD2 plan and settlement, we have encountered cost headwinds.

80. We need to respond to these workload requirements to maintain the safety and reliability of our network. Following the loss of the 97% standards in the 22/23 year, we implemented a recruitment programme to onboard 589 frontline operatives across the GD2 period to provide emergency response resources, but also to build the skills sets to provide repair services. This required an intensive period of training and building the necessary experience to be considered fully competent and unable to operate unsupervised. This recruitment and training requirement drives a perceived cost inefficiency within the GD2 period.

81. While we have over-spent allowances in GD2, we firmly believe a cost efficiency assessment approach that considered our unique regional and company-specific factors would have provided an allowance that would be more aligned with our expenditure outturn.

Scotland GD2 Performance

82. While our Southern performance has been a challenge in the GD2 period, our performance against allowances for Scotland has been positive showing a 4.2% / £52m underspend in real 2023/24 prices.

83. As shown in the earlier figure 3 the allowances we were awarded for Scotland were materially in line with our original GD2 Business Plan Data Templates (BPDT) forecasts, helping to ensure we were able to right-size our delivery from the start of the price control.

84. The main area of efficiency we have been able to derive against allowances is within Repex, seeing a 10% underspend to allowances alongside an expected over-delivery of workload. We highlight this differing performance ability between two regions that are within the same company, with the same overall management team and approaches as evidence to highlight the allowances and GD2 cost efficiency models as being inappropriate.

85. Efficiencies within Repex have been found through our ability to apply robust competition within our supply chain, [redacted] and through our ability to maintain a direct labour Repex workforce.

SGN Output Delivery

86. Our GD2 allowance was a Totex settlement to ensure we were funded to maintain our Licence conditions and deliver core agreed outputs which are displayed in Figure 4 below.

87. The table below shows our performance against our Licence obligations, output delivery incentives (ODIs)[7] and price control deliverables (PCDs) in GD2.

[7] ODIs include ODI-Fs which have a financial reward / penalty and ODI-Rs which are reputational.

Figure 4: GD2 Output Delivery

Outputs Summary		SC	SO
Meeting the needs of consumers and network users			
LO	Consumer vulnerability minimum standards	🟢	🟢
LO	Guaranteed Standards of Performance (GSOPs)	🟢	🟢
LO	Emergency response time (Uncontrolled)	🟢	🟡
LO	Emergency response time (Controlled)	🟡	🟡
LO	Digitalisation Strategy and Action Plan	🟢	🟢
LO	Annual Environmental Report	🟢	🟢
LO	Holder demolition	🟢	🟢
ODI-F	Customer satisfaction survey	🟢	🟢
ODI-F	Complaints metric	🟢	🟢
ODI-F	Unplanned interruptions	🟡	🟡
ODI-F	Network Asset Risk Metric	🟢	🟢
ODI-F	Deliver an environmentally sustainable network	🟢	🟢
ODI-F	Shrinkage and environmental emissions	🟢	🟢
ODI-F	Collaborative streetworks	🟢	🟢
ODI-R	Consumer vulnerability reputational incentive	🟢	🟢
ODI-R	Fuel Poor Network Extension Scheme	N/A	N/A

Outputs Summary		SC	SO
Deliver an environmentally sustainable network			
ODI-R	Shrinkage and environmental emissions	🟡	🟡
ODI-R	Business Carbon Footprint (BCF) reporting	🟡	🟡
PCD	Commercial Fleet EV PCD	🔴	🔴
PCD	Gas escape reduction	🟢	🟢
PCD	Biomethane improved access rollout	🟢	🟢
PCD	Intermediate pressure reconfigurations	🟢	⚫
PCD	Remote pressure management	⚫	🟢
Maintain a safe and resilient network			
PCD	Repex - Tier 1 mains replacement	🟢	🔴
PCD	Repex - Tier 1 services	🟢	🔴
PCD	Capital projects	🟢	🟢
PCD	NARMs	🟢	🟢
PCD	Cyber resilience Operational Technology	🟢	🟢
PCD	Cyber resilience IT	🟢	🟢

🟡 **Either missed a single year or at risk of missing final year**

🔴 **Expected to miss final year**

🟢 **Achieved or expected to achieve all outputs.**

Source: SGN

88. The table shows that we are performing strongly in most areas including customer satisfaction, supporting vulnerable customers, managing the risks associated with our network assets and increasing biomethane access. However, there are some areas that have fallen short in GD2 to date. These include emergency response time, Repex delivery in our Southern network, and the roll out of electric vehicles (EVs).

89. For those areas where we have had challenges, we have an appropriate allowance adjustment within the GD2 period. Such areas of GD2 allowance adjustments are for our:

    - **Commercial Fleet PCD**, we have encountered challenges in sourcing appropriate and cost effective EVs in a challenging vehicle market; and
    - **Tier 1 Mains and Services in Southern**, due to a challenging contractor market we have encountered difficulties in securing workforce to complete our original commitments within the GD2, and for the 2023/24 RRP submission we highlighted to reduce the risk of any over-recovery of allowances we have lowered our workload forecasts.

90. We note in particular using the Network Asset Risk Methodology (NARM) our view of network risk will have improved even further then we were originally allowed for, showing our commitment to ensure a safe and reliable network for customers.

91. We are confident we have delivered all outputs, requirements, and commitments that we are funded for within the GD2 period, or that there is an appropriate adjustment mechanism available for the GD2 close-out process.

Sector GD2 Performance

92. We carry out sector performance analysis to understand how networks can perform against their allowances for the GD2 period, as a way to highlight the impact of the latest cost pressures as well as the suitability of models used to determine allowances.

93. We have produced an analysis of the industry performance against the current view of allowances, as reported within the latest 2024 Regulatory Financial Performance Reporting packs, shown in the below table.

Table 2: Latest performance against allowances as per 2023/24 Regulatory reporting packs with SGN update on latest re-opener submissions

	FC	GD2 Allow	% delta
Eastern	2,348	2,088	*12.5%*
London	1,780	1,628	*9.3%*
North West	1,531	1,484	*3.1%*
West Midland	1,086	1,133	*-4.2%*
Cadent	6,744	6,333	*6.5%*

	FC	GD2 Allow	% delta
NGN	1,495	1,555	*-3.8%*
WWU	1,698	1,598	*6.3%*
Scotland	1,188	1,242	*-4.3%*
Southern	2,498	2,310	*8.1%*
SGN	3,686	3,551	*3.8%*

	FC	GD2 Allow	% delta
All GDNs	13,624	13,037	*4.5%*

Source: SGN analysis of Gas Distribution Network 2024 Regulatory Financial Performance Report Submissions

94. Looking across the sector it is apparent that the largest overspends are of those networks within the South of Great Britain, whereas the networks that seem to be performing the most well are those that are northern based, such as SGN – Scotland and Northern Gas Networks (NGN). This would seem to suggest allowances that potentially do not reflect the specific cost pressures of southern regions.

95. Looking at the trend of expenditure across networks as well as cost evolution between RRP forecast submissions it is also apparent that cost forecasts are increasing at a greater rate than inflation for each period of a new forecast. This would indicate that networks are experiencing greater cost pressures each year than previously forecast, further reinforcing a highly volatile cost market.

96. Further information on SGN-specific performance each year can be found within our stakeholder reports that are posted on our website, aiding our push to be transparent with our stakeholders.

C.3 GD2 Allowance Approach

97. As discussed in the previous section, the GD sector expenditure for GD2 is exceeding allowances. Within C.3 we highlight some of the challenges of the approach to determining allowances for GD2 as well as the risk of Ofgem relying too heavily on the metric of performance against allowances as a basis of which companies are deemed to be frontier and which are struggling.

98. Ofgem's view of efficiency for the GD2 period will be determined through the allowances that were set at the Final Determinations alongside the assessed uncertainty mechanisms across the period. While this is a benchmark of comparison, it is assuming the approach that was used to determine allowances is accurate, which both at the time and through hindsight has some clear challenges.

99. It is clear across sector performance that overall allowances were set too challenging due to the high under-performance of almost 5% for all companies, but what is most apparent is the range of differences of performance against allowances across networks, even within the same ownership group. Key examples being SGN with Scotland out-performing and Southern experiencing cost pressures, as well as Cadent with West Midlands out-performing, with those more Southerly sister networks struggling greater.

100. This would suggest the GD2 modelling approaches used to determine what the efficient expenditure should be were inappropriate – if all companies had a relatively equal performance differential against allowances it could be pointed to macro headwinds driving differences. Networks within the southern regions are showing a greater element of under-performance against allowances, potentially pointing to a lack of appropriate regional and company-specific factors being applied within the GD2 modelling suite.

101. One area of weakness within the GD2 cost assessment approach was the use of External Network Condition Reports as the driver for determining if repair expenditure was efficient. We highlighted this issue during the GD2 cost assessment approach, calling out the lack of operational intuitiveness for this driver, the lack of Ofgem guidance on how to determine an external report as well as a clear unexplainable difference across networks that could be assigned to efficiency within management control.

102. Through re-running the GD2 model suite but using the repair workloads as a driver we can identify an under-funding of £26m through the GD2 allowances as one example GD2 modelling issues.

103. The use of a single Totex model within the GD2 cost efficiency determination was also a key challenge, with an over-reliance on a rather simplistic modelling approach to determine the efficient expenditure on over £10bn worth of investment across multiple different regions, network configurations and internal company approaches.

104. This lack of robust cost modelling views overall caused a weakness in the ability of Ofgem to determine an appropriate allowance settlement for the workload that was required to be completed, marking elements as inefficient without any suitable alternative view models.

105. The above alongside a more stringent catch-up efficiency target of a walk to the 85th percentile created an increasing imbalance of risk with network companies' ability to deliver their required business plans.

106. Care should be taken when using allowances as a basis of efficiency, as there is a key risk that a perception of inefficiency can be embedded within the calibration of any future modelling approaches in GD3. Efficiency should take into consideration multiple facets, such as the cost to the consumer through the bill, the value for money that our investments create to society which can be identified through CBAs as well as comparative analysis when the models are fair, transparent, and robust to challenge.

C.4 Revised Efficiency Position – GD2 Totex Model

107. Using the latest reported information we have re-ran the GD2 econometric approach, highlighting the large differences in outputs with the latest actual data.

108. The cost benchmarking approach is a relative model – assessing each network's efficiency position in comparison with the other networks at a snapshot in time (i.e. for GD2 at the start of 2021). However, outcomes for each company may diverge from plans (and allowances). As such, while the GD2 performance is monitored against the allowances set post the CMA decisions[8], it is possible to re-run the regressions to assess the changing relative efficiency positions.

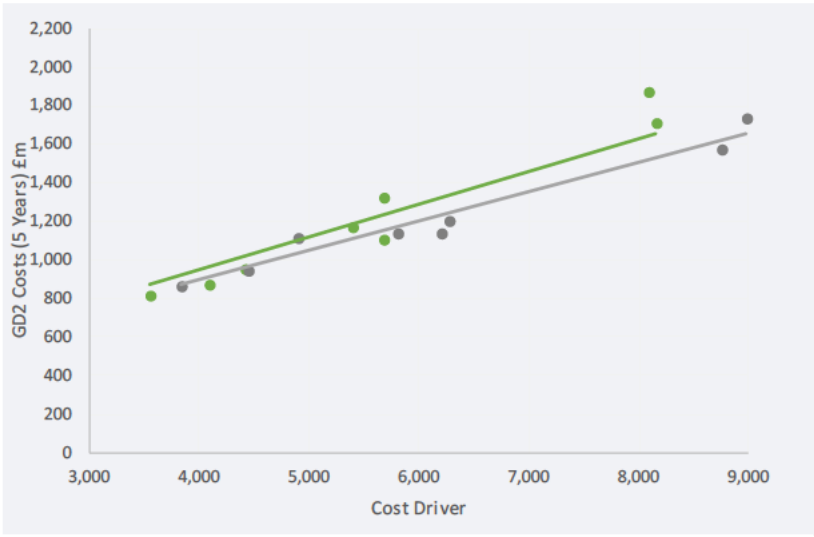
109. By re-running the same functional form regression model that was used in the GD2 Final Determination, with updated RRP data (actuals and forecasts), the notional company costs had it been set with the actual data can be identified.

110. The graph below shows the re-run of GD2 cost assessment models with latest reported 2023/24 RRP data (the green line) and how this compares to the original Final Determination outcomes (the grey line). The table next to the graph shows the updates results of each region on the regression outcome.

111. *Methodological Caveats:* This model has retained the same composition of the Composite Scale Variable (CSV) and the same approach to normalisations as the GD2 model, just with the updated actuals and forecast data. While the industry level unit costs used in the synthetic driver calculations have not been updated, the volumes have been amended.

[8] Adjusted for re-openers and Real Price Effects

Figure 5: Updated Efficiency Position in GD2 with Updated Costs and Drivers



Network	FD Outcomes		Updated RRP outcomes GD2	
	Efficiency Score	Rank	Efficiency Score	Rank
Sc	0.98	5	0 91	3
WM	0.99	6	0 91	2
Lon	1.09	8	0 94	4
NW	0.97	3	0 98	5
NGN	0.92	1	0.89	1
WWU	0.97	2	1.06	7
EoE	0.97	4	1.14	8
So	1.05	7	1.03	6
Upper Quartile	0.963		0.903	
85th Percentile	0.962		0.900	
Range	18%		28%	

Source: SGN analysis on 2023/24 RRP data

112. From these figures you can see that:

- There are significant swings in overall cost compared to those forecast in GD2. The notable are East of England (+£294m) and London (-£162m) these have a significant impact on the notional company efficient costs.
- Looking at the range of efficiency scores we can see an increase of 56% in range figures between the original Final Determination efficiency scores and the updated RRP data efficiency scores, demonstrating an increase in variability in the determination of efficiency.
- The greater variation in outcomes shows that the model was less accurate than anticipated at the Final Determination stage. The Final Determination model has a heteroscedasticity p-value of 0.5, while this model has a p-value of 0.062. If you use the standard decision threshold, the latter statistic would still be deemed to be homoscedastic, but only just. The significant change in the p-value shows an increase in scedasticity in the restated model. Errors are less constant than the prior iteration of the model.
- A high level of sensitivity. While the swings may seem small, the impact of them is significant. In this model, East of England would see a £272m swing in the efficiency gap from the Final Determination model.

113. In practical terms this demonstrates the weakness of being overly-reliant on a heavily calibrated model for a specific dataset, that being originally the GD2 submitted cost forecasts. By not having multiple model approaches that could manage differing cost forecasts, it is clear that the GD2 cost modelling suite was not able to robustly put forward an efficient view of the sector for GD2.

C.5 Activity Level Efficiency

114. While acknowledging those limitations, analysis of the RRP returns for 2023-24 is useful in presenting our performance at a more disaggregated level. We can look at expenditure in each core area of Network Opex, Non-Network Opex, Network Capex, Non-Network Capex and Repex by drivers to give an indication on efficiency of our network. All analysis below is before any regional and company-specific normalisation and is intended to provide a broad overview of efficiency in each core area.

Network Opex

115. We classify network Opex as Repairs, Emergency, Maintenance and Other Direct Activities (ODA). We have removed any network Opex costs related to SIU as this would not be comparable across networks.

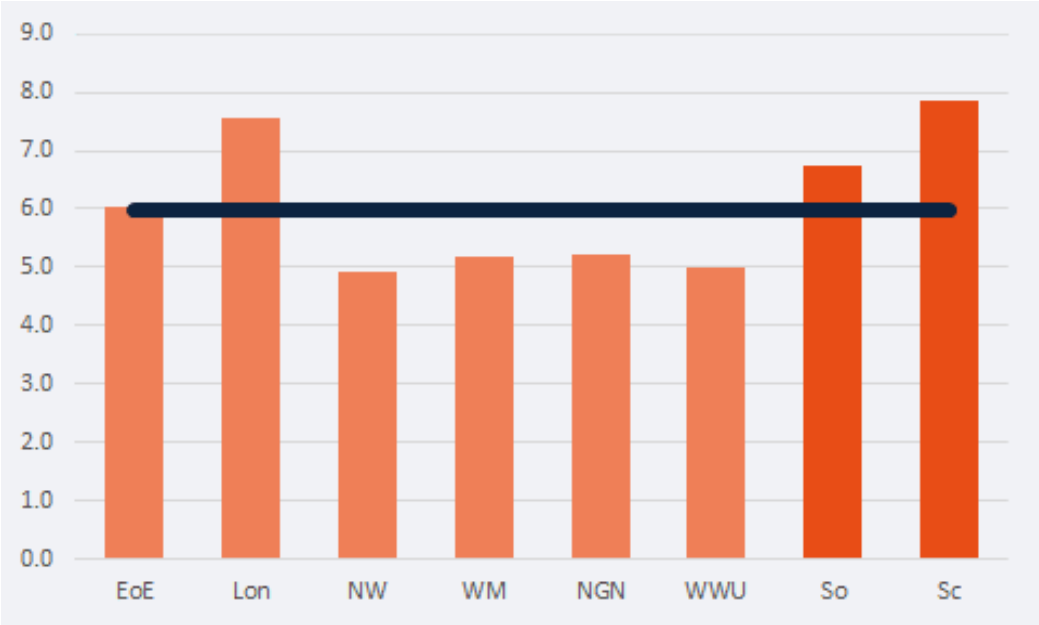
116. We have determined a driver for this expenditure as the industry cost weighting of the below:

- Mains and service report numbers for Emergency cost,

- Mains and service condition repair workloads for Repair cost,
- Maintenance Modern Equivalent Asset Value (MEAV) (as per GD2) for Maintenance cost, and
- Modern Equivalent Asset Value (MEAV) (as per GD2) for ODA

117. The below is a view of efficiency in this grouped core area over the above driver

Figure 6: GD2 Industry Efficiency Assessment for Network Opex



Source: SGN analysis using 2023/24 RRP data – pre-normalisation

118. The industry average efficiency ratio is 6.0 with Southern and Scotland both presented as having a higher expenditure in these areas.

119. For Southern we discussed earlier regarding known inefficiency within the GD2 period due to the onboarding of 587 frontline operatives, which will require upskilling which has a temporary productivity and therefore cost impact. Once this and any regional wage and productivity adjustments are made, we feel confident that our costs will be in line with the sector for GD2. The need for regional wage and productivity adjustments are further validated by Cadent London and Cadent East both showing higher on the rankings, and as with Southern, require cost normalisation to ensure comparability across networks.

120. Scotland is showing inefficiency against the industry benchmark which we believe highlights the challenges that we experience of sparsity within the Scotland region for our Emergency and Repair response as well as for our maintenance activities. We highlight this further within Section E when we discuss Regional Factors – Sparsity.

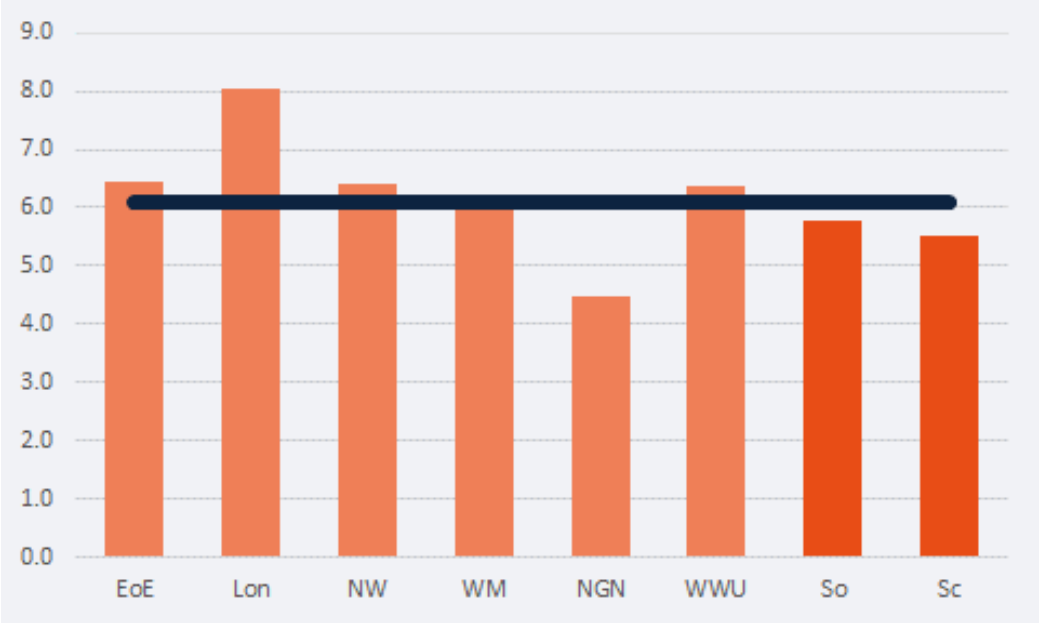
121. It is evident through GD2 efficiency that urbanity and sparsity are key impacting factors to cost for network Opex, with the most urban and sparse networks being those that are exceeding the un-normalised industry benchmark. Ofgem will need to ensure suitable regional factor considerations are made for this cost grouping.

Non-Network Opex

122. We classify non-network Opex as work management, business support costs and training & apprentice costs – the expenditure to support our frontline operatives. Costs within these areas are after any allocation to Capex and Repex activities, so are reflective of the network Opex support.

123. For the below analysis we have used MEAV as the driver to explain cost, though note this may not be the most appropriate driver as our back-office costs are more aligned to the number of frontline operatives and the workload they are required to carry out.

Figure 7: GD2 Industry Efficiency Assessment for Non-Network Opex



Source: SGN analysis using 2023/24 RRP data – pre-normalisation

124. The industry average efficiency ratio is 6.1 with Southern and Scotland both presented as having a more favourable efficiency in these areas.

125. Again, we note these costs are pre-normalisation, which we believe should be appropriate for back-office related costs for networks that are non-contiguous in location, such as Southern and Scotland which are at geographical opposite points of Great Britain. This reduces our ability to place back-office support within regions with cheaper labour costs.

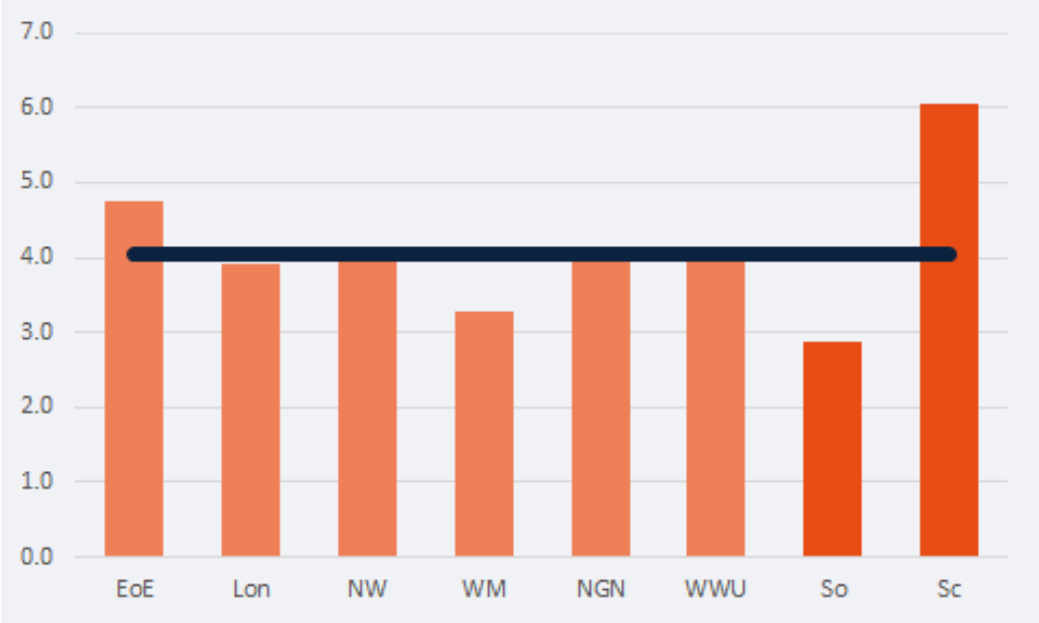
126. Despite this, we are still clearly showing our back-office non-network Opex costs to be efficient within the GD2 period against the industry.

Network Capex

127. We classify network Capex as LTS, Connections, Reinforcement, Governors, and Other Network Capex areas. These costs include the allocation of appropriate overheads to ensure a consistent view of burdened Capex activity.

128. For the below analysis we have used MEAV as the driver to explain cost, though note for some key cost areas such as LTS this may not be appropriate. We have also not carried out any normalisation for larger scale LTS projects. The below is to demonstrate a start view of GD2 efficiency.

Figure 8: GD2 Industry Efficiency Assessment for Network Capex



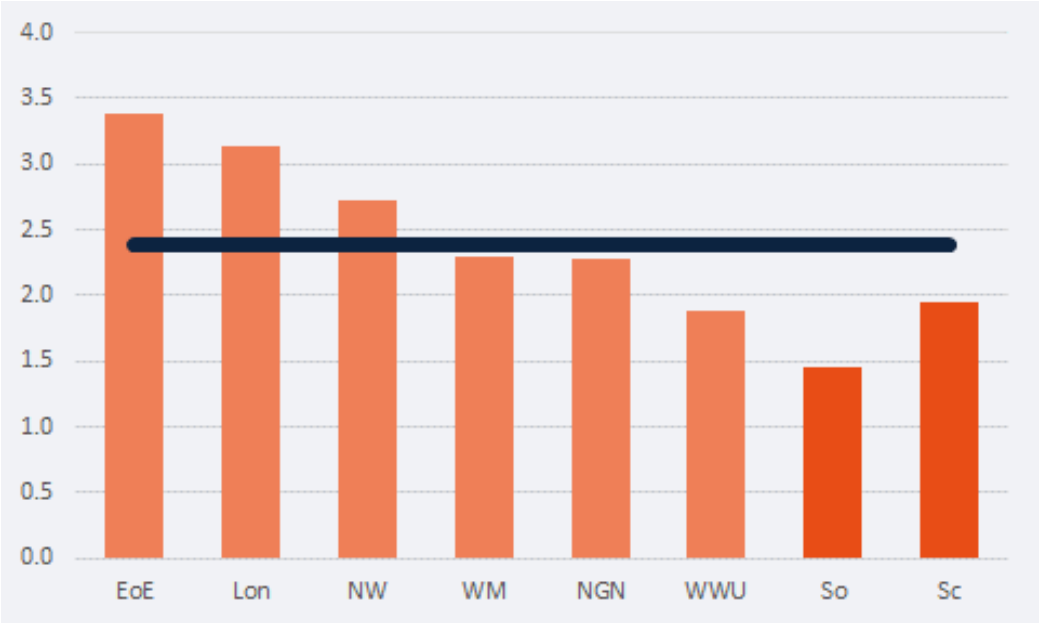
Source: SGN analysis using 2023/24 RRP data – pre-normalisation

129. The industry average efficiency ratio is 4.0 with a differing view of efficiency for Southern and Scotland in the GD2 period.

130. The volatility within the above efficiency ratios are due to LTS projects not being appropriately captured within MEAV as a driver. While Ofgem in their cost models do make adjustments to this effect, it is clear the scale of cost impact LTS has to networks, particularly for Scotland where geographical characteristics not only increase the scale LTS network relative to other networks, but also the risk associated with an asset failure.

131. Figure 9 removes the impact of LTS and highlights on an underlying basis our SGN networks are efficient in their delivery of Capex projects as a proportion of their MEAV.

Figure 9:GD2 Industry Efficiency Assessment for Network Capex (excl LTS)



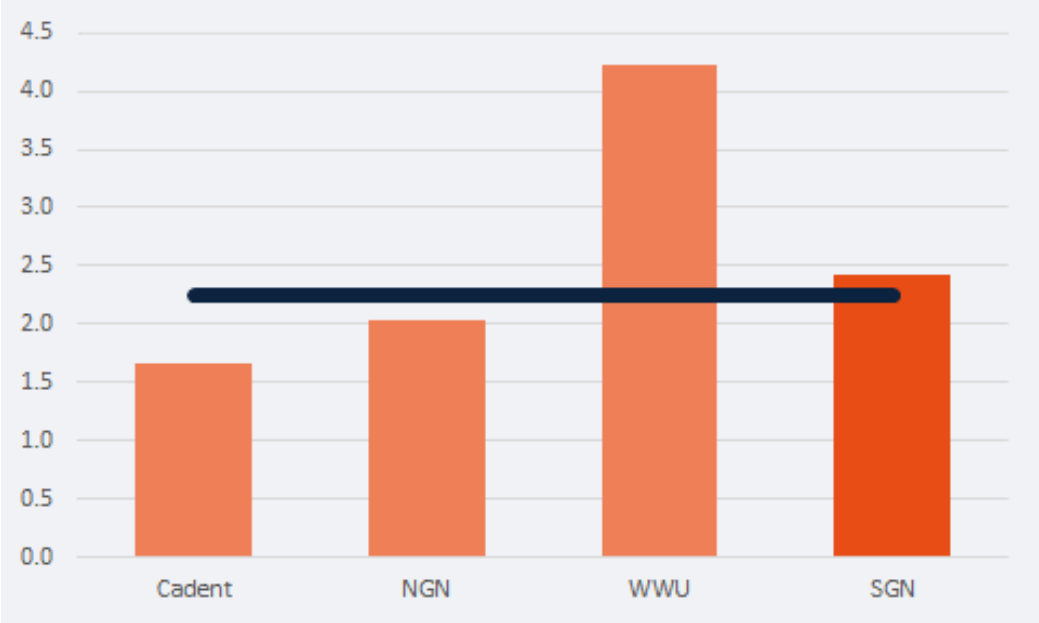
Source: SGN analysis using 2023/24 RRP data – pre-normalisation

Non-Network Capex

132. We classify Non-Network Capex as IT, Vehicles, Property and Other Non-Network Capex areas.

133. For the below analysis we have used MEAV as the driver to explain cost, though note that this may not be the most appropriate driver and alternatives could be used. We have also presented this view at the company level, as in most cases for non-network Capex our investment decisions are made at a company level as opposed to a network level.

Figure 10: GD2 Industry Efficiency Assessment for Non-Network Capex



Source: SGN analysis using 2023/24 RRP data – pre-normalisation

134. The industry average efficiency ratio is 2.3 with SGN on the industry average efficiency level.

135. We note that the above analysis is pre-normalisation, where SGN experiences for property in particular cost headwinds within Scotland due to the need for a greater number of depots as a proportion of MEAV than other networks and for Southern greater property costs due to property values within the area we work.

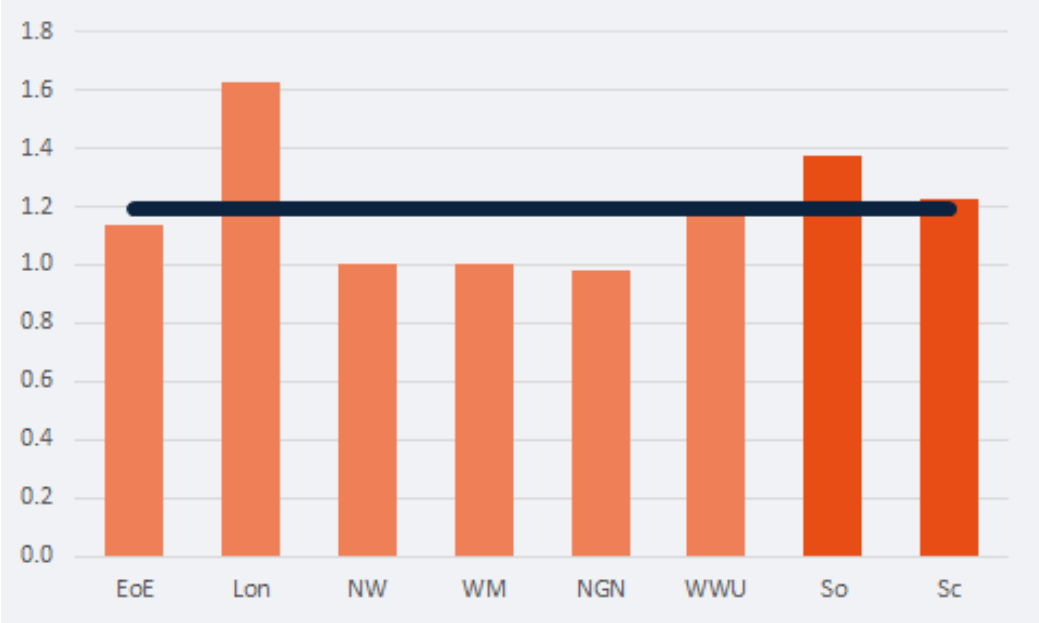
136. With consideration of cost headwinds to the above analysis, we are confident that our non-network related Capex costs are efficient within the industry.

Repex

137. Repex costs consist of all Repex activities with the exclusion of risers which due to networks being exposed to MOBs differently is separately assessed within Ofgem's cost modelling suite.

138. For the below analysis we have used the Repex synthetic approach that Ofgem had utilised within the GD2 cost assessment models, updated with the latest workload forecasts as through the 2023/24 RRP submissions. We note in particular we have not performed a normalisation for cost activities such as large diversionary projects that are non-rechargeable but customer driven.

Figure 11: GD2 Industry Efficiency Assessment for Repex



Source: SGN analysis using 2023/24 RRP data – pre-normalisation

139. The industry average efficiency ratio is 1.24 with Scotland at the industry average and Southern above average before regional and company-specific factor normalisation.

140. Scotland performance is at the industry average pre any normalisation factors. We discuss later within this document that our Scotland network experiences a regional wage adjustment, and with a combination of sparsity challenges impacting the ability of our contractors to work at the sparsest areas of our network we do have increasing cost headwinds compared to the notional network.

141. Southern performance seems to be second worst in terms of efficiency, but this is before any regional factor normalisation is carried out. This highlights that our costs are impacted by exogenous factors which drive increasing costs compared to the notional network.

C.6 Conclusion

142. Breaking GD2 down to activity levels we can demonstrate across each core grouping how we believe SGN has expenditure that is either better or at least matching industry performance, showing an overall efficient position within the GD2 period that we have used to carry forward into GD3.

143. After appropriate normalisations, we anticipate SGN to be amongst the frontier companies for efficiency, giving us confidence in our commitment that we will be ranked within the top 3 of GDNs in efficiency for an appropriately calibrated model.

Section D Our Efficient GD3 Plan

The investments that we are making within the GD3 plan require a careful assessment of a complex set of trade-offs including safety requirements, expectations of our key stakeholders and customers, value for money to customers, and affordability. Each of these areas are important for reviewing and challenging our business plan for us to confidently state our plan is efficient.

144. We have performed three tests when checking the overall quality of our plan, which check, (i) the Value for Money our investments provide, (ii) the affordability for our customers; and (iii) the efficiency when comparing our costs to our peers.

D.1 Value for Money of our Proposed Investments

145. We discuss our approach to CBAs and how we utilise this approach to justify value for money for the investments we undertake.

146. While our investments are primarily made to maintain our networks' safety and reliability, which in many ways are not quantifiable, it is also important that we demonstrate to the best of our ability that the investments we make generate value for money for customers.

147. We do this by following Ofgem's CBA approach, which carries out a 'Spackman' approach to network investment. This approach aims to replicate the way our customers pay for network investment, which spreads the investment over the longer term in line with Ofgem's financing policies.

148. The Ofgem CBA model also provides a view on the monetary value of societal benefits, with approaches that are aligned with the Government's Green Book guidance for consistency in approach with other governmental investment appraisal approaches. To justify the investments we make with customer funds, we follow this CBA approach. To quantify the societal risks associated with our assets we have used the GDN NARM monetised risk methodology whenever applicable.

149. In this section, we present the net present value (NPV) difference between a counter-factual do nothing / do minimum scenario and the chosen option that is within our GD3 Totex ask. We continue to use a 16-year NPV assessment point as an appropriate time period. From the first year of GD3, 2026, this will take us to 2043 (or 2047 for an investment in the final year of GD3).

150. We discuss the Future Energy Scenarios (FES) in Chapter 5 of the business plan and set out our concerns. If we assume the Holistic Transition pathway does transpire there will still be half a million customers on our network by 2047, that we have to keep safe. If the Counterfactual Pathway scenario transpires then there will be over 4 million by 2047. As our investments are necessary to maintain the safety and reliability of our network for any remaining customers, we have not tested FES scenarios through the CBA. By keeping gas safely contained they are independent of the number of customers or volume of gas transported, with the FES scenarios not impacting the choice of investment options in the CBA.

151. The below Table 3 shows the GD3 projected capital expenditure by area, the value that was tested through a CBA and the NPV that is projected 16 years from the start of GD3, being 2043.

Table 3: Summarised GD3 CBA Outputs

SGN	£m real 23/24 prices	Property	Fleet	IT (excl Cyber)	Network Capex	Repex	Enhancements	GD3 Capex / Repex
	GD3 Capital Expenditure	72.0	93.8	126.0	556.3	2,030.3	58.5	**3,030.2**
	GD3 CBA £m Tested	68.5	72.5	126.0	188.0	1,975.0	58.5	**2,488.5**
	% tested for Value for Money	**95%**	**77%**	**100%**	**34%**	**97%**	**100%**	**82%**
	NPV Delta against counter-factual after 16 years	**-2.8**	**71.9**	**9,416.5**	**485.4**	**264.5**	**186.6**	**10,422.1**

Source: SGN analysis of GD3 submitted CBAs

152. It can be seen from Table 3 that we have tested over 82% of our planned capital expenditure within the five-year period.

153. We can demonstrate that 16 years after our GD3 period the capital investments we make will derive at least £10.4bn greater net present value to customers compared to the option in which we had done nothing, demonstrating value for money for the investment decisions made by SGN. We present a more detailed list of our CBAs and their NPV in Appendix A: CBA List

154. While this is a positive position, we note that most of our investments within the GD3 period are required to ensure we have a safe and reliable network for our customers.

D.2 Bill Impact

155. Within section D.2 we discuss how the domestic customer bill evolves from the GD2 period to GD3, for areas that are in direct comparison with the GD2 framework and for those new policy impacts that the Regulator is proposing for the GD3 period. We highlight the long-term bill impact and how this compares against the wider utility bills that customers are experiencing.

Table 4: Bill Impact Evolution for Best View Totex position

£/household (23/24 values)	GD1 average	GD2 average	Direct comparison with RIIO-2				Policy impacts in RIIO-3			
			Maintaining core services	Proposed enhancements	Change in finance terms	GD3 Average bill impact	Faster investment recovery	Semi-nominal WACC impact	Disconnections	GD3 average bill impact
Scotland	**£176**	**£146**	£12	£4	£8	**£170**	£31	£8	£15	**£225**
Southern	**£187**	**£152**	£19	£3	£8	**£182**	£35	£9	£21	**£247**
SGN	**£184**	**£150**	**£17**	**£4**	**£8**	**£178**	**£34**	**£9**	**£19**	**£240**

Source: SGN analysis of GD3 BPFM

156. As a responsible custodian of our gas networks, we need to ensure the service we provide to customers is affordable. Throughout our stakeholder engagement (SGN-GD3-SD-12) our customers expressed their concern for the wider utility bill movement, and we have listened by focussing on controlling the bill as much as possible that is within our control.

157. We have calculated bill impacts on our best-view Totex position, which includes those uncertainty mechanisms we believe at this stage are most likely to be triggered. We discuss our best-view Totex position as well as our position on uncertainty mechanisms in more detail in section F.6 .

158. We forecast the GD3 Totex expenditure we have requested will generate an average bill across the five-year period for our domestic customers of £178 per annum for a like-for-like policy environment as GD2.

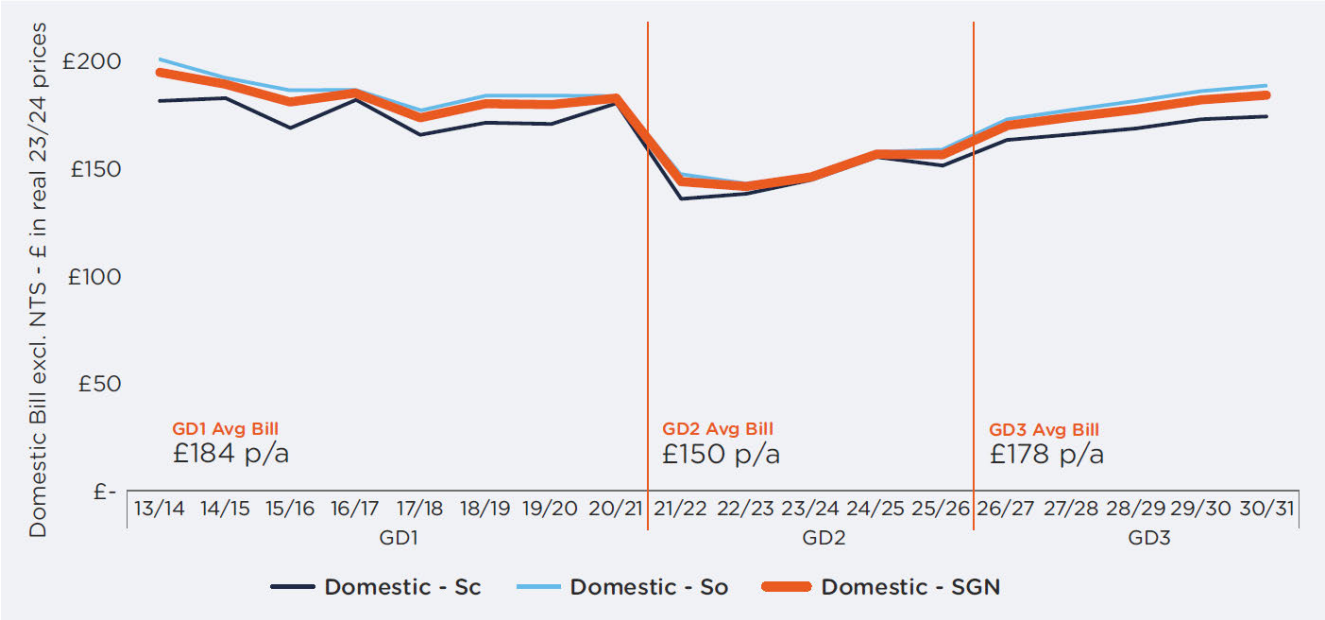
159. This compares to an average GD2 bill of £150 for our domestic customers, showing a £28 increase between the two price controls. We do note that the GD2 price control settlement, as discussed earlier within section C, has not provided sufficient allowances for SGN and the industry to deliver the commitments required by Ofgem. This more challenging allowance settlement was the main cause in a drop of customer bill between the GD1 and GD2 period, and has proven to be unsustainable.

160. We can split the £28[9] increase to:

- £17 of an increase to maintain core services. This covers the increasing costs of our emergency and repair response as well as maintenance of our network, which is c. 40% of this increase. Plus, the increasing workloads and complexity mix changes we are seeing within Repex, which is driving the remaining c. 60% of this increase. Some of this increasing cost pressures are due to new requirements we need to comply with, such as 12-hour working practices, while capital expenditure we demonstrate drives wider societal benefits such as reduced emissions.
- £4 for proposed enhancements, such as the cost of converting parts of our SIU areas to biomethane and implementing Advanced Methane Detection, areas which drive enhanced societal value over and above safety and resilience. These are primarily funded through uncertainty mechanisms to reduce the risk to customers that the activities will be delivered.
- £8 due to changes that are outside the control of SGN management, such as differing tax regulations between price control periods and increasing base return as calculated by the Regulator to maintain the appeal for investment to our networks.

161. We are proud to state our bill shows a long-term trend from the 2013 year (start of RIIO regulation) decrease in charges to customers when normalised for CPIH, the base inflationary measure Ofgem uses to normalise costs to a real price.

Figure 12: Long Term SGN Domestic Bill Evolution



Source: SGN analysis

162. This forecast as the Local Distribution Zones (LDZ) element of the domestic bill, based on an assumed domestic proportion of the bill at 82% (aligned with GD2 actual) and excluding any impact of NTS charges which we deem to be separate from our bill as it is driven through National Gas cost forecasts.

163. For our headline bill analysis, we have assumed our customer numbers will be materially flat within the GD3 period, which is in alignment with the FES24 Counter-Factual pathway which our disconnection cost forecasts are based on. A more

[9] We note rounding between the £28 delta and broken-down figures below has the delta summed to £29

detailed assessment of the implications of the Holistic Transition Pathway on bills is provided in our Finance document SGN-GD3-SD-09, which will have the following impacts:

- An extra £9 for the impact of applying a Semi-Nominal WACC policy to cover the cost of recovering inflation earlier.
- An extra £34 to align to Ofgem's option 2 Accelerated Depreciation approach which aims to recover the Regulated Asset Value (RAV) balance by a defined 2050 date.
- An extra £19 to align to the FES24 Holistic Transition pathway which will drive an increased cost forecast of c. £300m Opex money, assuming 50% of the increased disconnections would be paid for by customers, plus the impact of a smaller customer base to share the bill.

164. The overall impact of these Regulator policy decisions could amount to a further bill burden to domestic customers of £62 per annum, driving the overall customer bill to £240 per annum.

165. For the extra costs relating to forecasting against the FES24 Holistic Transition pathway, we did not believe it to be fair to customers to include within our ex-ante cost forecast a current aspirational view of where the future may end up within the medium term. We do propose within our GD3 business plan proposal an uncertainty mechanism to be able to respond to increasing disconnections when they occur but do not believe customers should pay for something which may not occur in the near term.

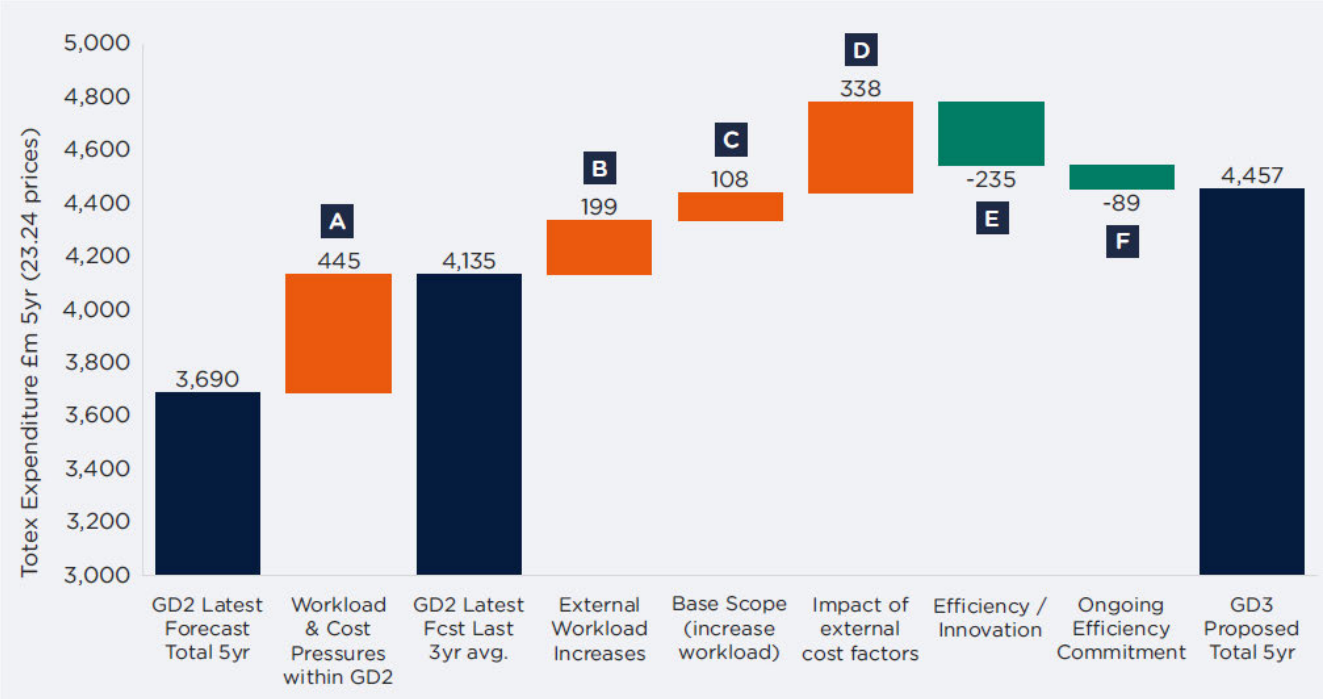
166. We discuss within our finance document (SGN-GD3-SD-09) in more detail our views on these Ofgem policy changes.

167. Overall, we put forward a plan that for the last year of GD3, the bill is at a lower point in real inflationary terms than it was 18 years prior. We believe this offers good value for money and affordability during challenging times.

D.3 Totex Trace from GD2 to GD3

168. To understand the impact our plan has on our stakeholders, we have performed analysis to define cost movements from our current position in GD2 to the forecast GD3, breaking out the workload parameters we expect to change in GD3 as well as cost challenges going forward.

Figure 13: Cost Trace of our GD2 latest position to GD3 plan



Source: SGN analysis

169. The above cost movements are defined as those that have come about through Ofgem requests within the SSMD, an increase in workloads compared to what was delivered in GD2, the impact of increasing cost pressures over and above inflation and the efficiencies we have built in to reduce this impact to consumers.

170. We discuss each of the above cost movements below, as referenced in the cost trace chart.

A Workload and Cost Pressures within GD2

171. Our reference year for compiling the GD3 business plan is 2023/24, to reflect the current real cost base. As such it is important to explain cost variances against the last three-year GD2 average, as opposed to the five-year GD2 average.

172. These workload and cost pressures have developed during the GD2 period due to changing external factors. Of the £445m movement, 33% is assessed to be a result of workload changes, in areas including:

- Increased reactive repair workloads which we have incurred in the later years of GD2;
- Cyber related workload that started in the later parts of GD2 due to Ofgem's approach to re-openers for assessing spend; and
- Timing of our Repex programme which due to challenging GD2 allowances, started at a slower pace in our Southern network.

173. The remaining 67% of the GD2 movement is due to increasing cost pressures that are recognised in our latest cost base. This includes:

- The costs associated with starting to move to 12-hour working; and
- The increasing cost of delivering our Repex programme based on the real contractor market rates received through more recent tenders, which are at least 35% higher than the prices we incurred at the start of GD2.

B External Workload Increases

174. These are the activities and associated costs that we will incur in the GD3 period due to changing requirements placed on us. This is forecast to increase our costs by £199m over GD3 compared to our GD2 position and is made up of three core areas:

- Implementation of 12-hour working [redacted] – as set out in Chapter 7 of the main business plan, embedding new working practices to help protect our employees and customers from the impact of fatigue will increase our ongoing operational costs as we need to maintain a greater frontline workforce along with back-office support.
- Complying with Ofgem's SSMD requirement of enabling data & digitalisation [redacted] – making data more openly available will be a benefit to consumers and support more efficient allocation of capital across the whole system on the transition to net zero, the additional costs to achieve this are included within our GD3 cost base.
- Connections costs [redacted] - while the domestic customer load allowance (DCLA) will be withdrawn, our obligation to offer quotations within defined timelines and to be the connection provider of last resort does not. As a result, the overhead costs associated with providing quotes is expected to remain broadly the same, while our ability to recover those overheads however is expected to decrease as fewer quotes are expected to be undertaken creating a stranded overhead. Given the uncertainty in the number of customer connections, we have proposed a re-opener mechanism to enable a flexing of overhead recovery.

C Base Scope (increased workload)

175. Higher workloads in GD3 have driven a net increase in costs of £108m, on a like-for-like basis compared to GD2.

176. In GD3 we forecast an increase in Tier 1 Repex workload as we deliver the 30-year Iron Mains Replacement Programme by 2032, and an increase in riser replacement activity as we respond to recommendations in the recent Grenfell Inquiry Report. We expect some workloads to reduce in GD3, primarily Tier 1 repair workload because the Repex programme has successfully converted most metallic mains to plastic.

177. These movements are set out in document SGN-GD3-SD-06: Network Asset Management Strategy.

D Impact of External Cost Factors

178. This highlights the cost pressures that we anticipate within the GD3 period, mostly associated with the Repex programme. These cost pressures are driven by external contractor costs due to a more challenging market for carrying out this work

and the more complex nature of the projects that need to be completed. These are already being realised in GD2 and are anticipated to continue into GD3.

179. The complexity factors we are most concerned about are projects that involve ductile iron, cross-road services, long services and road crossings. This is because such projects take longer to complete and can require more resource. As we move towards the end of the Repex programme we anticipate these factors will be more prominent than in our historic activity alongside a higher proportion of larger diameter pipelines to be decommissioned, as explained in the supporting MJM report (SGN-GD3-ECR-01) and in more detail within section F.5 of this document.

180. Contractors in the Great Britain supply chain are fully aware of the challenges and complexity involved in completing this HSE mandated programme, and as such there is much greater cost pressure in the remaining seven years that needs to be taken into account in any cost review.

181. We discuss the challenge of these cost and complexity pressures in greater detail within Section F, Cost Proposals Summary of this document, as well as the different ways in which the Regulatory framework can acknowledge these challenges within Section E, GD3 Efficiency Assessment.

182. This will be a challenging area within the GD3 cost assessment, as it is likely the networks will face differing cost challenges in completing the 30-year Iron Mains Replacement programme. This is due to different network configurations and the lack of a stable Regulatory framework for this vital safety programme over time, which has led to many changes in the way that the networks have delivered the work required.

183 [redacted] It is important Ofgem uses all the information available to it particularly in this quickly evolving cost area.

184. It should be noted that tender movements arising from differing complexity factor pressures would not be captured within a Real Price Effects index. Not taking them fully into consideration would increase the risk of inaccurate allowances, placing a significant risk on networks for financial under-performance without an uncertainty mechanism being available to respond to that risk.

185. This will likely come through as new tendering information for the GD3 period which we expect to be available in the summer of 2025 as we prepare for our delivery in the new price control. We note that a similar set of information was sent to Ofgem during the GD2 determinations, and ultimately were not appropriately considered as Ofgem did not alter their approach, as there was a perceived risk that the information would cause difficulties against what was originally submitted in network GD2 BPDTs. We request that Ofgem ensures that they can appropriately consider new information that is likely to be material to highlight latest cost pressures, which would not be captured within Real Price Effects.

E Efficiency / Innovation

186. This is vital to minimise the impact on customer bills. We acknowledge that within our Southern network, the first two years of GD2 were challenging with labour and contractor shortages making it hard to deliver efficiencies. We have carried out an in-depth analysis of our cost base within the last 18 months, running an internal programme to identify and implement process efficiencies. This has led to us embedding efficiencies of c. £47m per year in our cost base compared to our GD2 comparative position.

187 [redacted] Due to the onboarding of our recent large recruitment drive required through increasing workloads, our workforce requires time to settle into new ways of working which will drive efficiencies back to our efficient ways of working as we had delivered at the start of the GD2 period for the regions in which we work.

188. Finally, we have identified key unit rate areas where improved processes can deliver more efficient delivery. For example, more efficient processes to reduce the unit rates of delivering bulk service and relay after escape service replacements, which are high compared to the reported industry average in GD2. We anticipate our commitment to make savings in these areas will drive £16m per annum of savings.

F Ongoing Efficiency Commitment

189. Analysis by Economic Insight (SGN-GD3-ECR-20 & SGN-GD3-ECR-21), suggests an estimated ongoing efficiency range of 0.2% to 0.8% and a central recommendation of 0.5% per year.

190. We have committed to a 0.5% per year Ongoing Efficiency challenge within our plan, which we firmly believe is a stretching target considering the wider challenges networks are likely to encounter within GD3 that are not necessarily quantified within Economic Insights reports, such as the increasing complexity of completing the Iron Mains Replacement Programme.

191. This is further to our committed efficiencies discussed previously, resulting in an additional average of £18m per year of savings, a significant value within such a challenging and evolving macro landscape. A prediction of future ongoing efficiency above what is embedded within our inflation factors is always a challenge, but we consider alignment to the UK's productivity trends is most appropriate.

192. We note as Ongoing Efficiency is assumed to be a continuous improvement that compounds each year, by year five of GD3 it would be assumed that we should be making £25m efficiency savings compared to our current position, which is c. 3% of our forecast Totex expenditure for that year. This is a significant commitment for any company within such uncertain macro Great Britain as well as industry conditions.

193. We discuss our position on Ongoing Efficiency in more detail within section E.4 .

Section E GD3 Efficiency Assessment

A well-calibrated approach to efficiency assessment is key to unlocking the benefits that Gas Distribution Networks can offer to the wider stakeholder landscape. With key improvements to Ofgem's cost efficiency toolkit, we can demonstrate that our funding proposal is efficient and supports the investments in our network to drive value for money for our stakeholders.

194. Within this section, we will put forward the analysis we have carried out to determine how we believe our GD3 plan is efficient. We believe efficiency is more than just comparative benchmarking, it needs to have consideration of i) the impact of proposals on bills; ii) the value for money that can be generated long term for any investment and iii) the normalised comparative costs of delivering works / programmes.

195. Customers are the ultimate stakeholder in our view as they both pay and are most directly impacted by our delivery in terms of safety, reliability and environmental performance. This is why our efficiency must have consideration of the societal value that our investments bring. A mis-calibrated cost efficiency model will disallow spending that ultimately would drive value to customers and/or may provide insufficient funding for the outputs to be delivered efficiently and undermine investability and financeability.

196. In order for the GD3 cost comparative efficiency models to be well-calibrated they should consider learnings from recent Regulatory settlements, with key focus areas put forward by SGN of:

- Ensuring regional and company-specific factors are appropriately identified and applied within modelling technique;
- The use of appropriate cost drivers within any Totex or more disaggregated modelling;
- There is an appropriate review of changing challenges between price controls;
- Multiple modelling approaches are considered and utilised to ensure a balanced approach (there is no one-size-fits-all all approach); and
- A fair and appropriately stretching efficiency target is applied that is linked to the quality of models used for determining efficiency but recognises that all models have a significant error term.

197. Through all this assessment there needs to be consideration of unintended incentivised behaviours that could come about through the efficiency modelling approach. We have put forward some key risk areas that believe need to be tested in this area, to ensure a fair approach for all and to enable the correctly intended allowance funding to deliver our plan.

E.1 Regional and Company Specific Factors

This section outlines a review of the factors that affect each network uniquely. As per Ofgem guidance we outline our view on key factors that affect our Scottish and Southern networks.

The aim of applying company and regional factors is to ensure that any benchmarking uses comparable data across networks, currently applied through normalisations. Some elements affect networks based on their locality (regional factors) and some are unique to the network (company specific factors). Accounting for these factors when undertaking comparative benchmarking is key to ensure that cost differences between networks driven by these factors are not erroneously treated as inefficiency.

In this section we first review the spread of efficiency across the networks to assess is there are any biases in the performance of the GDNs. In that context we then review:

- Factors affecting the demand for labour
- Availability of skilled labour
- Regional Wages including differences for directly employed and contract labour
- Urbanity Productivity
- Reinstatement; and
- Sparsity

This provides an assessment of where there is the potential to modify the normalisations/adjustments to ensure they give a more up to date view of these costs.

We also then review the case for other factors that could be accounted for (as regional factors or company-specific factors as appropriate). These are:.

- Soil Type
- Complexity; and
- Costs of operating in the Isle of Wight

Finally, we consider the case for the application of in-modelling adjustments instead of pre-modelling normalisations.

198. Given each GDN delivers the same fundamental service, using broadly the same asset base of broadly the same age, it is appropriate to compare networks' costs to ensure the consumer is paying an efficient price for our work. However, networks are natural monopolies that have obligations to supply customers in the region which they operate. Networks cannot choose to move to another location where it may be cheaper to operate; and there are fundamental differences in operating costs across the country. It is important that these differences in operating costs are not falsely identified as inefficiency.

199. Each of the geographic areas will have different network lengths, populations, population density and topography. As such, each network may have unique activities (e.g. the SIUs in our Scottish network) and / or divergent costs (different labour markets). High level costs will not be directly comparable and require adjusting prior to comparing networks. This process is known as "normalisation".

200. The normalisation process has the aim of making sure that a comparable dataset (across networks) can be used in the regression models. Currently this involves what is also known as **pre-modelling adjustments** – assessing what the extra unique costs are and removing them from the dataset. (They are still assessed separately but excluded from the regression dataset). Current pre-modelling adjustments include regional wages, sparsity, density (productivity and reinstatement) and company-specific factors.

201. While these adjustments should make the data more comparable, there can be gaps in the coverage. It may be some categories are missing, or the estimation techniques may underestimate the scale of the unique costs. An alternative approach can be the use of **in-modelling adjustments**. This essentially involves adding an appropriate extra independent

variable in the regression model to control for the variation expected as a result of the exceptional (non-comparable) costs.

202. Both approaches can be used within modelling to create:

- A. a Totex model with normalisations applied, and
- B. a Totex model without normalisations, but with a density variable applied. (B).

203. The modelled cost from B can be compared with the modelled costs in A. If they are similar, model B is used to validate model A. If they are not – this will signal that the existing normalisations may be underestimating the non-comparable costs.

204. Depending on the degree of difference, it may be appropriate to use both these Totex models (in a multiple model approach) to generate a weighted view of the Totex costs and allowance. As mentioned earlier we will discuss the application of this from paragraph 336 onwards.

Normalisations and the Efficiency position in GD2

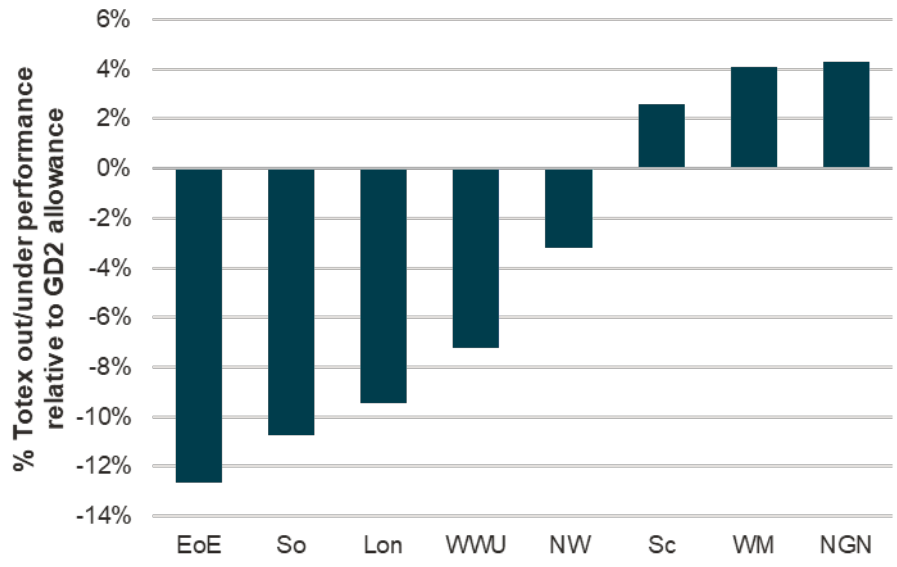
205. We discuss the approach to normalisation within the GD2 period relative to the efficiency positions across networks and regions, to highlight a pattern with assessed performance across the North and South regions, through both Totex performance views and a statistical test of the relevance of additional variables for southern regions.

206. In reviewing the cost benchmarking models, if the regional factors and normalisations were effective in accounting for regional differences, one outcome would be an efficiency outcome that is unrelated to network location.

207. We commissioned Frontier Economics to review the regional factors approach applied in GD2. As illustrated by Figure 14, their report suggests there is a north south split in networks performance against allowances:

> *"the latest Regulatory Financial Performance Reporting (RFPR) data shows that licensees operating in the southern parts of the country (i.e. EoE; So; WWU; Lon) are projected to over-spend their GD2 Totex allowances. These companies are projected to perform significantly worse against their RIIO-2 Totex allowances than licensees operating in the north. The emerging data therefore appears to indicate a 'north-south divide' on Totex performance in GD2."*[10]

Figure 14: Totex out/ underperformance relative to GD2 Allowances



Source: Frontier Economics Accounting for Regional Factors in Ofgem's Totex Model for GD3 2024

208. While it is the possibility that these performance outcomes reflect the spread of efficiency across networks, the large spread of performance outcomes (a range of c. 16%) and the significant divergence of performance within company

[10] Page 6 *Accounting for Regional Factors in Ofgem's Totex Model for GD3*, Frontier Economics, 2024

ownership groups does pose questions over whether the models used to calculate allowances are accurately reflecting the regional or company-specific factors facing each network.

209. Given the Scotland and Southern networks are commonly owned by SGN, with similar business practices, it seems improbable that there can be such a significant gap in efficiency between the two networks. Indeed, if there was, one might expect that the management team would not permit this divergence to persist and take actions to remedy the divergence in performance.

210. Furthermore, the divergence in performance is prevalent across more than one ownership group. With the gap in performance also existing for Cadent (comparing their London and East of England networks with their North West and West Midland networks), it seems unlikely that two ownership groups systematically allow for poorer performance in the same region (South East England).

211. The most likely explanation for the difference is that the associated costs are not directly comparable between the two regions (London/South East v elsewhere). Rather than poor management, it suggests that the differences in working in a densely populated area (Cadent London and SGN Southern) and more sparsely populated areas (e.g. Scotland) are not adequately reflected within the GD2 modelling approach.

212. Analysing the GD2 regression model results provides some evidence of material differences in efficiency scores between commonly-owned Licensees. SGN Southern and Cadent London GD2 efficiency scores suggested these networks were more inefficient than their sister Licensees. This is also reflected in the results from an updated version of the GD2 model which Frontier have run, which replicates the GD2 approach but incorporating the outcome of the RIIO-2 CMA appeal as well as updating for the latest regional wage data. As with the outturn Totex performance shown above, this result poses questions over the adequacy of the existing normalisation approach.

213. Returning to the hypothesis posed in paragraph 206, it is possible to assess if there is regional factor that is not accounted for in the Totex model. One approach is to run a regression model with a dummy variable for the South East (including London)[11]. If all regional costs are adequately normalised, then adding a further independent variable should not be statistically significant.

214. The figure below compares the new model (left column) with the GD2 Final Determination model (right column). The drivers in both models are the GD2 Totex CSV, plus two-time dependent variables t1 and t2. The additional variable (SthEastDV) is the dummy variable for London and the South East. The outputs are below.

Figure 15: GD2 Totex model with Additional Regional Dummy Variable

	GD2 Model Plus Dummy Variable (DV)	*GD2 Final Determination Model*
	(1)	*(2)*
	ln_Totex_sm	*ln_Totex_sm*
ln_Totex_csv	*0.752****	*.786****
SthEastDV	***0.0844******	
t1	*-0.0036*	*-.003*
t2	*0.00588*	*.006*
_cons	*0.151*	*-.075*
N	*104*	*104*
Adjusted R^2	*0.950*	*0.927*

$^{*}\ p < 0.05,\ ^{**}\ p < 0.01,\ ^{***}\ p < 0.001$

Source: GD2 Cost Benchmarking Modelling suite for model (2), and SGN's use of GD2 Modelling suite for model (1)

[11] "Dummy Variable" is a variable with a binary value (0 or 1) to indicate the absence or presence of some categorical effect that may be expected to shift the outcome. In this instance the categorical effect is that the South East geography has an effect on cost.

215. To evaluate if a model is statistically robust we can run a variety of tests, including the assessment of the p-values of each coefficient. In lay terms[12], where p-values are low, then it can be assumed that there is a statistically significant relationship. Typically, thresholds are set, as described in Figure 15. Where values are below 0.05 then a statistical relationship is present. The smaller the p-value, the more significant the relationship. The model with a South East dummy variable (i.e. the *SthEastDV* variable) added produces a p-value of 0.000 for each of the dummy variables and the CSV, thus denoting a statistical relationship.[13] Furthermore, the Adjusted R^2 has improved from 0.927 to 0.95.

216. This is a clear indication that there is a significant unexplained element of cost that the dummy acts as a proxy for. Potential explanations include:

i. An insufficient reflection of the costs of doing business in the Southern region;

ii. The normalisations carried out were insufficient;

iii. The Composite Scale Variable (CSV) poorly reflects the drivers that influence the cost of delivery; or

iv. There is a genuine deficit in the quality of management in London and southern England compared to the rest of the country.

217. Given that the London and southern networks are in different ownership groups, of which contain other networks (SGN – Scotland / Cadent – North East and West Midlands) that are among the frontier efficiency performers within the GD2 modelling approach it would cast doubt on any deficit being related to efficiency.

218. Overall, the potential questions in i, ii and iii raise concerns over the GD2 model and further highlights potential weakness of being reliant on a single Totex regression model cost to determine cost efficiency.

219. In light of this finding, it seems appropriate to review the normalisations to see if they are adequate. In the remainder of this section (section E.1) below we explore normalisations in more detail and assess appropriate adjustments. We now outline our view of the key normalisations that account for costs of working in different regions of Great Britain or company-specific factors.

Regional wages

Ofgem recognises the existence of regional labour markets, and these will cause differential costs. For example, it would be reasonable to expect labour costs to differ between the South East and Yorkshire and the Humber. The current approach involves assessing trends in different occupational wage rates across the different regions of the UK. These are used to calculate a regional wage rate index. This index is then used to deduct (normalise) the extra wage costs in the high-cost regions from networks costs prior to regression modelling.

In this section we consider key topics that affect the labour markets to assess whether these subjects warrant the amendment of the regional wages regional factors. Key topics are

- *Factors affecting demand for labour, notably the scale and patterns of infrastructure investment;*
- *The availability of skilled labour, including evidence of labour shortages and the effect of cost of living issues; and*
- *Differences between directly employed or contract labour*

Labour Demand

220. We highlight the future construction sector activity levels and how this compares against historical construction output within Great Britain, as well as a regional view for the South East in particular.

[12] Factually, any statistical test is to assess if the null hypothesis is true. Typically, the null hypothesis is where there is no relationship between the variables. A low p-value suggests the null hypothesis is unlikely. You can then assume that the alternative hypothesis is true (that there is a relationship between the variables). You cannot technically say you have tested for a statistical relationship, as the test is of the null hypothesis. However, for ease of explanation for the lay person, the document discusses the p-values showing there is a statistically significant relationship.

[13] When comparing the two models, given the drivers are all marked as statistically significant at the 1% level, you could ask which model has the best statistical relationships. While the R^2 assists as a measure of the goodness of fit with datapoints, this is not a measure of the joint significance of the independent variables. The strength of the variables together can be measured via the F-statistic and the associated p-value. This metric can also be used to assess different models in the modelling suite.

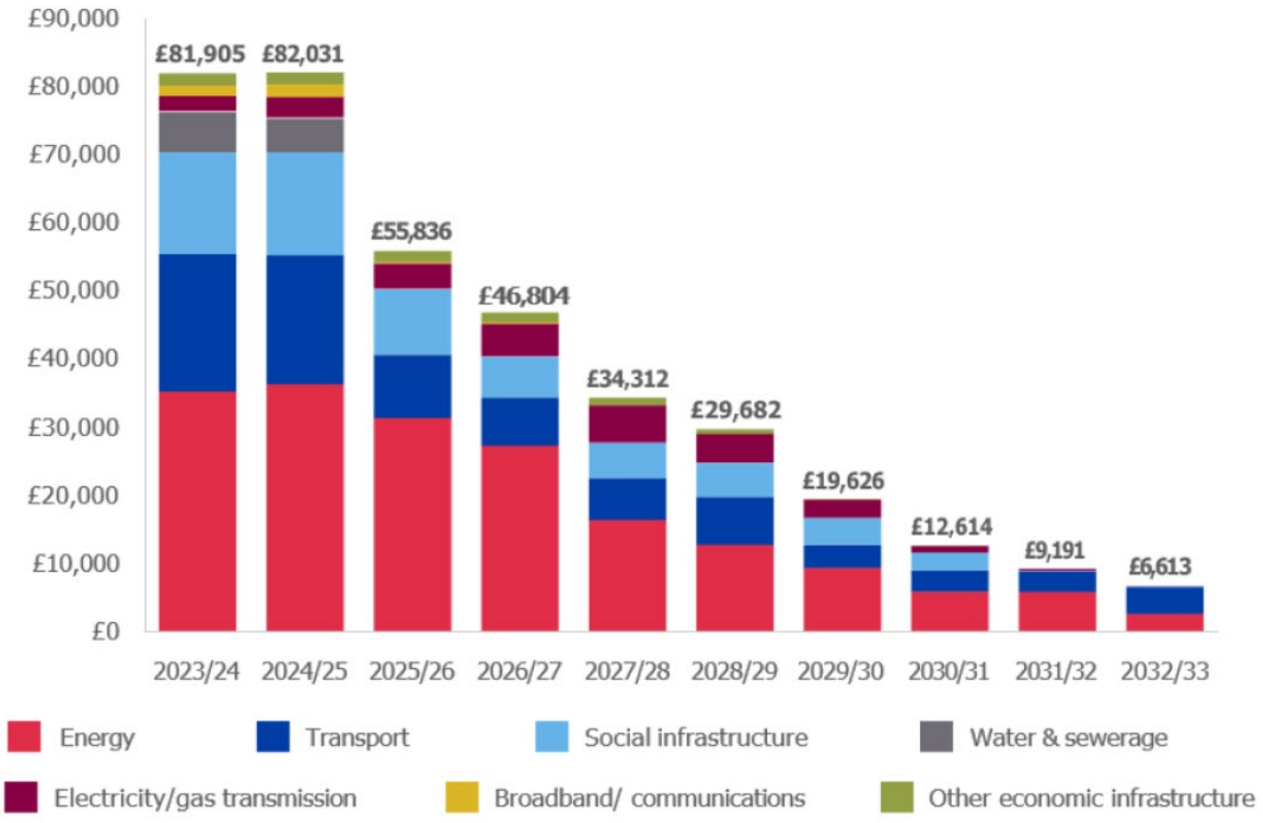
221. Simple economic theory would suggest that in a well-functioning labour market, participants will react to price signals. Where workers are needed wages will rise until enough labour is attracted to work for the company / project. Where locations exist where there is high demand for particular projects, wages rise faster than wages in other locations where the demand is lower. In an ideal world, differential wages rates will allow each regional labour market to reach an equilibrium at a wage rate where each business will have enough labour to meet demand. The cost assessment model builds on this principle, by accounting for wages in different localities through the application of a regional wage rate index.

222. However, in reality, the interactions between participants are more complex and a variety of factors will weigh on participants' decisions. One area is factors affecting the demand for labour.

223. The current Great Britain economy presents GDNs with challenges in sourcing labour, as there is a significant volume of infrastructure to deliver and a shortage of willing and able people to complete the work. Skilled workers have a great amount of choice of projects to work on. Gas networks must compete for this labour.

224. There is evidence of a significant increase in planned infrastructure projects. The Second National Infrastructure Assessment[14] highlights that investment has been on average £55bn p.a. over the last decade but will need to rise to an average of £70 - £80bn p.a. in the 2030s and £60 - £70bn p.a. in the 2040s.

Figure 16:Profile of planned pipeline investment by sector (£m) 2023/24 to 2032/33



Source: Analysis of the National Infrastructure and Construction Pipeline 2023 (HTML) - GOV.UK

225. The Government's National Infrastructure and Construction Pipeline (NICP)[15], tracks the immediate horizon. Figure 16 above indicates the 2023/24 and 2024/25 planned investment has already reached the recommended investment levels for the 2030s. While the investment appears to tail off, this does not represent all the future need. The associated commentary suggests this is in part due to public sector investment only being confirmed for the Spending Review period up to 2024/25. Public sector investment will be reviewed with the new Government's spending review. Furthermore,

[14] See page 16, Final-NIA-2-Full-Document.pdf, National Infrastructure Commission, 2023
[15] See Analysis of the National Infrastructure and Construction Pipeline 2023 (HTML) - GOV.UK

indicates that regulated industries (like Gas and Electricity) investment will be confirmed in forthcoming settlement periods.[16]

226. As such, the investment profile can only be seen as a minimum of what is currently being planned. Significant investments, including in Gas, Electricity Transmission and other utilities will add to this pipeline in the next few years, adding further pressures to labour demand across Great Britain.

Investment Skewed towards South East

227. Other industry sources provide some more detail on the infrastructure needs in our network areas. For example, Construction and Industry Training Board regional reports[17] highlight major construction projects will include:

- Water Sector Asset Management Programme (2025-30) worth £96bn;
- Upgrades to facilities and infrastructure at Heathrow and Gatwick;
- Thamesmead Development;
- Meridian Water Regeneration; and
- The Lower Thames Crossing.

228. These investments demonstrate there are plenty of engineering / construction projects that will be competing for labour with the same skills as GDNs require. We must compete for this labour, particularly in the South East of England.

Availability of Skilled Labour

229. With increasing demand for construction labour, we discuss the evidence of the availability of skilled labour within Great Britain and how this is evolving over time. We highlight the regional challenges that come about through increasing cost of living issues within the southern regions of Great Britain.

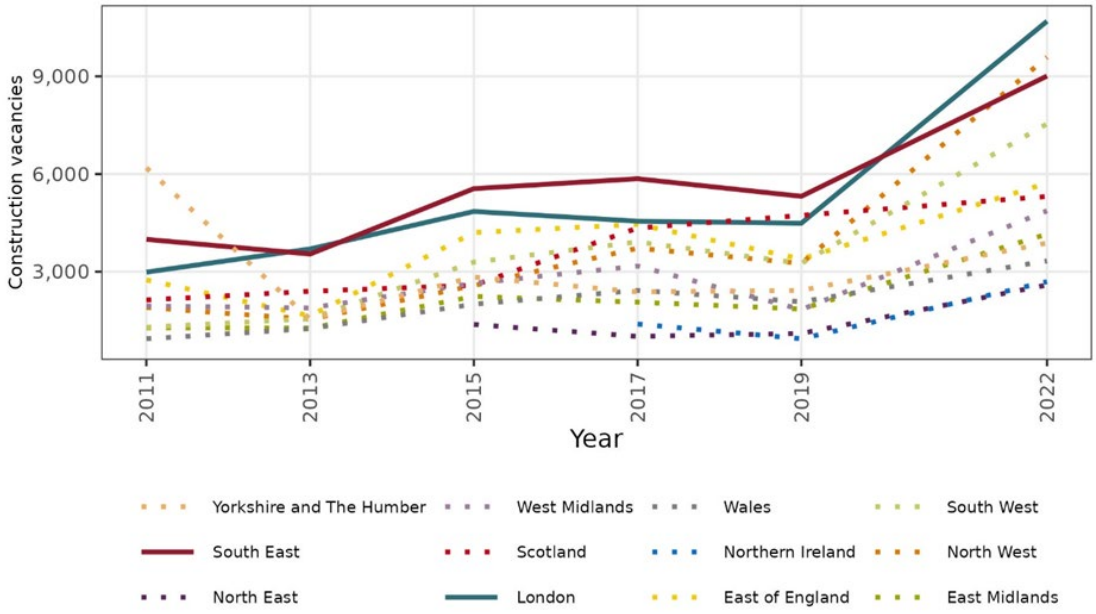
230. While in theory, the high levels of demand outlined in paragraphs 221 to 228, particularly in the southern areas, should bid up wage rates until the markets clear, this is not the case in practice. Labour is not perfectly mobile geographically – there is a significant cost of enticing labour to travel from outside of their home region, with additional costs of sustenance and lodging. Equally, labour is not perfectly transferable between industries - it takes new employees at SGN between two to four years to develop the competencies required to deliver our safety critical projects. This places a significant constraint on the ability of labour to transfer into the gas sector when it is available.

231. There are some external sources that provide evidence to assess if there are indeed constraints to the labour supply. One such source is the Department of Education's Employer Skills Survey. This typically bi-annual survey includes a record of vacancies across the construction sector.

[16] See paragraph 2.4 of Analysis of the National Infrastructure and Construction Pipeline 2023 (HTML) - GOV.UK

[17] See: Construction Skills Network Industry Outlook - 2024-2028, UK- ctb1003_csn-rep_uk-full_aw.pdf; Greater London - https://www.citb.co.uk/media/1cgfgvmj/ctb1003_csn-rep_regional_greater-london_aw2.pdf; South East - https://www.citb.co.uk/media/vjlpqwg0/ctb1003_csn-rep_regional_south-east_aw2.pdf ; and Scotland - ctb1003_csn-rep_regional_scotland_aw.pdf

Figure 17: Construction Sector Vacancies[18]



Source: Employer Skills Survey.

232. Figure 17 shows the trends in vacancy rates across all regions and countries across Great Britain. Frontier Economics has reviewed the data and concluded:

> *"The data illustrates a generalised sharp increase in vacancies across most regions of the UK between 2019 and 2022. This is consistent with the possibility that the Covid-19 pandemic in the intervening years caused some structural shift in either demand for construction work or (more likely) supply of construction labour. The trend is consistent with SGN's view that Brexit has restricted the labour supply (noting that the UK officially left the EU in January 2020). Whether this shift is temporary or more structural remains to be seen.*
>
> *We also note that vacancies in the construction sector in London and the South East are consistently higher (in absolute terms) than most other regions. While this is not a 'normalised' comparison, it is indicative of greater competition for construction labour in those regions - whether as a result of more job opportunities being generally available or labour supply being more limited (or a combination of both)."*[19]

233. While the overall vacancy count is a metric which can indicate trends in labour demand, two additional metrics can highlight where it is particularly challenging to fill specific roles. These are the Hard to Fill and Skill Shortage vacancies metrics. These two measures have also seen significant increases across the construction sector. This is further evidence of situations where there are not the individuals with the required skills available. There are a higher number of vacancies that remain unfilled for longer times, and construction businesses, including GDNs, are not sourcing the skilled staff they need to deliver workload.

Cost of Living Issues

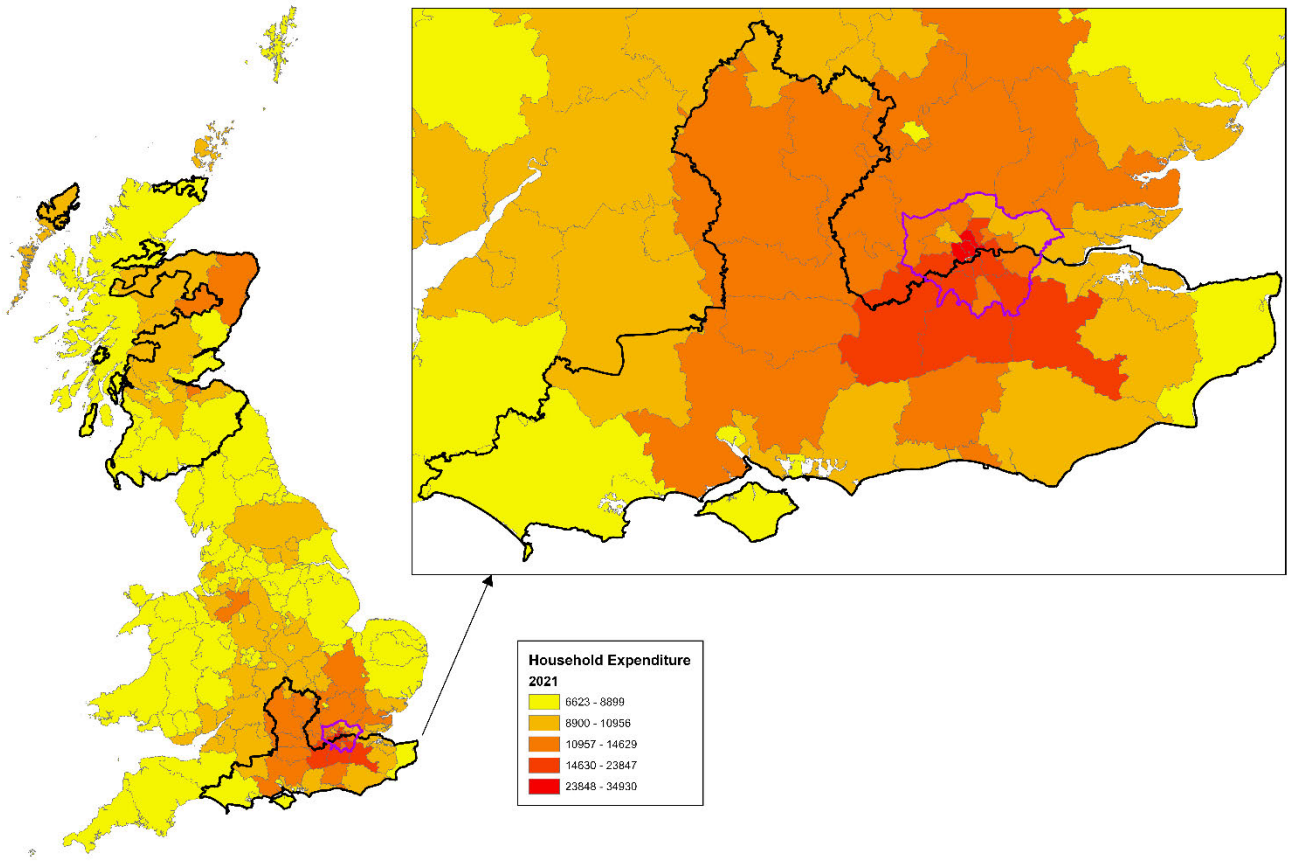
234. Labour will also consider the costs of living in any decision to take up a new post. While headline wages are important, it is the disposable income that will have the greatest effect on employees' quality of life. If living costs are too high, it may affect our ability to attract labour to work in our network areas.

235. Looking at this in more detail, if SGN want operational colleagues to live in or close to their operational area (for example, to reduce travel times to attend emergencies) they will want to know that their living costs are affordable.

236. The evidence shows that, as with wages, costs of living vary across the country.

[18] The Employer Skills survey is typically a bi-annual survey. The survey years were typically odd years (2011, 2013, 2015, 2017 and 2019). 2021 was missed (presumably due to Covid) and the survey was next conducted in 2022. There is a survey for 2024 underway, but not yet reported.
[19] See page 32, Frontier Economics *Accounting for Regional Factors in Ofgem's Totex Model for GD3* 2024

Figure 18: Household Expenditure Costs Great Britain and South East England



Source: Decomposition of the ONS Gross Household Disposable Income dataset. Expenditure items on a per head basis

237. Figure 18 shows the typical annual living costs across Great Britain with the South East of England inset, (based on the underlying data from ONS's Gross Household Disposable Income dataset) with SGNs networks boundaries (overlaid in black) and the Greater London area (overlaid in purple). The GHDI dataset has data disaggregated into primary and secondary income and expenditure.

238. The figure focuses on the expenditure elements. Primary expenditure is "Property Income paid", equating to rent and mortgages. Secondary expenditure is *Current taxes on income and wealth* and *Social contributions/Social benefits paid* and *Other current transfers paid*, equating to taxes. Figure 18 aggregates the per-head measures of these categories together to illustrate differences in base costs of living.

239. This data highlights that setting aside earnings of the whole resident population, living costs are on average higher in parts of Surrey and Kent just south of the M25, than within London.

240. While later analysis will show the Standard Occupation Classification (SOC) code hourly wage rates may appear higher in London, Figure 18 suggests that disposable income may affect staff's willingness to locate in a particular area. As such the underlying expenses are as important. The Annual Survey for Hours and Earnings (ASHE) wage data utilised in the cost assessment suite is based on where people work, not where they live. However, in the South East, many people will live outside the M25 and commute into London. The higher London wages will be used to cover the (higher) living expenses in areas outwith London (in Figure 18).

241. While localised living costs may be less of an issue for back-office staff (though note that both of our Scotland and Southern networks have amongst the greatest reported regional wage differences outside London), as they have more flexibility on where they live, the situation for network's operatives is different. There are operational reasons why it is better to have colleagues living in the localities they serve. If they serve Surrey and Kent, living in, or in close proximity to, these areas ensures SGN can respond to emergency and repairs call-outs in a timely manner. [redacted] It is therefore important operatives live within a reasonable distance from their operational area. If, as ASHE data suggests, there is a

lower wage outwith London, that suggests operatives in much of our Southern network may have lower wages but higher expenses. This makes it harder to attract staff to live and work in some locations.

242. Similarly, contractors will also be conscious of the costs of living in areas where they will undertake Repex. Living in a high-cost area will not be attractive if they do not have a long term pipeline of work from SGN. (While there may be other infrastructure projects in the South East, there is no guarantee the contractors will be able to take part in them while servicing our Repex programme). It would be more cost effective to live elsewhere and travel / stay in hotels and charge these as subsistence costs.

243. Overall, the higher cost of living will have behavioural impacts on our workforce. SGN believe living expenditure differences should be considered when determining an appropriate regional wages normalisation. The evidence supports the reasoning on why we encounter higher costs in our Southern network, as well as the reasoning in which mobility of labour is not fluid as there is a high barrier in terms of either re-location or travel costs and time.

Labour Demand and Supply Conclusions

Wider economic conditions make it hard for SGN to access the skilled labour it needs to deliver our workload

- The pipeline of immediate infrastructure projects, plus anticipated investments in future increases demand for labour with the right skills. Many of these projects are based in the South East of England.
- The tightness of the labour market is also evidenced by the significant uplift in vacancies (from the Employers Skills Survey)
- The higher cost of living in some areas out-with the M25 but within our network boundaries, are less attractive to live in but due to operational constraints there is a requirement our workforce is within a reasonable distance of our workload
- Together these factors add headwind challenges to recruit labour for all infrastructure projects and for our Southern network in particular, as evidenced by the significant uplift in vacancies (from the Employers Skills Survey)

Regional Wages: Direct Labour

244. This section discusses the direct labour element of regional wages, which was the sole GD2 approach to regional wage normalisation and applied equally to contractor labour costs.

245. At the start of section E.1 we outlined the aim of a normalisation is to ensure costs in the benchmark are comparable. We indicated that one area of adjustment is wages. We have already outlined some of the factors that will weigh in on labour demand and supply. These factors will influence wages. The normalisation approach will want to adjust wages to take account of these factors.

246. That said, there are other factors affecting wages that normalisations should consider. One is accounting for the different types of labour. i.e. directly employed (payrolled) labour and contract labour. These attract different costs. If the normalisation does not adequately account for those different costs, networks may be underfunded and not able to provide an adequate level of service for consumers.

247. SGN, in common with other GDNs, use a mix of labour to provide its operational activities. Depending on the activity and network area, some staff will be directly employed, while other activities will have to rely on be contract labour. This is in part reflective of the differing labour market conditions. In each region and each category (direct or contract) labour will be able to command different wage rates.

248. The GD benchmarking suite has a mechanism to account for differences in wage rates through the application of a regional wage index and normalisation. While SGN support the principle of accounting for regional wages, however, we believe there is a case to review its application.

249. How the Annual Survey of Hours and Earnings (ASHE) data is used warrants consideration. The regional index is based on hourly wages split by different region and Standard Occupational Classification (SOC) code, for all industries. This dataset is based on hourly wages of employed staff, as the ONS website states:

> "ASHE provides estimates for employee [20]earnings by gender and full-time/part-time workers."[21]

[20] Underline applied by SGN for our emphasis.

[21] Annual Survey of Hours and Earnings (ASHE) methodology and guidance - Office for National Statistics

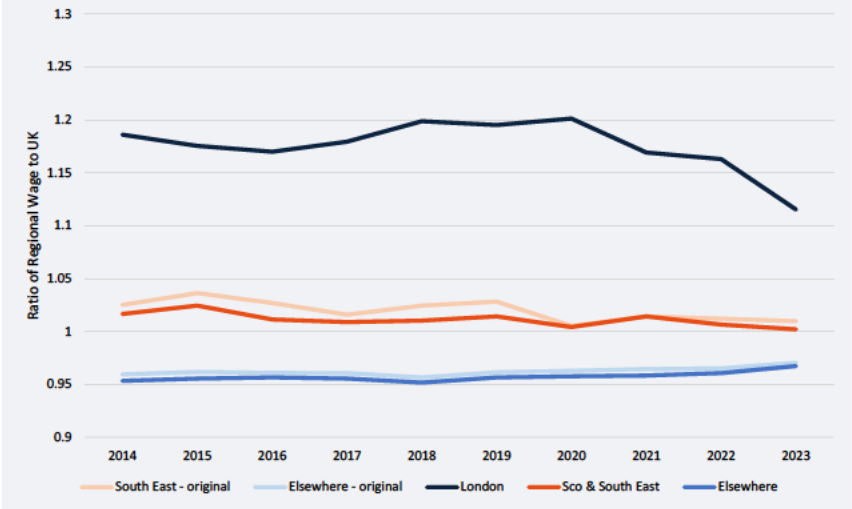
250. Given the recruitment challenges mentioned above, it is not possible to have a wholly direct employee workforce to deliver all of SGNs activities. We therefore use contract labour to deliver much of our workload. Many of our contractors utilise self-employed labour, for which cost movements are not explained by the ASHE survey. As such while the use of ASHE data to assess wage differentials for direct employees is warranted, a different approach should be applied for contractors to better explain the cost movements of the self-employed workforce.

251. We now turn to discussing the **geographic coverage of the regional wage adjustments.** Currently, the regional wage adjustment mechanism considers there to be three broad regions – London, the South East and Elsewhere. The London wage differential is applied to Cadent London, and to recognise that part of SGN's Southern network is within the M25, a weighted analysis generates a smaller regional wage adjustment for the Southern network. It is assumed that all other networks do not experience regional wage pressures, and they do not have a regional wage normalisation applied.

252. We are aware that Cadent has put forward the case for part of their East of England network to be considered for a regional wage adjustment, most recently at CAWG 15. This is based on the hypothesis that the London effect on wages does not just radiate south and west of London. It also radiates northeast of London. We put forward a view that our Scotland region has a regional wage difference that is as equal to the South East ASHE grouping, both now and has been historically. Such a regional wage difference would make sense due to differing taxation policies in Scotland and the challenges of sparsity we incur within the Scotland regions.

253. To examine this hypothesis further, an examination of the annualised data from ONS used in the regional factors adjustments assists in evaluating if there are persistent differentials between regions. One approach is re-evaluating the London, South East and Elsewhere categories. Using ONS's standard regions (not GDN boundaries) Scotland is presented together with the South East as the analysis suggests these regions' rates are clustered together.[22]. Figure 19 shows the differentials between the groups.

Figure 19: Ratio of Regional wages to Great Britain – Alternative Regional Groupings



Source: based on the updated version of GD2_RegionalCostIndices.xlsx shared by Ofgem at August 2024 CAWG, tab Cal_weighted_pay_2d, Mean hourly pay in each region

254. It is clear from Figure 19 that there is a significant difference between the wages of Scotland and the South East of England than the remaining "elsewhere" regions.

255. As South East has a regional wage adjustment applied to reflect the ASHE data presented, we believe Scotland also requires a normalisation adjustment to account for increased regional wages we experience in our network.

Potential Approach for Scotland

256. The differences between a revised "elsewhere" and a revised "South East and Scotland" regional groupings, in Figure 19, varies around 4% to 5%. An alternative option is to base the Scotland regional factor on that gap. As the gap has been narrowing, we have applied a more conservative estimate of 4% when assessing our proposed regional wage adjustment for Scotland.

Note on recent challenges with ONS data

257. Official data sources from ONS provide exogenous foundation datasets to understand the labour market across the UK countries and regions. However recent press reports[23] suggest that some datasets like the Labour Force Survey are being

[22] Definition of Groups: London = ITL; Elsewhere = ITLs of North East, North West, Yorkshire and the Humber, East Midlands, West Midlands, South West and Wales; Scotland, South East and East: these three ITL regions have been grouped together after analysis shows their wages are very similar.

[23] See Financial Times articles: ONS faces fresh scrutiny over flawed UK labour market data and Bank of England chief economist criticises statistics agency over poor jobs data

affected by reducing sample sizes. As the SOC code mapping exercise has been informed by an analysis of LFS data[24], the uncertainty surrounding the LFS robustness does bring some uncertainty to the mapping of SOC codes and therefore the regional wages calculations.

258. In that light it is appropriate to consider if caution in interpreting regional wages calculation is required, particularly with the most recent data, and whether alternative information may appropriate for some aspects of the normalisations.

Recommendation:

The regional wages mechanism should be changed to better reflect the use of direct and contract labour. We believe leaving the mechanism as is would underestimate the regional labour costs and ultimately make an error in the efficiency calculation.

- SGN recommend that the existing regional wage mechanism should continue, for directly employed labour only.
- Though due to recent reported challenges with ONS datasets, care should be taken when interpreting any recently changing trends.

Furthermore, we also think that Scotland should be considered for a regional wage adjustment as the ASHE data has always supported such a regional cost difference.

- SGN propose the application of a conservative 4% regional wage adjustment for cost normalisation in Scotland.

Regional wages / supply: contractor labour

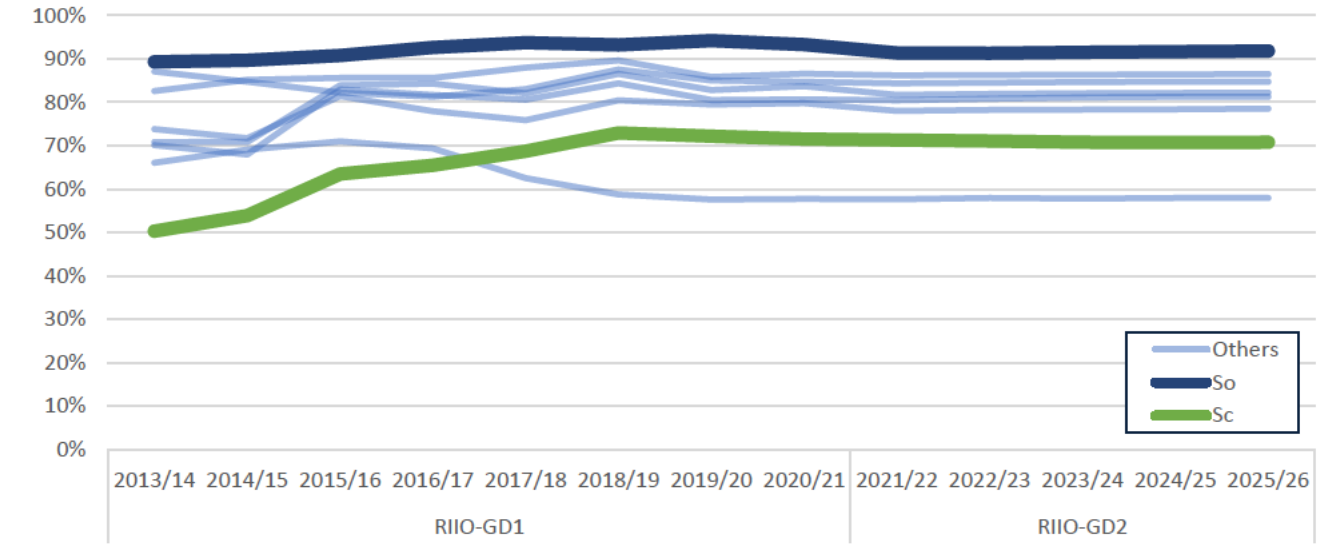
259. Contractor labour is a different type of expenditure with different cost drivers than direct labour. We discuss the difference between contractor and direct labour, the exposure to contractor labour that our Southern network has, as well as regional cost premiums of this activity.

260. Earlier in this document we highlighted the labour supply challenges in the infrastructure sector. While we have a direct labour recruitment strategy (see document SGN-GD3-SD-03, *Workforce and Supply Chain Resilience Strategy*), it is not always possible to recruit direct labour for all our activities. If a labour market is tight, and a premium can be earnt as a contractor, then the benefits for individuals of direct employment are limited. As such it may not be possible to employ direct labour in the volumes required. As paragraph 246 indicates, contractor labour attracts different costs. We now consider evidence on contractor wages and the impact on networks and SGN in particular.

261. Figure 20 displays data from GD2 BPDT submissions, highlighting the proportion of all networks Repex workload that utilises contractors.

[24] See *Regional Wages Update Methodology* paper supplied by Ofgem 28th April 2024

Figure 20: Percentage of Repex Workload (Value) delivered by Contractors in GD1 and GD2

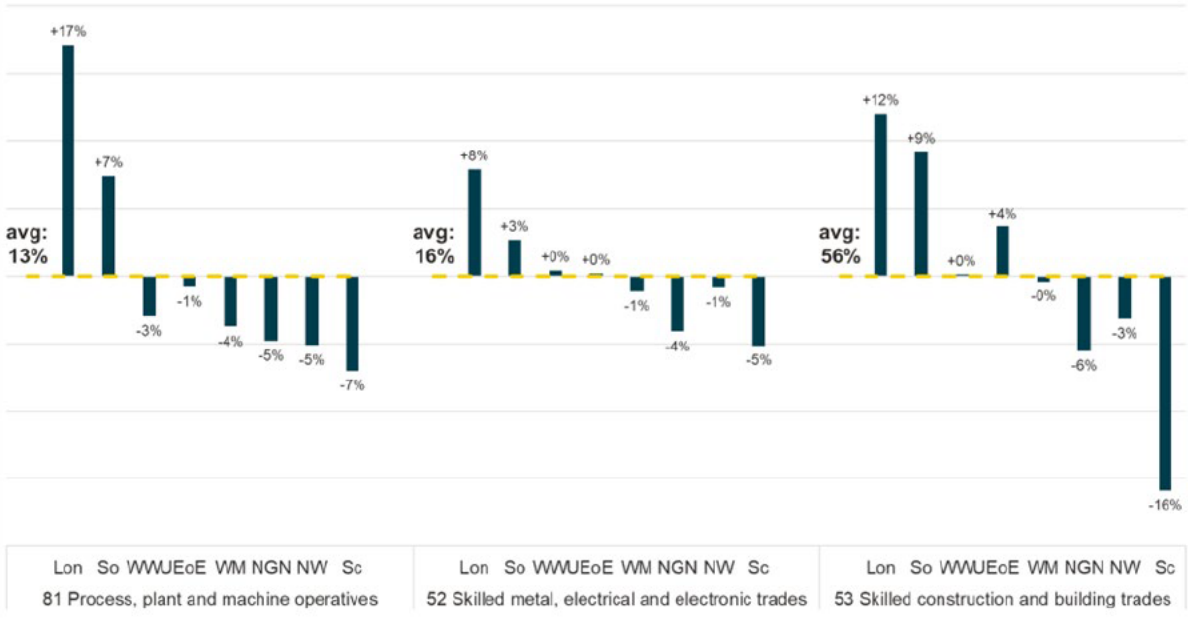


Source: GD2 BPDT's

262. Figure 20 demonstrates that networks use contractor labour to deliver the majority of Repex activity. SGNs Southern network has the highest reliance on contract labour.

263. Workers preferences to be an employee or be a contractor will influence the availability of direct labour or contract labour staff. Frontier Economics have reviewed Annual Population Survey to assess levels of employment and self-employment across Great Britain. The national self-employment rate (2021 – 2024) averages 14%[25]. In Southern the self-employment rate (across all SOC codes) is just over 16%. In the London network it is over 17%. Any variation by region and sector could influence the availability patterns for gas networks more acutely.

Figure 21: Average Proportion of Self-Employed Workers by GDN (Selected Soc Codes) – 2021 – 2024



Source: *Accounting for Regional Factors In Ofgem's Totex Model For GD3* Frontier Economics, 2024

264. Figure 21 shows that in the occupations we hire from, the self-employment rate is higher in Southern than elsewhere. The situation is particularly acute in the *'Skilled Construction And Building Trades'* category. Nearly two thirds of workers in this

[25] Source: *Accounting for Regional Factors In Ofgem's Totex Model For GD3* Frontier Economics, 2024

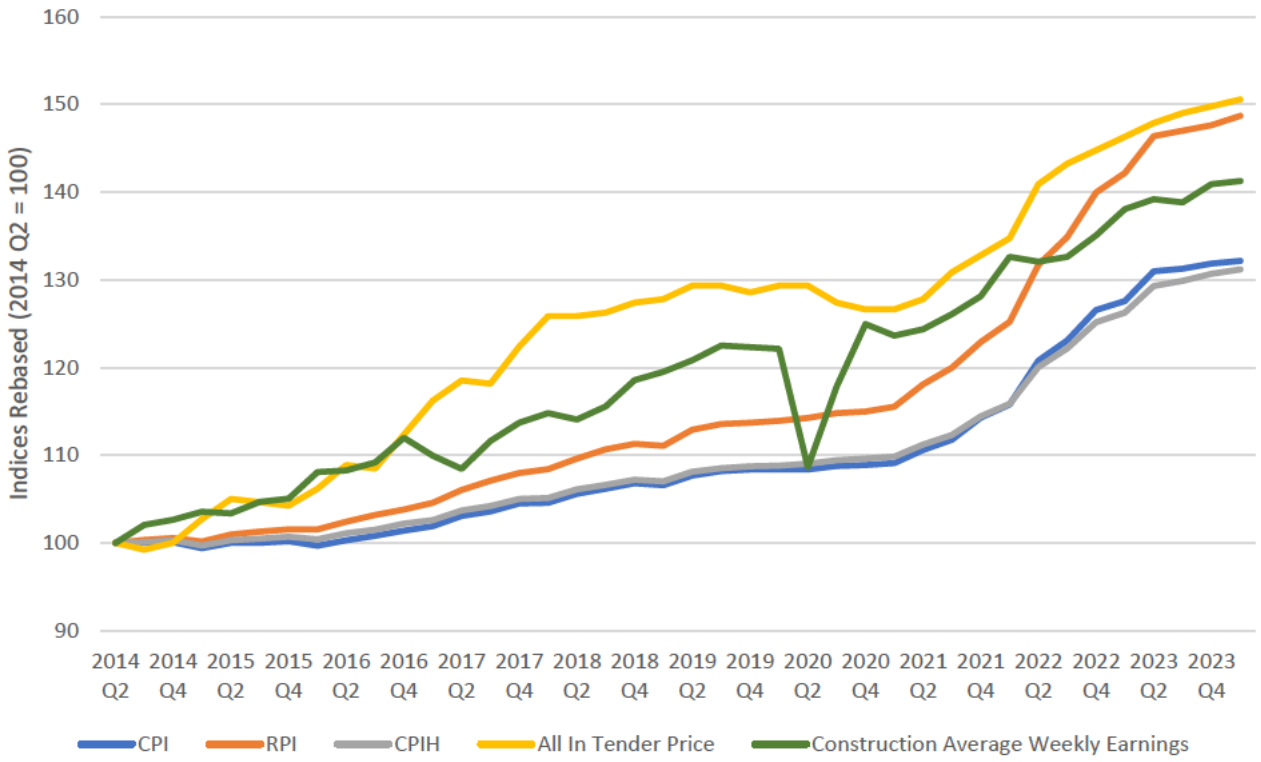
SOC code category are self-employed. This evidence suggests that SGN is operating in a market where it is not necessarily that easy to recruit skilled labour into our direct labour workforce.

265. Using contractors brings extra costs, that are not captured elsewhere in the cost assessment framework, like risk premia, contractor firms own overheads and profit margins. Where networks employ contractors for activities far from their operating base, they will have extra travel and subsistence costs.

266. There is contextual evidence which demonstrates that contracts across the construction sector attract a premium over wage rates. The Building Cost Information Service (BCIS) collect a variety of construction sector costs indices (Ofgem already use a selection of their indices in the Real Price Effects calculations). One of BCIS data series is an All in Contractor Tender Price Index. It is not energy specific, nor regional, but it does demonstrate there is a significant contractor premium across the whole of the Great Britain construction sector.

267. Figure 22 compares the All in Contractor Tender Price Index with other key price indices. Each are expressed as an index, relative to quarter 2 2014, to allow for the cumulative growth to be tracked.

Figure 22: BCIS All In Tender Price Index Cumulative Growth Compared to Inflation / Construction Wage Rates



Source: BCIS and ONS

268. Figure 22 shows contract tender prices have consistently risen faster than official measures of inflation. For example, when looking at index values in Q1 2024, (All in Tender Price = 150.5, CPIH = 131.19) the All in Tender Price sits 15% higher than CPIH (150.5-131.19)/131.19)). When comparing the tender index with ONS's construction wages index (the green line), tender prices growth diverges after the middle of 2016. Post-Brexit and with a tightening labour market, it appears contractors across the whole of the construction sector have consistently commanded a premium over construction hourly wage rates since 2016. The above demonstrates there may be sectoral cost pressures that are not being recognised in the cost assessment framework.

269. The divergence between contract tender rates and wages is evidence there is a persistent contractor premium networks must pay. In GD3, changes to the cost assessment framework will have to be assessed, to ensure the framework adequately accounts for the premium.

270. SGN believe it is appropriate to account for this contractor premia in the regional wage adjustment. Our experience is that these contractor premia are skewed towards the southern region. Any national index will mask regional variations. Some regions will see higher than the average, some lower. Our evidence suggests the higher rates may be charged within the South East. A case in point is Repex.

271. SGN have employed consultants Deecon (SGN-GD3-ECR-03 and SGN-GD3-ECR-18) to independently assess the cost data for delivering the Repex programme in both our Southern and our Scottish license area (this is discussed in more detail in section F.5). In this they undertook a detailed breakdown of the factors that impact the costs. This detailed data set also allows them to distinguish the costs of different types of delivery (direct labour or contract labour – CL) and network. Findings are summarised in Figure 23 below.

Figure 23: Direct Labour and Contract Labour Rates for Repex

Median Project Unit rates (£/m)	Scotland	Southern	Ratio	Relative Difference
[redacted]	[redacted]	[redacted]	[redacted]	
[redacted]	[redacted]	[redacted]	[redacted]	1.10

Source: Deecon Analysis of SGN internal data

272 [redacted]

273. It is possible that the observed contractor premium is driven by the fact that in the south, labour market dynamics mean we are more reliant on self-employed labour. This would not necessarily be reflected in Ofgem's ASHE benchmark - the ASHE data only reflects wages of payrolled employees: "ASHE provides estimates for employee[26] earnings by gender and full-time/part-time workers."[27] That said, a priori we might not expect material and sustained differentials in wages for self-employed labour vs employed labour. Alternatively (or perhaps in combination), the contractor premium could be driven by the changing market dynamics for contractors we describe above. We need to rely on contractors to deliver our Repex programme, and those contractors demand a premium which is currently not accounted for in Ofgem's regional labour adjustment (or, we believe, elsewhere in Ofgem's modelling normalisations).

274. Frontier Economics suggest that in practical terms, one way to adjust Ofgem's modelling approach to 'capture' a Contractor Regional Premium (CRP) might be to derive a percentage uplift that could be applied to the ASHE wages benchmark, using the data on regional unit rates shown in the table above. They calculate that a CRP of up to 10% could be applied[28],
noting also some limitations in their report of this.[29] The adjustment would need to be applied to the proportion of Repex work delivered by contractors.

275. One approach to do this is to do the following:

- First, estimate a contractor labour rate differential by uplifting Ofgem's ASHE benchmark differential (9% for Southern) by the 10% CRP. This results in a contractor labour rate differential of 20%.
- Then, estimate a regional wage index as the weighted average of Ofgem's ASHE benchmark differential (9%) and the contractor labour rate differential estimated at the previous step (20%), where the weight represents the proportion of contractors that we use in Southern (c. 80%).

276. By applying this approach, we conclude that Ofgem should adjust our contractor labour costs in Southern by 18% relative to elsewhere. The table below shows our findings.

Variable	Source	Factor	Factor
Direct Labour differential	Ofgem's GD2 benchmark based on ASHE data	A	9%
Contractor labour premium	Based on Deecon's analysis	B	10%
Contract Labour differential	SGN's estimation	C=(1+A)*(1+B)-1	20%
Proportion of contractors	SGN's estimation	D	80%
Labour differential	**SGN's estimation**	**E=(1+A)*(1-D)+(1+C)*D-1**	**18%**

Source: results of calculations differ due to rounding.

[26] Underline applied by SGN for our emphasis.

[27] Annual Survey of Hours and Earnings (ASHE) methodology and guidance - Office for National Statistics

[28] 10% = (1+68%)/(1+54%)-1.

[29] See Frontier's report, p. 58.

277. Due to southern regions being more exposed to self-employed labour, as demonstrated in Figure 21, our Southern network has less opportunities to manage a direct labour workforce. [redacted] We can demonstrate through national data Figure 22, that there is a premium for contractor labour on the national level and when compared to our own internal data being Scotland and southern networks are able to demonstrate our regional contractor premia differences that we are exposed to.

278. While we are attempting to reduce our reliance on contractor labour within the GD3 period within our Repex activities through employing direct labour, we will still be exposed to an increased regional contractor premium for the workforce that we are required to maintain to ensure the deliverability of the IMRRP. See our Workforce and Supply Chain Resilience Strategy (SGN-GD3-SD-03) for more information on how we are trying to optimise our workforce and supply chain to drive an efficient and value-for-money approach to carrying out our workload.

279. SGN believe the approaches put forward by Frontier Economics are well-considered and practical. Furthermore, while these metrics were based on an assessment of Repex activities, SGN know that we also employ contractors to deliver Direct Opex and Capex.

Regional Wage Adjustment Conclusions and Actions:

SGN believe it is appropriate to revise the regional wages adjustment methodology in light of the evidence on contractor costs. We propose:

1. Splitting the regional wages adjustments into two parts: a direct labour regional adjustment and a contractor regional adjustment
2. The direct labour regional adjustment should rely on the ASHE data methodology. It should also consider that Scotland wages are higher than the average. Our proposals include:
    a. A Southern regional wage normalisation of 1.09
    b. A Scotland regional wage normalisation of 1.04
3. The adoption of a contractor regional wage adjustment of 1.19 for a share of Repex, Direct Opex and Capex workloads

Urbanity Productivity

Ofgem recognise that working in urban areas brings with it extra costs. Networks face challenges like:

- High traffic levels / traffic management and permits
- Longer time to get to jobs
- Congested assets (alongside other utilities)
- Other more complex aspects of delivering work

These, and other factors, need more effort – more staff hours, more resources, longer elapsed time – than jobs in less urban areas. This brings extra cost to networks operating in urban areas. Ofgem recognise this extra cost through the application of an urbanity productivity adjustment.

The adjustment calculation utilises an adjustment factor (15% for London) based on the NERA / Arcadis assessment of London factors. When weighting by population, this resulted in a Southern network wide factor of 1.04.

In this section we discuss alternative measures of the impact of urbanity on networks activities. Traffic congestion is a key factor affecting jobs – whether actual travel time reduces hours on jobs, or extra traffic management costs.

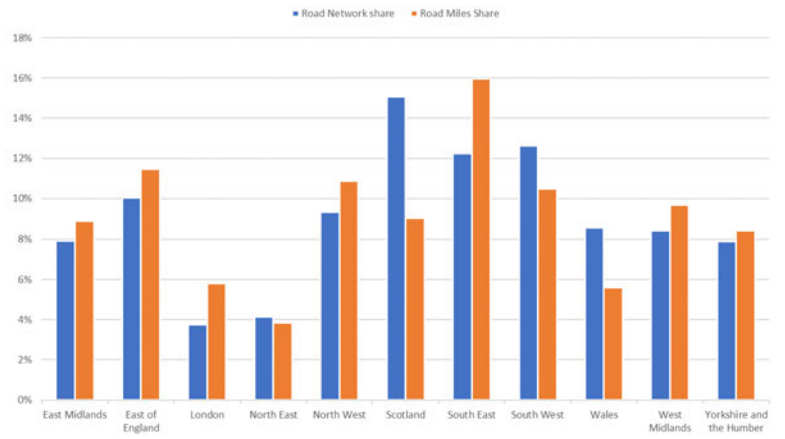
In this section we consider what data sources are available to assess the traffic levels across Great Britain and within our networks, and what it might tell us about the differing impact of congestion across different GDNs.

280. The regional factors approach recognises that there is a resourcing impact when working in more densely populated areas. Travelling to emergency or repair jobs/planned Repex work takes longer in major conurbations. With the reduced HSE mandated working time, that increased travel time must be incorporated into shorter days. Furthermore, densely populated areas may have restricted working hours based on lane permits to accommodate dense traffic or noise pollution at unsociable times.

External Travel Data

281. With traffic congestion / travel time having an impact on productivity, SGN have investigated what external and internal sources are available. The Department of Transport produces detailed datasets on road traffic. In particular, it publishes the total mileage travelled on roads and the total length of roads in each region[30]. This is set out in Figure 25[31].

Figure 25: Road Transport Statistics by Region 2023



Source: Department of Transport, Road Transport Statistics, 2023

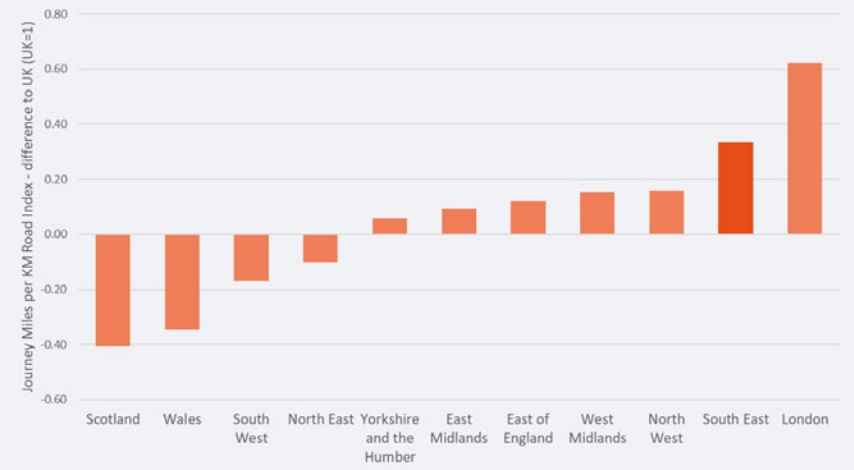
282. While it is not exactly the same boundary as SGN Southern, The South East ITL does offers some relevant insights. Figure 25 demonstrates that while the South East has the third largest road network (12% of road network) (behind the Southwest and Scotland), it had the largest share of the journey miles travelled at 16%.

283. With the road network length and the journey miles, it is possible to create the metric journey miles per network mile for each region and the Great Britain. To allow a comparison across the country, the journey miles per mile of the network can then be expressed as a ratio of the Great Britain aggregate. Regions with more journey miles travelled per length of road network are likely to experience more traffic congestion on average.

284. Figure 26 highlights London and the South East have consistently had relatively higher congestion than other UK regions. These relative congestion rates (South East +0.34 and London +0.62 compared to UK, where UK = 1) are significantly higher than the urbanity productivity ratios used in the GD2 models (1.04 (i.e. +0.04) for Southern and 1.11 (i.e. +.11) in London).

285. This data is not an exact measure of the differences in road congestion faced by GDNs when undertaking work - which will depend on the extent of peak traffic congestion at times of the day when our staff are required to travel; and on the spread of congested road network across each network. Nevertheless, it is indicative measure of the challenges faced in the south.

Figure 26: Journey Miles per mile of road network, Ratio of Great Britain Aggregate, Great Britain ITL regions[32]



Source: SGN analysis of Department of Transport Statistics

Internal Travel Data

286. In light of the challenges outlined in paragraph 285 it is appropriate to assess internal travel data from our vehicle tracking systems, and we have undertaken an analysis of individual vehicle journeys over a whole year (2023).

287. A key factor to consider is sub-network density. Travel times in the New Forest will be different to the travel times in Surbiton, even though they are both in the same network. To allow for some sub-network analysis, our travel time data

[30] See: https://roadtraffic.dft.gov.uk/downloads

[31] See https://storage.googleapis.com/dft-statistics/road-traffic/downloads/data-gov-uk/region_traffic_by_vehicle_type.csv

[32] ITL Regions – International Territorial Level regions – (Previously NUTS regions), not GDN network regions

has been mapped to the areas the vehicles have travelled through, based on the Westminster and Scottish Government's urban: rural classification schemes. While there are further urban and rural subcategories, we have aggregated analysis to urban and rural areas within each network. This segmentation allows for some control over differences in each region's density.

Figure 27:Hours Spent Travelling per Week - 2023

Median Hours Spent Travelling	Rural	Urban
Scotland	3.4	4.8
Southern	2.9	5.7
Southern as Ratio Scotland	**0.9**	**1.2**

288. It is clear from Figure 27 that, at an aggregate level, Southern colleagues spend nearly 20% more time every week on average travelling in urban areas than colleagues travelling in Scottish urban areas. Having said that, this is the median values. At the upper quartile, colleagues in Southern urban areas can be travelling for 8.5 hours a week. That is greater time lost to work. The current density adjustment would not appear to allow for this extra 20% of time in the most urban areas in Southern.

289. While there is an argument that the travel time will average out over the networks, there is evidence to suggest the time taken travelling is significantly skewed towards Southern's urban areas.

Figure 28: Aggregate Journey Hours Scotland and Southern 2023

Aggregate Journey Hours	Rural	Urban	Total
Scotland	122,640	158,885	281,525
Southern	162,854	309,916	472,770
Total	285,494	468,802	754,295

290. In 2023, 41% of the recorded SGNs journey time (i.e. the 309,916 hours) was undertaken in urban areas of Southern. It would therefore be prudent to consider the sub-network spread in travel times as they will have different impacts on productivity down time.

Figure 29: Weighting of travel times by Rural and Urban

Travel Time 2023	Rural	Urban
Southern Travel Time	162,854	309,916
Southern Shares	34.45%	65.55%
Differential to Scotland	0.86	1.19
Weighted Average	1.08	

291. In light of the evidence from Department of Transport data and internal SGN data, we believe it is appropriate to revise the Urbanity Productivity adjustment. While there could be a case to base the adjustment for Southern on external data, we take the view that the internal data demonstrates that we manage travel time better than the typical driver. As such, to recognise the urban/rural split, we have weighted the travel time (Figure 29) to calculate a productivity factor based on our internal data, of 1.08.

Urbanity Productivity Conclusions and Actions:

It is appropriate to revise the urbanity productivity regional adjustment to, at the minimum, account of our evidence the impact of travel congestion. For Southern we propose:

1. Setting a floor urbanity productivity adjustment of 1.08 (instead of 1.04 in GD2).
2. Ofgem consider the case for setting a higher productivity adjustment based on Department of Transport travel statistics and other potential data on underground utility network congestion.

Reinstatement

292. In this section we consider whether other Regulators approaches offer any insight on potential adjustments to the Urbanity reinstatement normalisation.

293. The current Ofgem benchmarking approach recognises there are higher costs associated with reinstatement in highly urban areas. These costs are treated as extra labour costs and have regional labour indices applied to them. As with other regional factors, a suitable adjustment will fully recognise these higher costs to ensure networks can provide an adequate service for consumers.

294. The starting point for this factor is previous research for GD2. SGN asked Frontier Economics to review the previous approach.

295. In their research, Frontier Economics considered the previous NERA/Arcadis research into the extra cost of working in urban areas like London. That work suggested the GD1 framework did not fully adjust for the costs of working in London. Frontier Economics compared the GD2 framework with the NERA/Arcadis report (SGN-GD3-ECR-22) and have concluded the GD2 framework did not account for factors including reinstatement of streets in urban areas[33].

296. Furthermore, Frontier examined practises in other Regulatory environments. Their report highlights that other Regulators have applied a differential approach. They note that in PR24, Ofwat have recognised that

> "replacing mains in London is likely to be more expensive than in other parts of England and Wales due to the added complexity of working in a very congested and densely population area"[34]

297. Frontier Economics report notes that Ofwat provided Thames Water with an uplift to the standard unit cost for replacing mains.

Reinstatement Conclusions

Ofgem to consider updating the reinstatement adjustment index for working within highly urban environments, in light of data provided as part of the NERA/Arcadis report at the start of GD2 and with consideration of the latest Ofwat approach for working in London.

Sparsity

As with operating in densely populated areas, operating in the most sparsely populated areas can involve a greater amount of effort than the average. Primarily, relatively more staff are needed to cover larger geographies with fewer jobs, which costs more.

In this section we discuss the existing sparsity adjustment and consider what differential impact the HSE's requirement to cap shifts to a maximum of 12 hours could have on serving our sparser areas of Scotland.

Existing Population-Based Sparsity Adjustment

298. It is recognised across many fields that providing services to rural communities costs extra than serving suburban/urban areas. Where there is an obligation to provide services to consumers, it is right that the provider is compensated for only the extra cost of serving the most rural communities. A good mechanism will use metrics that are objective and account for the driver of the extra costs and / or use an adequate proxy of cost variation.

299. The current cost assessment approach calculates sparsity based on relative population density at network level. These normalisations are currently applied to emergency and repair activities. In the GD2 cost assessment suite, this adjustment gave Scotland a sparsity adjustment of £8.3m (£1.7m p.a.) in GD2.

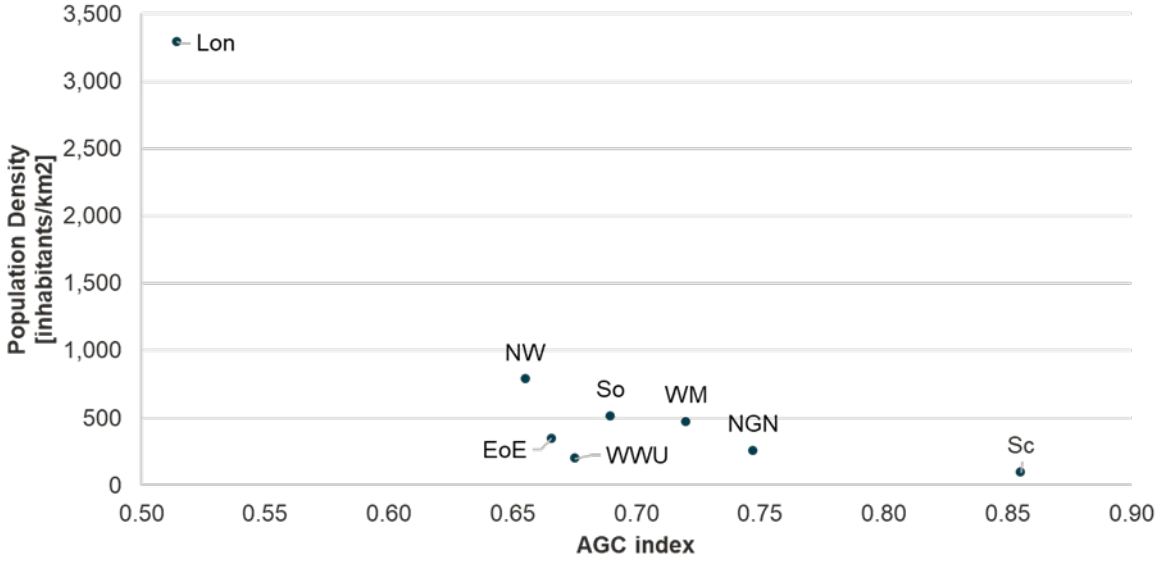
300. Indeed, analysis by Frontier Economics shows that we are an outlier compared to other GDNs according to an index that measure the variation in population concentration – the Adjusted Geographic Concentration Index (ACG) (derived using a

[33] Frontier Economics report, p. 42.

[34] Frontier Economics report – sourcing Ofwat (Jul 2024), PR24 draft determinations, Expenditure allowances, p. 35. https://www.ofwat.gov.uk/wp-content/uploads/2024/07/PR24-draft-determinations-Expenditure-allowances-to-upload.pdf

methodology used by the OECD to derive similar indices). The index varies from 0, least variation in population concentration in sample provided, to 1, maximum variation in population concentration in sample provided.

Figure 30 Concentration vs. Population density by GDN



Source: *Frontier Economics' regional factors report, Figure 20, p. 50. AGC stands for Adjusted Geographic Concentration Index.*

301. The scatter plot above shows for each GDN its ACG index against an aggregate measure of population density. As can be seen from the chart, Cadent London has the lowest ACG and highest aggregate population density. This means that while Cadent's London service area is densely populated, this higher level of density is homogenously spread throughout the service area. On the other hand, SGN Scotland has the highest ACG and amongst the lowest aggregate population density. This is because - despite our overall lower density - the variation in population density across our area is wide – and considerably more so than in other low density service areas, like WWU and NGN. The measure of aggregate population density used by Ofgem for its GD2 sparsity adjustment would not allow to capture the impact of this unique characteristic of our Scottish service area. As recommend by Frontier, Ofgem may want to test whether this metric could explain regional differences in costs further.

302. SGN are therefore supportive of continuing with the population-based sparsity adjustment as a baseline, but further consideration is required for the impact of 12-hour ways of working and incremental property costs we are exposed to.

Impact of 12-Hour Working Pattern

303. While we acknowledge the analysis for urbanity productivity shows a sparsity effect (relatively lower absolute travelling times) for Scotland – the analysis just highlights that there are many sparsity and density effects (and the associated costs) that are not well correlated with population density. While population density may be part of the picture, other factors should also be taken into account.

304. For operational activities, networks have a requirement to respond to calls within 1 hour. In rural areas travel distances are longer, meaning we must station colleagues in more remote areas to ensure that we can respond to incidents timeously (hence the lower weekly travel times mentioned in Figure 27).

305 [redacted]

306 [redacted]

307. Two factors suggest it is inappropriate to adopt such an approach:

i. [redacted]

ii. [redacted]

308. Given the shift change in costs, it is appropriate to consider a different approach to account for the 12-hour working pattern impacts in different parts of the country.

12-Hour Approach

309 [redacted]

310. [redacted]

311 [redacted]

i. [redacted]

ii. [redacted]

iii. [redacted]

iv. [redacted]

312 [redacted]

313. While we do believe more work could be undertaken to measure sparsity effects, SGN propose taking a hybrid approach. Adopting the type of approach outlined in paragraph 311 to account for the shift change in costs arising from moving to a 12-hour working pattern, plus retention of the population based sparsity measure as a proxy, for those aspects that do not have a specific driver.

Sparsity Conclusions and Actions:

SGN believe it is appropriate to have two adjustments for sparsity

- The existing sparsity adjustment calculation for our Emergency, Repair and Maintenance activities which are core Opex, plus
- [redacted]

Soil types

314. In this section we discuss the effect differing soil types can have pipe deterioration and whether this warrants further examination.

315. Any asset has a particular lifespan. While a PE pipe might be expected to last 80 years, that assumes it is well maintained and no external factors will skew the need for maintenance of particular pipes. In reality if those external factors exist, that increase the need for maintenance over the asset lifespan, it is right for networks to be compensated for the extra cost, so that they are incentivised to undertake the appropriate maintenance to ensure the safety of the network for consumers. One area of risk that the benchmarking approach does not appear to adjust for is the risk of higher deterioration arising from pipes sitting in particular soil types.

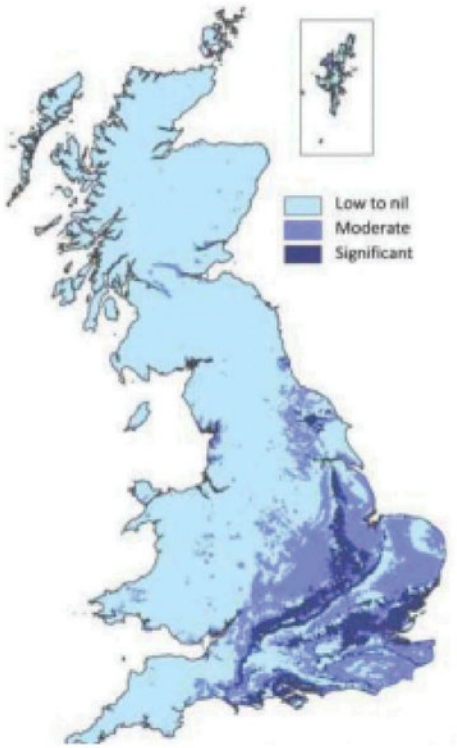
316. SGN have undertaken analysis of the incidence of deterioration / leakage across our Scotland network. This research has identified that there is an increased incidence of deterioration when incidents are categorised by soil type. We believe that where there is increased deterioration this will impact on cost. We outline the hypothesis below.

317. Landscapes and topography vary significantly throughout Great Britain, as do soil types. Soil type is thought to impact the rates of deterioration of different materials of pipe. This is due to a wide variety of factors, including: drainage; water retention; presence of different elements and minerals; and aeration.

318. Initial internal analysis was conducted only on our Scottish network. It suggests that soil types play a significant role in mains failures. We analysed different types of mains failures, separated into material and band; and used GIS to determine the soil type that the failure occurred in. Once compiled, we noted that certain pipe material and soil combinations show much higher deterioration rates (controlled for length of main within each soil type).

319. If this is true in Scotland, further research is required to assess if it is true in other network areas. Figure 31 comes from a report analysing climate change risks on railway infrastructure. It shows that there are clay types in South Eastern England where there is medium and higher risk of soil movement, particularly should there be climate change events. This demonstrates that the risk is not evenly distributed across the country. The higher risk areas are in localities with a more densely populated network. It seems likely that there could be an even higher risk GDNs could be dealing with climate change driven deterioration events in the southern networks.

Figure 31 Potential shrink-swell of clay soils in the Great Britain (adapted from British Geological Survey)



Source: *Impact of climate change on railway construction, maintenance and safety in the United Kingdom*, DeVinne, N; DeBold, R; Forde, MC; and Ho, C, 2022[35]

320. Where that risk materialises, there will be greater cost borne by the southern networks that will be out with our control. While there is more work to do to quantify the impact, SGN believe the Southern network, along with other regional networks, should have a regional adjustment to account for this risk.

Complexity

321. We discuss our definition of complexity factors, and how they impact our costs in further detail within Section F.5 . Within this section we discuss if such complexity factors are reflected in network configuration differences, plus the approaches that could be used to ensure any exogenous variances in costs are suitably normalised ahead of cost efficiency assessment.

322. The nature of operational activity, particularly in Repex, is affected by the location of the pipes needing attention. In more urban areas, the underground situation is more likely to be characterised by congestion:

- Gas networks have a greater number of complex assets in urban areas: like single sided mains, risers, long services, road crossings and stranded assets

[35] https://www.researchgate.net/publication/361197642_Impact_of_climate_change_on_railway_construction_maintenance_and_safety_in_the_United_Kingdom

- Other utilities like water / wastewater, electricity, broadband etc are more likely to be in close proximity to gas network assets in urban areas and will need careful planning to deal with

323. Dealing with these assets will involve greater time and cost, which may even have restricted working hours in urban authorities. While population density may be an adequate proxy for measuring these costs, a new price control provides the opportunity to reconsider how these aspects are accounted for in the cost assessment approach.

324. Our Network Asset Management Strategy (document SGN-GD3-SD-06) and supporting paper from MJM Energy (SGN-GD3-ECR-01) maps out in more detail the history of the Repex programme. It highlights that delivery had been targeted to replacement of the highest risk assets, as mandated by the HSE, leaving a subset of assets that are required to be replaced that are a different mix to historic workload.

325. As discussed within the Network Asset Management Strategy document under section B.5, the analysis of remaining Tier 1 workload shows over two third of remaining workload in Southern have complexity issues, compared to almost half in Scotland. More so, for Southern 34% of the remaining length has more than 2 points of complexity, while in Scotland this is reduced to 24%.

326. We discuss in Section F.5the impacts of these network complexity factors to our productivity, as tested with our principal contractors. We present in the below Figure 50 how our work hours per metre evolve over time, showing a difference in productivity through the workloads we have to complete against both networks.

327. Given that skewing towards greater complexity in Southern, SGN are of the view that the costs will have a regional aspect to it and should be considered in the cost assessment framework. Our view may change, depending on what other networks say about the complexity of the Repex programme. However, at this point we believe complexity should be considered in regional factor calculations as it is clear there is a significant difference between our SGN networks.

328. Frontier Economics have considered what alternative approaches could be used. While the optimal approach would involve sourcing exogenous metrics to use as drivers within the cost assessment suite, Frontier Economics recognise this will be challenging to deliver for GD3. Instead, they recommend undertaking a technical review of the complexity issue and potentially modifying the Repex synthetic driver to allow networks that have a complexity-driven higher unit cost to have a higher unit cost in the synthetic.

329. Alternatively, it may be that a specific normalisation could be added in the pre-modelling adjustments. We propose both these options can be considered in the Cost Assessment Working Group meetings in 2025, ahead of Determinations to ensure consistency in approaches across networks for carrying out this important cost normalisation.

Isle of Wight

330. Activities we need to carry out on the Isle of Wight incur extra costs which are unique to SGN, we discuss these costs and the reasons as to why they are unique below.

331. Notwithstanding the sparsity adjustments described from paragraph 298 onwards, it is recognised that there are some distinct geographies that are isolated and have such unique costs that they are considered entirely separately. The example is the Statutory Independent Undertakings (SIUs). Some of the SIUs, like the Kintyre peninsula, while on the mainland are hard to get to and remain isolated. Other SIUs like in the Western Isles, are island based and have the extra aspect of crossing water. The cost assessment approach acknowledges these unique challenges and treats these services separately. It is right that areas of the network with unique transport challenges are recognised in the price control.

332. One locality that has unique challenges arising out of physical barriers to accessing the area is the Isle of Wight (IoW). Operating a gas distribution business on the island comes with several challenges that are not seen in other parts of mainland network operation. These factors are not due to sparsity as seen in our Scotland network, but means the island is more like the Western Isle SIU, as a consequence of the island being geographically disconnected from the mainland. These factors include:

- Minimal competition in tender events: Due to the restricted geography of the island there are a limited number of vendors available for competitive procurement events, hence competition is low in this vendor controlled environment;
- Requirement to maintain baseline number of resources available on the island: We operate a sub-depot on the IoW. Due to the high ferry costs and duration of the journey to the island (approximately three hours from the parent depot in Poole to the IoW depot in Ryde) it is necessary for us to have a sub-depot and employees permanently stationed on the island to ensure a twenty-four seven emergency service provision, including repair and maintenance activities. Ferry transport also causes other issues. As a result, we have a total of 45 employees based directly on the island. To maximise the efficiency of the IoW operation our industrial operatives are

multiskilled; That said, this FTE count is much higher than the rest of the wider Southern network area (excluding London). This 45 employees equates to one FTE for every 8.7 km^2 in the Isle of Wight, compared to one FTE for every 19.3 km^2 across the rest of Southern. Incremental labour costs for this equate to c. £7.5m across the GD3 price control.

- Additional costs associated with shipping of plant, equipment and materials. This also poses challenges on the IoW since there are limited resources upon the island. There is availability for plant hire on the island, however there is limited supply of plant and equipment due to a sole supplier and demand from other utilities.

333. In light of the similarities with an SIU, it is appropriate to consider the costs to serve the island, and assess whether the information provides justification for a company-specific factor. We have assessed how much additional cost we have incurred over the last 5 (full) years from operating on the IoW (over and above the normal cost of operation). This is summarised in Figure 32 below.

Figure 32: Quantifiable Additional costs of operating on the Isle of Wight (2023/24 Prices)

23/24 real prices - £'000s	2019_20	2020_21	2021_22	2022_23	2023_24	5 Year Average
Total Ferry Costs	3.6	22	45	170	27	53
Total FCO Waiting Time	11	52	42	40	38	36
Total Non-Ferry Related Travel and Accommodation Costs	15	9	9	12	13	12
Total TM and Local Authority Costs	177	170	173	204	245	194
Total Reinstatement Premium	163	133	108	161	292	171
Incremental Labour Costs if at SGN Southern (excl London) avg.	1,511	1,511	1,511	1,511	1,511	1,511
Total IOW Costs for GD3 Business Plan	**369**	**387**	**377**	**587**	**614**	**1,978**

Source: SGN

334. This assessment suggests that the additional costs we incur because of the geographical location of the IoW are an additional £2.0m per year on average. This implies total additional costs of over £9.9m over five years.

335. In light of the similarities to an island SIU described above, and the material cost in Figure 32, SGN propose the inclusion of a company-specific factor for the Isle of Wight.

In-Modelling Population Concentration Variables

336. We have discussed within this section primarily regarding pre-modelling normalisation adjustments to account for the regional factors that affect the costs of working within our networks. However, there are alternative modelling approaches to account for these factors.

337. In the Sector Specific Methodology Decision (SSMD), Ofgem outlined its approach to cost modelling. Between paragraphs 5.17 and 5.35 they outline the benefits of assessing other modelling approaches like alternative Totex models, middle-up models and disaggregated models. Indeed, Ofgem recognise the benefits:

> "we noted that combining multiple Totex models could provide a more diverse top-down view of efficiency through the use of a greater variety of cost drivers, different time periods, and modelling techniques. We also considered the benefits of middle-up and disaggregated modelling, and noted that a combination of different cost aggregation approaches could provide an alternative view of Totex to go alongside top-down modelling, or be used to validate the results of our Totex benchmarking."[36]

338. SGN fully support the consideration and application of alternative models, as applied in GD1 and ED2.

339. One such approach is to include an extra driver variable in a benchmarking models. While there are limitations with using population in some normalisations like sparsity; at a Totex level, density can be a proxy for drivers of cost differences. Where a suite of multiple models is used, then it would seem appropriate to consider including the use of a Totex model with a density variable to give that richer view of cost efficiency.

340. There are various measures of density that can be employed. In this section, we examine just one measure: "customers per network length" to assess if density metrics can add value to the cost assessment approach.

[36] see paragraph "5.20 in RIIO-3 Sector Specific Methodology Decision – GD Annex", July 2024

341. In their review of regional factors, Frontier Economics have considered whether using a density variable in the econometric models would be statistically robust. Using the GD2 dataset Frontier add a density variable "customers per network length" to the model.

Figure 33: Test results of Totex plus density variables – linear relationships

	Ofgem's GD2 model	Model 1. Excl. urbanity and sparsity adjustments	Model 2. Incl. urbanity and sparsity adjustments	Model 3. Excl. urbanity / sparsity adjst. & controlling for Cadent London[37]
CSV	0.825***	0.845***	0.842***	0.845***
Time trend 1	-0.007	-0.007	-0.007	-0.007
Time trend 2	0.007	0.007	0.007	0.007
Log of density		0.394***	0.304***	0.399***
Log of density interacted with Cadent London dummy				-0.001
Constant	-0.3073	-2.173***	-1.765***	-2.195***
Adjusted R^2	0.94	0.97	0.97	0.97

Source: Frontier Economics
*Density is defined as connection per network length. Significance levels: * p < 0.05, ** p < 0.01, *** p < 0.001*

342. Figure 33 above demonstrates that adding a density variable does add value to modelling. Frontier make two comments as a result:

- density captures some variation in costs which is not currently captured by Ofgem's GD2 model
- Ofgem's adjustments for urbanity and sparsity may not be sufficiently normalising for cost variation relating to density.

343. We can see that each of the models with a *log of density* independent variable is statistically significant (with *** representing significant p-values and overall improved R^2 relative to the GD2 (post CMA) model). Frontier Economics recommend considering testing density models again when the GD3 BPDT dataset is available.

344. That said, other parts of the analysis by Frontier Economics shows that there are limitations with adopting a density model as they do not necessarily reflect the two extremes of sparsity and density. Frontier have tested a quadratic equation form however it was not statistically robust. As a result, we do not rule out the potential for using a density variable however at this point we have not identified one that robustly explains the current observable data.

345. Given the evidence provided by Frontier Economics that some density models do provide some explanatory value, SGN believes assessing additional models, including those with density variables, will add value to give a richer understanding of efficiency position and in this case a differing view of the scale of regional factors. We will return to the scope for additional models in section E.3 . We believe it beneficial to discuss the various multiple models (including density models) approaches at future Cost Assessment Working Groups, once there is a better understanding of how the wider company business plans.

E.2 Cost Drivers

Section E.2 discusses the existing cost drivers used in the Ofgem models and considers whether some drivers warrant reconsideration. In particular, the section discusses

- Repex synthetic cost calculation, including reviews of
  - Synthetic categories
  - Unit cost filtering
- The appropriate driver for measuring repair workloads
- The use of MEAV as a scale variable

[37] Frontier Economics have also tested a model including both a Cadent London dummy and an interaction of this dummy with the log of density and found similar results.

- Other drivers that could be used in GD3

346. Econometric models look to explain (and predict) an outcome variable (in our case costs) by testing its relationship with one or more driver variables. A well specified model will ensure those driver variables have a causal link such that any variation in (predicted) cost will be as a result of a variation in one of the model drivers.

347. The drivers chosen should reflect engineering or economic intuitiveness. The challenge for the modellers is to identify drivers that meet that criteria, but at the same time creates a statistically robust model. In energy models, it can mean using internal measures, however that risks incentivising networks to maximise the chosen internal activity. As such having exogenous variables are preferable to minimise the influence that networks have on the drivers.

348. A new price control offers the opportunity to reassess the drivers. This section starts with a discussion of the existing GD2 model, including some aspects that could be enhanced, and then concludes with a discussion of some options for future modelling.

349. We believe it imperative that drivers should be both operational intuitive as well as statistically relevant, and as we discuss further within section E.3 the use of multiple models of different weightings can reflect the challenges of drivers that may be operationally sound but may not be as strong for a statistical perspective.

GD2 Drivers

350. In the GD2 single Totex cost efficiency model the driver was a Composite Scale Variable (CSV) with 7 drivers to explain the various cost areas, shown below:

Figure 34: GD2 Totex CSV Driver Make-Up

Cost Area	Driver	Weighting
Emergency	1.Emergency CSV (Customer Numbers (0.80) and Total External Condition Reports (0.2))	0.05
Maintenance	2. Maintenance MEAV	0.08
Repairs	3. Total External Condition Reports	0.05
Repex	4. Repex Synthetic Costs	0.38
Mains Reinforcement	5. Mains Reinforcement Synthetic Costs	0.01
Connections	6. Connections Synthetic Costs	0.06
Other: Work Management; Business Support; Other Direct Activities; Training and Apprentices, Other Capex	7. MEAV	0.37

Source:

351. These drivers were chosen as they were deemed to reflect a weighted average of scale and workload drivers used in the previous GD1 price control bottom-up models. It was assumed that by utilising similar weighting as per the GD1 models the CSV would have an economic, engineering and statistical logic, as discussed within Ofgem's RIIO-2 Final Determination GD sector annex para 3.88.

Review of GD2 Drivers

352. While some of the drivers will continue to be appropriate, some warrant review, to assess whether they remain appropriate, and/ or whether using other drivers will provide an alternative view of cost efficiency – whether that be in the current Totex model, additional Totex models, middle up models or disaggregated models.

353. Some key areas where SGN believe alternatives require examination are: (Repex) synthetic costs; Repairs; and the MEAV.

Repex Synthetic Costs

354. For Repex, two key factors should be considered, (i) synthetic categories and (ii) unit cost filtering to ensure the driver does not unnecessarily discard genuine unit rates submitted by networks that could be impacted by complexity factors, which are discussed in more detail within section F.5 . These complexity factors are an explanatory factor for differing unit costs that are outside the control of a well-controlled network, due to the configuration of a network.

Synthetic Categories

355. The Network Asset Management Plan and our review of GD2 have highlighted that the outstanding workload is more complex, and that, in SGNs opinion, the prevalence of this complexity is more skewed towards urban areas. As Southern and London are more densely populated, then these costs could warrant a regional normalisation.

356. Complexity will have an (upward) effect on costs. Where possible additional drivers can be identified, they should be included in the cost assessment suite to ensure that any future complex workload is allowed for in the benchmarked cost.

357. The current Repex driver is based on a synthetic cost calculation. This combines the workloads and costs from all networks for each category and band of Repex. An industry average unit cost for each band within each tier of Repex workload is then derived. Currently complexity is not a factor that is accounted for. The industry averaging also involves filtering out outlier unit costs from high cost and low-cost submissions.

358. It might be that high unit cost submissions are due to complexity increasing the cost that a particular network faces. However, as complexity is not explicitly captured in the BPDT submissions, the impact of complexity is difficult to measure and has no common, Regulator derived, definition across networks. The filtering approach may ignore higher unit costs that are entirely valid, because of complexity. Removing these unit costs may result in a lower industry average unit cost than would otherwise have been the case. Those with more complex workloads due to network configurations would find it difficult to achieve the unit costs without complexity accounted for.

359. It is therefore appropriate to consider how the Repex synthetic could be amended to account for complexity. Several approaches could be applied. Frontier have suggested that Ofgem could undertake a technical review of complexity, followed by an application of a higher unit cost for those networks deemed to have complex workloads. There will be others, including reviewing the unit cost filtering.

Unit Cost Filtering

360. The second aspect of the Repex synthetic that could be reviewed is the filtering approach itself. By filtering out unit costs that sit outside of certain parameters, actual data points are removed. If the data points removed are predominantly those at the higher cost end of the distribution this can cause a downward bias in the results by selecting out potentially valid data points. This may skew the results against regions in the South which, without proper adjustment for regional factors are likely to have a higher proportion of data points within the excluded data set.

361. SGN presented its thoughts on this topic to the CAWG on April 10th 2024. Some key challenges with the unit cost filtering approach include:

- Its application is very complex: using multiple files and multiple sheets. It is not easy to verify or identify if errors exist.
- Sophisticated, static rulesets: the application of rulesets that exclude values firstly beyond 100% of the mean and then +/- 40% of the mean does not account for any valid changing spreads of datapoints. There is the risk that a change of data spread in GD3 (say from complexity) may remove valid unit cost observations.
- The filtering is applied at quite granular levels: in some tier/ banding combinations there are very few observations meaning one networks cost may be dominant in calculating the industry average.
- Together, there could be a concern the unit costs are not accurate.

362. SGNs presentation to the CAWG of April 10th 2024 outlined an alternative approach of using econometric models to calculate the industry average unit costs. Some key points about the methodology are:

i. A unit cost can still be predicted for each tier/ banding combination.
ii. However, the regression models are calculated at Tier level
    a. This allows for greater sample sizes and
    b. Avoids dominance of individual networks in any individual categories
iii. Unit costs are the dependent variables. The independent variables are dummy variables for each category banding (A – H where appropriate)
iv. The first step is to run a regression with all the independent variables. Where any dummy variables have insignificant p-values, they are removed through backwards elimination, until all independent variables are significant.
v. An asymmetric predicted confidence interval range is then applied (to account for the skewing of datapoints typically seen). Where observations sit out with the range, the datapoint is then removed.

vi. A second regression is then run, to generate predicted unit cost values by band.

363. At the April 2024 CAWG, SGN presented outputs from the tests of this approach that we had undertaken, using GD2 data. All the models had independent variables with significant p-values, and all but one had R^2 between 0.57 and 0.86.

364. SGN believe this approach is robust, more transparent and easier to implement than the current outlier approach that is potentially prone to bias. Furthermore, it is also flexible. An amended approach might help identify networks with higher complexity and then allow a higher unit cost to be applied.

Repex Synthetic recommendations

SGN believe that the Repex synthetic calculations should be revisited.

- When the BPDT data is available the revised unit costs filtering approach should be tested. (This approach could also be tested on the Capex synthetic and Connections synthetic).
- We also recommend assessing if the Repex synthetic can be adjusted to incorporate complexity: potentially allowing a higher unit costs for those networks that can demonstrate more complex outstanding workload.

Repairs

365. This section examines the key metrics that drive the costs of repair workloads. A comparison of the count of repairs and reports is presented, to assist any review of what the best metric is to accurately assess costs that networks incur.

366. The cost driver employed in GD2 to determine the efficiency of repair expenditure was fundamentally flawed. By relying on 'external condition reports' instead of the more operationally relevant 'total repairs' metric, the model failed to accurately capture the true cost drivers and introduced significant distortions in efficiency assessments.

367. Within GD2, we assess that SGN had a reduced allowance of £26m, equating to a 16% reduced against GD2 requested repair funding, due to the use of 'external condition reports' within the CSV as opposed to a more operationally intuitive driver of 'total repairs' within the cost modelling suite. This was a material challenge to SGN within the GD2 period.

368. While seemingly objective, the use of 'external condition reports' as a driver suffers from a fundamental disconnect with the true cost of repairs. The problem lies in the assumption that each report represents a single repair. In reality, a single report can encompass multiple repairs of varying complexity and cost.

369. This crucial distinction is lost in the current assessment, leading to misleading comparisons between networks. Within the below Table 5 we demonstrate the difference in rankings of efficiency scores with using total external condition reports compared to using total condition repairs as a driver for the GD2 originally submitted repair forecast costs (un-normalised). Efficiency scores are calculated by using a simple ratio analysis:

Table 5: Repair : Report Efficiency Score Positions

	Repair : Reports Ratio	Efficiency Score Rank when using Reports across GD2 period	Efficiency Score Rank when using Repairs across GD2 period	Change
EoE	1.165	2	3	-1
Lon	1.134	6	7	-1
NW	1.138	1	1	0
WM	1.182	3	4	-1
NGN	1.077	5	6	-1
WWU	1.588	4	2	2
So	1.514	7	5	2
Sc	1.271	8	8	0
Ind.	**1.235**			

Source: SGN analysis using GD2 Business Plan Data Table submissions

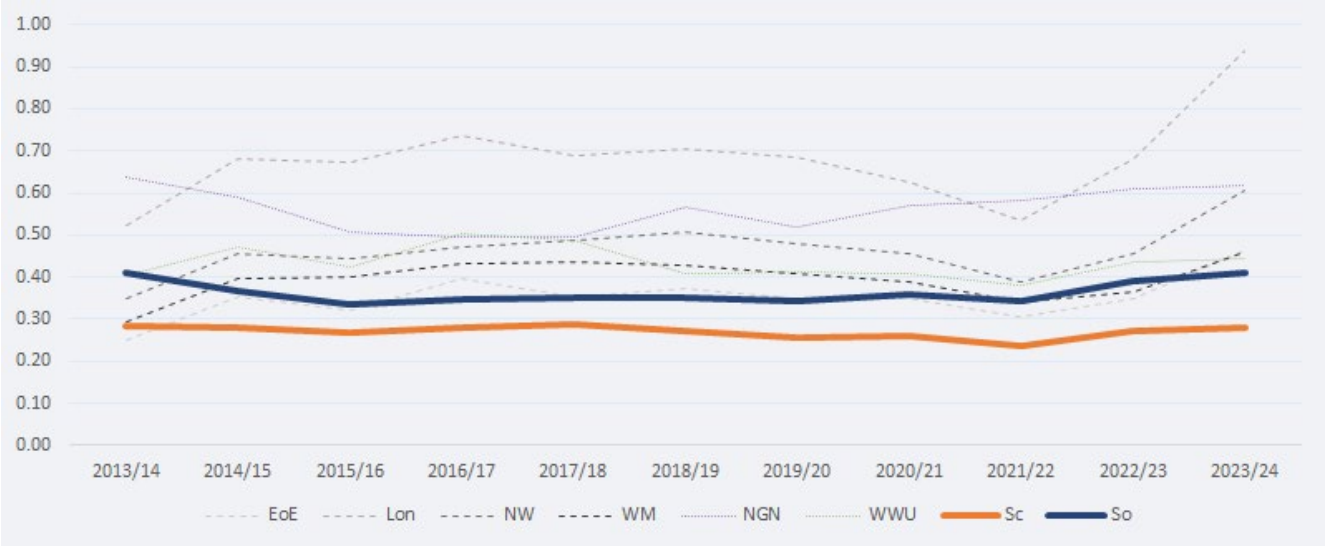
370. Those networks, such as SGN Southern and WWU, that incur a higher number of Repairs per Report have a greater efficiency score differential when changing to utilising total condition repairs as a driver. The use of this driver in GD2 implies inefficiency is driven by a higher number of repairs per report, which is operationally illogical and penalizes networks for diligently addressing all identified faults.

371. The number of repairs required per report is outside our control, and to ensure the safety of our network we must respond and fix any fault we find through a callout.

372. To imply there is a level of inefficiency due to us responding to faults would embed the incorrect behaviours within network businesses, and we would recommend that Ofgem assesses the efficiency of our response to a repair that is required to be completed.

373. We can demonstrate further this disconnect by reviewing the ratio of reports over metallic length, as shown within Figure 35 below. The SGN regions are showing the ratio to be at lower end of the industry average, which would suggest that we receive fewer external reports than other networks.

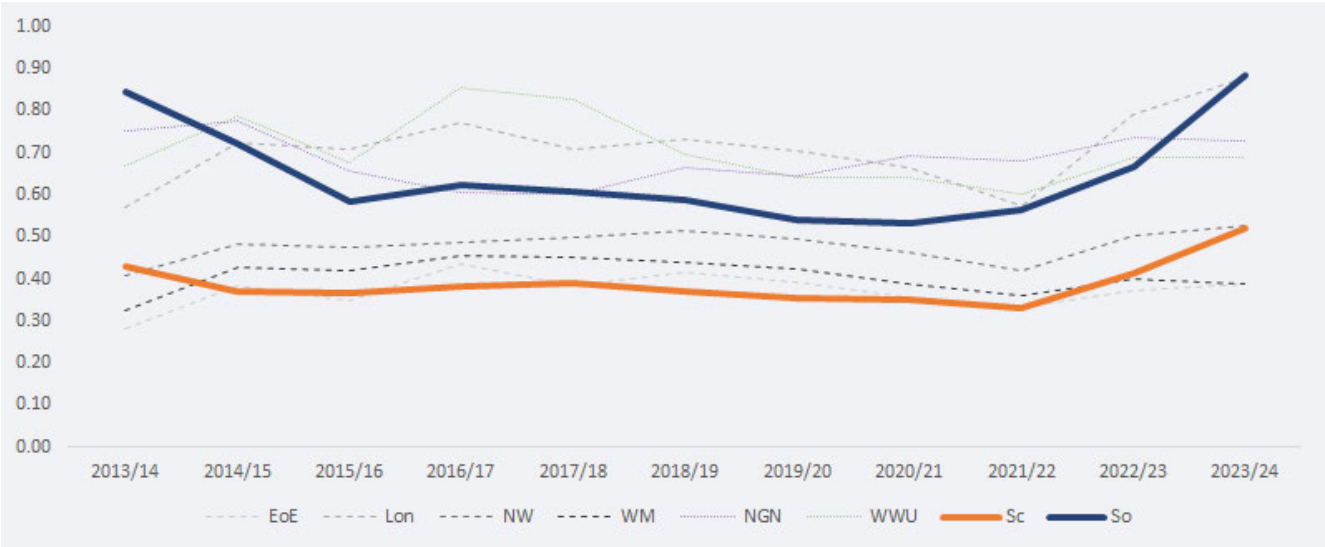
Figure 35: Reports per Metallic Length



Source: SGN analysis of RRP returns

374. Whereas when we review the number of condition repairs we are required to complete per metallic length, as shown within the below Figure 36, we can see the SGN networks to be much closer within the industry average. Southern in particular has a significant shift in ranking compared to the Reports we receive per metallic length.

Figure 36: Condition Repairs per Metallic Length



Source: SGN analysis of RRP returns

375. This discrepancy between reports and repairs is not indicative of cost inefficiency. Several factors beyond network control contribute to this difference, including regional variations in utility congestion, differing stages of the Iron Mains Replacement Programme implementation, and the lack of consistent reporting guidance.

376. Particularly we note the lack of official guidance by Ofgem within both the annual RRP Regulatory and Instructions Guidance (RIGs) as well as within the BPDT guidance for defining a report. Due to lack of definition, it cannot be said with confidence that the approach each network has used historically is consistent across networks.

377. Particularly we note in recent years some networks with specific repair-to-report ratios of lower than 1, suggesting that on average they receive more reports of gas leaks than they intervene on which seems illogical, as engineering logic would suggest across all reports you would expect at least over 1 repair to be undertaken per report.

378. The consequences of utilising condition reports as a driver can lead to underfunding of a critical network activity, which is reactive and through which we need to respond. This has the potential to create further pressures and challenges in other activities of Totex, reducing our ability to drive efficiencies within SGN.

379. This is inappropriate where the driver utilised has clear undefined inconsistencies across networks, that can be demonstrated as being outside of management control, alongside a lack of guidance on how to measure the driver in a consistent way.

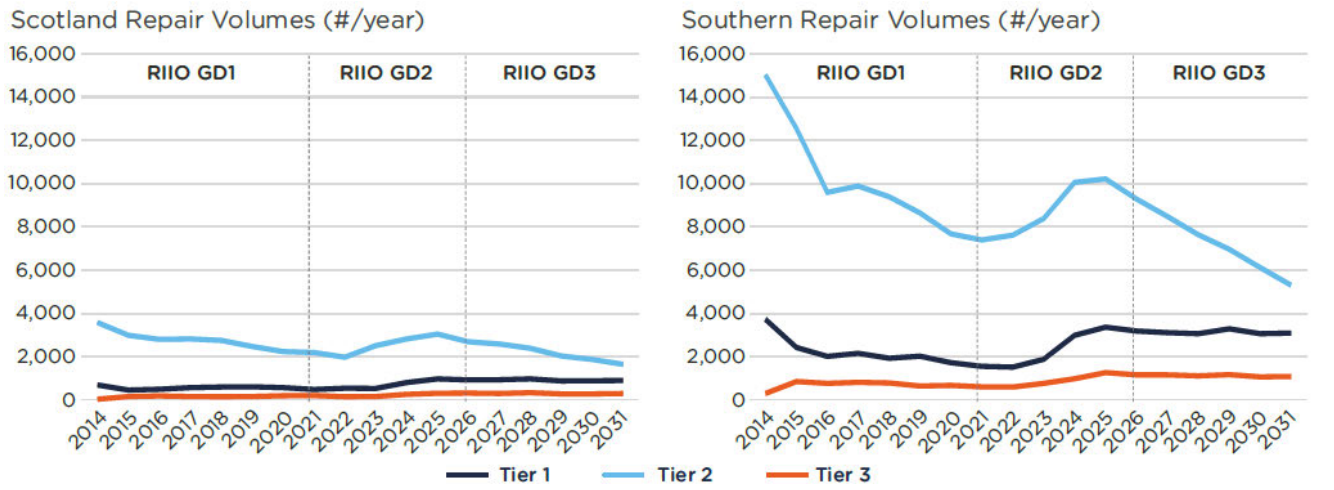
380. To assess the cost effectiveness of repair costs, the use of condition repair workloads would be a more appropriate driver to use. A single report can encompass multiple repairs, of differing complexity through tier levels. As such, only through using the repair workloads as a driver would a cost efficiency assessment suitably capture these differing mix challenges between networks.

381. With the Figure 36 above, we can demonstrate that the proportion of condition repairs over metallic length, which would be an appropriate driver to highlight scale of network that is more likely to suffer a fault and therefore repair, is within a consistent range across networks.

382. We can see within Figure 36 (repairs) and Figure 35 (reports) that the comparable variability in both metrics underscores that using condition repairs as a driver would be equally effective in capturing performance differences.

383. Further, by utilising the repair workload as the main driver to determine the cost efficiency of repair costs, consideration will be able to be made for the changing mix of Tier 1, Tier 2 and Tier 3 workloads as the completion of the IMRRP occurs. The figure below highlights the expected evolution in SGNs repair workloads by tier.

Figure 37: SGN Repair Workloads by Tier



Source: SGN and Bearing Point analysis

384. With the completion of the IMRRP focussing on Tier 1, due to be completed by December 2032, we are expecting to see a sharp decline in our Tier 1 related metallic faults vastly changing the mix of our repair workloads.

385. Tier 2 and Tier 3 workloads by their nature take longer to repair, and therefore have a higher cost incurred.

386. To ensure this change in mix is incorporated into cost efficiency assessment, the repair workloads will be required to be used as a cost driver as external reports are not able to be split by tier level. As within Repex and Capex activities, a Repair Synthetic driver can be derived through the forecast workloads by tier.

387. Failing to account for this mix change through the use of a more appropriate driver will fundamentally undermine the accuracy and reliability of the statistical model, leading to flawed efficiency assessments and underfunding of networks to carry out a vital safety critical function.

Repairs Recommendations

- Ofgem should use number of repairs as the driver of repair costs.
- Ofgem should ensure the repair workloads are considered by tier to ensure mix differences are suitably accounted with cost efficiency assessment.
- Ofgem should ensure there is clear and transparent guidance on how networks measure external reports, as currently this metric does not have consistency in approach.

Modern Equivalent Asset Value (MEAV)

388. We discuss the challenges of using MEAV as a driver for costs within the GD2 cost modelling, as well as our concerns regarding the current transparency and relevance of unit rates used to determine the MEAV.

389. MEAV is used as a scale driver to reflect network size, assumed to capture relative differences in scale between GDNs better than other drivers such as customer numbers[38]. While we acknowledge the MEAV driver can allocate a weighting to each asset to reflect the complexity of managing such asset, the use of the replacement unit rates as a proxy for weighting does not necessarily translate to the impact each asset type has to costs over the longer-term period.

390. A key example of this asset replacement cost not being reflective of the lifetime cost of managing an asset type would be within Multple Occupancy Buildings (MOBs which requires a much greater maintenance and back-office support cost across its relative lifetime then the difference in asset replacement unit rate would suggest.

391. The use of replacement unit rates is not always appropriate to determine the complexity of an asset across the longer term, and for certain asset groupings an adjustment to the replacement unit rate would be required to ensure a suitable driver to reflect differences in scale of GDNs.

392. Further, some unit rates used to determine the MEAV have not been updated to reflect the latest cost differences for activities, again a key example of cost pressures increasing at different rates across asset types will be within MOBs, where the cost of scaffolding used within asset replacement has increased significantly compared to other cost areas. This cost increase does also increase the complexity of back-office activities to complete a job.

393. MEAV within the GD2 cost models was the explanatory variable for 37% of the modelled Totex, as shown in Figure 34, and therefore is significant in its impact to the determination of cost efficiency across networks through Ofgem assessment.

394. Failure to fully understand the differences in MEAV between networks would greatly reduce the appropriateness of this cost driver in any cost assessment modelling, and consideration of any catch-up efficiency should therefore be had to reflect such challenges with this cost driver.

MEAV recommendations

We believe there is a place for a driver that reflects scale, but given the materiality of MEAV we believe it is important the following activities are carried out to improve the robustness of this driver:

- Update of unit rates used to determine the MEAV to account for latest data
- Review MEAV components for any missing categories
- Review MEAV changes over time to understand challenges with data quality
- A detailed review and understanding of differences in MEAV across networks, to ensure that there is operational intuitiveness and defendable differences across networks.

[38] Ofgem GD2 Final Determination – GD Sector Annex para 3.112

E.3 Multiple models

Section E.3 examines some of the challenges with economic modelling and considers whether using multiple models can address these challenges and offer a wider perspective on cost efficiency. The aim of cost benchmarking is to ensure that consumers are charged the most efficient costs to receive a service, while still ensuring that networks have enough funding to provide consumers with an adequate, safe, level of service. This section provides views that can help Ofgem determine whether multiple models can add value to delivering that aim for customers.

The section will cover challenges with econometric models, including:

- Operational insight,
- Robustness, and
- Transparency

395. Many economic Regulators benchmark the performance of regulated companies against their peers using econometric models. In most cases multiple models are used. This is the case in other sectors Ofgem regulate, like electricity distribution, and in other sectors like water.

396. At GD1, Ofgem applied multiple model approach for the gas sector. In GD2 Ofgem assessed 27 different models. These were a mixture of (multiple) Totex models, middle up models and disaggregated models. The assessment found challenges with the robustness of some of the models and Ofgem settled on using one Totex model to measure efficiency and set allowances.

397. The regions in which companies operate are varied, with multiple exogenous as well as endogenous factors that can impact efficiency for both the positive and negative. Multiple models bring many benefits in addressing the challenges in the econometric modelling of costs within such areas. By giving an alternative view of cost efficiency we can prevent the risk that a single model does not capture all of the unique characteristics of a particular region or cost structure, therefore ensuring that customers overall pay a fair price for investments.

398. This section will discuss the different tests we believe are important to determining multiple models.

Operational Insight

399. The purpose of econometric modelling is to use statistical analysis to predict future costs. Therefore, it is imperative that the models used to predict future costs are relevant and suitably calibrated to how a business operates. While it is possible to test for this and achieve strong statistical results on explanatory drivers and model types, first there needs to be a check to ensure that any model can be justified from an operational perspective and engineering justification.

400. This check is not always straightforward and will include an element of qualitative rationale to ensure the particular drivers and model type makes sense from an engineering and economic perspective. Equally, a test at this stage is to make sure that the modelled output coefficients are sensible in terms of magnitude and sign (positive / negative relationship with costs) and remain stable across different sensitivities.

401. We welcome Ofgem's acknowledgement in the recent SSMD publication of 'giving more weight to operational insight/engineering rationale over statistical performance'[39] but would suggest that for the GD3 determinations that Ofgem ensures the operational insight logic for particular models and driver choices is plainly explained.

402. A key example within the GD2 example is the use of external condition reports as a driver for repair cost activity, as discussed early in section E.2. We do not see clearly where the operational insight into using such a driver was explained within the GD2 Final Determination. And for further drivers, the justification in places is simply because it has been used in the past.

403. We present in Figure 38 below our views on appropriate cost drivers based primarily on operational insight for our activity areas, using the available data Ofgem has within the cost assessment toolkit.

[39] Ofgem RIIO-3 Sector Specific Methodology Decision – GD Annex (July 24) – para 5.29

Figure 38: SGN Operational Insight on Cost Drivers for Activity Areas

Cost Area	% of SGN Totex	Driver within Ofgem Toolkit	Comments
Repex	45%	**Repex Synthetic**	The GD2 approach for Repex Synthetic is mostly appropriate, but further consideration will be required for complexity factors and potentially an updated approach to managing outliers.
IT - Total	9%	**MEAV / Company FTE**	Our IT expenditure is inherently linked with how many employees we have, and this would be the most appropriate driver to explain our costs. We do acknowledge this would be an endogenous driver and as such a combination of company FTE and an updated MEAV to ensure a more exogenous control would seem most appropriate.
Maintenance	6%	**Maintenance MEAV**	While we have challenges with the unit rates used to determine the weightings of asset groupings within the Maintenance MEAV - we believe once appropriately corrected this will be the most robust driver for Maintenance activity.
Repair	6%	**Repairs by Tier**	As discussed with section E.2 the use of Repair workloads is the most appropriate driver to explain the costs that networks incur.
LTS	6%	**LTS Synthetic**	While MEAV includes LTS assets, it does not appropriately explain the required activity that would be needed within a price control period. An approach akin to Mains Reinforcement and Connections Synthetic drivers could be more appropriate to help explain costs, though note costs are largely bespoke and not comparable.
Work Management	5%	**MEAV + Activity Driver**	While an updated MEAV would account for network scale, it is not appropriate to manage activity differences which are captured within the synthetic approaches used elsewhere - an activity driver would also be required.
Other	5%	**MEAV / Customer Numbers / Network Length**	Scale of network size would be most appropriate to determine the efficiency of other costs, so a combination of an updated MEAV, customer numbers and network length would be most appropriate to explain scale differences across networks.
Business Support Costs	4%	**MEAV / Customer Numbers / Network Length**	Scale of network size would be most appropriate to determine the efficiency of back-office costs, so a combination of an updated MEAV, customer numbers and network length would be most appropriate to explain scale differences across networks.
Emergency	4%	**Emergency CSV**	As most of our workload is customer driven to ensure the number of customers networks have to respond to seems reasonable.
Property	3%	**MEAV / Customer Numbers / Network Length**	Scale of network size would be most appropriate to determine the efficiency of property costs, so a combination of an updated MEAV, customer numbers and network length would be most appropriate to explain scale differences across networks. It is important to note the importance of appropriate normalisations ahead of cost assessment of property costs.

Vehicles Capex	2%	**MEAV / Company FTE**	Our vehicle expenditure is inherently linked with how many employees we have, and this would be the most appropriate driver to explain our costs. We do acknowledge this would be an endogenous driver and as such a combination of company FTE and an updated MEAV to ensure a more exogenous control would seem most appropriate.
SIU	2%	**Separate Technical Assessment**	SIUs have no appropriate cost comparators across networks and therefore there would be no driver available within Ofgem's cost assessment toolkit. A separate technical assessment would be most appropriate.
Connections	1%	**Connections Synthetic**	While the Connection costs within Totex remaining in GD3 are primarily expected to be stranded overheads, the use of a connection synthetic driver as per the GD2 approach would ensure the costs expected have an appropriate driver.
Reinforcement	1%	**Mains Reinforcement Synthetic**	As per GD2 approach the use of a synthetic will ensure the required workload across networks is included within drivers, as networks will have different workload requirements due to network configuration differences.

Source: SGN analysis

404. We note many drivers are not optimal from an operational standpoint, particularly ones that require the use of network scale. Such challenge to find appropriate drivers of operational insight should be considered when assessing any catch-up efficiency target, which is discussed further within section E.4 .

Robustness

405. Once a clear operational and engineering justification is put forward for a model and driver selection, it is important that the outputs of any models are robust and pass relevant statistical tests.

406. While some models may display high statistical accuracy, through significant p-values and R^2 values, other associated tests like tests of normality, heteroscedasticity, pooling and the RESET tests may show that there are imperfections with the models. Where a model fails one or more of these tests, it can indicate that a model may not predict costs as well as modellers would like, for individual years or networks.

407. We acknowledge through past price controls that a wide variety of statistical tests have been used to determine if a model is suitable for determining allowances, yet we would suggest that models should not be simply disregarded if they do not have the highest R^2 values. While it is always favourable to strive for such strong statistical accuracy, there is a great risk that in doing so models become overly defined, causing ultimate weakness in their operation.

408. This is a further test for robustness, in that do the outputs of models seem reasonable. This test is challenging in that any bias of past views of performance should be disregarded, and instead focus should be that efficiency scores are within a reasonable range and are relatively stable over time.

409. A final test on robustness is if the model is sensitive to underlying assumption changes. Are the drivers and model configuration flexible enough to handle differing futures. I.e. does the statistical relationship between costs and drivers represent a true causal relationship that will predict well even when there are substantial changes in the operational environment[40] or the external economy[41]. We note with our analysis of the GD2 single Totex model this has not been strong in handling differing actuals, with a widening in efficiency score range using the latest outturn data, discussed earlier in section C.4 .

410. That said, any of the tests mentioned here should always be considered in tandem with the operational intuitiveness. If a model fails one test, but is known to represent the way gas networks operate, it can still be considered, alongside other models.

[40] E.g. changes to shift patterns mandated by the Health and Safety Executive

[41] E.g. a more volatile inflation environment

Transparency

411. As mentioned within operational insight, overall when a model and driver selection occurs is transparent and easy to follow. There is a risk that through complicated combinations of Composite Scale Variables (CSVs) and multiple modelling approaches the clarity of modelling outputs is lost, and the reasoning for any inefficiency is not clear to follow.

412. Companies, including ourselves, perform highly lengthy and detailed business planning processes involving multiple steps to ensure our plans are robust, defendable and above all accurate for future spends. While it is important to ensure our plans are efficient, it is also important that we understand by what logic our plans are deemed to either be efficient or not in order for us to implement any potential customer benefit changes that peer companies may operate.

413. Totex models are useful in that they help to mitigate the risks of cost allocation, and can generally perform stronger through statistical tests, yet they lack transparency with little to no visibility on where a particular company may be efficient or inefficient.

414. It is important to have a balanced view of modelling to help determine the transparency and clarity, so networks are able to deliver any efficiency challenges that are put forward. Without so would be equal to setting an arbitrary challenge with little reasoning as to why.

Potential models to use

415. In GD1 and GD2, Ofgem assessed some 27 models[42], at a Totex level, middle up level and disaggregated level. Revisiting these models with the updated BPDTs data will be a starting point. However, there could be other models to consider. These could be regression models or in the absence of statistically robust outcomes disaggregated models based on unit rate or ratio analysis. Some of the suggested models are shown in Figure 39 below:

Figure 39: SGN View on Alternative Totex Regression Models[43]

Cost	Drivers/Model Description
Totex	CSV model with alternative measures of density
Totex	Explicit explanatory variables, like customers plus network length plus throughput
Totex	Revised CSV with repair numbers instead of reports
Totex	Revised CSV with synthetic cost calculations utilising regression-based unit costs
Totex	Revised CSV with synthetic costs adjusted to account for higher unit costs where complexity present

416. As discussed above within transparency, we believe it important that consideration of disaggregated modelling is also had to enable clarity on where it is determined networks are efficient or inefficient. While we acknowledge disaggregated modelling can result in weaker statistical performance, we still believe outputs are strong due to their relative simplicity and ability to drive direct comparison of activities across networks.

417. Ofgem does successfully use disaggregated modelling within electricity distribution, at both the ED1 and ED2 price controls by acknowledging that the individual disaggregated models have a weaker statistical performance and therefore carries out efficiency challenges at the median level, as opposed to directly at a higher efficiency target. This is a pragmatic approach to ensure the benefits of disaggregated modelling are brought forward to give a more balanced view of efficiency performance.

418. As with GD1, one option is to take a view on which models are justifiable (from statistical validity and / or engineering and economic rationale) and collect them together with a weighting for each, in order to present an overall efficiency position/allocate allowances to different work activities.

Ofgem's Emerging Thinking

419. We have noted in paragraph 337 the SSMD recognises the benefits that multiple models can bring. SGN look forward to working with Ofgem, through the Cost Assessment Working Groups, to examine what alternative models can add value to the understanding of cost efficiency, using the GD3 BPDT data.

[42] See summary outputs from GD2 CAWG 13, 9th March 202

[43] SGNs view is not an exhaustive list

420. SGN believe the benchmarking team should evaluate models outlined above in particular, plus consider the three tests presented previously of (i) operational insight, (ii) robustness, and (iii) transparency to ensure a clear and justifiable cost assessment process.

E.4 Catch-up up Efficiency

Section E.4 undertakes a review of catch-up efficiency to aid with the assessment of what the appropriate methodology should be applied to set GD3 catch-up efficiency target.

The section starts by covering:

- The purpose of the catch-up efficiency target
- A description of the current approach

It then considers methodological challenges when catch-up efficiency interacts with the econometric model. It covers modelling considerations like:

- The assessment of noise
- The relationship with model drivers, and
- Pre-modelling adjustments

It concludes with a discussion of the interaction of catch-up efficiency with other parts of the price control, plus alternatives from outwith the Great Britain energy sector. Themes discussed are:

- Unintended Incentivised behaviours
- Changing Views of Regulators
- Alternatives to a Single Efficiency Target

421. The setting of a 'catch-up' efficiency target is to ensure all networks are performing at an equal level of efficiency performance, which could be determined at any percentile of the assessed efficiency. We note Regulators normally set a stretching target for the sector to ensure customers across Great Britain receive equal value for money, but in doing this it is imperative that consideration of any data quality, modelling and the Regulatory policies issues are had. Any weakness in these areas would be a further burden on a set stretching target.

Current approach

422. The benchmarking model generates a relative efficiency score for each network. The current approach for assessing catch-up efficiency is to reference this range of efficiency scores. The catch-up efficiency target is set based on the upper range of networks' efficiency score, and not set at the efficiency level of the leading company. Ofgem know that econometric models do include some noise and therefore recognise that the range of efficiency scores may not be wholly based on inefficiencies.

[redacted]

423. In the GD2 Draft Determination Ofgem put forward to target the 85th percentile for the catch-up efficiency, and at the Final Determination this was amended to include a glidepath movement to the 85th percentile with reasoning being due to (i) the outperformance of networks in the GD1 price control[44], (ii) supposed improved model robustness[45], as well as (iii) high confidence in the data provided by networks to support normalisations[46].

Performance Against the 85th percentile in GD2 so far

424. In previous price controls the catch-up efficiency target was set at the 75th percentile. In GD2 it was set at the 85th percentile for the first time. Now GDNs are partway through the GD2 price control, it is possible to assess if the catch-up efficiency is operating as intended and whether networks converging towards the 85th percentile, as Ofgem had expected, is achievable based on past performance.

[44] Ofgem RIIO-2 Draft Determinations – Gas Distribution Annex – para 3.26
[45] RIIO-2 Final Determinations – GD Sector Annex (REVISED) – para 3.31
[46] Ofgem RIIO-2 Draft Determination – Gas Distribution Annex – para 3.25

425. In section C.4 we provided a view of the updated efficiency position using updated data from the 2023-24 RRP data pack. It does not appear that networks are moving down the glidepath. For example, the original GD2 Final Determination catch-up efficiency target was set at the 82nd percentile for 2024 as per the glidepath assumptions. Some networks have not made significant advances towards reaching the associated Totex allowances for 2024. Indeed, some networks seem to have a relatively worse outturn spending position. This is further supported by sector performance being significantly below allowances.

426. At a more technical level, the updated model has a borderline heteroscedasticity test result (a p-value of 0.062), coupled with a failed RESET test suggests patterns in the residuals exist and the potential for omitted variables. It does not seem right to push all networks to a stretched catch-up efficiency target when the frontier company's efficiency position may not have sufficiently accounted for cost drivers affecting it or other networks.

427. Furthermore, if there was constant variance, then one could argue that the drivers will affect networks in similar ways and in that case, networks should each be able to achieve the efficiency glidepath. However, patterns in the residuals may mean there are unaccounted factors that may inhibit the ability of the individual (particularly laggard) companies to reach the glidepath efficiency.

428. Overall, this suggests that the stretching efficiency target to the 85th percentile has not been achievable within the GD2 period, and the use of justification of previous performance against a set allowance was not justifiable to setting an increasing efficiency target.

429. While it is understandable to use historical performance as an indicator for future, this is only appropriate when it can be clearly demonstrated that the previous periods used for determining costs are comparable. GD1 was a long price control, for which the Regulatory framework (RIIO) was new, and the cost assessment processes were different to the GD2. Furthermore, Great Britain has in recent years had significantly more volatility than the GD1 period, with the impact of Brexit, Covid-19 and political challenges driving uncertainty within our business, most of which was known during the GD2 Final Determination.

430. These factors are clear demonstration that the sector's history would not be a clear indication of its future, and we note going forward to GD3 further volatility with a challenging labour market (both direct and contractor), the increasing and relatively unknown complexity across the sector of completing a large multi-decade replacement programme as well as continuing macro- Great Britain challenges with increasing interest rates and low Great Britain productivity.

Modelling Considerations

431. We now describe some factors in the current modelling framework that could have asymmetric impacts on networks ability to achieve catch up efficiency.

432. In the current cost assessment models, the relative efficient peer is identified from the residuals relative to the line of best fit from the notional company. Targeting the frontier residual implicitly implies that the gap is because of inefficiency. However, in reality, residuals in any model come from three different sources: inefficiency, omitted variables / modelling inaccuracies and noise.

Assessment of noise

433. There are statistical approaches, like Stochastic Frontier Analysis (SFA) that can be used to separate out the residuals into inefficiency and noise. However, this has faced criticisms in other Regulatory environments. For example, in its submission to Ofwat in PR19, United Utilities commissioned Vivid Economics to assess catchup efficiency. The submission noted that SFA is

> *"often performed on large data samples (thousands) rather than the 107 that we have within Water…. and so is less appropriate for such a small sample size."* [47]

434. The gas networks Totex model dataset is of a similar size – 104 observations in GD2. SFA faces the same challenge in Gas Distribution of a small dataset.

435. In principle, Ofgem recognises the noise portion of residuals and the weaknesses of using SFA, by not setting the catch-up efficiency challenge at the frontier company. Plus, they do not use the SFA approach to estimate the noise portion. Instead, Regulatory judgement has been used to set catch-up efficiency.

[47] See page 66 *Cost Assessment Proposal* Doc Reference S6002: https://www.unitedutilities.com/assets/ViewerJS/index.html?filename=S6002_Cost_assessment_proposal.pdf#../../globalassets/z_corporate-site/pr19/supplementary/s6002_cost_assessment_proposal.pdf

Relationship with Model Drivers

436. However, the robustness of the chosen catch-up efficiency challenge has some interdependency with the model (or models) independent variables. It assumes that the model variables are all the correct variables, and the quality of the data submitted is high.

437. We have earlier highlighted the challenge with accurately assessing the correct number of external condition reports and its relationship with the number of repairs (section E.2). Application of the methodology may not be consistent and there is a risk some networks count of external reports misrepresents the actual network position of what actually drives costs incurred in emergency or repair work. Furthermore, the price control period, on which the catch-up efficiency is based, uses forecasts, which are the best assessment of the future. This may be mismatched with reality as we progress through the price control.

438. In this example, one might choose to replace the total external condition reports independent variable with total repairs. These alternative models could have similar goodness of fits but would result in different efficiency gaps. One or more networks could be unfairly disadvantaged from the choice of one or the other driver and may then be set a catch-up efficiency target that they have little hope in meeting.

Pre modelling Adjustments

439. Another aspect of quality that may affect the robustness of the catch-up efficiency is the accuracy of the pre-modelling adjustments. These are intended to make the data used in the econometric models comparable. However, the calculations are just as susceptible to data quality issues or incorrect assumptions, that the econometric models face.

440. An area where regional factors could be too low is the deductions for regional wages when delivering Repex. Our business plan highlights that while SGN's Scotland network utilises direct labour for a relatively greater proportion of our Repex workload, due to labour market (and other) constraints, the Southern network is not able to utilise direct labour as freely. The contractor labour comes at a premium compared with directly employed labour.

441. The current regional labour pre-modelling adjustment framework utilises data from the ASHE dataset. This data only covers employees' earnings, not contract / self-employed labour movements. The regional factors methodology does not make deductions for the premium for contractor companies higher wages, travel and subsistence, risk premia or profit margin.

442. Therefore, in network areas where contractor labour is more prevalent, costs being fed into the Repex lines could, as a result of inadequate normalisations, not be suitably comparable. If that were the case, any Repex specific model would see those networks displaying a poorer efficiency position.

443. There is the risk that the benchmarking model residuals would include an element of inappropriate normalisation as well as statistical noise, inefficiency and poor-quality cost data.

444. This evidence highlights the risks of poor-quality data, which can feed all the way through to the catch-up efficiency target. It risks setting an efficiency target which is unrealistic and unachievable for some networks. We now consider data quality in more detail.

Data Quality

445. As well as model robustness, there was a view that data quality was high through the cost assessment process, with reference to an increased sample size in GD2 within the Final Determination. Additionally, there was a view that the BPDTs included improved quality of data.

446. While we note the existence of Regulatory Instructions and Guidance (RIGs) to support networks in the completion of annual reporting, as well as business plan guidance which for BPDT completion are based on the RIGs, there are a number of issues both with the RIGs for annual reporting and for the BPDTs for collating forecast data for the GD3 price control.

447. We highlighted within section E.2 under our comments on Repair cost drivers, challenges with definitions of Reports within the RIGs, and the lack therefore of comparability of this core driver that is used by Ofgem to determine costs. This lack of definition reduces the ability of networks to be suitably compared when utilising reports as a driver. We are in constant discussion with Ofgem during annual RIGs developments and cost visits, to ensure improvements to definitions and instructions for consistency across networks. This is still an evolving space.

448. Further, the BPDT and process for developing the template for the GD3 period has experienced challenges. The BPDT template and guidance itself were not finalised until 30th September 2024, relatively late in the process and still exhibited multiple errors, which have been presented to Ofgem as part of the BPDT submission. While we believe we have captured errors in the template, this highlights challenges with data quality that may be present in the cost assessment datasets.

449. In light of the challenges with the RiGs and BPDT development mentioned above, SGN propose that data quality has not materially changed from the GD1 period. There is no evidence of significant improvements in data accuracy or consistency to support an increasing catch-up efficiency challenge.

Unintended Incentivised behaviours

450. There is a wealth of academic research[48] to demonstrate that optimism bias is a natural human tendency. People tend to underestimate the likelihood of a negative event and overestimate the likelihood of positive outcomes. This has consequences for many fields, including economics. Government departments, like the Department of Transport have undertaken studies to quantify its scale[49]. The HM Treasury explicitly recognises this risk in the Green Book guidance for Investment appraisals, with appendix 5 covering approaches to dealing with it[50].

451. There is a risk that it impacts on the cost assessment framework. Planners and managers have the expertise to adequately assess the costs that feed into the price control forecasts, based on historical performance and trends. However, they will not have perfect foresight future events or costs that may be associated with delivering programmes of work or costs associated with individual issues at particular locations. Some cost submissions may be optimistic.

452. There is a risk that parts of the price control framework could exacerbate optimism bias. While individual projects CBAs should incorporate sensitivity analyses to account for optimism bias, this is not carried through to some of the data that is fed into the econometric models: for example, forecast unit costs for the Repex synthetic.

453. Ofgem incentivises networks to reveal their true costs through a Business Plan Incentive (BPI). The BPI is also used to incentivise companies to stretch themselves to deliver at the lowest cost they can. The current proposed calibration of the BPI for GD3 rewards the frontier company the most and penalises the least efficient company at the setting of the price control. When this interplays with optimism bias, some companies may submit over-optimistic cost submissions (like low Repex unit costs), as they may believe they can achieve lower costs than is actually the case.

454. As set out in our letter to Ofgem[51], this could have implications for other networks. Given that 5 years' worth of data will be forecasts, networks could be encouraged to submit lower-cost forecasts than they otherwise might have done, because they are chasing the BPI reward.

455. The consequence is that networks in the upper quartile submit costs that are lower than the realisable cost of delivery. This widens the range of costs submitted; and pulls down the notional company costs and therefore the catch-up efficiency target. Companies that do not perform as well in cost assessment face an efficiency target that is in part based on over-optimistic comparator cost information from peers. In addition, they face a financial penalty, which makes it even harder to reach the efficiency target. When calibrating the price control it is important to adequately account for this optimism bias risk.

456. Given the multiple issues (described above) that could occur with the setting of the catch-up efficiency target, one prudent way to reduce overoptimism would be to set a more cautionary catch-up efficiency target. At least rolling back to the upper quartile.

Alternative to a Single Catch-up Efficiency Target

457. Given the aspiration to examine other models, there is an alternative approach to setting a single catch-up efficiency target, as adopted in Germany. As referred to in our Sector Specific Methodology Consultation response[52], in the German energy sector, the Regulator takes the view that each network should be stretched to achieve the best efficiency they can. They recognise that individual econometric models can paint alternative efficiency positions for each network, to better reflect the unique company and regional characteristics of each network. As such, rather than judging each network on a single view of efficiency, individual networks are set an efficiency target and allowance based on the most efficient model they are placed on.

Conclusions

458. This section highlights that there are several factors that can directly, or indirectly affect the catch-up efficiency target set, and the ability of networks to meet them. From data quality to modelling considerations, and unincentivized behaviour, each can give an imperfect view of efficiency. In light of the mid-price review performance, it is clear that the 85th percentile target is too stretching and risks GDNs having insufficient finances to provide a safe and reliable network for

[48] For example: (PDF) The Optimism Bias: A cognitive neuroscience perspective
[49] See: Department of Transport Optimism Bias Study
[50] See: The Green Book (2022) - GOV.UK
[51] 22-04-28 – SGN-Ofgem Letter Business Plan Incentive
[52] See SGN Sector Specific Methodology Consultation Response – GD Annex – Answer to question GDQ50, paragraph 5.16

consumers. SGN believe it is right to reconsider the catch-up efficiency target and re-calibrate it according to the evidence, we do return to the use of the 75th percentile target.

Catch up Efficiency Recommendations

Reviewing the reasonings for applying a stretching catch-up efficiency in the GD2 period, SGN believe consideration of an alternative to the 85th percentile is warranted.

- Due to challenging model robustness, lack of consistency in guidance and increasing costing volatility, we believe it is appropriate to at least roll back to setting the catch-up efficiency to the 75th percentile.
- We also believe the German approach should be considered. Where GD3 returns to having multiple models, this offers the opportunity to set catch up efficiency targets relative to what is really achievable by each network. Such an approach would also avoid any unintentional conflict with the Business Plan Incentive.

E.5 Ongoing Efficiency

Section E.5 covers a review of Ongoing Efficiency measures and in particular discusses key points from an independent research piece, undertaken by consultants Economic Insight, for all GDNs. Some of the key topics include:

- The complexity of measuring ongoing efficiency
- Productivity trends in the wider Great Britain economy
- Uncertainty and its relationship with investment
- The impacts of stretching targets on funding
- The alternative measure proposed by Economic Insight

459. In any sector of the economy, there is an expectation that efficiency gains can be realised on an ongoing basis. In competitive sectors in particular the profit motive incentivises companies to focus on being more productive. In regulated monopolies, like gas distribution, industries have been structured to encourage pseudo-competition. While catch-up efficiency incentivises laggard companies to innovate, the frontier company can still benefit from making improvements to their Total Factor Productivity (TFP).

460. To recognise this ongoing productivity potential, price controls set an ongoing efficiency target to reflect this productivity improvement potential. As with other incentive mechanisms, the chosen target could have material impacts on consumers and networks alike. Underestimate the potential on-going efficiency potential (with a lower efficiency target) and networks retain greater revenues, resulting in consumers being charged more than is truly efficient. Set too stretching a target and it risks networks being underfunded, constraining their ability to deliver high quality services for consumers.

461. The challenge for Ofgem is to set this ongoing efficiency target at the optimum level that reflects the true potential for a sector (in this case gas distribution networks) to improve. An independent research project by [redacted] highlights the challenges posed in arriving at an ongoing efficiency target. This section discusses these factors.

Existing Target

462. It is important to consider the wider economic context when considering what ongoing efficiency target to set. Potential for ongoing efficiency should be set in the context of productivity gains in similar sectors and the wider economy. If the wider economy has poor economic growth (poor productivity gains) it is unlikely gas sector will be able to significantly outperform other (potentially non-regulated) industries.

463. Looking at recent history, RIIO-GD2 Ofgem set a challenging target for ongoing efficiency of 1% p.a. Despite the UK experiencing very low productivity since the 2008 financial crisis, this OE target was based on an assumption that productivity growth will return to longer term trend rates during the GD2 period.

Factors to Consider

464. On-going efficiency is possible across all sectors of the economy, the narrow individual experience of gas networks may not reflect the true potential for productivity across the gas networks, energy sector, and other utilities. While not all innovations in other sectors will map across to gas distribution, It is important to consider external evidence. Employing consultants can give an objective view for Ofgem. In preparation for RIIO-3, all the gas networks (distribution and transmission) collectively commissioned Economic Insight to provide an independent view on the topic. It draws significantly on an unrelated, independent, academic review of literature on the topic *The UK Productivity Puzzle: A Survey of the Literature and Expert Views* [53], published in collaboration with the Sheffield University Management School. The report by Economic Insight is supplied for Ofgem's consideration.

465. The report does identify key factors that will affect the potential for on-going efficiency itself, and the calculation of a target. These are:

Evidencing and Measuring Ongoing efficiency

466. The report notes that productivity growth can be driven by many factors, like catch-up efficiency or economies of scale, not just ongoing efficiency. Furthermore, notwithstanding this factor, the data used could be volatile as a result of lumpy capital expenditure. Productivity will reduce during the investment phase, followed by a large increase in productivity, followed by flat productivity. The time window chosen to assess OE could therefore affect the assessment if the lumpy capital investment is within that time period.

467. Other choices are made in estimating OE, like the measure to use (gross output or value added) and the comparator industries to benchmark against. Each will affect the estimate outcome. For example, Economic Insight find that using a value-added measure of efficiency increases volatility of the metric, as does using too narrow as set of comparator industries. Indeed, they find replicating the approach adopted in GD2, with updated data would result in materially different ranges of ongoing efficiency for the GD2 time period (moving down from a range of 0.2% - 1%, to a revised -1.1% to 0.5%).

468. The above factors and the retrospective reassessment of the OE target for GD2 should be given careful consideration, to assess if recommended methodological changes should be applied.

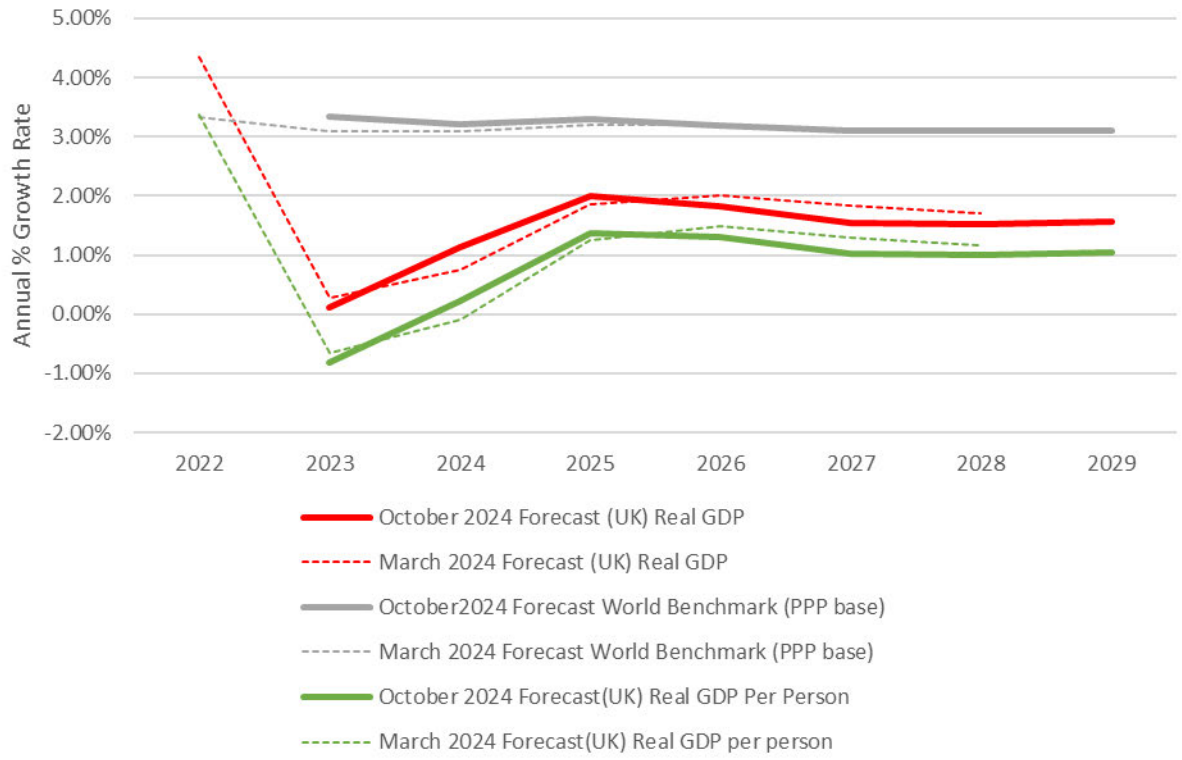
The Productivity Puzzle

469. There has been significant academic research undertaken on the UK's productivity puzzle. The decline in productivity is broad based affecting many industries and has been ongoing since 2008. Forecasts of the UK economy does not suggest any material improvement is expected in the near future. Indeed, Economic Insight cite recent ONS data suggests that growth was zero in June and July 2024. Output per hour growth was -0.2% and 0.3% in the first 2 quarters of 2024. Looking forward, in February 2024, the Bank of England forecast TFP growth averaging 0.3% p.a. for 2024 to 2026.

470. The most recent Office of Budget Responsibility (OBR) forecasts shown in Figure 40 concur with the above. Despite a focus on investment in the recent budget, the OBR forecasts do not suggest any significant upward shift in economic growth.

[53] See: https://www.tandfonline.com/doi/full/10.1080/13571516.2024.2367818

Figure 40: OBR Forecasts of Economic Growth March 2024 and October 2024

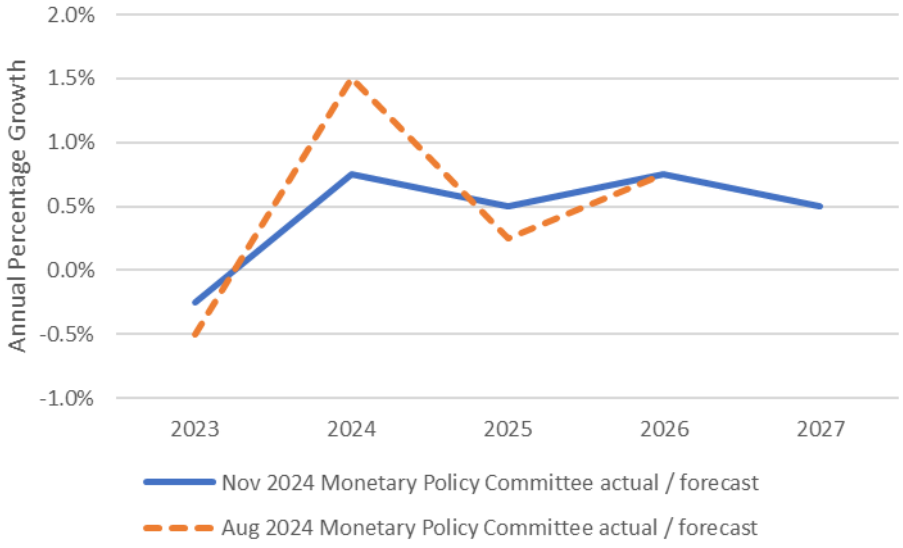


Source: Office of Budget Responsibility (OBR) March 2024 Forecasts and October 2024 Forecasts

471. Indeed, the forecasts actually suggest marginal falls in the economic growth trajectory relative to the March 2024 forecasts. Overall, wider economic growth does not appear to be accelerating.

472. The Bank of England now forecast the following labour productivity:

Figure 41: Labour Productivity Forecasts



Source: Bank of England Monetary Policy Report November 2024

473. While the near-term views of whole economy productivity is lower than the August forecast, but the longer-term forecast remains unchanged, It does not appear that labour productivity is shifting upwards compared to previously reported data.

474. In light of all this evidence, a key comment from Economic Insight is that they believe **the UK productivity slowdown is unlikely to fully unwind over RIIO3**.

Uncertainty and its relationship with Investment

475. Economic Insight discusses the potential for innovation for gas distribution networks. Academic literature indicates the four most important factors explaining the UK productivity slowdown are:

- Investment
- Infrastructure Quality
- Quality of Human Capital Stock and
- Management Quality
- Economic Insight indicates these are economy-wide impacts.

476. Looking at investment in particular, Economic Insight suggests that uncertainty surrounding the future of gas networks may make it harder for gas networks to secure investment than for other regulated industries. Furthermore, the uncertainty may make it specifically challenging for gas networks to make riskier or innovative investments that would drive productivity growth.

477. With economies of scale being another driver of efficiency, it is noteworthy that Economic Insight suggests other sectors can expand, and therefore benefit from scale economies. Gas networks are less likely to see significant expansion in customer numbers in the future. Future economies of scale are less likely in the gas sector.

OE and Funding

478. Given the re-assessment of the OE targets, Economic Insight suggests that gas networks may have been significantly underfunded. Continuing with higher OE targets could exacerbate the issue.

Proposed methodology

479. As OE cannot be easily observed from Total Factor Productivity (TFP) data, there will be some uncertainty over the true value of OE. Economic Insight therefore recommends setting a target towards the middle of any estimated range.

480. Economic Insight suggests an Ongoing Efficiency target of 0.5%. The consultant's methodology suggests an estimated OE range of 0.2% to 0.8%. Their central recommendation is **0.5% p.a.**

481. While there are certainly concerns that the economic outlook may have deteriorated since the preparation of the Economic Insight report (see Figure 40) SGN recognise setting an ongoing efficiency target incentivises networks (including the most efficient networks) to push for further productivity gains. SGN concur with the setting of a mid-point target as proposed by Economic Insight.

Ongoing Efficiency Recommendations

SGN are supportive of re-evaluating the OE methodology and recommends the use of a stretching 0.5% target in GD3 which aligns to the data that has been analysed as per our independent Economic Insight report.

E.6 Real Price Effects

Section E.6 discusses the Real Price Effects mechanism. It covers research undertaken by consultants [redacted], for all GDNs. Some of the key topics include:

- Views on materiality thresholds
- Issues with index selection like
  - Index volatility
  - Lag of reversion to trend
  - Alternative indices that can be considered
- Lagging of indicators

482. The RIIO Price control is primarily set ex-ante. Existing data is used to model the future efficiency of networks and allocate allowances. However, during the price control, the real world may impact on utilities, meaning that some of the assumptions used are incorrect. An effective price control allows for mechanisms to adjust the revenues networks receive in light of any of these changes. Reopeners are an example of this ex-post adjustment. So is the Real Price Effects mechanism.

483. While the price control is anchored to a base date using the CPIH measure of inflation, we know that some costs will diverge from CPIH. The RPE methodology is used to "true up" allowances on an annual basis to account for divergences in sector-specific inflation from CPIH. For the gas distribution networks, the RPE mechanism allows for differing inflation for labour and materials only.

484. While the mechanism was created ex-ante, it is applied ex-post, during the price control. There is a risk that the mechanism does not provide for all the costs divergences that develop as we move through a price control. In GD2, the external environment has been somewhat volatile, with factors like Brexit, Covid and war driving inflation and impacting on gas networks costs. It may be that the RPE mechanism does not reflect that changed environment.

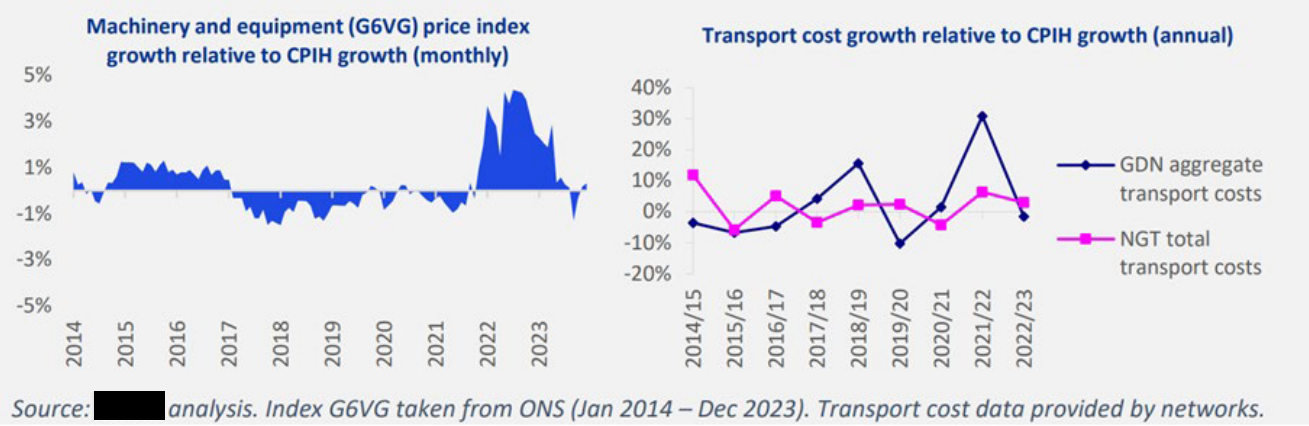
485. As with Ongoing Efficiency, the gas networks have commissioned an independent consultant, [redacted], to undertake a review of the existing mechanism, to assess if there are any potential changes to the RPE mechanism that will improve the ability of the price control to account for exogenous cost pressures that gas networks face. That report is provided alongside our business plan submissions.

486. The rest of this section discusses some of the themes the [redacted] report examined.

Materiality

487. At GD2, materiality thresholds of 10% of Totex were used to determine whether an input cost category should have an RPE allowance. Regulatory judgement was used to set these thresholds. This meant that labour costs and material costs passed the materiality thresholds, but the machinery and equipment, plus the vehicles categories did not pass the materiality tests.

Figure 42: Trends in Machinery and Equipment, and Transport Costs Indices

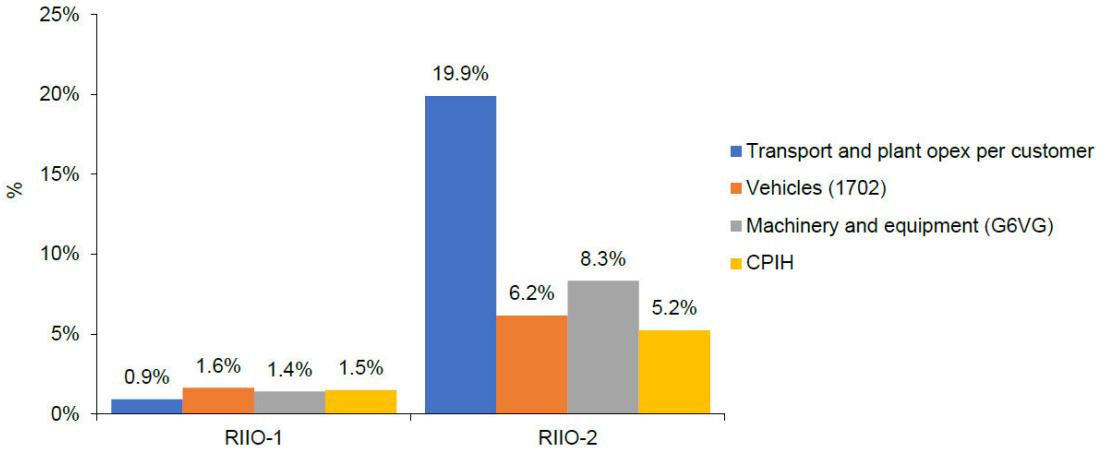


Source: [redacted] analysis. Index G6VG taken from ONS (Jan 2014 – Dec 2023). Transport cost data provided by networks.

488. An ex-post review of Machinery and Equipment, and Transport Costs indices (Figure 42) suggests these costs have become a material share of the cost base of networks. This has been particularly the case since 2021/22, with factors like the end of Covid-19 increasing activity and the war in Ukraine increasing oil prices having a wider effect on the economy – feeding through to many categories of expenditure by networks.

489. Translating the indices in Figure 42 into annualised trends (Figure 43) shows how material increases in costs can be.

Figure 43: Average Annual Growth Rate in Transport and Plant Opex per customer, and other price indices for GDNs, RIIO 1 and 2



Source: [redacted] analysis.

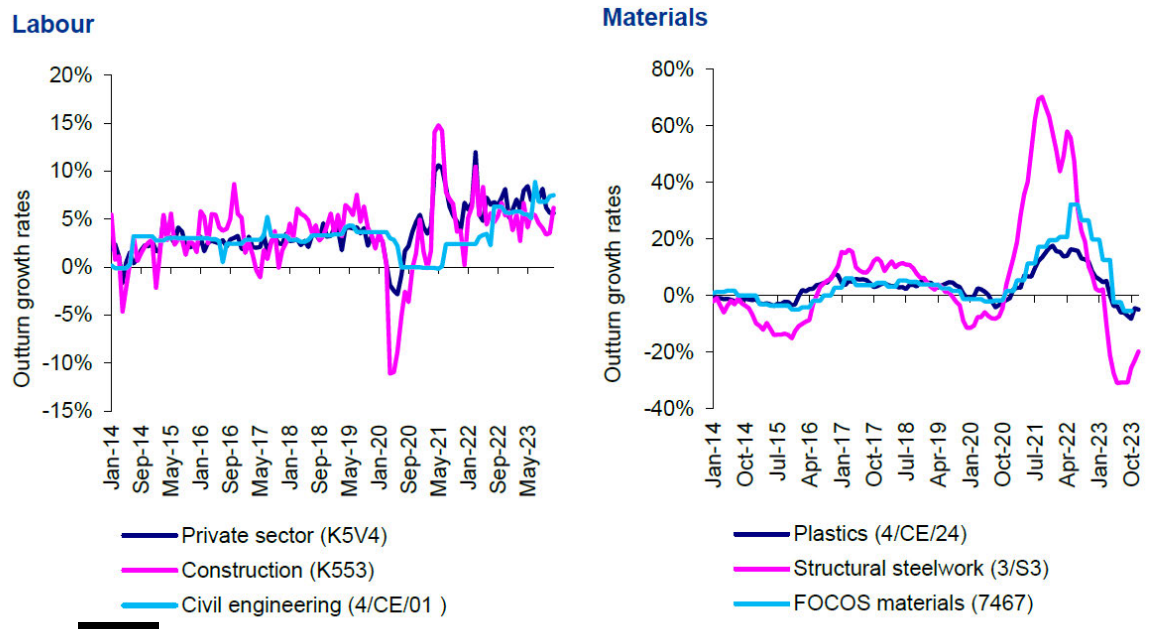
490. The uplift in the Transport and Plant Opex per Customer index is particularly marked. With the benefit of hindsight that index might have been included in the GD2 mechanism. It is also apparent there is a break in the trends between RIIO 1 and RIIO 2.

491. *Recommendation:* It would therefore be prudent to remove the materiality thresholds so that any cost that becomes material (and materially different from CPIH) can be allowed for.

Index Selection: Volatility in Component Indices

492. The GD2 RPE framework had three indices for labour and three for materials. Notwithstanding the risk of omitted variables (see materiality threshold discussion) misaligning the overall RPE index with in-price control divergences, one would hope that the constituent labour and material indices do align with the movements in networks outturn labour and material costs.

Figure 44: Growth in Outturn Input Price Indices within GD RPE



Source: [redacted] analysis.

493. Figure 44 indicates there has been some volatility in the constituent indices of the RPE. This volatility risks being out of alignment with the true costs the gas networks face.

494. [redacted] analysis suggests that while the indices correlate well at a Great Britain level, this is not the case at network level. [redacted] note that the correlation is poor for cadent networks and is inversely correlated for the East of England and London networks.

Figure 45: RPE Labour Indices Correlation with GDN Labour Totex

	Agg	Cadent				NGN	SGN		WWU
		EoE	Lon	NW	WM		Sc	So	
Composite index	0.917	-0.291	-0.050	0.193	0.514	0.911	0.912	0.912	0.910
Private sector (K5V4)	0.921	-0.278	-0.037	0.206	0.524	0.915	0.916	0.916	0.914
Construction (K553)	0.938	-0.259	-0.017	0.227	0.543	0.931	0.932	0.932	0.931
Civil engineering (4/CE/01)	0.874	-0.330	-0.095	0.145	0.467	0.871	0.872	0.871	0.870
CPIH	0.896	-0.329	-0.094	0.138	0.453	0.893	0.894	0.893	0.892

Source: [redacted] analysis.

495. This is borne out by an analysis at the more granular level, of correlation with Labour indices. Figure 45 also demonstrates that the Labour indices are inversely correlated for some networks.

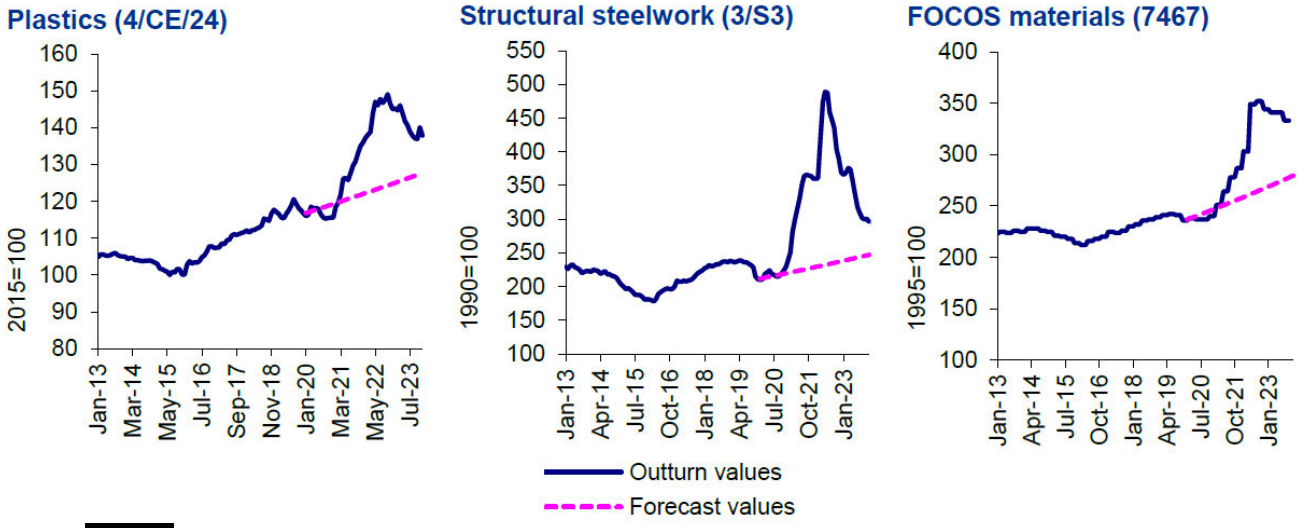
496. Given this significant mismatch between the RPE indices and two of the networks, a review of the RPE methodology seems warranted, including the index composition – to see if another mix of indices will better reflect the costs of all networks.

Index Selection: Lag of Reversion to Trend

497. When the RPE mechanism is updated annually it includes calculations for the remaining years of the price control. Where the indices have forecasts published (typically by ONS or the OBR) these are included. However, for some indices, particularly the material indices, forecasts are not provided. The current methodology assumes a quick reversion to trend.

498. [redacted] have reviewed the forecast and outturn values. Figure 46 considers the material indices.

Figure 46: Material Price Indices: Forecast Versus Outturn Values



Source: [redacted] analysis.

499. For materials, the recent time period suggests that the costs of the material categories within the index no longer revert to trend quickly. This appears to be persistent. Given the wider geopolitical situation, and its impact on oil prices and thereafter on materials, it is unsurprising that the costs have not reverted to trend. Given the high degree of uncertainty in

the world, one could argue the reference period (2000 onwards excluding 2009/10 and 2010/11 to control for the financial crisis)[54] for calculating the trend is not currently appropriate.

500. In principle, this reversion lag should be less material. The lag will mean that costs will eventually pass through to the networks. However, there could be a timing issue if the reversion to trend does not occur before the end of GD3. Costs may drag on into GD4.

Index Selection: Alternative Indices

501. Given the aforementioned challenges, it is prudent to assess if other indices may provide a more robust view of real price effects, to generate a better RPE mechanism that may more closely align with exogenous cost changes networks will face in the RIIO 3 price control. [redacted] undertook a review of potential indices that could be added to the mechanism. This was based in part on an analysis of what has been used for other energy utilities and by other Regulators for other utilities.

502. While the existing RPE mechanism has 3 labour and 3 materials indices, [redacted] has identified there are many other indices that could be considered. There are:

- 21 labour-related indices
- 14 material-related indices and
- 5 plant and equipment related indices

503. Looking at Labour indices for example, [redacted] identify 11 indices that have not been fully assessed by any UK Regulator[55]. Some of these are ONS's AWE[56] indices or ASHE[57] indices at relevant sector level, like the *ASHE – Skilled trades* index, the *AWE- electricity, gas and water supply* index and the *ASHE – Process, Plant and Machine operatives* index. These (and the other) labour-related indices should be evaluated to see if each of these variables aligns well with the outturn costs. Where they do, they can be added to the existing RPE or replace one or more of the existing indices. The CAWG should discuss it.

504. Similarly, with materials, [redacted] also highlights several alternative drivers. For example, the *BCIS Pipes and Accessories: Plastic* Index which has not been assessed. Given the aim of the Iron Mains Replacement Programme is to replace metal pipes with PE pipes, then there is an argument that an index like this might be a good index to consider.

505. Overall, [redacted] recommends that the list of indicators is assessed to see if the RPE would be improved with additional components.

506. In addition to the recommendations by [redacted], consideration should be given to adding the BCIS's All-in Contract Tender Price index into the Real Price Effects (RPE) mechanism. While page 43 highlights the adjustment to regional factors to allow for better ex-ante assessment of efficiency, but there is still a risk that outturn contract rates diverge from the assumed rates in the ex-ante models. To protect networks from this outturn risk, it is prudent to use the All-in Contractor Tender Price index in the RPE. There are factors which must be considered in such a decision:

507. The Real Price Effects index currently uses specific indices covering wages and materials only. While the All in Contract Tender Price index will cover wages and materials, it will also cover other costs mentioned in paragraph 265 above. The RPE index would require careful re-calibration.

508. Furthermore, while the BCIS All-in Contractor index is a useful metric to measure the approximate premia, it would require updating, (or potentially disaggregation) to ensure it is as representative of the infrastructure / energy sectors as it is of the whole construction sector.

Lagging of Indicators

509. Networks often have procurement contracts that fix material costs for a specific period. Alternatively, suppliers or contracts may not immediately increase their unit prices to maintain their competitive position, even as their own input costs rise. However, there will eventually come a point where these suppliers must pass on the increased costs. In both scenarios, the cost increases may not be immediately passed on to the networks.

[54] Source: Page 109 [redacted]
[55] Ofgem, Ofwat, or Utility Regulator (N. Ireland)
[56] Average Weekly Earnings
[57] Annual Survey of Hours and Earnings

510. [redacted] has conducted correlation analysis and suggested that using lagged indicators would better align the Real Price Effects (RPE) true-ups with the timing of when networks actually experience cost changes. This approach would ensure a more accurate reflection of the cost adjustments that networks face over time.

SGN View

511. In light of the research findings from [redacted] we do believe some further work is required. The ultimate aim is to design a new RPE index. However, the research from [redacted] highlights key areas where further work may be required. Furthermore, with earlier analysis in paragraph 259 onwards highlighting the cost differentials for contractors, it is important to consider if other adjustments, in light of the business plan submissions are appropriate. SGN are therefore supportive of a further assessment of the RPE mechanism, through the CAWG meetings, to examine the potential for:

- Removing materiality thresholds
- Reassessing indices to include
- Assessing whether a new reversion to trend assumption is warranted, and
- Whether a lag in indices is warranted

Real Price Effects Recommendations

SGN are supportive of applying an RPE mechanism. We believe it can evolve, by looking at the following aspects:

- Examining removing the materiality thresholds, to allow for unforeseen changes in cost categories to be accounted for
- Reassessing what indices should be included
- Reassessing the reversion to trend growth assumptions for those indices without independent forecasts
- Considering application of a lag component to better account for the timing of when costs increases are passed on to networks
- Investigating if a more regional, or network specific RPE index can be applied

Section F Cost Proposals Summary

We discuss below the evolution of costs from GD2 to GD3 along with the factors that drive costs, how we have embedded efficiency within these areas and what implications should be considered within cost efficiency assessment by area.

F.1 Direct Opex

512. Our Direct Operating Costs consist of network-related expenditure to manage and react to events that occur on our network. These activities are vital to ensure a safe and reliable network, with us needing to maintain our assets to a high standard ensuring longevity of critical equipment, as well as responding to emergencies and making assets safe again when failures do occur.

513. There is a high correlation of this expenditure group with our network investment plan, with our Iron Mains Replacement Programme (IMRRP) within Repex removing some of the riskiest metallic pipeline and replacing metallic with plastic, helping to reduce repair workloads across the GD3 period.

514. Our direct Opex activities are primarily labour-based costs, and with the recent HSE requirement to move to a maximum 12-hour working pattern our costs have been adversely impacted. The upfront costs of this move are covered in a re-opener submitted in Sept 24, and not included in these costs. We have carried out analysis with external consultancy support to determine the most efficient pathway to enabling this 12-hour maximum working pattern. Within each area below, we explain the impact we foresee through moving to 12-hour working and the mitigations we have put in place.

Emergency

515. Our Emergency expenditure type relates to the cost of responding to a call out as per Ofgem's required standards of service, being within two hours for a controlled escape and within one hour for an uncontrolled escape.

Table 6: SGN Emergency GD2 to GD3 Costs (£m - 2023/24 real prices)

£m	GD2 5 year avg.	GD2 last 3 year avg.	26/27	27/28	28/29	29/30	30/31	GD3 avg.
Scotland	**10.1**	**10.9**	12.2	12.1	12.0	11.9	11.7	**12.0**
Southern	**28.9**	**31.9**	27.3	26.9	26.5	26.1	25.7	**26.5**
SGN	**39.0**	**42.8**	**39.5**	**39.0**	**38.5**	**38.0**	**37.5**	**38.5**

Source: SGN analysis of GD3 BPDT

516. Given the importance of this activity type to customers, and carry out extensive analysis each year to ensure we are appropriately resourced. We always aim to reach each emergency within the defined time, this is not always possible given the time-specific circumstances.

517. Our cost base within Emergency is primarily labour-based for our First Call Operatives (FCOs), and the cost to respond to an external report as well as the non-productive waiting time of an FCO where we are not able to re-allocate their time to other activities. We must maintain a steady and robust workforce to ensure we can respond to any emergency call-out, which can peak at any point, particularly in the winter months, we utilise in-fill work which is less urgent to ensure we keep our FCO workforce as productive as possible.

518. The main driving workload for this activity is Publicly Reported Escapes (PRE), with the peak PRE being the metric we ultimately resource to ensure we can maintain our 97% standard in all years. Within the GD3 period we forecast that annual average PREs will continue to decline, but note that the peak that we need to resource to declines at much slower rate. For determining our workload forecasts, we have utilised a multiplicative forecasting approach to ensure the seasonality peaks are considered and understood.

519. Costs are based on our existing efficient level of unit rate, once we have normalised for the recent impact of hiring in our Southern network, impacting our productivity adversely, while we onboard new FCOs and ensuring they are competent.

520. Within GD2 we have assessed our FCO productivity at 79% while our plan for the GD2 period shows an improvement to 80% when excluding the impact of 12-hour way of working. This improvement is part of our commitment to drive efficiencies within our business at all levels.

521 [redacted] Scotland is expected to have a proportionally greater impact due to the more disaggregated and sparse depot coverage that is required in this area, reducing the ability to have synergy savings. Further supporting information on our Emergency strategy can be found within our main business plan in Chapter 5.

Repairs

522. Our repair expenditure is the next step to dealing with an emergency call out, where our repairs team pick up from the FCO after their initial assessment and process of making safe any publicly reported call out.

Table 7: SGN Repair GD2 to GD3 Costs (£m - 2023/24 real prices)

£m	GD2 5 year avg.	GD2 last 3 year avg.	26/27	27/28	28/29	29/30	30/31	GD3 avg.
Scotland	**12.2**	**14.1**	15.5	15.2	14.0	13.7	13.3	**14.3**
Southern	**40.7**	**47.2**	43.1	41.1	40.6	37.9	36.5	**39.8**
SGN	**52.9**	**61.3**	**58.5**	**56.3**	**54.6**	**51.7**	**49.8**	**54.2**

Source: SGN analysis of GD3 BPDT

523. Workload is a key driver of this expenditure area, and as with PRE we anticipate the workload to show a decline overall within the GD3 period due to the continuing replacement of metallic pipe with plastic. For our Tier 1 assets, this replacement is greater than the rate of degradation that we see across our network, and as such we have forecast a greater reduction in Tier 1 repair workload.

524. For our Tier 2 and Tier 3 assets, currently, the rate of degradation is greater than the rate we replace our pipes. As such, we anticipate an increase in this workload area, though due to it being a materially lower asset population than our Tier 1 from an overall perspective our workload is decreasing by 9%.

525. Our workload forecasts have been supported by work through Bearing Point (SGN-GD3-ECR-02), to better understand the drivers that impact the likelihood of a gas escape, and therefore a required report. We discuss this further within Chapter 5 of our main business plan and section B.3 of our Network Asset Management Strategy (SGN-GD3-SD-06).

526. Our costs are determined using a unit rate methodology, assessing our costs at a tier level. Due to the differing mix between Tier 1 and Tier 2 / Tier 3 assets, we anticipate our unit rate to increase within the GD3 period, as we are dealing with more complex repair workloads.

527. We believe our costs to be efficient when considering regional and company-specific factors, particularly for regional wage differentials in southern and the impact of sparsity on our ability to respond to repairs in Scotland. We discuss our GD2 performance in more detail in section C.5 .

528 [redacted] Further supporting information on our Repair strategy can be found within our main business plan in Chapter 5.

Maintenance

529. Maintenance is a key expenditure area to ensure the long-term management of our assets and can be a key driver to ensuring our assets last as long as possible, driving value for money.

Table 8: SGN Maintenance GD2 to GD3 Costs (£m - 2023/24 real prices)

£m	GD2 5 year avg.	GD2 last 3 year avg.	26/27	27/28	28/29	29/30	30/31	GD3 avg.
Scotland	**16.8**	**18.1**	21.8	21.7	21.9	22.1	22.1	**21.9**
Southern	**28.8**	**31.0**	35.7	35.9	36.8	36.6	35.9	**36.2**
SGN	**45.6**	**49.0**	**57.4**	**57.6**	**58.7**	**58.7**	**57.9**	**58.1**

Source: SGN analysis of GD3 BPDT

530. Our maintenance programme is informed by our internal policy documents and informed by our condition monitoring programme. While our assets are broadly expected to remain the same, we have an increased number of bespoke connections relating to biomethane blending that drive an increase in maintenance costs. Our underlying Annual Maintenance Plan (AMP) for our base workloads is expected to remain consistent across GD3.

531. We do have new workloads in relation to;

- Riser and Complex Distribution System maintenance (+£6m Scotland / +£9m Southern) as a response to the recent Grenfell enquiry report and our ongoing work to help reduce the risk of MOBs
- Inclusion of VCMA costs within baseline activities as requested within the Ofgem SSMD (+£4m Scotland / £9m Southern) for the provision of checks of Carbon Monoxide checks in customer homes
- Increased number of surveys to support potential overbuilds requirements (+£2m).

532. Maintenance is a core area in our network management strategy and is imperative to ensure our assets are robust and last as long as possible, which drives increased value through keeping our assets running smoothly. We discuss our wider strategy of managing our network assets within the Network Asset Management Strategy (SGN-GD3-SD-06).

533 [redacted] Further information can be found within our supporting document SGN-GD3-ECR-23.

Statutory Independent Undertakings (SIU) Opex

534. Our Statutory Independent Undertakings (SIU) Opex activity reflects the ongoing running and maintenance of our five independent gas networks that serve customers within the most remote parts of Scotland. The costs within this section cover primarily the cost of the Liquified Natural Gas (LNG) and Liquified Petroleum Gas (LPG) of which is used as fuel for the SIUs, the transportation of this fuel from the Isle of Grain plus the corresponding management and running of this process.

Table 9: SGN SIU Opex GD2 to GD3 Costs (£m - 2023/24 real prices)

£m	GD2 5 year avg.	GD2 last 3 year avg.	26/27	27/28	28/29	29/30	30/31	GD3 avg.
Scotland	**8.0**	**7.5**	8.2	8.6	9.0	9.5	10.0	**9.1**
Southern	**0.0**	**0.0**	0.0	0.0	0.0	0.0	0.0	**0.0**
SGN	**8.0**	**7.5**	**8.2**	**8.6**	**9.0**	**9.5**	**10.0**	**9.1**

Source: SGN analysis of GD3 BPDT

535. This activity is unique to SGN, with no comparator costs available across networks and therefore costs should be assessed separately for efficiency, as per the approach utilised within GD2. We have submitted as part of our business plan a separate SIU Strategy document (SGN-GD3-SD-11 - Strategic Independent Undertakings (SIU) Strategy) to ensure suitable information on our approach to this vital function to the c. 9,500 customers we support within the SIU regions.

536. Our costs are anticipated to increase compared to the GD2 average due to ongoing LNG / LPG fuel price volatility across the price controls and the costs of implementing 12-hour working practices in particular.

537. Due to the highly sparse regions in which our SIUs operate, to ensure as cost efficient a process as possible we currently operate at minimum staffing levels and rely heavily on standby rotas to manage sudden peaks in activities if they arise. These rotas will need to change with the introduction of 12-hour working practices which will have a relatively large impact to our emergency and repair costs within SIUs.

538. We discuss further within SIU Capex below our plans for de-carbonising the SIUs within the GD3 period. The costs put forward for SIU Opex assume our current working practices, along with forecasted costs of LNG and LPG. At this time we do not have certainty on the timelines associated with bio-CNG conversion; and once converted we don't assume savings in fuel costs (likely to be similar to LNG/LPG). However, there is a long-term opportunity (beyond GD3) to reduce transportation costs due to the proximity of biomethane sources.

Other Direct Activities

539. Our Other Direct Activities (ODA) costs are primarily odorant as well as consumable tools and equipment that are utilised in the ongoing workings that we carry out as a network.

Table 10: SGN Other Direct Activities GD2 to GD3 Costs (£m - 2023/24 real prices)

£m	GD2 5 year avg.	GD2 last 3 year avg.	26/27	27/28	28/29	29/30	30/31	GD3 avg.
Scotland	**3.2**	**3.5**	4.0	4.0	4.0	4.0	4.0	**4.0**
Southern	**4.5**	**6.6**	8.7	6.2	6.2	6.2	6.2	**6.7**
SGN	**7.7**	**10.0**	**12.7**	**10.2**	**10.2**	**10.2**	**10.2**	**10.7**

Source: SGN analysis of GD3 BPDT

540. We anticipate our costs within these areas to remain broadly static compared to the GD2 period for odorant and consumable tools and equipment expenditure.

541 [redacted]

F.2 Indirect Opex

542. To ensure the efficient and reliable working of our frontline staff, we need to ensure we have a well-functioning back-office team to provide support and management, removing the need to deal with the administration side so frontline teams can focus on the assets.

543. While we acknowledge the importance of these roles, we note the need to ensure focus is on our frontline staff. As such, within GD2 we have carried out reviews of our back-office support functions and implemented efficiencies to ensure our back-office is right sized. These efficiencies are the starting point for our GD3 plan, so are built in from the start within our costing proposals.

Work Management

544. Our work management function is made up of those back-office support areas that work directly with our frontline operatives, covering areas such as Asset Management, Operations Management, System Control and Customer Support.

Table 11: SGN Work Management GD2 to GD3 Costs (£m - 2023/24 real prices)

£m	GD2 5 year avg.	GD2 last 3 year avg.	26/27	27/28	28/29	29/30	30/31	GD3 avg.
Scotland	**13.9**	**14.7**	12.7	14.0	16.1	16.1	15.1	**14.8**
Southern	**26.9**	**27.1**	31.2	32.4	34.1	34.1	33.2	**33.0**
SGN	**40.8**	**41.8**	**43.8**	**46.4**	**50.2**	**50.1**	**48.2**	**47.8**

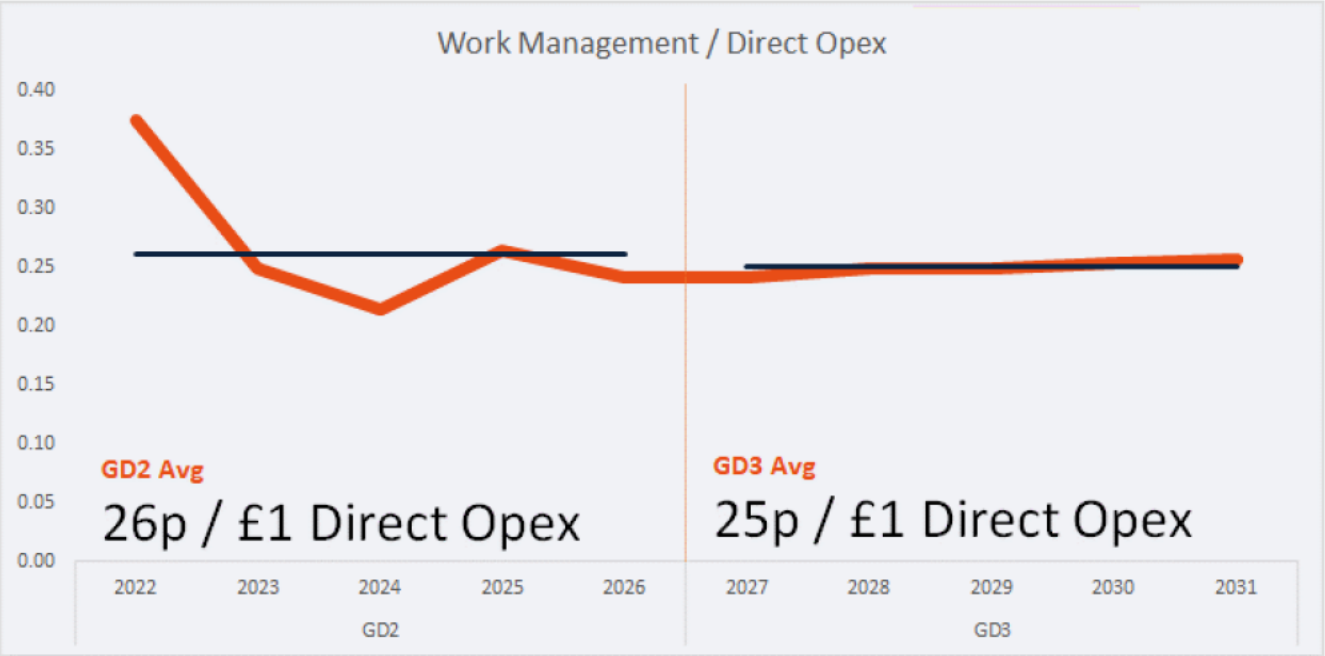
Source: SGN analysis of GD3 BPDT

545. Our work management function is made up of those back-office support areas that work directly with our frontline operatives, covering areas such as Asset Management, Operations Management, System Control and Customer Support.

546. As per our approach to back-office costings, we have started with our final year of GD2 as a base to put forward our GD3 cost proposals. Within Customer Support we have embedded costs relating to the movement of VCMA costs to baseline, increasing our costs compared to GD2 by £2.4m within Work Management which is a re-allocation to funding that was previously classed outside of Totex. We have included this value within our Bespoke, Uncertain and Separate Assessment proposals as we do not believe it would be comparable in efficiency assessment across networks.

547. The costs presented in our plan are after allocation to Capex and Repex activities, which means the remaining cost in this area is primarily to manage our direct Opex activity. A simplistic rate of determining efficiency change across price controls is looking at our Work Management cost / Direct Opex cost. For GD2 this averaged at 26p of Work Management per £1 of Direct Opex, improving by 4% into GD3 at 25p of Work Management per £1 of Direct Opex.

Figure 47: Work Management Cost as a proportion of Direct Network Opex



Source: SGN analysis using GD3 BPDT

548. The improvement in efficiency demonstrated above is reflective of our GD2 programme to drive improvements in our back-office relative to our frontline workforce.

549. We discuss in Section C our relative efficiency to other networks within GD2, and note that both our Scotland and Southern networks are impacted by sparsity and density cost headwinds. Scotland has to cover some of the largest Great Britain land area, ensuring we have an emergency and repair response that can reach our assets in required times. Southern has challenges relating to urbanity congestion, for each emergency we respond to there are more properties and customers to manage than the industry average. Both challenges drive increased costs.

550 [redacted]

Core Business Support

551. Our Business Support costs are those that help ensure our staff can complete their jobs to their best of their abilities, and includes areas such as Opex finance, HR and other back-office functions that are not network related. Opex IT and Property Management costs are discussed further below.

Table 12: SGN Core Business Support Costs GD2 to GD3 Costs (£m - 2023/24 real prices)

£m	GD2 5 year avg.	GD2 last 3 year avg.	26/27	27/28	28/29	29/30	30/31	GD3 avg.
Scotland	9.8	11.2	8.7	8.7	9.6	11.6	9.6	9.6
Southern	20.5	24.0	15.8	15.8	17.4	21.1	17.4	17.5
SGN	30.2	35.2	24.5	24.5	26.9	32.8	26.9	27.1

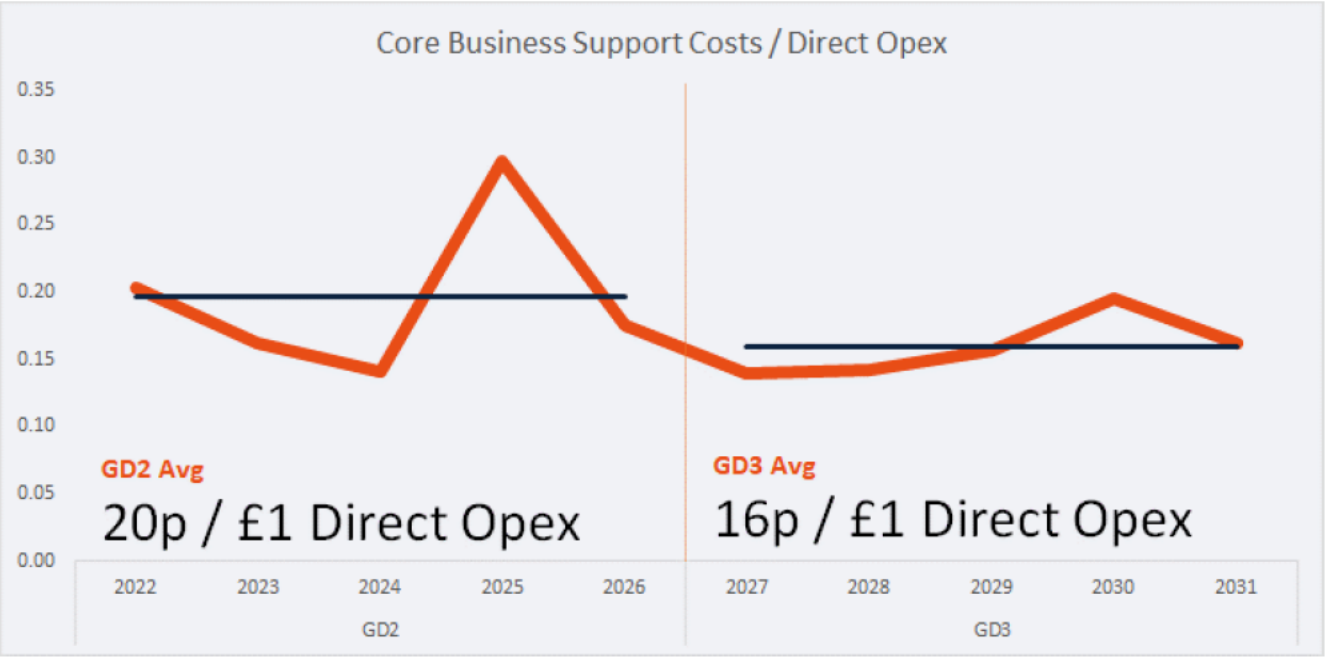
Source: SGN analysis of GD3 BPDT

552. We have carried forward our year five efficient position for Business Support costs into GD3, which, as with Work Management costs we believe will embed efficiencies into the GD3 period.

553. Our costs are presented post allocation to Capex activities, so the remaining costs presented are those that support our network Opex activities (repair, emergency, maintenance). We can carry out a ratio of costs against these activities to determine how our efficiency will change from GD2 into GD3.

554. The allocation model we utilise is in alignment with our independently audited accounting practices, and ensures that costs related to our Capex activities are appropriately burdened with the full costs to complete said activities. This ensures a more robust comparison of costs across networks regardless of a direct labour or contracting strategy to complete.

Figure 48: Core Business Support Cost as a proportion of Direct Network Opex



Source: SGN analysis using GD3 BPDTs

555. Core Business Support costs are expected to be 19% more efficient over the price control periods for the activity in which it supports, driving c. £40m of efficiencies for customers into GD3 compared to GD2.

IT Opex Costs

556. The IT costs discussed here are for the operating cost expenditure we incur, to cover our IT professionals, service contracts and software fees within years.

Table 13: SGN IT Opex GD2 to GD3 Costs (£m - 2023/24 real prices)

£m	GD2 5 year avg.	GD2 last 3 year avg.	26/27	27/28	28/29	29/30	30/31	GD3 avg.
Scotland	**9.7**	**11.4**	17.3	17.9	17.6	17.3	17.3	**17.5**
Southern	**27.7**	**35.9**	31.4	32.5	31.8	31.4	31.4	**31.7**
SGN	**37.4**	**47.3**	**48.7**	**50.4**	**49.4**	**48.7**	**48.7**	**49.2**

Source: SGN analysis of GD3 BPDT

557. We discuss IT Capex costs further below but note for cost comparison purposes across networks both Capex and Opex should be considered together due to potential allocation differences across companies. We also believe IT is primarily a company activity, as opposed to a network activity as a result there is benefit in carrying out cost efficiency assessment at the company level as opposed to network level.

558. IT is a constantly evolving area, with further enhancing requirements through protective functions such as Cyber Protection as well as new activities such as Data and Digitalisation strategies that have changing expectations from stakeholders.

559. Fundamentally our IT systems services and infrastructure underpin our ability to provide emergency response, network operations and asset management to ensure a safe and secure network, protecting life and property, to serve our customers and other stakeholders and to add social value by innovating and sharing data.

560 [redacted]

561. Our workforce is increasing in the GD3 period due to extra workloads and the need to have an increased number of staff to manage fatigue. As such, we anticipate the need for an increased IT support function. The remaining cost increases within IT Opex of £24m are to support the projected increase in FTE we have between price controls of 13%.

562. We discussed further within section E.2 Cost Drivers the most appropriate driver to explain our IT expenditure across companies being company FTE, as the number of employees we have is directly linked to the IT services that we are required to provide.

563. As well as IT Capex costs discussed in section F.4 below, we forecast our IT investments to drive value for money to customers of at least £9.4bn by 2043 compared to us not investing in our systems within the GD3 period.

564. Further information on our IT strategy can be found within the supporting document SGN-GD3-SD-07 IT and Telecoms Strategy.

Property Management Opex Costs

565. Our Property Management operating expenditure is to support the running and security of sites, ongoing repairs and maintenance of sites and the rental costs of sites that are leasehold.

Table 14: SGN Property Opex GD2 to GD3 Costs (£m - 2023/24 real prices)

£m	GD2 5 year avg.	GD2 last 3 year avg.	26/27	27/28	28/29	29/30	30/31	GD3 avg.
Scotland	4.6	5.1	4.4	4.4	4.4	3.6	3.4	4.1
Southern	9.5	10.7	8.1	8.0	8.1	6.5	6.2	7.4
SGN	14.1	15.8	12.5	12.5	12.5	10.0	9.6	11.4

Source: SGN analysis of GD3 BPDT

566. We are continuing to transition away from SSE sites in the GD3 period. During this period, we have engaged external consultancy support to ensure our property strategy is aligned with our internal operating models as well as being efficient for the future.

567. External consultancy analysis, as justified through our CBA demonstrates our adopted approach to transition to a freehold strategy and reduce number of operational sites from 68 to 59 within the price control will by NPV neutral by 2043, and after which will generate ongoing benefit due to the transition. Savings are demonstrated within our plan through lower Opex property management costs compared to our GD2 position. The Capex expenditure is set out in Section F.4 along with the associated EJPs.

Training and Apprentices

568. Costs within the Training and Apprentices area cover the functions to perform training across SGN as well as the costs of apprentices while they are becoming competent to be embedded within our workforce, which can take up to three years.

Table 15: Training and apprenticeship costs (£m - 2023/24 real prices)

£m	GD2 5 year avg.	GD2 last 3 year avg.	26/27	27/28	28/29	29/30	30/31	GD3 avg.
Scotland	4.6	5.4	4.7	4.7	4.7	4.7	4.7	4.7
Southern	7.8	9.3	7.8	7.8	7.8	7.8	7.8	7.8
SGN	12.4	14.7	12.5	12.5	12.5	12.5	12.5	12.5

Source: SGN analysis of GD3 BPDT

569. Our investment in the future is vital to ensure we have a robust workforce to manage our network safely and reliably. We have always been focussed on the future of our workforce, and within the GD2 period started on our need to right-size our direct Opex areas (repairs, emergency) for both the immediate requirements for activities we were facing and for known impacts in the future relating to 12-hour ways of working.

570. Our plans for GD3 include 40 apprentices to be recruited per year in Southern, and 22 apprentices to be recruited per year in Scotland. We have also included all supporting trainer and management costs to ensure our new recruits have all the tools and expertise available to them to be competent and productive at the earliest opportunity.

571. Further information regarding our training and apprenticeship strategy can be found within our supporting document SGN-GD3-SD-03 Workforce and Supply Chain Resilience Strategy.

F.3 Network Capex

572. Our Network Capex proposals are vital to maintaining the integrity of our network, comprising of asset management replacement costs and load-increasing costs. While we anticipate load-related expenditure to reduce compared to GD2 due to lower new connection demand, there is still an expectation for some load-related expenditure particularly for larger I&C loads, as well as strategic reinforcement programme.

573. Our non-load related expenditure is justified through either CBAs to demonstrate the value for money to consumers and payback period or through alignment to our policies for replacement of assets.

574. Costings within Capex areas are in most cases bespoke, particularly with larger scale projects that are found within our LTS Capex activities, which have limited scope for comparative analysis. We have called out our projects that over £5m of expenditure within the GD3 period for separate assessment due to the lack of comparator data to perform statistical benchmarking.

LTS, Storage & Entry

575. The Local Transmission System (LTS) is critical to the continued supply of gas to around 6 million customers (4 million in Southern and 2 million in Scotland). It serves whole communities, business, and significant industrial customers (e.g. refinery and power stations) often from single pipelines, PRS and Offtakes.

Table 16: SGN LTS, Storage & Entry GD2 to GD3 Costs (£m - 2023/24 real prices)

£m	GD2 5 year avg.	GD2 last 3 year avg.	26/27	27/28	28/29	29/30	30/31	GD3 avg.
Scotland	**31.8**	**39.7**	18.8	25.1	30.5	20.6	13.5	**21.7**
Southern	**22.8**	**25.7**	24.2	32.1	35.0	33.0	28.3	**30.5**
SGN	**54.6**	**65.4**	**43.0**	**57.2**	**65.5**	**53.6**	**41.8**	**52.2**

Source: SGN analysis of GD3 BPDT

576. The objective of the LTS GD3 investment plan is to invest where necessary to improve the health of assets within the LTS. We use a 4Rs strategy which considers different investment options, including Repair, Refurbishment, Rebuild and then Replace.

577. Our approach to workload is driven by compliance with both Pressure System Safety Regulations 2000 (PSSR) and Pipeline Safety Regulations 1996 (PSR), and integrity investment requirements highlighted by condition data from the network asset population. We discuss our asset details and approach to workload for GD3 within our SGN-GD3-SD-06 Network Asset Management Strategy, Section F.

578. Our costings for these workloads are based on our historically achieved rates and experience of how these complex projects are delivered by our contracting partners. This approach ensures that our forecasts are robust to activities we have completed historically, and by using, where available, the historically delivered costs of multiple projects we can ensure a balanced view of risk is included within our plan.

579. The cost driver for LTS assets is to maintain a safe and reliable network. These assets are the backbone to our network and therefore our customers. We note the main drivers that are used by Ofgem to determine efficiency within this area has been Modern Equivalent Asset Value (MEAV) and Customer Numbers, both of which do not suitably reflect the network configuration differences that Scotland has, as well as potential differences in age profiles across networks. We explain our position on appropriate cost drivers within Section E.2 Cost Drivers.

580. Equally, consideration is needed on the lack of comparability available on projects, due to the bespoke and targeted approach to our investment plans within LTS. We call out, in particular, some large site rebuilds such as Glenmavis in Scotland and Isle of Grain and Welling within the Southern network. These projects have unique characteristics such as design differences and land cost challenges that remove the ability for comparative analysis.

581. The following EJPs are in support of our LTS expenditure:

Investment Decision Pack	Reference	Coverage
Compliance	SGN-GD3-EJP-LTS-001	Network - LTS
Full Site Rebuilds	SGN-GD3-EJP-LTS-002	Network - LTS
Glen Mavis	SGN-GD3-EJP-LTS-003	Network - LTS
Isle of Grain	SGN-GD3-EJP-LTS-004	Network - LTS
Pipelines	SGN-GD3-EJP-LTS-006	Network - LTS
Pre Heating	SGN-GD3-EJP-LTS-007	Network - LTS
Pressure Control	SGN-GD3-EJP-LTS-008	Network - LTS
Welling PRS	SGN-GD3-EJP-LTS-008	Network - LTS

Connections

582. Connections expenditure relates to connecting new customers to our network, along with the supporting costs of quotations to support external parties connecting to the network.

Table 17: SGN Connections GD2 to GD3 Costs (£m - 2023/24 real prices)

£m	GD2 5 year avg.	GD2 last 3 year avg.	26/27	27/28	28/29	29/30	30/31	GD3 avg.
Scotland	**6.6**	**4.9**	5.6	5.9	5.9	5.8	5.8	**5.8**
Southern	**8.2**	**7.7**	6.7	6.9	7.0	7.6	7.2	**7.1**
SGN	**14.8**	**12.6**	**12.3**	**12.8**	**12.8**	**13.4**	**13.0**	**12.9**

Source: SGN analysis of GD3 BPDT

583. Our new connections workload has been declining over recent years and with the recent Ofgem decision to remove the Domestic Load Connections Allowance (DLCA) contribution to customers to support new gas connections[58], we forecast this decline in our connections workload to continue.

584. We note that our forecasts and those of the FES 24 Counter-Factual scenario do not assume connections will completely cease within the GD3 period, with there still being a place for gas until wider Government policy is defined and clarified.

585. Due to the removal of the DLCA, we anticipate our competitiveness to provide quotes to customers to further reduce, as we are burdened by the need to carry out quotes not just for our own activity, but also to support the quotes that are requested for Independent Gas Networks. Further, the design and quotes we put forward in the future will need to be more bespoke, increasing the complexity and time to complete such activities for our back-office functions.

586. While we have forecast our back-office support function costs for Connections to decrease in the GD3 period, we do not anticipate it to change significantly at this time. With the likelihood of lower acceptance rates of our quotes, due to both a lack of contribution through the DLCA and ever increasing overhead burden, we highlight a risk of stranded overheads that are included within our ex ante Totex ask.

587. Our cost forecasts assume that accepted quotes will have a fixed 65% burden rate of overheads for the prime activity costs, that will be customer funded. As our overhead costs will be broadly fixed through the activity of quotations and designs that we are required to be completed, and increasing complexity of bespoke quotes, this will leave a stranded overhead that will change depending on the actual number of accepted quotes and jobs carried out we are able to do.

588. This cost area is expected to be highly uncertain for the GD3 period, due to challenges with both the underlying number of designs and quotes required through customer demand, as well as the number of accepted quotes we receive which will have a direct impact on the stranded overheads across SGN.

589. As such we have proposed uncertainty mechanisms within Chapter 8 of our main business plan. This is in the form of both a volume driver, that assumes an adjustment to allowances to manage the stranded overheads dependent upon accepted quotes, if there are more accepted quotes the Totex allowance is reduced to reflect overheads being covered by direct customer funding, and conversely, if accepted quotes are lower than forecast allowances to cover stranded overheads is adjusted accordingly.

[58] Ofgem SSMD GD Annex (July 2024) – para 4.227

590. We acknowledge that this will be a highly evolving area during the GD3 period, and as such suggest a cap and collar is placed around a volume driver which would trigger a re-opener if there is a substantial difference to forecast position in both accepted quotes and underlying number of quotes and designs (which would impact the underlying overhead costs).

Reinforcement

591. Reinforcement expenditure is a load related activity that can be both driven through customer demand changes, as well as through strategic choices to reinforce the network in specific locations to reduce the need for network configuration changes, thus reducing net cost.

Table 18: SGN Reinforcement GD2 to GD3 Costs (£m - 2023/24 real prices)

£m	GD2 5 year avg.	GD2 last 3 year avg.	26/27	27/28	28/29	29/30	30/31	GD3 avg.
Scotland	**3.8**	**5.2**	2.6	2.7	2.6	2.5	2.4	**2.6**
Southern	**3.2**	**4.1**	8.7	8.2	7.8	7.6	7.7	**8.0**
SGN	**7.0**	**9.3**	**11.4**	**10.9**	**10.4**	**10.2**	**10.2**	**10.6**

Source: SGN analysis of GD3 BPDT

592. Reinforcement is an essential workload to maintain supplies to our network at 1 in 20 peak conditions. Without reinforcement on our continually evolving network, we risk not meeting our licence condition to maintain supplies. We discuss our approach to reinforcement in more detail within document SGN-GD3-SD-06 Network Asset Management Strategy, section D.

593. Our activity for reinforcement is driven by (i) general reinforcement as a result of changing external needs which then lead to a risk of poor pressure and (ii) strategic reinforcement to support more efficient design and reduce the need for open cut replacement when replacing mains.

594. We acknowledge, as we did within our GD2 business plan submission, that there is a degree of uncertainty over workload in particular for customer driven reinforcement, and propose as we did then to include a volume driver to help manage this uncertainty in the price control. We explain this proposal in more detail within Chapter 8 of our main business plan.

Governors

595. This cost area is for the age and non-compliance related replacement of our governor assets, which are vital to ensure the safe and reliable running of our network.

Table 19: SGN Governors GD2 to GD3 Costs (£m - 2023/24 real prices)

£m	GD2 5 year avg.	GD2 last 3 year avg.	26/27	27/28	28/29	29/30	30/31	GD3 avg.
Scotland	**2.8**	**2.9**	4.0	3.1	2.5	2.8	2.3	**3.0**
Southern	**7.0**	**5.8**	10.0	10.5	12.2	9.4	8.3	**10.1**
SGN	**9.8**	**8.7**	**14.0**	**13.6**	**14.7**	**12.2**	**10.6**	**13.0**

Source: SGN analysis of GD3 BPDT

596. Across both our networks, we own and operate over 7,000 district governors and more than 26,000 service governors in rural, suburban and city centre areas. They reduce gas pressure within the network systems to allow efficient and safe gas transportation. The governors service mostly domestic customers and the smaller industrial and commercial customers.

597. Our workloads are defined by a health and criticality matrix, following a risk-based approach to ensure a correct intervention programme is selected from our 4Rs strategy which considers different investment options, including Repair, Refurbishment, Rebuild and then Replace.

598. Further information on our approach and the need is explained in our document SGN-GD3-SD-06 Network Asset Management Strategy.

Statutory Independent Undertakings (SIU) Capex

599. Our Statutory Independent Undertakings (SIU) Capex activity ensures our five independent gas networks that serve customers within the most remote parts of Scotland are safe, robust and efficient. The costs within this section cover our compliance requirements for network assets, as well as required property interventions.

Table 20: SGN SIU Capex GD2 to GD3 Costs (£m - 2023/24 real prices)

£m	GD2 5 year avg.	GD2 last 3 year avg.	26/27	27/28	28/29	29/30	30/31	GD3 avg.
Scotland	**2.3**	**2.4**	6.1	6.0	9.1	6.0	4.8	**6.4**
Southern	**0.0**	**0.0**	0.0	0.0	0.0	0.0	0.0	**0.0**
SGN	**2.3**	**2.4**	**6.1**	**6.0**	**9.1**	**6.0**	**4.8**	**6.4**

Source: SGN analysis of GD3 BPDT

600. We put forward our Capex plan to ensure we maintain compliance and have an enduring SIU solution going into the future. We discuss our proposals in more detail within document SGN-GD3-SD-11 - Strategic Independent Undertakings (SIU) Strategy.

601. As discussed within the SIU Opex area, due to the unique nature of our activities in these locations our costs are not comparable to other networks, and therefore are required to be separately assessed for efficiency.

Other Network Capex

602. Expenditure within Other Network Capex consists of Security, Pipelines plus Electrical and Instrumentation activities.

Table 21: SGN Other Network Capex GD2 to GD3 Costs (£m - 2023/24 real prices)

£m	GD2 5 year avg.	GD2 last 3 year avg.	26/27	27/28	28/29	29/30	30/31	GD3 avg.
Scotland	**2.0**	**2.4**	5.8	5.3	8.0	10.1	8.7	**7.6**
Southern	**4.7**	**3.9**	10.5	7.9	7.9	7.9	8.5	**8.5**
SGN	**6.6**	**6.3**	**16.3**	**13.2**	**15.9**	**17.9**	**17.1**	**16.1**

Source: SGN analysis of GD3 BPDT

603. Costs within this activity ensure the robust management of our network assets and are driven by compliance with both Pressure System Safety Regulations 2000 (PSSR) and Pipeline Safety Regulations 1996 (PSR).

604. As such we have required activities to complete in the GD3 period, including:

- [redacted]
- The introduction of greater Cathodic Protection workloads to maximise the lifespan of our assets,
- An increased workload related to valve remediation,
- Pressure Management Maintenance activities.

F.4 Non-Network Capex

605. Our non-network Capex areas help support our business, ensuring we have the right framework in IT, Property and fleet to get the job done efficiently. We have utilised independent external experts to assure our requests in these areas, engaging external consultancy support with Gartner for our IT expenditure, and utilised the latest purchase / lease values for our vehicle forecasts.

IT Capex

606. The IT costs discussed here are for the capital expenditure we incur for our IT projects, covering our core GD3 projects, Cyber related activities and Data & Digitalisation activities.

Table 22: SGN IT Capex GD2 to GD3 Costs (£m - 2023/24 real prices)

£m	GD2 5 year avg.	GD2 last 3 year avg.	26/27	27/28	28/29	29/30	30/31	GD3 avg.
Scotland	**15.4**	**19.4**	16.0	18.4	15.4	7.6	3.7	**12.2**
Southern	**19.0**	**20.6**	29.7	34.1	28.6	14.1	6.9	**22.7**
SGN	**34.4**	**40.0**	**45.7**	**52.5**	**44.0**	**21.6**	**10.6**	**34.9**

Source: SGN analysis of GD3 BPDT

607. SGN's IT systems services and infrastructure underpin our ability to provide emergency response, network operations and asset management to ensure a safe and secure network, protecting life and property, to serve our customers and other stakeholders and add social value by innovating and sharing data.

608. Our IT capital expenditure is primarily made up of our core GD3 projects, which make up [redacted] of our Capex forecast, including projects that are anticipated to generate at least £9.4bn of NPV by 2043 compared to doing nothing. These projects are required to be ensure compliance in providing our core services.

609. Data & Digitalisation capital expenditure is projected to be [redacted] in the GD3 period, and is a new activity type for the new price control. This activity is core to support requests from our key stakeholders

610 [redacted]

611. More data on our strategy supporting this expenditure can be found in SGN-GD3-SD-07 IT and Telecoms Strategy plus the below supporting EJPs and CBAs

Investment Decision Pack	Reference	Coverage
Field Service Replacement	SGN-GD3-EJP-IT-FieldSvcRepl-001	IT - Core IT
Enterprise Asset Management (EAM)	SGN-GD3-EJP-IT-EntAssetMgmt-002	IT - Core IT
Enterprise Resource Planning (ERP)	SGN-GD3-EJP-IT-EntResPlan-003	IT - Core IT
Specialist Applications	SGN-GD3-EJP-IT-SpecApps-004	IT - Core IT
Integration Services	SGN-GD3-EJP-IT-IntegrServices-005	IT - Core IT
Hardware Devices	SGN-GD3-EJP-IT-HardwareDevs-006	IT - Core IT
Software Platforms	SGN-GD3-EJP-IT-SoftPlatforms-007	IT - Core IT
Data and Telecoms Refresh	SGN-GD3-EJP-IT-DataTelRefresh-008	IT - Core IT
Mandatory IT System Change	SGN-GD3-EJP-IT-MandITSysChg-009	IT - Core IT
Learning and Competency Management	SGN-GD3-EJP-IT-LearnCompMgmt-010	IT - Core IT
Xoserve	SGN-GD3-EJP-IT-Xoserve-011	IT - Core IT
Customer and Stakeholder	SGN-GD3-EJP-IT-CustStakehold-012	IT - Core IT
Catalogue and Master Data Management	SGN-GD3-EJP-Data-CatMasterData-001	IT - Data and Digitalisation
Data Governance	SGN-GD3-EJP-Data-DataGovern-002	IT - Data and Digitalisation
Recruitment Apprenticeships and Data Literacy	SGN-GD3-EJP-Data-RecApprentDL-003	IT - Data and Digitalisation
Data Platform and Operating Model	SGN-GD3-EJP-Data-DataPlatModel-004	IT - Data and Digitalisation
Business Analytics and Exploration	SGN-GD3-EJP-Data-BusAnalyticsExp-005	IT - Data and Digitalisation
[redacted]		

Transport and Plant Capex

612. Our vehicle and plant capital purchase costs are listed in the following table.

Table 23: SGN Transport and Plant Capex GD2 to GD3 Costs (£m - 2023/24 real prices)

£m	GD2 5 year avg.	GD2 last 3 year avg.	26/27	27/28	28/29	29/30	30/31	GD3 avg.
Scotland	**3.5**	**5.3**	8.6	8.8	4.8	4.1	8.9	**7.1**
Southern	**7.3**	**10.8**	13.1	11.2	10.4	12.2	11.6	**11.7**
SGN	**10.9**	**16.1**	**21.7**	**20.0**	**15.3**	**16.3**	**20.5**	**18.8**

Source: SGN analysis of GD3 BPDT

613. Our investment in our fleet ensures our frontline workforce can deliver their activities, it is vital we have an up-to-date vehicle fleet to ensure our workforce can respond to emergency situations in a timely fashion.

614. We currently have a vehicle population of roughly 1,800 vehicles with plans to increase this to around 2,100 vehicles by the end of the GD3 period to support our required uplift in headcount for compliance with 12-hours way of working.

615. Vehicles are key area in which we can improve our Scope 2 environmental footprint, and while an ideal situation would be to move our fleet to 100% alternative fuel vehicles, currently there is too much uncertainty around lifespan, reliability and range to instil confidence in us transitioning. Despite this, we believe transitioning to a five year replacement cycle of vehicles can drive savings through reduced fuel usage and maintenance costs, enabling also Scope 2 emission savings. We discuss our fleet strategy in more detail within our supporting Fleet EJP (SGN-GD3-EJP-FLE-001).

Property

616. The below costs are for our property capital investments, including site fit-outs as well as any potential purchase of land / buildings when it is the most cost efficient approach to do so.

Table 24: SGN Property Capex GD2 to GD3 Costs (£m - 2023/24 real prices)

£m	GD2 5 year avg.	GD2 last 3 year avg.	26/27	27/28	28/29	29/30	30/31	GD3 avg.
Scotland	**0.8**	**1.0**	1.9	1.7	1.9	1.9	1.7	**1.8**
Southern	**5.7**	**6.9**	31.5	8.5	17.2	2.5	3.2	**12.6**
SGN	**6.5**	**7.9**	**33.4**	**10.2**	**19.0**	**4.4**	**4.9**	**14.4**

Source: SGN analysis of GD3 BPDT

617. An efficient property portfolio is critical to ensuring the efficient management of our network, with depots required in strategic locations to ensure the timely response to callouts across our regions.

618. Within the GD3 period, we are coming to the end of some core leases, particularly in our Southern network, and as such require to re-locate sites. We see this as an opportunity to improve our employee experience, increase staff engagement and provide a sense of belonging across our workforce.

619. We will also target to reduce the total number of property assets from 68 to 56 by the end of GD3, focussing on core hubs to deliver the above stated outcomes. This will incur an initial outlay in the GD3 period for fitout costs as well as the purchase of strategic freehold properties, which will generate value in the future through reduced rental costs.

620. Further information regarding our property strategy can be found within the supporting EJPs:

Investment Decision Pack	Reference	Coverage
Property Projects	SGN-GD3-EJP-PRO-001	Property
Property Security	SGN-GD3-EJP-PRO-002	Property
Property Management	SGN-GD3-EJP-PRO-003	Property

F.5 Repex

621. Our Repex programme, particularly the Tier 1 programme within the GD3 period, is the largest cost area within our plan. This is also the largest cost increase compared to the GD2 period, being driven by a combination of workload increases, differing mix of works and complexity factors as well as rate challenges due to external contractor pressures compared to the start of GD2.

622. While we are confident regarding the workload to be completed in the GD3 period, we recognise that the costing of required workload is challenging due to the changing cost drivers previously mentioned. We engaged external consultancy support to aid this costing challenge, both to help support the assessment of complexity factors and to aid with building a cost model to support our GD3 business plan submission. Tables 24 and 25 list our complete Repex costing evolution from the GD2 to the GD3 forecast expenditure.

Table 25: Scotland Repex GD3 Cost Forecasts

Scotland £m	GD2 5 year avg.	GD2 last 3 year avg.	26/27	27/28	28/29	29/30	30/31	GD3 avg.
Tier-1 - Mains	**37.2**	**37.3**	38.0	38.8	38.7	38.5	38.5	**38.5**
Tier 1 - Services	**14.1**	**14.3**	12.7	13.0	12.9	12.9	12.9	**12.9**
Tier-2A Mains and Services	**0.0**	**0.1**	0.0	0.0	0.0	0.0	0.0	**0.0**
Tier-2B Mains and Services	**1.2**	**1.3**	4.9	5.0	5.0	5.0	5.0	**5.0**
Tier-3 Mains and Services	**0.9**	**1.1**	2.6	2.7	2.7	2.6	2.6	**2.6**
< 2" Steel Mains and Services	**6.3**	**7.1**	4.3	4.4	4.4	4.3	4.3	**4.3**
> 2" Steel Mains and Services	**1.9**	**2.0**	3.4	3.5	3.5	3.5	3.5	**3.5**
> 30m Mains and Services	**0.4**	**0.5**	0.7	0.7	0.7	0.7	0.7	**0.7**
Other Mains and Services	**0.5**	**0.7**	0.7	0.7	0.7	0.7	0.7	**0.7**
Diversions Mains and Services	**0.4**	**0.6**	2.4	5.4	1.2	0.4	0.4	**2.0**
Other Services	**6.4**	**7.1**	4.0	4.6	4.5	4.5	4.5	**4.4**
Risers	**3.0**	**3.8**	13.1	10.0	10.0	10.0	9.9	**10.6**
Iron Stubs	**0.3**	**0.4**	0.6	0.6	0.6	0.4	0.3	**0.5**
Robotic Intervention	**0.0**	**0.0**	0.0	0.0	0.0	0.0	0.0	**0.0**
Total Repex	**72.7**	**76.4**	**87.5**	**89.2**	**84.8**	**83.6**	**83.3**	**85.7**

Source: SGN analysis of GD3 BPDT

Table 26: Southern Repex GD3 Cost Forecasts

Southern £m	GD2 5 year avg.	GD2 last 3 year avg.	26/27	27/28	28/29	29/30	30/31	GD3 avg.
Tier-1 - Mains	**110.6**	**123.3**	166.2	167.0	166.9	166.5	166.5	**166.6**
Tier 1 - Services	**42.1**	**43.9**	48.5	48.7	48.7	48.6	48.6	**48.6**
Tier-2A Mains and Services	**0.3**	**0.5**	0.0	0.0	0.0	0.0	0.0	**0.0**
Tier-2B Mains and Services	**5.0**	**7.4**	14.6	14.7	14.7	14.6	14.6	**14.7**
Tier-3 Mains and Services	**4.7**	**4.9**	12.9	13.0	12.9	12.9	12.9	**12.9**
< 2" Steel Mains and Services	**5.9**	**6.1**	4.7	4.7	4.7	4.7	4.7	**4.7**
> 2" Steel Mains and Services	**5.0**	**6.6**	8.3	8.6	12.3	7.7	7.7	**8.9**
> 30m Mains and Services	**0.8**	**0.8**	0.8	0.9	0.8	0.8	0.8	**0.8**
Other Mains and Services	**0.9**	**1.2**	6.0	6.1	6.1	6.1	6.1	**6.1**
Diversions Mains and Services	**-0.7**	**-2.1**	2.7	2.7	0.6	0.6	0.6	**1.4**
Other Services	**28.6**	**34.3**	13.6	13.8	13.8	13.8	13.8	**13.7**
Risers	**14.4**	**13.4**	42.6	38.0	38.0	38.1	37.8	**38.9**
Iron Stubs	**0.9**	**1.3**	2.9	3.0	3.0	2.9	2.9	**2.9**
Robotic Intervention	**5.5**	**8.0**	0.0	0.0	0.0	0.0	0.0	**0.0**
Total Repex	**223.9**	**249.9**	**323.9**	**321.1**	**322.6**	**317.3**	**317.0**	**320.4**

Source: SGN analysis of GD3 BPDT

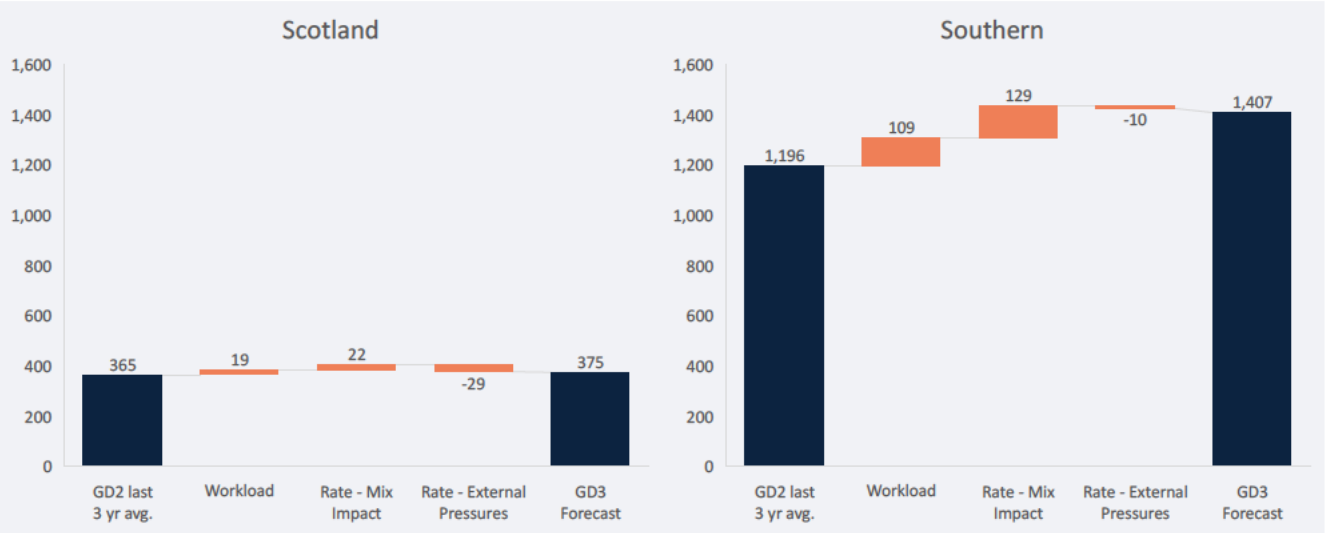
623. To ensure continued safe and reliable service, our Repex (excl. risers) investment needs to increase by £237m (+15%) in GD3, split to a £12m (+3%) increase for Scotland and a £225m (+19%) increase for Southern.

624. We discuss our riser investment separately due to the high value and unique nature of this activity.

625. Our Repex activity is a complicated mix of different workload types, which themselves have differing diameters of pipe that have differing approaches to replacement which can cause price differences. A Tier 1 cast iron pipe within diameter band C will be inherently quicker to replace then a complicated Tier 2B ductile iron pipe within diameter band F.

626. We break down our cost movement into unit rate pressures through justified volume changes, differences in mix for the work remaining to be completed and expected external cost factors we are currently seeing.

Figure 49: Repex (excl risers) Cost Trace from GD2 3 yr average to GD3 Forecast



Source: SGN analysis of GD3 BPDT submission

627. Increased workload is a key driver of increased cost for GD3, with Scotland seeing a £19m (5%) increase due to workload and Southern seeing a £109m (9%) increase due to workload.

628. The type of workload we are required to replace, i.e. the mix of activities we have to carry out compared to the last three years of GD3 are also causing cost pressures, driving a £22m (6%) increase in cost within Scotland and a £129m (11%) increase in cost within Southern. This mix difference is due to the work we have left to complete, with higher pipeline banding left to decommission and is aligned to the complexity factors we discuss further within Network Asset Management Strategy (NAMs) document - SGN-GD3-SD-06 Section B.

629. Our unit rate movements against our last three-year GD3 position are expected to be relatively inline, with Scotland forecasting £29m (8%) lower unit rates and Southern forecasting £10m (1%) lower unit rates. While we forecast to encounter headwinds relating to cost areas such as Street Works (due to increasing requirements from local authorities), we have also identified specific areas where we expect to make savings in the new price control.

630. Such a saving is with other Repex services and more specifically our relay after escape activity, which we have committed to drive savings of c. £47m in Southern within the GD3 period through the more efficient use of our contractor and direct labour to deal with this activity.

Workload – Mains and Services

631. The work we are required to complete is a key driver to cost change between the two price control periods, particularly for our Southern region.

632. Workload is primarily driven through the Iron Mains Replacement Programme (IMRRP) – referred to as '*Category A*' work within the Network Asset Management Strategy document, section B.5. This is a mandatory programme set by the HSE, with a requirement to replace all Tier 1 mains (less than or equal to 8" diameter) by December 2032.

633. We also carry out workloads related to the mandatory safety programme driven by The Pipeline Safety Regulations (PSR 1993)– referred to as '*Category B*' work within the Network Asset Management Strategy document, which primarily drives

workload within Tier 2b, Tier 3, large diameter steel mains (greater than 2 inches) and Iron mains outside of 30m of a property.

634. Our final workload approach is a precautionary programme driven by the need to reduce the safety risk posed by assets that are not included within the mandatory programmes– referred to as *'Category C'* work within the Network Asset Management Strategy document. These covers areas defined projects such as bulk services and Complex Engineering Schemes.

635. The workloads we are planning on carrying out also have significant benefits as concluded through a review into our Tier 1 programme with DESNZ that fed into the Repex Review. We also discussed earlier within section D.1, Table 3: Summarised GD3 CBA Outputs the investment in our Repex programme as a whole is expected to generate over £250m worth of societal value by 2043 (16 years post end of GD3).

Mix Impact

636. The work we carry out is complex, with many different aspects that impact the productivity of our workforce and therefore the cost of completion. Some of these complexity challenges we already measure and report to Ofgem within annual reporting, such as banding differences, certain material types (ductile iron) and services density. While some complexity factors that incur productivity challenges, we do not report in a consistent way to Ofgem on a regular basis, these are aspects such as road crossings, long services and crossroad services.

Banding Mix

637. Lay banding reflects the pipeline diameter that we install when we carry out a mains replacement, and ranges from Band A which is for an installed pipe with a diameter less then 75mm to Band H which is for an installed pipe with a diameter greater than 630mm.

638. A key driver of Repex complexity is our banding mix, and with our required workload for GD3 showing an increased proportion of work within higher bandings, this drives increased costs through more challenging replacements. Our Tier 1 programme has the largest element of mix cost variance between price controls, due to both the significant amount of defined workload required and the relative change in banding mix between periods.

639. The below table represents how our banding mix within T1-Iron activity is expected to evolve from the last three year average of GD2 to the GD3 remaining workload:

Table 27: Banding Mix Evolution for T1 Iron Repex Workload

	Scotland - T1 Iron			Southern - T1 Iron		
Band	GD2 last 3yr avg.	GD3	*% change*	GD2 last 3yr avg.	GD3	*% change*
Band A	55%	44%	*-10%*	57%	40%	*-17%*
Band B	32%	34%	*2%*	32%	41%	*8%*
Band C	12%	18%	*6%*	10%	17%	*7%*
Band D	1%	2%	*2%*	0%	2%	*2%*
Band E	0%	1%	*1%*	0%	1%	*1%*
Band F	0%	0%	*0%*	0%	0%	*0%*
Band G	0%	0%	*0%*	0%	0%	*0%*
Band H	0%	0%	*0%*	0%	0%	*0%*

Source: SGN analysis of GD3 BPDT

640. The workload remaining to be completed within the IMRRP is that of higher banding activity in the final seven years of the programme. This will reduce our productivity and therefore increase costs and is included within our cost forecasts. We explain in more detail in the Network Asset Management Strategy document, section B.5 why our remining network configuration is that of higher banding workload.

641. Within the GD2 cost efficiency assessment, Ofgem has utilised a Repex Synthetic cost driver that provides a mechanism for cost challenges through banding mix differences to be considered.

Complexity Factors through Network Configuration

642. While banding mix is a known area of complexity for which Ofgem appropriately considers within its cost assessment, there are many other different complexity factors that will cause a productivity challenge, and therefore a cost impact.

643. We have engaged consultancy support from MJM to help define and map the remaining complexity factors that are withing our Tier 1 workloads up to the end of the IMRRP.

644. The below table summarised from analysis carried out by MJM provides a brief explanation of the complexity factors that we believe SGN is exposed to for the completion of the IMRRP.

Table 28: Network configurations of the different types of Tier 1 Iron Mains remaining

Remaining types of pipe	Brief description / explanation of the complexity factors SGN is exposed to for the completion of Iron Mains Replacement Programme
Road crossings	Extra cost and time due to complete or partial road closure
Isolated Mains	Geographically remote from seed pipes so not included in previous projects
Stubs	Short lengths of pipe <3m in length connected to Tier 2 or Tier 3 iron pipes
Service density	Mains expensive to replace due to time taken to deal with connected services (density >9 services per 100m)
Long services	The long services impact on asset replacement time as they cannot be inserted and must be open cut
Riser proximity	Risers within 25m of assets which would also require replacement
Cross road services	Customer services that connect with the customer by crossing a road requiring a complete or partial road closure

Source: MJM Repex report

645. MJM's analysis shows that of the remaining population of pipes to be replaced under the IMRRP, 69% in our Southern network have one or more configuration factors while in our Scotland network, it is 49%. Many of the remaining pipes exhibit more than one of these network configuration factors, particularly in Southern where 43% show two or more.

646. Within the MJM report it is explained that the reason for this increase in complexity factors is due to the top-down risk approach to determine the order of asset replacement. Targeting the replacement of the highest-risk assets and improving safety, however put less emphasis on replacing those assets deemed *'less-risky'* in a high-risk cohort. These assets are typically further away from properties and into more complex environments.

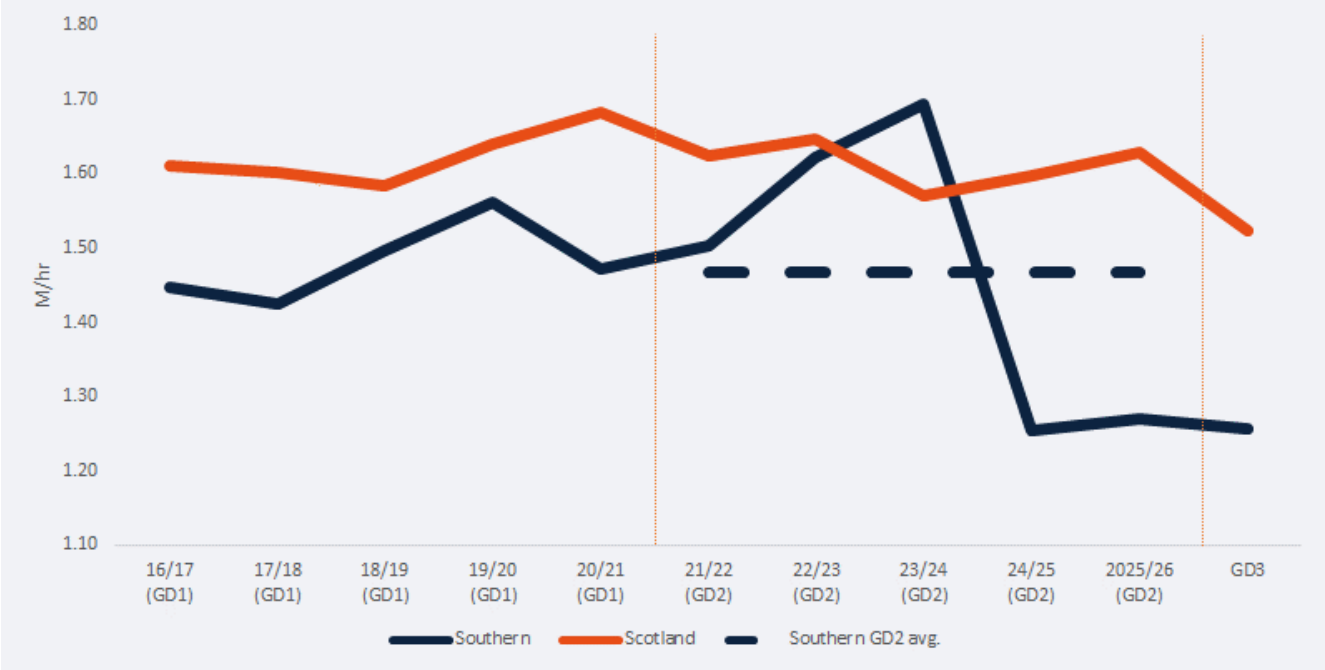
647. For example, long services are more likely to occur where connected properties are further away from the main, hence the long service. These properties being further away from the main would entail a relatively lower risk, leaving the workload with a higher proportion of long services to the end of the IMRRP. This is set out in more detail in the Network Asset Management Strategy document section B.2.

The Productivity Impact of Complexity Factors through Network Configuration

648. To quantify the productivity impact of these complexity factors we spoke with our contractor partners. We presented a standard Repex job in terms of man hours it would be expected to take to complete, and then proposed the alternative complexity scenarios defined within Table 28 as well as the impact on productivity through banding changes, to understand the differing productivity challenges against a standard baseline.

649. We have applied these productivity assumptions to our categorised historically delivered and future planned workloads to determine a productivity trend, shown in the below figure.

Figure 50: Repex Tier 1 Network Configuration Productivity Trend – metres/hour/per team



Source: SGN analysis

650. The productivity trend through network configuration differences shown above is reflective of the workload we have replaced or is remaining to be replaced before the end of the IMRRP. External impactors to productivity, such as working within highly urban areas will not be shown within the above view.

651. We can see through this analysis that historically Southern has had reduced productivity through the work that we have completed compared to the Scotland network, which has had relatively more productive work available to be completed.

652. In Figure 50, in Southern, with the movement to the GD2 price control, we were under-funded against our business plan and as such looked to drive efficiencies within our supply chain, the contractors only accepted the most productive work in order to realise a margin within that constraint and many contractors sought higher rates in other industries, creating an exodus of contractor availability. In the second half of GD2 we recognised that constraining to the allowances would not deliver the length that we required, we put forward work packages that contained relatively more productive work to attract new entrants to the market and paid higher rates so that contractors would accept the less productive work with a view to securing and stabilising the contractor base.

653. For Scotland in contrast, we maintained a much more managed productivity position, through us having confidence to engage our contractor base earlier due to suitable allowances within GD2 and a relatively easier complexity picture in comparison to Scotland.

654. While we are still working hard to build our supply chain, our contractor base is becoming more resilient as a result of us investing in increased support of our contractors. Accordingly, we started to offer more complex work to contractors from the middle of the price control, which has a productivity drop and an associated cost increase.

655. Moving to GD3, Southern's expected productivity will be at the same level as incurred within the 2024/25 and 2025/26 years. The increasing productivity challenge is being experienced now, within GD2 and the costs we are incurring in the later years of GD2 will be more akin to expected within GD3.

656. This is a similar picture as for Scotland, with GD3 productivity expected to be broadly in line with the later years of GD2, so the unit rates we are incurring today are expected to be a good proxy for use within the GD3 period.

657. Changes in our costs from the start of the GD2 period to the expected GD3 period are driven by increasing complexity. Our supply chain is aware of these complexity factors as the challenges are being experienced today.

658. Consideration of the increase in complexity will be required within cost efficiency assessment. At this stage, we do not know the productivity impacts of complexity factors through network configuration of other networks, as this data is not

reported, and we will be unaware of other network challenges. But we can see this is a key expected difference between our Scotland and Southern unit rates.

Unit Rates

659. To determine robust unit rates that are reflective of the cost pressures we face within each network, we engaged an external consultancy partner, Deecon Consultancy, to support with analysis of our data to add an element of independence to calculating costs.

660. The aim of this work was to:

- Make better use of the base level of data available within our systems;
- Use current and historical cost data to define component unit costs determined using Monte Carlo simulation techniques to prove the statistical validity of the forecast values;
- Forecast future workload modelled through a bespoke demand tool to aggregate our asset IDs to work packages, simulating real-world delivery approaches; and
- Apply the unit costs to these forecast work packages to inform the population of the GD3 BPDTs.

661. Fundamentally, we wanted to ensure that the volume of information we have available was analysed independently to inform the unit rates that we expect for the GD3 period[59]. We note this analysis has used historically achieved unit rates as an indicator of the future, and while some factors we have made considerations for such as known changes in Street Works. We note an increased element of risk relating to external contractor pressures for gas sector work that are not necessarily considered within other controls, such as Real Price Effects (RPEs).

662. We have utilised this approach to ensure our cost forecasts within the BPDTs are robust and reflective of the data that we have currently available. The workload has been subject to detailed analysis by both internally and through external experts. Publications such as the HSE Draft Enforcement Policy (19th Oct 2024) demonstrates new information may impact workload. There is a greater degree of uncertainty over how our contractor partners will respond to such workload expectations alongside other external factors such as the impending PR24 water settlement and wider construction works that will impact contractor prices. It is important that Ofgem ensures there are opportunities for the most up-to-date market data to be presented and to be fully incorporated in the final cost assessment and settlement, where it is likely network companies will receive much more relevant costing data for the work that will be needed to complete in the GD3 period.

Summary of Deecon Approach

663. Deecon carried out a cost forecast of our mains and services within Tier 1, Tier 2 and Tier 3 workload categories. The supporting paper for this is Deecon - REPEX Mains Lay Cost Modelling Report (SGN-GD3-ECR-03).

664. Historical spend was categorised into different cost components as reported within our systems, split as:

- Core costs; primarily contractor and direct labour expenditure;
- Material costs;
- Street Works costs;
- Services; and
- Variations.

665. These cost components were aligned to region and activity that they were incurred historically, creating a selection of component unit costs that can be analysed and applied to the future work packages that are forecast to incur.

666. Our costs are impacted by the region in which the work is carried out, as well as the relative complexity of each work package. To account for this challenge Deecon formed a view of work packages that represent the likely outcome would be incurred in GD3, highlighting areas of grouped work which would most likely be carried out through contractor / direct labour plus those work packages that would more likely incur stranded assets that would recur day rate type costing.

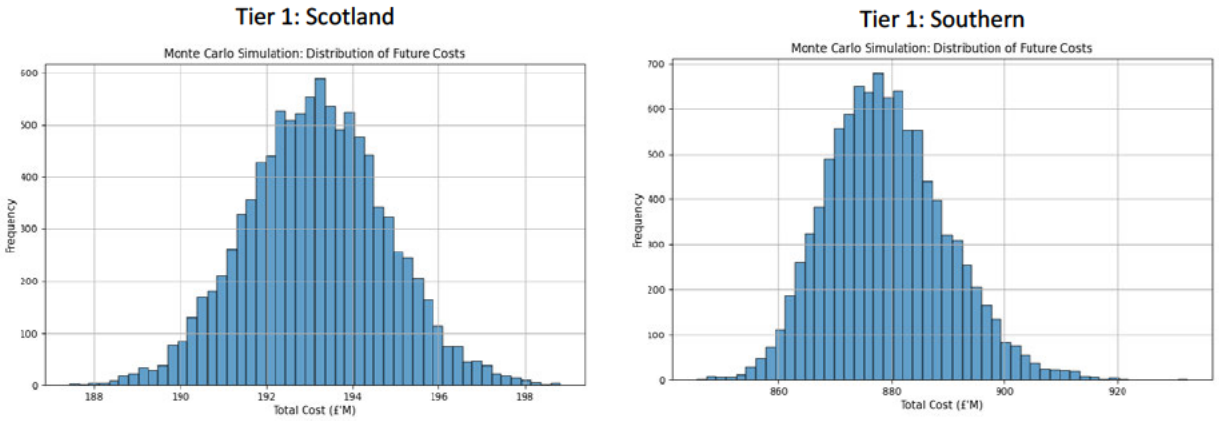
667. With a view of component unit rates by region and the work packages that will be needed to be completed within GD3, simulations can be performed to test the probability of different cost outcomes. Deecon performed Monte Carlo

[59] It should be noted that while we have significant data, the first couple of years for GD3 were blended rate contracts, this is typically more cost effective in a stable market and was used successfully in GD1. As cost pressures have come through and an increasing complexity of projects contractors have not agreed to complete them on a blended rate basis and we have move increasingly to specific rate cards. This provides significantly more granular detail on cost movements and we will continue collating data to enhance the evidence base over the coming period.

simulations, testing for each cost component within each work package the inter-quartile range of costs that were determined through our historical data.

668. The distribution of costs determined through these Monte Carlo simulations are shown in figure 51.

Figure 51: Monte Carlo Distribution Results for Tier 1



Source: Deecon Consulting analysis – Repex Mains Lay Cost Modelling Report – October 2024

669. This sensitivity analysis has helped to inform the right level of cost forecast to go forward in GD3, clearly demonstrating the potential impact if our cost forecasts are wrong. Within Scotland we can see that cost forecasts have a balanced symmetrical risk for customer and company and a narrow spread from 188-198 £/m. For Southern in contrast, the risk is less symmetrical, with a stretched distribution to the right and the range is much broader from 850- 910 £/m highlighting greater risk to company of extra cost.

How this analysis has been incorporated within GD3 BPDTs

670. Due to constraints with the number of Tier 3 observations, unit rates were only able to be developed for Tier 1 and Tier 2 work types. We have utilised this dataset to help inform our unit rates for the GD3 submission in the following way:

Table 29: Approach to allocating Deecon Consultancy analysis of Repex Unit Rates

Activity Type	Unit Rate Used	Reason
Tier 1 Iron	Tier 1 reported	Aligned with analysis completed.
Tier 1 Steel	Tier 1 higher range	Tier 1 <2" steel activity is primarily lower banding activity, the reported unit rates for Tier 1 (particularly in Scotland) seem overly low compared to historical achieved rates.
Tier 2	Tier 2 lower range	The analysis carried out by Deecon will most likely have a combined Tier 2 and Tier 3 rate, therefore the lower range will be more applicable to Tier 2 activities
Tier 3	Tier 2 higher range	The analysis carried out by Deecon will most likely have a combined Tier 2 and Tier 3 rate, therefore the higher range will be more applicable to Tier 3 activities
Iron > 30m	Tier 1 higher range	The higher range unit rate was more aligned to our GD2 actual outturn
Steel >2"	Tier 1 higher range	The higher range unit rate was more aligned to our GD2 actual outturn
Other	Tier 1 reported	The reported range unit rate was more aligned to our GD2 actual outturn

Source: SGN

671. As the approach to determine unit rates was based on historical assessment of costs, any future known changes to unit rates for reasons exogenous to SGN should be incorporated. We know that highway authorities within our Southern regions are implementing new lane rental schemes, and as such we can forecast the impact this would have to our costs.

672. By utilising the work package data that Deecon Consultancy had assessed for work to be completed in GD3, we can identify the highway authorities our work will be carried out within. We have utilised this information and the average rates we are charged by highway authorities to determine our Southern Street Works costs will increase by 5% within the GD3 period compared to historic. This increase is both through an expected increase in charges through the authorities we work within, as well as the full effect of the introduction of new charging schemes as in alignment with our recent GD2 Street Works re-opener submission. Further information is presented to Ofgem within our BPDT commentary document

Multiple Occupancy Buildings

673. MOBs are a high-risk group of assets supplying gas to around a third of our customer base. Our current workload is driven by a programme of replacing and refurbishing deteriorating steel risers, initiated in GD1 and continuing into GD2. Additional workload has also been identified through valve remediation programmes and the impact of legislation like the Building Safety Act 2022 and the Grenfell Inquiry. This reasons for the proposed workload are set out within the Network Asset Management Strategy document - SGN-GD3-SD-06 - section C.

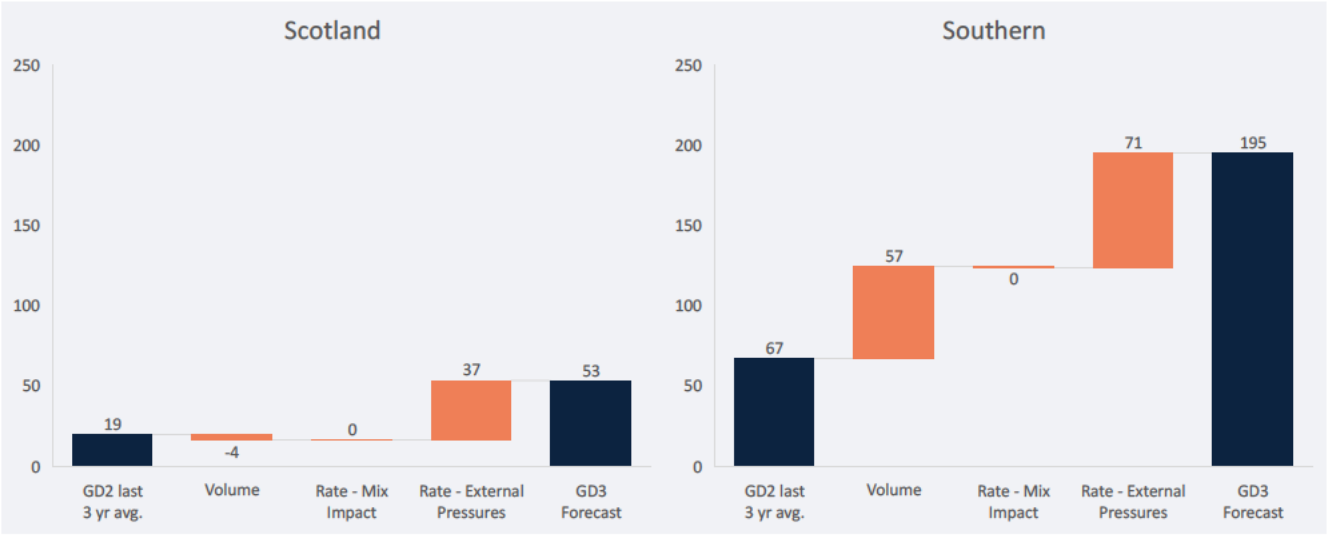
674. Our RIIO-GD3 programme proposes a broader scope for MOBs, including a continuation of steel riser replacements, a proactive PE riser replacement programme due to fire spread risks, and pipeline isolation valve (PIV) remediation driven by mandatory requirements. A maintenance programme for existing installations is also proposed to ensure compliance and address increased awareness from building owners. Uncertainty exists around the exact workload within this programme.

675. Complex Distribution Systems (CDS), introduced in GD2, are larger-scale equivalents to risers supplying commercial premises. Initial surveys indicate a relatively low proportion of true CDS installations, but they are high-cost to refurbish or replace.

676. The potential for permanent disconnection of supplies is being investigated as one of the main projects set out in the innovation document SGN-GD3-SD-05 to support decarbonisation goals, but significant challenges remain in terms of cost and customer acceptance. Overall, the workload for MOBs is influenced by asset condition, Regulatory changes, risk management, stakeholder engagement, and decarbonisation goals.

677. The forecast expenditure for this safety-critical workload is expected to be £161m (186%) greater than in GD2. Below is a breakdown of how we forecast expenditure to move between the last three-year average of GD2 and GD3.

Figure 52: Risers Cost Trace from GD2 3 yr average to GD3 Forecast



Source: SGN analysis of GD3 BPDT

678. The volume within Scotland is currently anticipated to be materially the same for the GD3 period as we are forecasting to deliver in the last three-year average of GD2. Whereas Southern we are forecasting to increase workload by 184% driving an increase of £57m in cost.

679. Our mix of activities between refurbishment and replacement across floor bandings is expected to remain similar to the GD2 period.

680. The main driver for cost increases within risers is the expected cost pressures we are forecasting, with a £37m increase in cost within Scotland and a £71m increase in cost within Southern.

681. We anticipate prices to increases due to greater robustness needed in our approach to replacement of risers, as aligned with recent HSE and Grenfell publications. Further we are experiencing significant increases in scaffolding costs, which is a main proportion of riser costs, over and above any real price effect indices that are intended to track this cost movement.

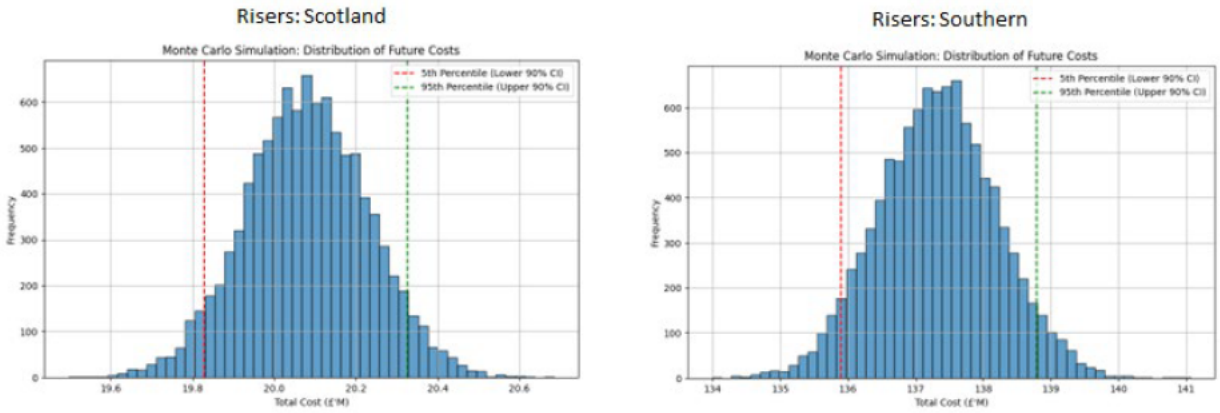
Costing Approach

682. As with our mains and services Repex activity, we have engaged consultancy support through Deecon Consultancy to enable a robust, independent and data driven analysis of our internal data set.

683. As within the wider Repex approach Deecon has assessed our underlying data and attributed to cost components as far as our data is stored. During this analysis the number of data points available for Scotland was too low to perform a meaningful assessment, as such we have utilised the same unit rates for Scotland and Southern regions. It is our view that due to the main cost elements being that of external scaffolding costs, that does not have regional variation, to use the same costs across both networks would be sensible.

684. Deecon performed a Monte Carlo analysis of the various cost components as per the approach to wider Repex costs, demonstrated in the below figure

Figure 53: Distribution of Costs through Monte Carlo Analysis of Risers



Source: Deecon Consulting analysis – Repex Risers Cost Modelling Report – October 2024

685. The forecast of future costs through the Monte Carlo analysis have generated a broadly even distribution of outcomes, showing that the approach will generate unit rates of even risk to customer and shareholders on the expectation that future cost pressures will be captured appropriately through a well-calibrated RPE mechanism.

686. We note on this risk that our Riser external cost pressures have not tracked well to RPE movements, and consideration of this will be required with overall risk assessment of the regulatory settlement.

687. Further supporting EJPs for our Repex program can be found below:

Investment Decision Pack	Reference	Coverage
Bulk Services (excluding other services)	SGN-GD3-EJP-RPX-001	Repex
Cams Hall	SGN-GD3-EJP-PRO-002	Repex
Other Mains and Services	SGN-GD3-EJP-RPX-003	Repex
South London Main	SGN-GD3-EJP-RPX-004	Repex – Uncertainty
Tier 1 Mains and Services	SGN-GD3-EJP-RPX-004	Repex

F.6 Approach to Uncertainty

688. A key consideration for GD3 is the appropriate balance of risk in our business plan where there are areas of uncertainty. Where there is high confidence in the volume of work to be delivered and a robust evidence base for cost assessment, no uncertainty mechanism is required – this applies to the majority of our anticipated expenditure. Where there is uncertainty we propose the use of uncertainty mechanisms.

689. When considering whether an uncertainty mechanism should be applied, we have recognised that there is an administrative burden associated with their implementation and as a result only propose them where the costs in question are financially material.

690. We have also identified a number of projects, which although they don't meet the £15m threshold for a Price Control Deliverable (PCD), we have named within our business plan alongside their associated costs as we believe it important these costs are assessed suitably through the value for money they deliver to customers, and regarding the uniqueness of costs they exhibit.

691. Further information on these projects are put forward within Chapter 8 of main business plan.

692. As per Ofgem guidance we have presented our plan as baseline but alongside a 'best view' level of Totex[60], including the uncertainty mechanisms we anticipate being triggered within the price control period. Below is a breakdown of what we included over and above the baseline Totex to form our 'best view'.

Table 30: SGN GD3 Trace from Baseline Totex to Best View Totex

	Scotland	Southern	SGN
Baseline Totex	**1,316**	**3,141**	**4,457**
Complex Distribution Systems	13	18	**31**
Diversions	14	10	**24**
South London Main Repex	-	30	**30**
SIU Biomethane	16	-	**16**
Digital Leakage Platform Analytics	17	33	**50**
NZARD UIOLI	13	30	**43**
Innovation - *Other Revenue Allowances*	18	24	**42**
VCMA - *Other Revenue Allowances*	14	29	**44**
Best View' Totex	**1,421**	**3,314**	**4,736**

Source: SGN analysis.

693. We present our business plan with the best data we have available currently to represent the workload we need to complete to ensure a safe and reliable network, at the costs we incur for the regions in which we work. We have used our own historically achieved cost data that is incurred through market contractor rates and within the current regulatory framework that incentivises companies to strive for efficiency of costs.

694. While we are confident that our costs presented represents the best data available to us for our required workload at the time of submission, we note the highly volatile supply chain market which is currently biased towards lower supply of labour and higher demand for work (as discussed in section E.1). Alongside recent rhetoric around the future of gas and the increasing complexity factors that are remaining for our core IMRRP workload our contractor cost risk is high currently.

695. Ofgem should consider the most relevant data that is available, and it would be an error Ofgem not to consider the most recent market evidence in the setting of allowances.

696. There will be more relevant information available on how our cost risks evolve between our business plan submission date of December 2024 and the Determination period in the summer of 2026, again through finalised tender process. As such we ask that Ofgem ensures that relevant information can be submitted and considered ahead of any Final Determination, and this is clearly demonstrated that such evidence can be embedded within a timeline of events up to the Final Determination.

697. This could involve a formal resubmission of BPDTs based on latest cost data post the July 2025 RRP submission, which will give companies the opportunity to present on a consistent basis the latest cost pressures that are forecast for the GD3 period within this highly volatile period.

698. We thank Ofgem and all stakeholders for consideration of the points raised within this document, and we welcome any further questions or clarifications on the positions we have put forward.

[60] Ofgem RIIO-3 Business Plan Guidance – para 7.11

Appendix A: CBA List

Below is a detailed breakdown of the CBA summarised list presented in Table 3 within section D.1.

Area: Network Capex

Network	Name	EJP Reference	GD3 Cost	NPV £m at 2043
Scotland	Full Site Rebuilds	SGN-GD3-EJP-LTS-002	20.9	101.6
	Glen Mavis	SGN-GD3-EJP-LTS-003	5.7	26.1
	Governors Other	SGN-GD3-EJP-G&I-002	2.5	0.3
	High Capacity Governors	SGN-GD3-EJP-G&I-004	4.9	0.4
	Metering	SGN-GD3-EJP-E&I-004	6.2	6.1
	Pre Heating	SGN-GD3-EJP-LTS-007	12.3	16.8
	Pressure Control	SGN-GD3-EJP-LTS-008	8.5	48.4
	R6 Governors	SGN-GD3-EJP-G&I-005	7.9	13.8
	Total		**68.8**	**213.6**
Southern	Full Site Rebuilds	SGN-GD3-EJP-LTS-002	26.6	16.3
	Functional Safety	SGN-GD3-EJP-E&I-002	8.6	2.4
	Governors Other	SGN-GD3-EJP-G&I-002	9.6	6.5
	High Capacity Governors	SGN-GD3-EJP-G&I-004	4.1	-0.5
	Isle of Grain	SGN-GD3-EJP-LTS-004	9.3	17.1
	Metering	SGN-GD3-EJP-E&I-004	2.6	8.4
	Pre Heating	SGN-GD3-EJP-LTS-007	9.8	48.9
	R6 Governors	SGN-GD3-EJP-G&I-005	39.6	159.5
	Welling PRS	SGN-GD3-EJP-LTS-009	8.9	13.1
	Total		**119.1**	**271.8**

Area: Network Enhancements

Network	Name	EJP Reference	GD3 Cost	NPV £m at 2043
Scotland	Advanced Methane Detection	SGN-GD3-EJP-DST-001	4.9	13.9
	LGT	SGN-GD3-EJP-E&I-003	8.9	14.6
	Bio CNG	SGN-GD3-EJP-SIU-001	15.8	26.6
	Total		**29.6**	**55.2**
Southern	Advanced Methane Detection	SGN-GD3-EJP-DST-001	11.3	92.5
	Remote Pressure Management	SGN-GD3-EJP-DST-009	11.1	3.6
	LGT	SGN-GD3-EJP-E&I-003	6.5	35.3
	Total		**28.9**	**131.4**

Area: Network Repex

Network	Name	EJP Reference	GD3 Cost	NPV £m at 2043
Scotland	Steel Services Operating above 75mb	SGN-GD3-EJP-DST-002	5.5	-1.5
	MOBs-Risers	SGN-GD3-EJP-DST-004	41.9	13.8
	Bulk Services excl other services	SGN-GD3-EJP-RPX-001	6.9	4.1
	Other Mains and Services	SGN-GD3-EJP-RPX-003	62.3	4.5
	Tier 1 Mains and Services	SGN-GD3-EJP-RPX-005	284.0	88.6
	Total		**400.7**	**109.5**
Southern	Steel Services Operating above 75mb	SGN-GD3-EJP-DST-002	1.3	1.1
	MOBs-Risers	SGN-GD3-EJP-DST-004	178.8	17.0
	Bulk Services excl other services	SGN-GD3-EJP-RPX-001	27.2	36.1
	Cams Hall	SGN-GD3-EJP-RPX-002	6.3	61.8
	Other Mains and Services	SGN-GD3-EJP-RPX-003	211.0	12.4
	South London Main	SGN-GD3-EJP-RPX-004	30.0	0.9
	Tier 1 Mains and Services	SGN-GD3-EJP-RPX-005	1,119.8	25.6
	Total		**1,574.3**	**155.0**

Area: Non-Network Capex

Network	Name	EJP Reference	GD3 Cost	NPV £m at 2043
SGN	Property Strategy Projects	SGN-GD3-EJP-PRO-001	43.9	-10.1
	Property Security	SGN-GD3-EJP-PRO-002	3.9	1.0
	Property Management	SGN-GD3-EJP-PRO-003	20.8	6.3
	Fleet	SGN-GD3-EJP-FLE-001	72.5	71.9
	Total		**141.1**	**69.1**

Area: IT (excl Cyber)

Network	Name	EJP Reference	GD3 Cost	NPV £m at 2043
SGN	Business Analytics and Exploration	SGN-GD3-EJP-Data-BusAnalyticsExp-005	3.7	35.9
	Catalogue and Master Data Management	SGN-GD3-EJP-Data-CatMasterData-001	2.8	111.5
	Data Governance	SGN-GD3-EJP-Data-DataGovern-002	0.0	106.3
	Data Platform and Operating Model	SGN-GD3-EJP-Data-DataPlatModel-004	5.4	100.9
	Recruitment Apprenticeships and Data Literacy	SGN-GD3-EJP-Data-RecApprentDL-003	0.1	84.2
	Customer and Stakeholder	SGN-GD3-EJP-IT-CustStakehold-012	1.3	176.1
	Data and Telecoms Refresh	SGN-GD3-EJP-IT-DataTelRefresh-008	7.4	1,239.1
	Enterprise Asset Management (EAM)	SGN-GD3-EJP-IT-EntAssetMgmt-002	14.7	1,003.2
	Enterprise Resource Planning (ERP)	SGN-GD3-EJP-IT-EntResPlan-003	20.0	889.6
	Field Service Replacement	SGN-GD3-EJP-IT-FieldSvcRepl-001	30.9	1,002.6
	Hardware Devices	SGN-GD3-EJP-IT-HardwareDevs-006	12.1	1,223.0
	Integration Services	SGN-GD3-EJP-IT-IntegrServices-005	3.7	1,035.8
	Learning and Competency Management	SGN-GD3-EJP-IT-LearnCompMgmt-010	2.5	413.1

	Mandatory IT System Change	SGN-GD3-EJP-IT-MandITSysChg-009	1.7	321.0
	Software Platforms	SGN-GD3-EJP-IT-SoftPlatforms-007	5.9	1,231.2
	Specialist Applications	SGN-GD3-EJP-IT-SpecApps-004	8.3	399.5
	Xoserve	SGN-GD3-EJP-IT-Xoserve-011	5.5	43.4
	Total		**126.0**	**9,416.5**