



Government
Actuary's
Department

British Coal Staff Superannuation Scheme

Actuarial valuation as at 31 March 2024 –
supplementary report

17 March 2025



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Supplementary Report

1. My report dated 17 March 2025 presents the results of the actuarial review of the British Coal Staff Superannuation Scheme ('BCSSS' or 'the Scheme') as at 31 March 2024. This supplementary report is addressed to the Trustees and Guarantor (Department for Energy Security and Net Zero, or 'DESNZ') of the Scheme and gives full details of the actuarial analysis underpinning the valuation results.
2. I have carried out an actuarial review of the Scheme as at 31 March 2024, in accordance with paragraphs 1.28 and 2.2 of the agreement between the Guarantor, the Trustees and the Committee of Management dated 13 February 2015 ('the Agreement'). The Agreement served to amend the Scheme rules, replacing the previous requirements for actuarial reviews (the original clauses were set out in the British Coal Staff Superannuation Scheme (Modification) Regulations 1994, Statutory Instrument No 2576).
3. This report sets out the detailed technical background to the review, the assumptions and methodology I have adopted for the 2024 valuation, the results of the valuation, some comments on the results and their sensitivity to the assumptions used and a statement on Scheme risks. This information is included in the relevant appendices to this report.
4. The results reported at this valuation did not trigger a consultation under paragraph 2.7 of the Agreement.
5. This report also considers the ability of the Scheme to meet its Obligations over a three-year period, in accordance with paragraphs 2.12 of the Agreement.

Limitations and compliance

6. Scheme members are entitled to see a copy of this report on request. This report must not otherwise be reproduced, distributed or communicated in whole or in part to any other person without GAD's prior written permission.
7. Other than the Trustees and the Guarantor, no person or third party is entitled to place any reliance on the contents of this report, except to any extent explicitly stated herein, and GAD has no liability to any person or third party for any act or omission taken, either in whole or part, on the basis of this report.
8. In preparing this report, GAD has relied on data and other information supplied by Capita as described in the data report. Any checks that GAD has made on this information are limited to those described in the data report, including any checks on the overall reasonableness and consistency of the data. These checks do not represent a full independent audit of the data supplied. In particular, GAD has relied on the general completeness and accuracy of the information supplied without independent verification.

9. This work has been carried out in accordance with the applicable Technical Actuarial Standards: TAS 100 and TAS 300 issued by the Financial Reporting Council (FRC). The FRC sets technical standards for actuarial work in the UK.

[Redacted]

[Redacted]

[Redacted]

17 March 2025

Appendix A: Valuation requirements and results

A.1 This actuarial review is the fourth since the Scheme was restructured in 2015 and has been carried out in accordance with the Agreement. The Agreement brought into effect significant changes to the valuation requirements compared to reviews prior to the restructuring. The previous actuarial review was carried out as at 31 March 2021 and the report was signed by my predecessor, [REDACTED], on 11 April 2022.

Obligations and Buffer Percentages

A.2 The main purpose of this actuarial valuation is to derive the two figures shown in Table A1. These are the annual compound real return¹ on the Scheme's total assets that would be needed over the lifetime of the Scheme to expect to be able to meet:

- the Scheme's future benefit payments and the Scheme's expenses (excluding investment expenses), but excluding any future payments to the Guarantor (the '**Obligations Percentage**'); and
- the Scheme's future benefit payments, the Scheme's expenses (excluding investment expenses) and a payment to the Guarantor on 31 March 2033 equal to the 'Buffer' (as defined in paragraph 2.4 of the Agreement) indexed using the CPI measure of inflation (the '**Buffer Percentage**').

Table A1 – Obligations and Buffer Percentages

Real rate of return (annual) required over the lifetime of the Scheme ²	Obligations Percentage	Buffer Percentage
As at 31 March 2021	-1.7%	-0.1%
As at 31 March 2024	-0.5%	1.9%

A.3 The actual real return on the Scheme assets over this period was lower than the Obligations (and Buffer) Percentage calculated in March 2021. This relative underperformance means that higher rates of return are required from March 2024, all else being equal. In addition, higher inflation than expected between 31 March 2021 and 31 March 2024 has increased future benefit payments.

¹ For the avoidance of doubt, all references to a real return in this report refer to a return in excess of Retail Prices Index (RPI) inflation.

² Percentage returns are quoted net of any investment management expenses.

Consultation

- A.4 Paragraph 2.7 of the Agreement includes a table which sets out certain triggering events and intended outcomes. At the 2024 valuation, a triggering event occurs if the valuation results show the:
- Obligations Percentage is in excess of 5% a year; or
 - Buffer Percentage is less than 1% a year.
- A.5 If a triggering event occurs, the Guarantor and the Trustees are obliged to consult with a view to agreeing a course of action, whose purpose is to achieve the relevant intended outcomes described in the Agreement.
- A.6 A consultation was triggered at the 2021 valuation (as the Buffer Percentage was lower than 1%). As part of the consultation, in March 2022, the Trustees considered the funding position of the Scheme strong enough to support the creation of additional benefits to members, along with payments to the Guarantor. In May 2023, the Guarantor declined the proposal, in view of the risk to the Guarantor if future investment returns fell short of those required. As a result, both parties were content to conclude the consultation with no actions arising, on the basis that the assets of the Scheme were considered sufficient (but not materially more so) to meet future benefit payments and maintain a buffer up to 31 March 2033.
- A.7 There is no triggering event at the 2024 valuation, with the Buffer Percentage calculated to be in excess of 1% a year.

Solvency Guarantee

- A.8 The Agreement (paragraph 2.12) also requires the actuary to advise the Guarantor and the Trustees if the total value of the Scheme's assets is considered to be insufficient to meet the Scheme's Obligations³ over the next three years. This solvency guarantee (broadly) seeks to ensure that shortfall payments are made to the Scheme from the Guarantor in the event that the actuary considers the Scheme's assets to be insufficient to meet its Obligations over a three-year period.
- A.9 The total projected Obligations payments over the three years following the valuation date are expected to represent around 20% of the available assets at the valuation date⁴. Therefore, I expect there to be sufficient funds to meet the Scheme's Obligations for the next three years on any reasonable set of assumptions.

Other requirements

- A.10 There is no requirement within the Agreement to calculate estimated present values of the Scheme's liabilities or determine if there is any surplus or deficiency (requirements which applied under the previous valuation provisions).

³ 'Obligations' is defined in paragraph 1.7 of the Agreement and effectively represents the Scheme's benefit payments and expenses.

⁴ In this context available assets are considered to be £8,576 million.

A.11 Actuarial valuations are produced on a triennial basis, consistent with established practice, and the actuary is required to consult with the Trustees and the Guarantor on the assumptions to be used.

Cashflow projection

A.12 A graphical representation of the projected cashflows out of the Scheme is shown in Figure A1. Figure A2 shows the progression of the Scheme’s assets, assuming investment returns in line with the Obligations and Buffer Percentages, and Obligations payments in line with the cashflows illustrated in Figure A1.

Figure A1 – BCSSS annual Obligations payments (real RPI terms)

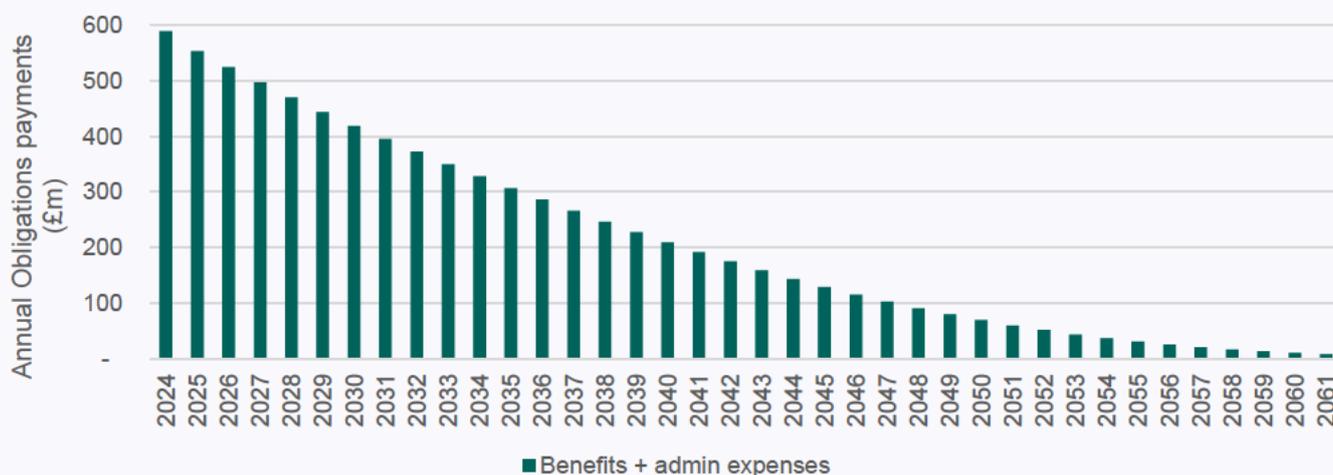
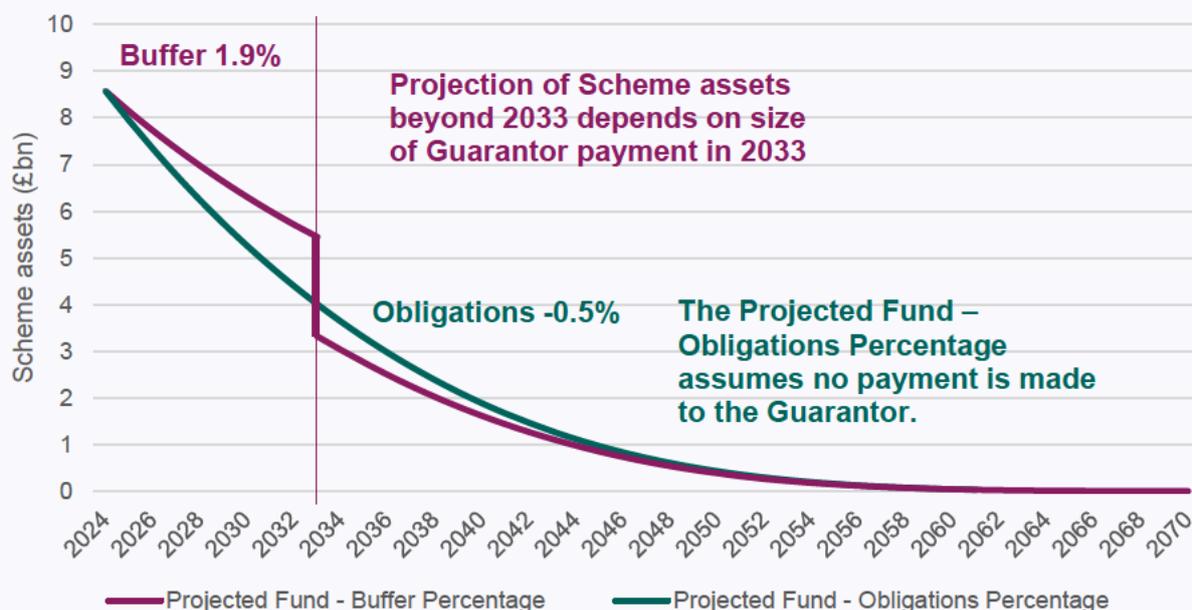


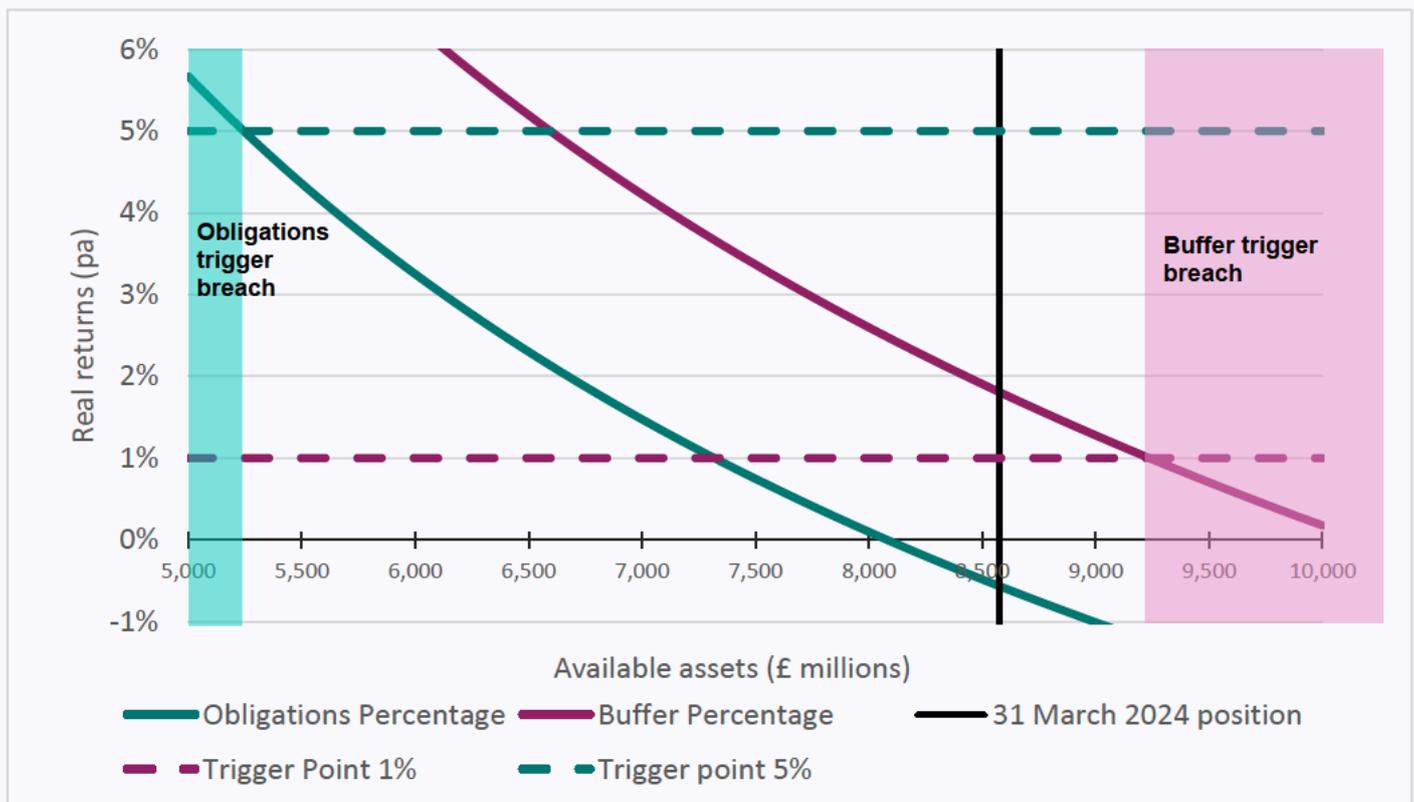
Figure A2 – BCSSS scheme assets projections (real RPI terms)



Asset volatility

- A.13 It should be noted that the valuation results are subject to a significant degree of short-term volatility. This volatility arises because the valuation results depend directly on the market value of the Scheme's assets which can fluctuate materially over short periods. In this context, it is therefore important to understand the limitations of assessing the likelihood of successfully achieving certain outcomes at a single point in time. Figure A3 below illustrates how the Obligations and Buffer Percentages change depending on the asset value (assessed at the valuation date).
- A.14 Further comments on the risks faced by the members and Guarantor can also be found in the 'Statement on risk' in Appendix I.

Figure A3 - Obligations and Buffer Percentages by asset value



- A.15 This shows that assets as at 31 March 2024 are around:

- £0.7bn lower than would have triggered a consultation due to the Buffer Percentage falling below 1% - that is, assets would have needed to be at least around £0.7bn higher at the valuation date to trigger a (Buffer Percentage) consultation.
- £3.3bn higher than would have triggered a consultation due to the Obligations Percentage exceeding 5% - that is, assets would have needed to be at least around £3.3bn lower at the valuation date to trigger an (Obligations Percentage) consultation.

Appendix B: Valuation background

Scheme history

- B.1 As a consequence of the privatisation of the coal mining industry in 1994, the BCSSS became a closed scheme with effect from 31 October 1994 (the Guarantee Date). Most employees were transferred to successor employers at that time, although a handful of staff continued in active membership of the Scheme, with the last leaving active service in August 2003. There will not be any new entrants to the Scheme in future.
- B.2 Nearly all members (97%) are now in receipt of pensions, either in their own right or as the surviving partners of mining industry staff.
- B.3 A description of the Scheme's benefit provision is given in Appendix C and a summary of the membership data used in the valuation can be found in Appendix D.
- B.4 The UK government guaranteed that financial support would be provided, if necessary, to ensure that the real value of pensions in payment (and deferred pensions) at the Guarantee Date will be maintained throughout the remaining lifetime of the Scheme.
- B.5 Until February 2015 the terms of the guarantee provided that any new surplus arising would be shared on an equal basis between the members of the Scheme and the Guarantor. The members' share of the surplus was used to provide additional 'bonus' benefits. The Guarantor's share of the surplus was used to provide annual payments from the Scheme to the Guarantor. These arrangements were facilitated through the operation of up to five subfunds.
- B.6 In February 2015, an Agreement was signed between the Trustees and the Guarantor. This brought an end to the surplus-sharing arrangements and all the notional subfunds were merged into a single fund on the Agreement date, known as the "Guaranteed Fund", or the "Fund". Other changes effected by the Agreement are summarised below.

Scheme operation

- B.7 The series of annual payments which were paid to the Guarantor ceased from 1 April 2015 and a £500 million payment was made from the former Investment Reserve⁵ to the Guarantor on 1 April 2015.
- B.8 The remainder of the former Investment Reserve is to remain in the Scheme until 2033. This projected payment to the Guarantor in 2033 has been linked to Consumer Prices Index (CPI) inflation since 2015.
- B.9 There are provisions to consult on additional payments prior to 2033 in particular circumstances. Such payments could either be additional payments (or cash injections) from (to) the Fund to (from) the Guarantor.

⁵ This held the surplus present in the Scheme at the time of restructuring in 1994 (after the granting of benefit improvements to members following the 1992 valuation).

Valuation requirements

- B.10 The Agreement replaced the actuarial valuation requirements in place at the time. The main valuation framework involves:
- the actuary must advise the Trustees and the Guarantor of the Obligations and Buffer Percentages.
 - certain triggering events and intended outcomes have been established, with reference to the valuation results corridor.
 - a solvency guarantee was introduced.

Member benefits

- B.11 Following the merger of the subfunds, benefits payable from the former Guaranteed Fund became 'Core Benefits'. Benefits payable from the former Bonus Augmentation Fund benefits became 'Guaranteed Bonuses'.
- B.12 Uplifts in Guaranteed Bonuses equal to 2% of Core Benefits were awarded each year, up to and including, January 2019. The initial award in the series was granted in January 2014.
- B.13 Crystallised Augmentations (under the previous terminology) continued to reduce until 31 December 2019, in line with the provisions in the Scheme rules prior to the February 2015 amendment. However, they are no longer subject to further reduction after 31 December 2019. All 'Guaranteed Bonuses' are now level (that is, they are not subject to any further increases or decreases).
- B.14 Members' benefit entitlements are fully guaranteed and no longer vary as a result of the Scheme's funding position.

Developments since 2021

Pension Increases

- B.15 Core Benefits (which are in excess of Guaranteed Minimum Pensions) increase each year in line with changes in the Retail Prices Index (RPI). Table B1 below shows the annual increases applied since the previous valuation.

Table B1 – Pension increases since 2021 valuation

Date of increase	Increase applied
January 2022	7.1%
January 2023	14.0%
January 2024	5.3%

- B.16 Overall, total pension increases to Core Benefits (excluding Guaranteed Minimum Pensions) were about 28.6% over the three years since the 2021 valuation.
- B.17 The increase in January 2025 was 3.6% and this has been reflected in the valuation results.

Investment returns

- B.18 Over the three years ending 31 March 2024, the Scheme assets earned an average nominal return of about 2.9% a year. The real return (in excess of pension increases) was about -5.4% a year.
- B.19 This is materially lower than the 2021 valuation Buffer and Obligations Percentages. The investment performance, in the context of heightened inflation, has resulted in an increase to the Buffer and Obligations Percentages.

Appendix C: Benefit structure

C.1 A summary of the main Scheme benefits is set out in Table C1 below.

Table C1 – Main Scheme benefits (earned in Scheme up to 1994)

Core Benefits	Pre-1987 leavers	1987-1990 leavers	Post 1990 leavers
Basis	Final salary (annual pensions accrued based on final pensionable salaries and years of service). Payable for life. Most pensions are guaranteed for 5 years.		
Normal retirement age	60 (some members have the right to retire at 50 on unreduced benefits)		
Pension accrual rate	1/80	1/80	1/60
Cash lump sum on retirement	3 x pension plus cash by commutation at a rate of 9:1	3 x pension plus cash by commutation at a rate of 9:1	Cash by commutation at a rate of 9:1 only
Conversion of cash lump sum into pension	None	Conversion of up to half of cash lump sum amount into pension	None
Contingent spouse pension	Payable on member death based on 2/3rds of member pension – subject to eligibility		
Pension increases in retirement	In line with RPI (except for GMP benefits where statutory increases apply) Increased each year on 1 January in line with changes in RPI from previous November.		
Guaranteed Bonuses	Awarded since 1994. All now level – i.e. not subject to increases or decreases Otherwise in line with member's Core Benefits as described above.		

Appendix D: Membership data

- D.1 The amounts of each member's benefit entitlements are recorded by the Scheme administrators, Capita.
- D.2 Data have been provided by Capita, for the purposes of this valuation. This includes individual membership data as at 31 March 2024, and the changes in membership since the 2021 valuation (when complete individual data were last provided).
- D.3 Overall, I am content that the data appears to be sufficiently accurate for the purpose of the valuation and reconciles with that used at the 2021 valuation. Nonetheless, in order to carry out the valuation, I have relied upon the accuracy of the data as provided to me. I have not carried out a full, independent audit of the data.
- D.4 The results reported at this valuation are based on the membership data provided and my understanding of members' current benefit entitlements. Any future changes to member benefit entitlements (for example, action that may be required to address GMP equalisation issues⁶) may affect the results reported at future valuations.
- D.5 Summaries of the membership data are provided in the tables below. Table D1 shows the number of Scheme members and amounts of pensions in payment, or accrued benefits for deferred members, as at 31 March 2024. Core Benefits and Guaranteed Bonuses are identified separately. Table D2 shows how the number of Scheme members (separately for pensioners, dependants and deferred members) has changed since the 2021 valuation.
- D.6 The Scheme has been largely closed to new accrual since 1994. The membership therefore consists of pensioners in payment (members and dependants) and deferred members.
- D.7 Further information on the 2024 valuation data can be found in a separate GAD paper dated 16 October 2024, entitled '2024 valuation – data report'.

⁶ An approximate allowance for the potential impact of future benefit changes due to equalising GMPs has been included at the valuation as set out in paragraph F.5. The extent to which actual benefit changes in the future differ from this approximate adjustment may result in higher or lower returns being reported at future valuations.

Table D1 – Number and amounts of pension as at 31 March 2024

Category	Number of members			Weighted average age	Total pension, £ per year		
	Men	Women	Total		Core Benefits ⁷	Guaranteed Bonuses	Total
Deferred members⁸	722	492	1,214	59.6	£6,565,273	£1,014,048	£7,579,321
Pensioners	23,260	5,348	28,608	76.1	£401,007,775	£65,530,000	£466,537,775
Dependants	148	11,030	11,178	84.1	£112,922,578	£16,345,803	£129,268,381
Overall Total	24,130	16,870	41,000	77.6	£520,495,626	£82,889,851	£603,385,477

Individual components may not sum to totals due to rounding.

⁷ Before any levelling option deduction is made.

⁸ EPB only members excluded from deferred summaries.

Table D2 – Changes in membership numbers⁹, 2021 to 2024

	Deferreds	Pensioners	Dependants
From 2021 valuation	1,868	32,229	12,515
Movements 2021 to 2024:			
Additions			
Pension credit cases	4	13	-
Reinstatements	-	1	-
New retirements/dependants	-	620	1,823
Reductions			
Retirements	(620)	-	-
Deaths	(13)	(4,248)	(3,156)
Other exits	(25)	(7)	(4)
Total movements 2021 to 2024	(654)	(3,621)	(1,337)
As at 31 March 2024	1,214	28,608	11,178

⁹ Summary provided by Capita.

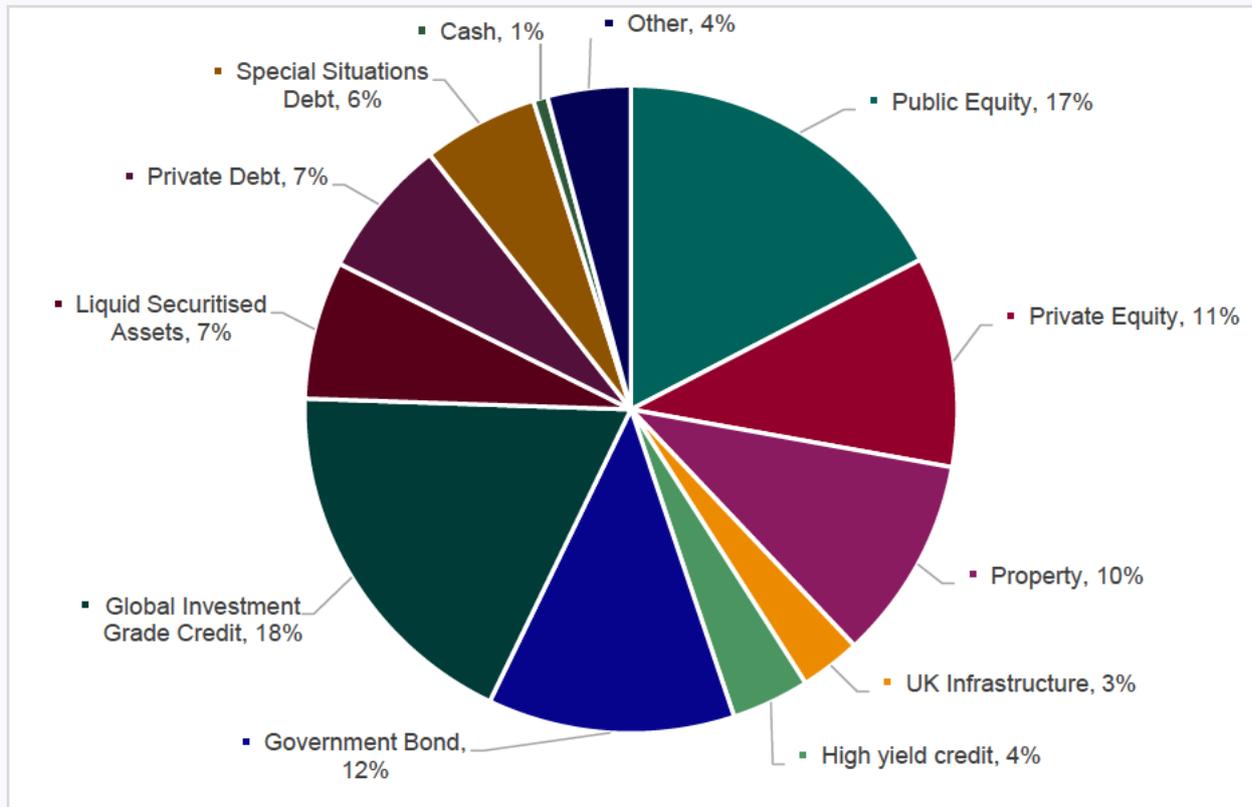
Appendix E: Asset data and investment strategy

- E.1 The Trustees have provided copies of the Scheme’s annual report and accounts and other relevant information on the Scheme’s assets and investment strategy. Summaries of the relevant asset data are given below.
- E.2 Table E1 shows the consolidated revenue account for the period 31 March 2021 to 31 March 2024 for the Scheme. Figure E1 summarises the actual asset allocation of the Scheme at the valuation date.

Table E1 – Consolidated revenue account: 2021 to 2024 (£ million)

Market value as at 31 March 2021	9,597
Income	
Return on investments	
Investment income	884
Change in market values	(57)
Investment management expenses	(58)
Total income	769
Expenditure	
Benefits and transfers out of Scheme	(1,777)
Payments to the Guarantor	0
Administration expenses	(13)
Total expenditure	(1,790)
Market value as at 31 March 2024	8,576

Figure E1 – Distribution of assets as at 31 March 2024



Buffer Payment

- E.3 The '2015 Reserve' was defined in the Agreement and its value was calculated as £1,707 million¹⁰. The 2015 Reserve can be considered to be the Guarantor's share of the surplus when the coal industry was privatised, less the parts of that surplus already released to the Guarantor (including the £500 million paid on 1 April 2015), accumulated with investment returns to 31 March 2015.
- E.4 The 2015 Reserve, increased in line with CPI from 2015, is due to be paid to the Guarantor in 2033. It is the payment of this amount in 2033 (the 'Buffer') which is allowed for in the calculation of the Buffer Percentage.
- E.5 The 'Adjusted Reserve', which is the 2015 Reserve increased to a certain date (as defined in the Agreement), has been calculated as £2,261 million as at 31 March 2024¹¹. For the 2024 valuation, the Buffer is equivalent to the Adjusted Reserve (no further payments have been made to the Guarantor since the payment on 1 April 2015), with allowances for assumed CPI increases between 2024 and 2033.

¹⁰ This calculation is described in more detail in [REDACTED] letter of 13 July 2015.

¹¹ Further details of this calculation can be found in [REDACTED] letter of 29 April 2024.

Appendix F: Methodology and assumptions

Consultation

- F.1 In preparation for this valuation, I have consulted with both the Trustees and the Guarantor on the assumptions and methodology to be adopted, as required by paragraph 2.17 of the Agreement.

Methodology

- F.2 The Scheme's benefit liabilities are all in respect of deferred members and pensioners in payment (plus any associated expenses). There are no active members. The valuation methodology is to project the expected cashflows in respect of the members' benefits (and target payment to the Guarantor, as appropriate), using the assumptions adopted. The annual real rates of return required on the Scheme's assets over the Scheme's lifetime, in order to meet the Scheme's cashflow requirements, are then calculated at the valuation date.

Rationale for assumptions

- F.3 I have set the assumptions consistently with a 'best estimate' principle. However, for certain demographic assumptions I have erred on the side of prudence where it is appropriate to do so, for example where there is a choice between two reasonable assumptions or some uncertainty about the statistical credibility of observed experience. This approach is consistent with the rationale adopted at the previous valuations.
- F.4 Further details on the derivation of the demographic assumptions can be found in the 'Analysis of Experience' report dated 4 October 2024.

GMP equalisation

- F.5 An adjustment equivalent to a 0.025% addition to the Obligations and Buffer Percentages has been included in the valuation results. This reflects potential future benefit changes relating to the requirement to equalise male and female GMPs accrued from 17 May 1990. This adjustment has been calculated approximately and has regard to the treatment of GMPs within the Scheme.
- F.6 This adjustment is consistent with adjustment adopted for the 2021 valuation of 0.025%.

Assets

- F.7 The assets are taken at market value at the valuation date. Further details of the assets can be found in Appendix E.

Financial assumptions

Inflation

- F.8 I have assumed that long-term increases in CPI will be 2% a year. This has regard to the Bank of England's target for CPI of 2%.
- F.9 I have assumed that up to February 2030 (when RPI will be aligned with CPIH), increases in RPI will be 3% a year. The initial assumption is c0.5% lower than the level of RPI implied from gilt yields, reflective of the market pricing in an 'inflation risk premium'.
- F.10 From February 2030 onwards, I have assumed that long-term increases in RPI will be 2.1% a year. This allows for my long-term CPI view of 2% a year and RPI aligning with CPIH.
- F.11 In forming a long-term view on CPI I have considered economic forecasts and the Bank of England's target, rather than adopting a view implied directly from markets. The markets do not anticipate a 'step-change' commensurate with the impact of revising the RPI methodology from February 2030. Consequently, the implied 'inflation risk premium' is higher in the period after 2030 than the level implied before 2030.
- F.12 CPIH has moved relatively closely with CPI over the last 10 years, reflecting the similarities in the indices and the fact that they only differ by the inclusion of residential rental price growth and council tax in the CPIH index. In the long-term, I consider it reasonable to assume differences in the indices might cause CPIH (and therefore RPI) to exceed CPI by 0.1% a year.
- F.13 In the Scheme year ending 31 March 2031 the pension increase will be based on the increase in RPI over the year to November 2030. As such I have allowed for a blend of pre and post February 2030 rates.
- F.14 The January 2025 RPI increase of 3.6% has been reflected in the results calculation. I have considered whether allowance for further variant short-term assumptions might be adopted for this valuation. I am satisfied that any potential updates would not lead to material changes to the results and therefore no further short-term adjustments are required.

F.15 The inflation assumptions are summarised in Table F1 below.

Table F1 – Assumed future annualised inflation

Scheme year ending ¹²	RPI	CPI (for post 88 GMP)	CPI (for Buffer payment)
2025	3.6% ¹³	N/A	3.0% ¹⁴
2026	3.0%	1.7%	2.0%
2027 to 2030	3.0%	2.0%	2.0%
2031	2.3%	2.0%	2.0%
2031 onwards	2.1%	2.0%	2.0%

F.16 Increases in payment on post-1988 Guaranteed Minimum Pensions (GMPs) are in line with CPI, subject to a cap of 3% and floor of 0% each year. The valuation allows for the expected April 2025 increase of 1.7%. Thereafter, post-1988 GMPs are assumed to increase in line with relevant CPI inflation for valuation purposes.

F.17 Revaluation of GMPs before GMP payment age is in line with Section 148 orders. The known increase of 7.6% was allowed for as at April 2024. For following years, GMPs before GMP payment age are assumed to increase in line with CPI inflation plus 1.25% a year.

F.18 Increases in the Buffer payment are in line with annual increases in CPI each January.

F.19 **Impact:** The change in the CPI and RPI assumptions since the 2021 valuation reduces the Buffer and Obligations Percentages by less than 0.1%.

Expenses

F.20 At the 2021 valuation, administrative expenses were assumed to be £5 million a year up to 2033 (when the Adjusted Reserve is due to be paid), and then reducing in line with total benefit payments thereafter.

F.21 Administrative expenses have been slightly lower than expected since the 2021 valuation, at an average level of £4 million a year.

¹² Increases on different member benefit tranches are based on a variety of monthly inflation measures, but for simplicity a single rate of annual inflation for each index is used.

¹³ 2025 inflation reflects actual November 2024 RPI.

¹⁴ 2025 inflation reflects actual January 2025 CPI.

- F.22 However, I have retained the 2021 valuation assumption for the 2024 valuation, rather than reducing it to reflect slightly lower experience, due to the low materiality of a small change in this assumption. Therefore, this assumption can be viewed as marginally on the prudent side.
- F.23 Consistent with the 2021 valuation, no allowance is made for any investment expenses. Accordingly, the Obligations and Buffer Percentages should be interpreted as rates of investment return which are net of investment expenses.
- F.24 **Impact:** No impact as the assumption is unchanged from the 2021 valuation.

Demographic assumptions

Mortality

- F.25 At the 2024 valuation, the only material change in the demographic assumptions relates to the mortality assumptions. The mortality assumptions can usefully be considered in two parts:
- what rates of mortality do the members experience now, in 2024 (commonly referred to as the “baseline” mortality assumptions)?
 - How might these rates change in future?
- F.26 I have chosen the baseline mortality assumptions for the 2024 valuation having had regard to analysis of the Scheme’s recent mortality experience. My analysis showed that, in aggregate, Scheme mortality rates have been broadly in line with, if slightly lighter than, mortality rates expected in 2021. This is despite the period of analysis being impacted by the COVID-19 pandemic and as such no explicit adjustment has been made for COVID-19. Additional analysis was also carried out using postcode data. The implied mortality rates from this study were broadly aligned with the 2021 valuation assumptions (and recent Scheme experience) except for categories where variations would be expected, such as ill health groups. This provided further assurance on the valuation assumptions adopted.
- F.27 The “S4” series of the Self-Administered Pension Scheme (“SAPS”) mortality tables were released in February 2024. These are based on large datasets and mortality experience between 2014 and 2019. I have adopted mortality assumptions with reference to the S4 tables, with scaling adjustments applied to reflect the observed mortality experience of the Scheme.
- F.28 The change in baseline assumptions at this valuation has led to a slight increase in life expectancies. Both the Buffer and Obligations Percentages consequently increase by around 0.3%. Overall, I consider these baseline assumptions to err slightly on the prudent side of best estimate (based on recent experience up to the valuation date).
- F.29 To allow for future improvements to members’ assumed mortality rates, I have used the Office for National Statistics’ (ONS) 2021-based interim principal population projections for the UK population which were the latest available at the time that calculations were undertaken.

F.30 Aligning the assumptions for future improvements in mortality rates to the ONS 2021-based interim principal projections for the UK population has led to a slight decrease in life expectancies. Consequently, both the Buffer and Obligations Percentages decrease by around 0.1%.

The assumed rates of mortality are set out in Table F2.

Table F2 – Assumed mortality rates¹⁵

Category	2024 assumptions	2021 assumptions
Pensioners who retired in normal health:		
Male non-industrials	100% S4NMA-21	110% S3NMA-18
Male industrials	140% S4NMA-21	150% S3NMA-18
Females	105% S4NFA-21	105% S3NFA-18
Pensioners who retired in ill-health:		
Males	130% S4NMA-H-21	110% S3IMA-18
Females	130% S4NFA-H-21	110% S3IFA-18
Current and future dependants:		
Female dependants	95% S4DFA-G2-21	115% S3DFA-18
Males dependants	95% S4NMA-21	115% S3NMA-18

F.31 Table F3 shows the life expectancies (allowing for future improvements) using the 2024 valuation assumptions, and the 2021 valuation assumptions, for comparison. The sample ages in the Table F3 have been chosen to broadly correspond with the average age within the overall pensioner or dependant category. Life expectancies are quoted as at 31 March 2024.

¹⁵ Mortality assumptions are expressed in terms of published standard mortality tables, adjusted by a loading factor. The '-21' label means that the S4 standard tables are adjusted from their base year of 2017 in line with improvements observed in actual UK population mortality rates up to 2021, and thereafter in line with the 2021-based principal population projections for the UK published by the ONS. A loading factor of 140% means that the probability of death at every age is taken to be 40% greater than in the standard table.

Table F3 – Comparison of life expectancies (years)

	2024 assumptions	2021 assumptions
Normal health non-industrial male aged 76	12.8	12.5
Normal health industrial male aged 76	10.9	10.7
Normal health female aged 76	14.1	14.1
Dependant female aged 84	7.8	7.4

F.32 No allowance is made for mortality in the period prior to a member's retirement.

F.33 **Impact:** Overall, the change in mortality assumptions increases both the Obligations and Buffer Percentages by around 0.2% a year.

Commutation assumptions

F.34 The commutation assumptions adopted at the 2021 valuation have been retained for this valuation.

F.35 The assumed percentage of pension commuted for a cash lump sum at retirement is given in Table F4:

Table F4 – Assumed percentage of commutation at retirement

Members leaving service:	2024 assumptions	2021 assumptions
Before 1987	0%	0%
Between 1987 and 1990	0%	0%
After 1990	15%	15%

F.36 **Impact:** No impact as the assumption is unchanged from the 2021 valuation.

Early Retirement

F.37 The early retirement assumptions adopted at the 2021 valuation have been retained for this valuation.

F.38 The assumed rates of early retirement for members with a normal retirement age of 60 are given in Table F5:

Table F5 – Assumed rates of early retirement

Age	2024 assumptions	2021 assumptions
50	40%	40%
51 to 59	5%	5%
60	100%	100%

F.39 Deferred members aged over the earliest age at which they can retire with an unreduced pension who have not yet claimed their pensions are assumed to retire immediately.

F.40 **Impact:** No impact as the assumption is unchanged from the 2021 valuation.

Marital Statistics

F.41 The marital assumptions adopted at the 2021 valuation have been retained for this valuation. The assumptions for the proportion of members with partners vary by age at time of death, whereas a uniform age difference between members and their partners is assumed at all ages. Some examples of the assumptions at various ages are provided in the Table F6:

Table F6 – marital statistics

Age	Proportion partnered		Age difference (males assumed to be older than their partners)
	Males	Females	
60	84%	100%	+3
70	79%	88%	+3
80	66%	63%	+3
90	42%	29%	+3

F.42 The proportion of surviving partners assumed to be eligible for a pension on the death of the member are unchanged from the 2021 valuation and are as follows:

Male members: 100% entitlement to a survivor pension

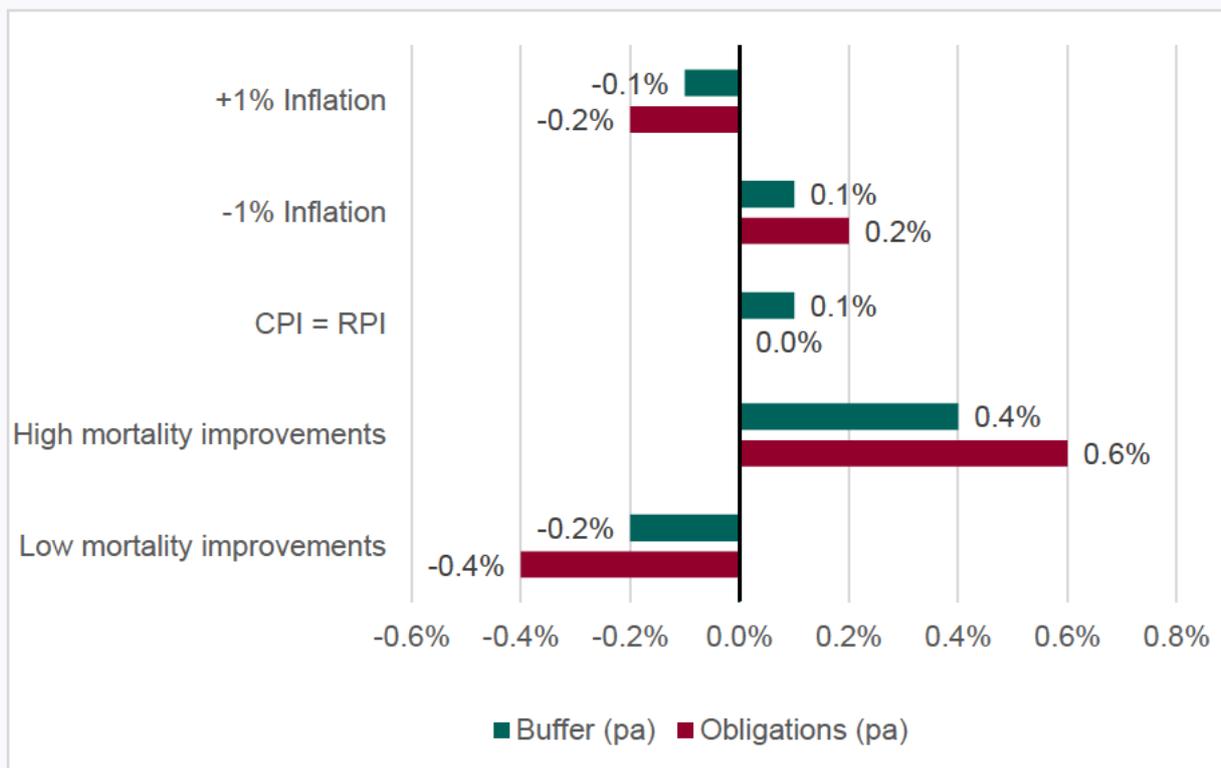
Female members: 20% entitlement to eligible survivor if aged under 60
12.5% entitlement to eligible survivor if aged 60 to 80
2.5% entitlement to eligible survivor if aged over 80

F.43 **Impact:** No impact as the assumption is unchanged from the 2021 valuation.

Appendix G: Sensitivity of the valuation results to assumptions

- G.1 This section illustrates the sensitivity of the valuation results to variations in the valuation assumptions. The Obligations and Buffer Percentages depend on the assumptions used for the valuation. If the assumptions change, then the reported position changes.
- G.2 The two most important valuation assumptions relate to inflation and mortality. Figure G1 below illustrates the sensitivity of the results when varying these assumptions. However, it should be recognised that any significant differences in future valuation results will most likely be attributed to the actual performance of Scheme assets compared to the Obligations and Buffer percentages, rather than adjustments to the specific valuation assumptions outlined below.

Figure G1 – Impacts of different assumptions on Obligations and Buffer Percentages relative to valuation results



Variant inflation scenarios

- G.3 The first two variant inflation scenarios above show the effect of varying all the inflation assumptions by 1% in every future year. Under the '+1% inflation' scenario, higher inflation means that non-increasing benefits are assessed as being less valuable in real terms, and the Obligations and Buffer Percentages reduce. Effects of a similar magnitude occur in the opposite direction for the low inflation scenario ('-1% inflation') illustrated.
- G.4 The third variant inflation scenario ('CPI=RPI') shows the impact of varying the CPI assumptions so that CPI inflation is assumed to be the same as RPI going forward. There is little change to the Obligations Percentage (as most benefits are either linked to RPI or are non-increasing). The Buffer Percentage, however, increases as the Buffer payment (which is linked to CPI to 2033) is assessed as being more valuable in real terms.

Variant mortality scenarios

- G.5 The two mortality variants show the impact of varying how quickly mortality rates are assumed to improve each year in the long-term. The valuation mortality assumptions assume a long-term improvement rate of 1.2% a year.
- G.6 The first mortality variant ('High mortality improvements') shows the effect of assuming annual improvements to mortality of 1.9% a year after 2024. In broad terms, this change in assumption might be considered similar to increasing the life expectancy of a typical pensioner by around half a year to a year. Assuming a longer life expectancy means we expect members' pensions to be paid for longer, resulting in more valuable benefits and therefore higher Obligations and Buffer Percentages.
- G.7 The second mortality variant ('Low mortality improvements') shows the impact of assuming no future improvements in mortality after 2024. In broad terms, this change in assumptions might be considered similar to decreasing the life expectancy of a typical pensioner by around half a year. Assuming a shorter life expectancy means we expect members' pensions to be paid for a shorter period, resulting in less valuable benefits and therefore lower Obligations and Buffer Percentages.
- G.8 The variant scenarios are not presented as alternative 'best estimate' views. They are intended to provide context on a reasonable range. These changes in mortality improvement assumptions lead to a step change in the value assigned to the liabilities. If the assumptions were not changed, but the experience did follow the alternative variant, then the same change would eventually emerge in the funding position of the Scheme, but only gradually over time. Thus, we see that while the mortality assumptions and experience are important, the overall effect may emerge gradually over a period of years.

Appendix H: Reconciliation of the results with the previous valuation

- H.1 The following charts show how the Obligations and Buffer Percentages for the Scheme have changed over the three years from 31 March 2021 to 31 March 2024.
- H.2 More detail on each event which has resulted in a change to the Obligations and Buffer Percentages is provided in the following paragraphs. It should be noted that the size of each individual effect can vary depending on the order in which each event is analysed.

Figure H1 - Change in the Obligations Percentage between 2021 and 2024

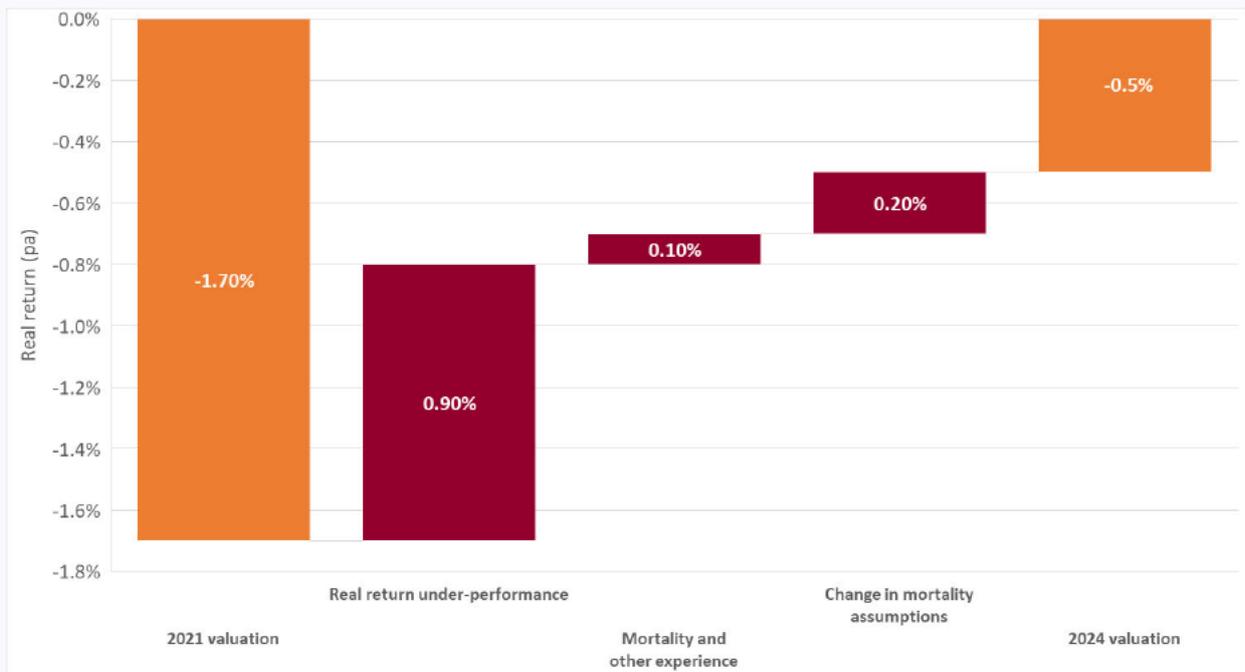
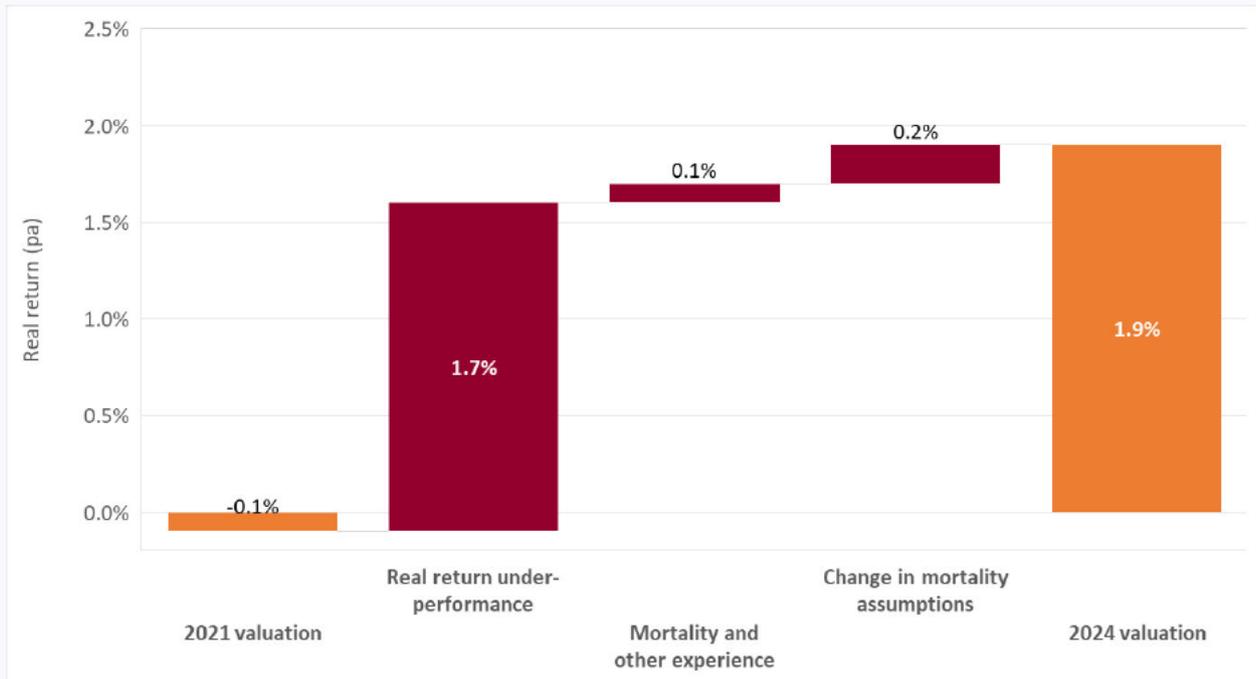


Figure H2 - Change in the Buffer Percentage between 2021 and 2024



Investment and inflation experience between 2021 and 2024

H.3 Real returns over the 2021-2024 intervaluation period have been lower than the Obligations and Buffer Percentages calculated as at 31 March 2021 meaning that higher returns are required in future.

Mortality and other scheme experience between 2021 and 2024

H.4 Scheme experience, excluding investment and inflation experience over the 2021-2024 intervaluation period, has increased the required rates of return by around 0.1% a year. This effect is mostly attributable to slightly lighter mortality experience than assumed.

Changes to mortality assumptions

H.5 As described in Appendix F, updated mortality assumptions have resulted in a small increase in assumed life expectancies. This has increased the required rates of return by around 0.2% a year.

Other assumption changes

- H.6 Other changes to the assumptions (other than mortality) are the changes to the inflation assumptions (both RPI and CPI). These have had a small effect of less than 0.1% a year on the required rates.

Appendix I: Statement on risk

- I.1 This statement summarises the financial risks facing the members of BCSSS and the UK government as the Scheme's Guarantor.

The financial risks faced by the members of the BCSSS

- I.2 Following the changes to the Scheme in 2015, the risk to the members is more limited than prior to 2015. Their benefits are defined and guaranteed by the UK Government.
- I.3 The principal risk for remaining members relates to (high) inflation. The inflationary (RPI-linked) increases on Core Benefits mean that the majority of member benefits are protected against high inflation. However, Guaranteed Bonuses are not index-linked (they are level) and consequently their value will decrease in real terms over time.
- I.4 Although Core Benefits are protected against high inflation due to their link to RPI, the nominal value of these benefits is expected to reduce following the reform of RPI from 2030 (compared to expectations assuming no change to the RPI methodology).

The financial risks faced by the Guarantor of the BCSSS

- I.5 Following the changes to the Scheme in 2015, the Guarantor bears all the Scheme's financial risk (although recognising that members still face some inflation risk). The members' benefits are now fixed and the guarantee requires that the Guarantor provides funds to ensure that benefits can be paid in the event of the Scheme's assets being considered insufficient.
- I.6 The principal financial risk facing the Guarantor (and ultimately the taxpayer) is that the Guarantor needs to make an additional payment to the Scheme.
- I.7 Further, the Guarantor is also exposed to the risk that the Buffer payment in 2033 will be lower than anticipated.

Investment and liquidity risks

- I.8 These risks could occur if the returns on assets were insufficient. For example, if the average real returns achieved on investments were:
- lower than the Obligations Percentage, the Guarantor would need to make an additional payment to the Scheme
 - lower than the Buffer Percentage (but higher than the Obligations Percentage), the Buffer payment in 2033 would be lower than anticipated

- I.9 Given the Scheme's maturity and liquidity requirements, the Scheme also faces a material liquidity and cash flow risk. To the extent that income proceeds on the Scheme assets are insufficient to meet cash flow requirements, it is necessary to sell asset holdings. There is a risk that assets need to be sold at unfavourable times. It will therefore be important to manage the asset portfolio effectively.

Mortality and inflation risk

- I.10 Apart from investment risk, the Guarantor also bears the risk that members live longer than expected, increasing the cost of providing the member benefits. The cost of funding the Scheme (in real terms) will also be higher if inflation turns out to be lower than expected.
- I.11 Sensitivities relating to mortality and inflation assumptions were shown in Appendix G.

BCSSS investment strategy

- I.12 Throughout the period since 1994, the Scheme has invested in a diversified portfolio comprised largely of return-seeking assets.
- I.13 Since the last valuation, market conditions have changed materially; for example, there has been a notable increase in interest rates. The Trustees have taken some recent de-risking steps but continue to invest a substantial proportion of the Scheme assets in return-seeking assets. The Scheme is therefore exposed to potentially volatile investment outcomes.
- I.14 Recognising the increasing maturity of the Scheme and the associated impact on liquidity requirements, the Trustees have an objective to improve the security of cash flows over time. This will become increasingly important after 2033, when the Adjusted Reserve is scheduled to have been paid in full to the Guarantor. The Trustees' investment strategy and return targets aim to deliver the returns necessary to deliver this improved certainty of cash flows by 2033.

Term dependency of investment returns

- I.15 The Obligations and Buffer Percentages are based on the assumption that the same real rate of return will be achieved at the end of the Scheme's lifetime as in the short term. For the 2024 valuation, this translates to an Obligations Percentage of -0.5% per year and a Buffer Percentage of 1.9% per year.
- I.16 In practice, however, a lower rate of return may be anticipated in the long term. This is because the Scheme's ability to generate additional returns may diminish gradually over time as the size of the Scheme's assets decreases and the proportion of cash flows paid out relative to assets increases. This aspect will be a key consideration, in particular, after the payment is made to the Guarantor in 2033.

- I.17 The desire to achieve additional higher returns in the short term will reflect the perspectives of the Guarantor and the Trustees, having regard to the balance between additional returns and the associated investment risk.
- I.18 Further, due to the relative size of benefit payments out of the Scheme assets, investment returns in the short term are more significant to the success, or otherwise, of long-term target outcomes than returns further into the future.
- I.19 The impact of short-term returns is highlighted in Table I1. All else being equal, this indicates possible 2027 valuation results based on three return scenarios between the 2024 and 2027 valuations, assuming other experience is in line with the 2024 valuation assumptions.

Table I1 – Obligations and Buffer Percentages

Return scenario	2024-2027 real return (% per year)	Possible 2027 valuation results	
		Obligations Percentage	Buffer Percentage
2024 Obligations Percentage achieved	-0.5%	-0.5%	2.9%
2024 Buffer Percentage achieved	1.9%	-1.3%	1.9%
Achieve Trustee best estimate return (6.3% per year nominal)	3.0%	-1.7%	1.4%

Mitigating the financial risks faced by the Guarantor

Investment Risk

- I.20 The investment risk reflects the investment strategy of the Scheme, which is to target the real returns needed to be able to pay members' pensions. The Scheme has recently taken some steps in a move towards a lower risk investment strategy. This reduces the volatility of outcomes and in turn could be expected to reduce the likelihood of the Guarantor needing to pay additional funds into the Scheme over the long-term.
- I.21 If the Trustees invested the entire Scheme assets in matching assets (that is, a portfolio of government bonds whose proceeds matched the liability cashflows closely), then that would give much greater certainty of outcome. However, this approach would not be able to guarantee full payment of the Buffer in 2033. It should also be noted that even if the Scheme moved to a portfolio with a closer match to its benefit cashflows, it would still be exposed to re-investment risk.

Mortality Risk

- I.22 There is less scope for the Trustees to manage the mortality risk and, given the circumstances of the Scheme, such management may not be desirable due to additional cost or complexity.
- I.23 The Trustees could secure insurance contracts against unexpected improvements in the mortality rates of either the UK population as a whole or the Scheme's members. However, the cost of this insurance may be significant, potentially outweighing the benefits of having such insurance.
- I.24 It should also be noted that the UK Government retains a very large exposure to longevity risk through the provision of the state and public service pensions. In this context, the Trustees might wish to understand if the Guarantor views its longevity risk in the Scheme any differently to its wider exposure.

Allowance for risk in the principal valuation assumptions

- I.25 In setting the 2024 valuation assumptions, I have had regard to the risks mentioned in the following paragraphs. However, I have made no separate explicit allowance for any one of those risks.
- I.26 Given the nature of this valuation, an assumption regarding future investment returns is not required. No explicit adjustment has been made to the valuation assumptions to allow for these risks.
- I.27 The Trustees and the Guarantor should have due regard to the impact of climate-related risk and other geopolitical risks in ongoing Scheme management. Understanding the potential impact on the Obligations Percentage and Buffer Percentage can help inform risk considerations.
- I.28 Similarly, the proposed assumptions about future mortality improvements are based on the ONS UK population projections. In compiling its projections, the ONS consider a wide range of factors which might influence future mortality experience in the UK but do not make a specific and explicit adjustment for any one factor such as climate change.

Climate-related risk and geopolitical risks

- I.29 Climate-related and geopolitical factors are emerging risks and potentially significant. We have set out some more detail on this below.
- I.30 Climate-related risk and the world-wide response to, for example, global warming have the capacity to be major influences on the global economy and on our health and well-being, particularly over the long term. As such they represent risks to future investment returns and to future mortality expectations both of which are relevant to pension funds.
- I.31 Similarly, armed conflicts and other geopolitical risks may also present risks to future investment returns and future mortality expectations.
- I.32 Climate change and the steps to mitigate it are already underway. Risks relating to this are expected to be relevant to the Scheme over the short- to medium-term.

- I.33 Climate related risks fall into two categories:
- **Physical risks**, arising due to the chronic changes in temperature, rainfall, sea-level and acute events such as wildfires, droughts, flooding and other extreme weather events; and
 - **Transition risks**, arising from moves to a greener, low carbon economy primarily arising from policy interventions and/or financial market reactions.
- I.34 These risks can lead to widespread impacts on, for example, asset returns, interest rates, inflation and life expectancy.

Scheme considerations

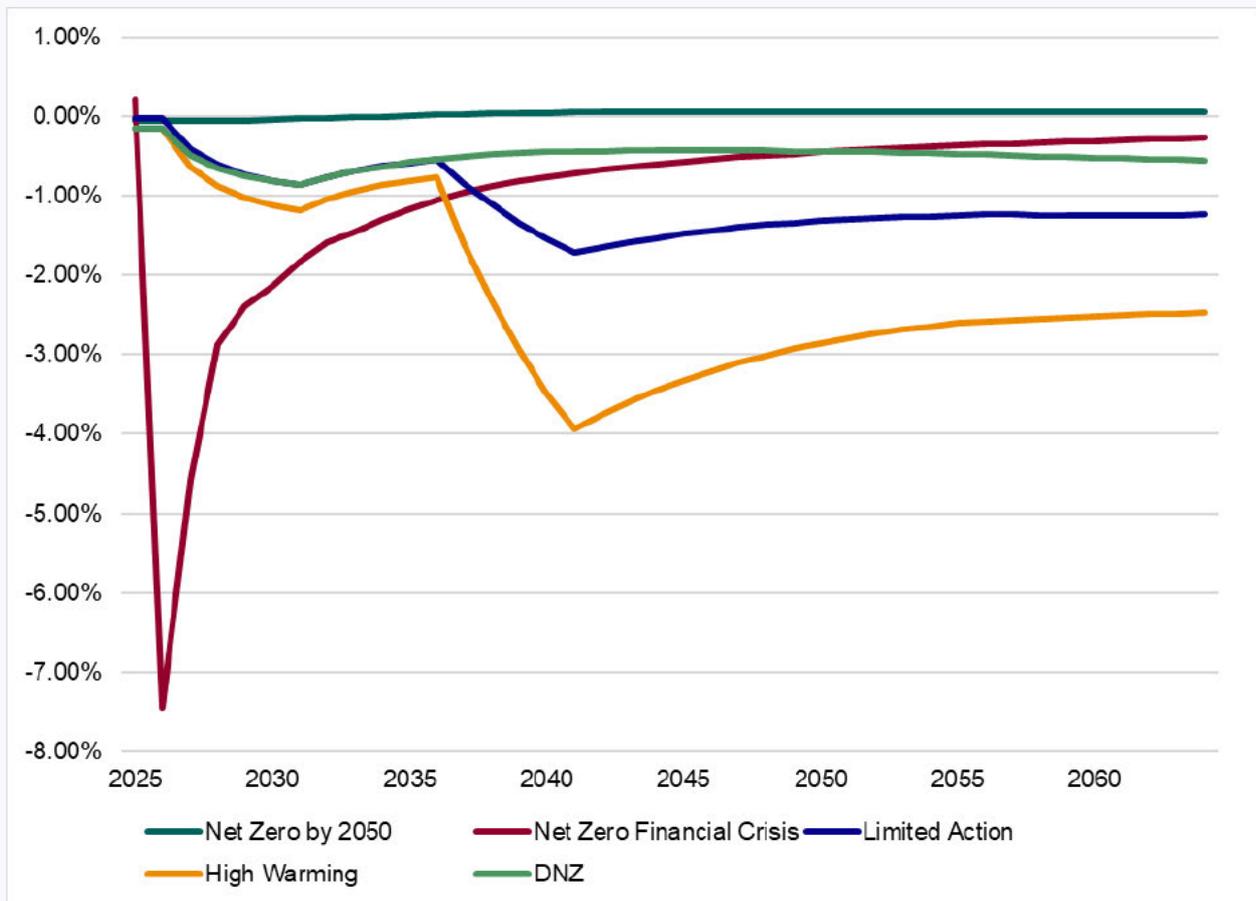
- I.35 In terms of demographic risks, while there might be impacts from heatwaves and severe winters on the Scheme's demographic experience, we would expect any impact on the funding position to be relatively limited. This is because the Scheme is already at a mature stage and views on life expectancies are stabilising (absent any unforeseen one-off events or rapid medical advancements).
- I.36 The Scheme's exposure to the economic risk of climate change is more material than its exposure to demographic risk. Noting that:
- capital markets will implicitly price in some level of climate risk (although asset price adjustments can still be expected to the extent that market views on the future impact of climate change are not perfect); and
 - investment returns in the short-term are more material for Scheme funding than those over the longer-term.
- I.37 Notwithstanding these points, a key risk for the Scheme will relate to any asset price adjustments on account of climate change. New evidence may emerge which indicates that an alternative scenario is becoming more likely than previously anticipated, for instance, evidence which indicates that we will move away from fossil fuels sooner than expected, stranding fossil fuel assets and repricing the associated companies and infrastructure. Such a development may trigger a change in the value of the assets held by the Scheme.
- I.38 Whilst it is not possible to predict exactly how different scenarios may affect the Scheme's funding position, it is important to consider the associated risk and potential implications. To inform considerations, further comments on different climate scenarios are set out below.
- I.39 Of course, depending on the success and efficiency of a transition to a low carbon world, there may also be potential for an improved economic outlook and Scheme experience compared with the central view.

Modelled scenarios

- I.40 The Paris Agreement, which came into force on 4 November 2016, has as its overarching goal to hold “the increase in the global average temperature to well below 2°C above pre-industrial levels” and pursue efforts “to limit the temperature increase to 1.5°C above pre-industrial levels.” The COP28 UN Climate Change Conference held at the end of 2023 concluded that progress against the Paris Agreement targets had been too slow across all areas of climate action. Countries responded with a decision on how to accelerate action across all areas by 2030, but there remains some uncertainty about the timing and effectiveness of these actions.
- I.41 To illustrate this uncertainty, we have considered the following different climate scenarios¹⁶ showing the impact on global equity returns:
- Net Zero: orderly transition to net-zero by 2050
 - Net-Zero financial crisis: disorderly and financially disruptive transition
 - Limited action: limited transition with high exposure to physical risks
 - High warming: failed transition leading to very severe physical risks
 - Delayed Net-Zero (DNZ): orderly transition not implemented on scale required to reach net zero by 2050
- I.42 The graph below shows the average change in equity returns (broad developed market world) at each year in the future up to 2060 that might be expected under each of the scenarios described above.

¹⁶ 2023 release of ClimateMAPS, a joint development by Cambridge Econometrics and Ortec Finance

Graph I1 – average change in equity returns



I.43 As can be seen from the above, only the Net Zero by 2050 scenario envisages no change in expected equity returns. Under this scenario, it is assumed that financial markets are not materially disrupted by the transition and physical risks implied by an orderly transition to Net Zero by 2050. All other scenarios assume there will be a reduction in equity returns of varying degrees.

I.44 Some further notable features in the above graph include:

- The Net Zero Financial Crisis scenario envisages disruptive effects in financial markets as climate risks are abruptly priced-in in 2026, leading to a confidence shock to the financial system that year.
- Some financial market disruption is expected during the late 2020s arising from transition risk in the Limited Action, High Warming and DNZ scenarios, leading to an overall impact of around -1% p.a. on equity returns under each scenario to the early 2030s.

I.45 Further financial market disruption is envisaged during the 2040s in the Limited Action and High Warming scenarios due to extreme weather events and high temperatures impacting expected performance, leading to an overall impact of around -2% p.a. and -4% p.a. under each scenario respectively.

- I.46 Whilst these scenarios should only be viewed as illustrative, the analysis provides helpful context around the potential asset shocks which could be experienced by the Scheme in the coming years. The impact of any asset “shocks” on future valuation results will depend on the size of the shock and the time it arises. Table I1 illustrates the possible impact on the Buffer and Obligations percentages of short-term returns: 1% a year asset underperformance over 3 years to the 2027 valuation would lead to around a 0.5% increase in return requirements at the next valuation.
- I.47 I am aware that the Trustees continue to develop their approach to managing climate related risk in view of the potential impact on investment performance. I would be happy to work with the Trustees on any relevant initiatives as appropriate, and to facilitate an improved understanding of Scheme risks for future valuations.

COVID-19 risk

- I.48 While the period of analysis has been impacted by the COVID-19 pandemic, we do not believe it is appropriate to make any explicit adjustment. This is because the majority of adverse experience as a result of the COVID-19 pandemic occurred prior to the valuation. In addition, Scheme mortality rates have been broadly in line with, if slightly lighter than, mortality rates expected in 2021 suggesting any impact of COVID-19 was relatively modest. This is consistent with the approach taken at the 2021 valuation where we carried out our experience analysis based on the full three years of experience.