Enclosure 6
Ameren Nuclear Decommissioning Trust
Results of Asset/Liability Study and
Funding Adequacy Analysis - Fall 2023

(14 pages follow this cover page)

Ameren Nuclear Decommissioning Trust

Results of Asset/Liability Study and Funding Adequacy Analysis

Willis Towers Watson

Fall 2023 Amended

wtw

Amended Attachment 4

Modeling Assumptions – Cost Projections

- Projection of decommissioning costs in 2023 dollars provided by TLG increased to $1,098 million (2020 cost was $1,047)

Costs in 2023 dollars (000s)

Year	Plant	IFSI	Total	Break Even Case: Cumulative Annualized Escalation Factor	Break Even Case: Total Escalated Cost ($000)
2023	0	0	0	4.53%	0
2024	0	0	0	4.71%	0
2025	0	0	0	4.79%	0
2026	0	0	0	4.84%	0
2027	0	0	0	4.83%	0
2028	0	0	0	4.85%	0
2029	0	0	0	4.86%	0
2030	0	0	0	4.86%	0
2031	0	0	0	4.87%	0
2032	0	0	0	4.88%	0
2033	0	0	0	4.85%	0
2034	0	0	0	4.83%	0
2035	0	0	0	4.83%	0
2036	0	0	0	4.83%	0
2037	0	0	0	4.84%	0
2038	0	0	0	4.83%	0
2039	0	0	0	4.81%	0
2040	0	0	0	4.79%	0
2041	0	0	0	4.79%	0
2042	0	0	0	4.78%	0
2043	0	0	0	4.78%	0
2044	22,579	0	22,579	4.78%	63,054
2045	125,110	0	125,110	4.77%	365,434
2046	210,225	0	210,225	4.76%	641,270
2047	221,397	0	221,397	4.73%	703,378
2048	141,758	0	141,758	4.72%	470,183
2049	139,353	0	139,353	4.72%	483,625
2050	97,305	10,556	107,861	4.71%	391,827
2051	53,107	330	53,437	4.71%	202,788
2052	61,535	1,160	62,695	4.70%	248,699
2053	13,282	250	13,532	4.70%	56,171

Amended Attachment 4

Modeling Assumptions – Asset Projections

- Projection of decommissioning costs in 2023 dollars provided by TLG increased to $1,098 million (2020 cost was $1,047)

	Break Even Case	
Year	Total Escalated Cost ($000)	Market Value ($000)
2023	0	1,075,240
2024	0	1,117,974
2025	0	1,174,500
2026	0	1,234,702
2027	0	1,282,264
2028	0	1,341,291
2029	0	1,390,333
2030	0	1,455,507
2031	0	1,522,215
2032	0	1,596,195
2033	0	1,669,821
2034	0	1,746,076
2035	0	1,828,177
2036	0	1,920,179
2037	0	2,017,363
2038	0	2,129,106
2039	0	2,240,870
2040	0	2,351,915
2041	0	2,488,477
2042	0	2,616,334
2043	0	2,745,530
2044	63,054	2,843,291
2045	365,434	2,903,954
2046	641,270	2,662,940
2047	703,378	2,149,667
2048	470,183	1,568,726
2049	483,625	1,180,953
2050	391,827	766,752
2051	202,788	450,749
2052	248,699	281,508
2053	56,171	77,211

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Capital Market Assumptions

Summary assumptions for July 1, 2023 Towers Watson Investment Services						
	1st Year Returns	10th Year Returns	10 Year Returns	31st Year Returns	31 Year Returns	Annual Risk
	Arithmetic Mean	Arithmetic Mean	Geometric Mean	Arithmetic Mean	Geometric Mean	Standard Deviation
US Large Cap Equity	9.6%	8.8%	7.2%	8.8%	7.0%	17.9%
Government/Credit	5.5%	3.5%	3.8%	4.9%	4.3%	4.0%
Cash	4.6%	3.8%	3.8%	4.2%	3.9%	3.1%
Inflation	3.0%	2.5%	2.5%	2.5%	2.5%	2.4%

- Asset classes are described by their returns, volatility, and correlation with other asset classes
- Expectations for individual asset classes were developed by the WTW Investment Model as of July 2023
- Return assumptions are net of 15 bps of management fees
- Return distributions incorporate fat tails
  - Our asset model switches among different states of normal and stressed market conditions
  - “Regime switching” creates more frequent and severe downside events (“fat tails”) than would have occurred under a normal (or lognormal) distribution and allows for converging correlations
- Simulated government yield curves and simulated corporate spreads are used in developing liability discount rates and returns on fixed income
- For additional background on WTW’s views and assumptions, please consult the most recent Asset Return Assumptions paper

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Asset Projections - Assumptions

- Starting assets at 6/30/2023 are $1,075M

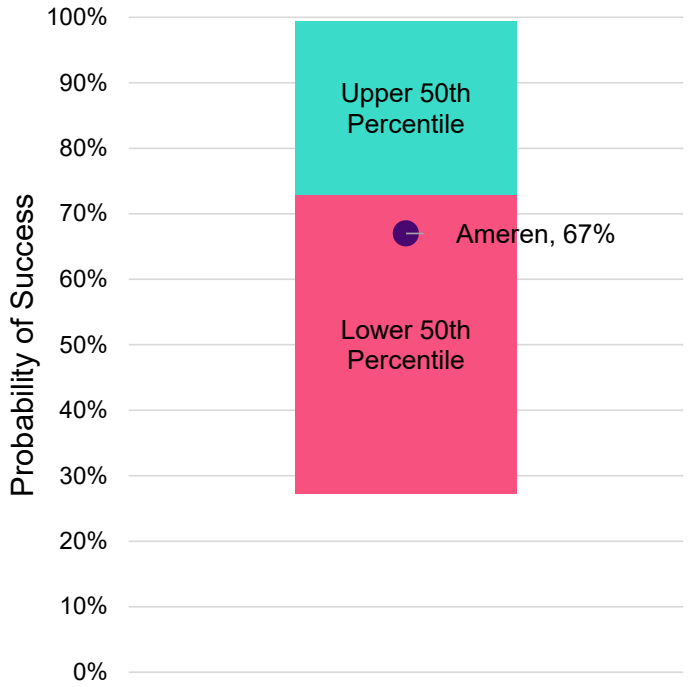
	Market Value ($M)	Book Value ($M)	Target Allocation
US Government/Credit Bonds	346	385	35%
Large Cap US Equity	729	185	65%
Total	1,075	570	100%

- Assets are projected in each year and vary with:
  - Simulated asset returns
  - Simulated costs
- The asset allocation is rebalanced on an annual basis with a 5% reallocation band
- Contributions of $6.8M per year until decommissioning begins
- As decommissioning approaches, the asset allocation de-risks
  - 5 years of future cumulative decommissioning costs as a % of assets, at that time, are invested in 50% fixed income and 50% cash

- Tax Assumptions
  - Assumed Tax Rate: 20%
  - Pay out of capital gains taxes annually (calculated using simulated market value in excess of simulated book)
  - Assets sold as a result of routine annual turnover
  - Assets are assumed to rebalance back to the target allocation annually
  - Assets sold in order to pay decommissioning costs
    - Costs paid by asset class in proportion to the amount in excess of target allocation prior to annual rebalance in the interest of minimizing taxes paid
  - Pay out income taxes annually
    - Income assumed: ~2% dividend for equity; simulated yield for fixed income

NDT Funding Analysis – Summary

Compared to 31 Nuclear Power units



- Ameren's probability of success to having enough money to fund the decommissioning of Callaway in 2044 using the DECON method is 67%.
- This compares favorably with peer universe of nuclear reactors studied by Willis Towers Watson whose median probability of success is 73%.
- CONCLUSION: The current funding level of $6.8 million is sufficient to provide reasonable assurance under most economic scenarios that there will be adequate funds available to decommission Callaway.

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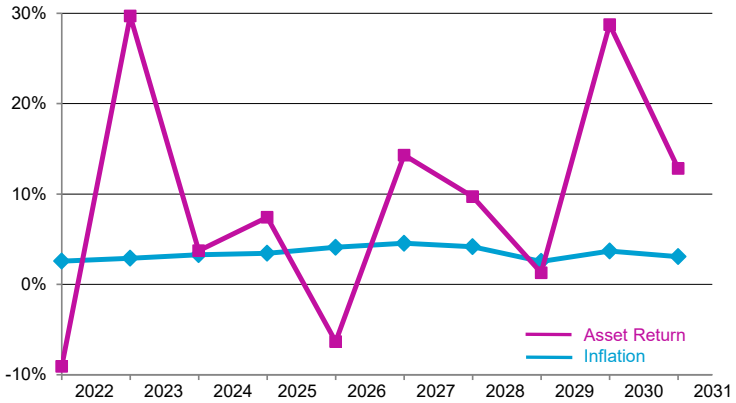
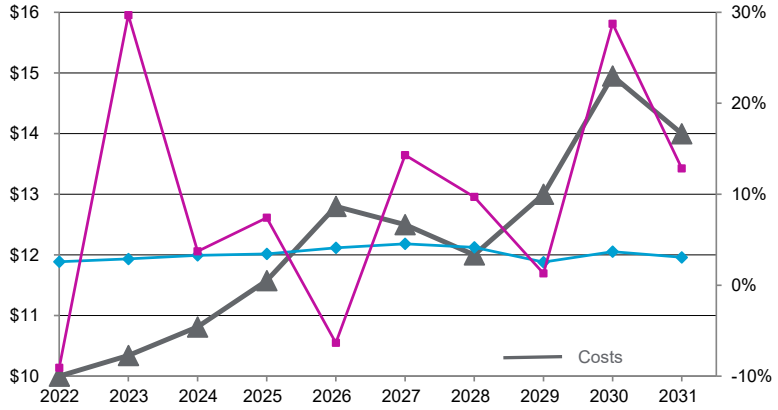
How Does Willis Towers Watson Model Work?

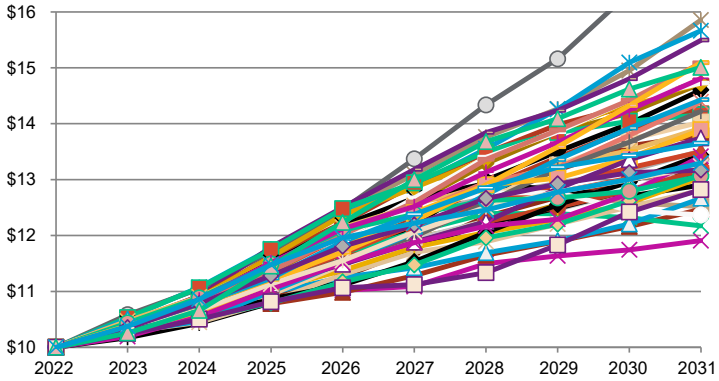
1. Project Future Economic Environments



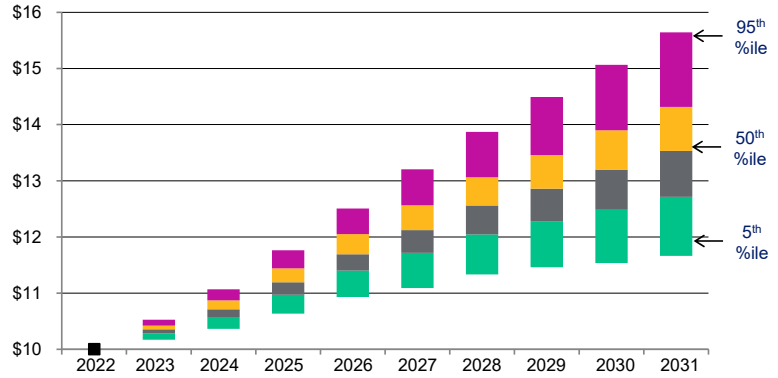
2. Project Costs at Each Future Year



3. Repeat 5,000 Times



4. Rank Results



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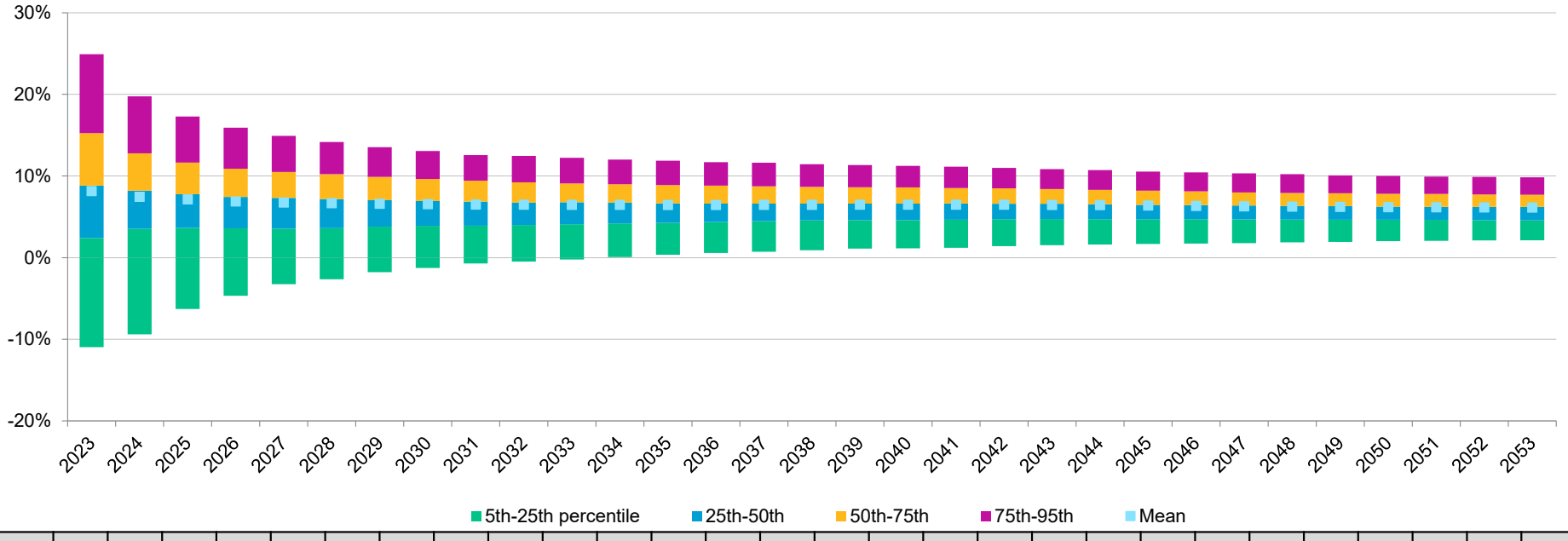
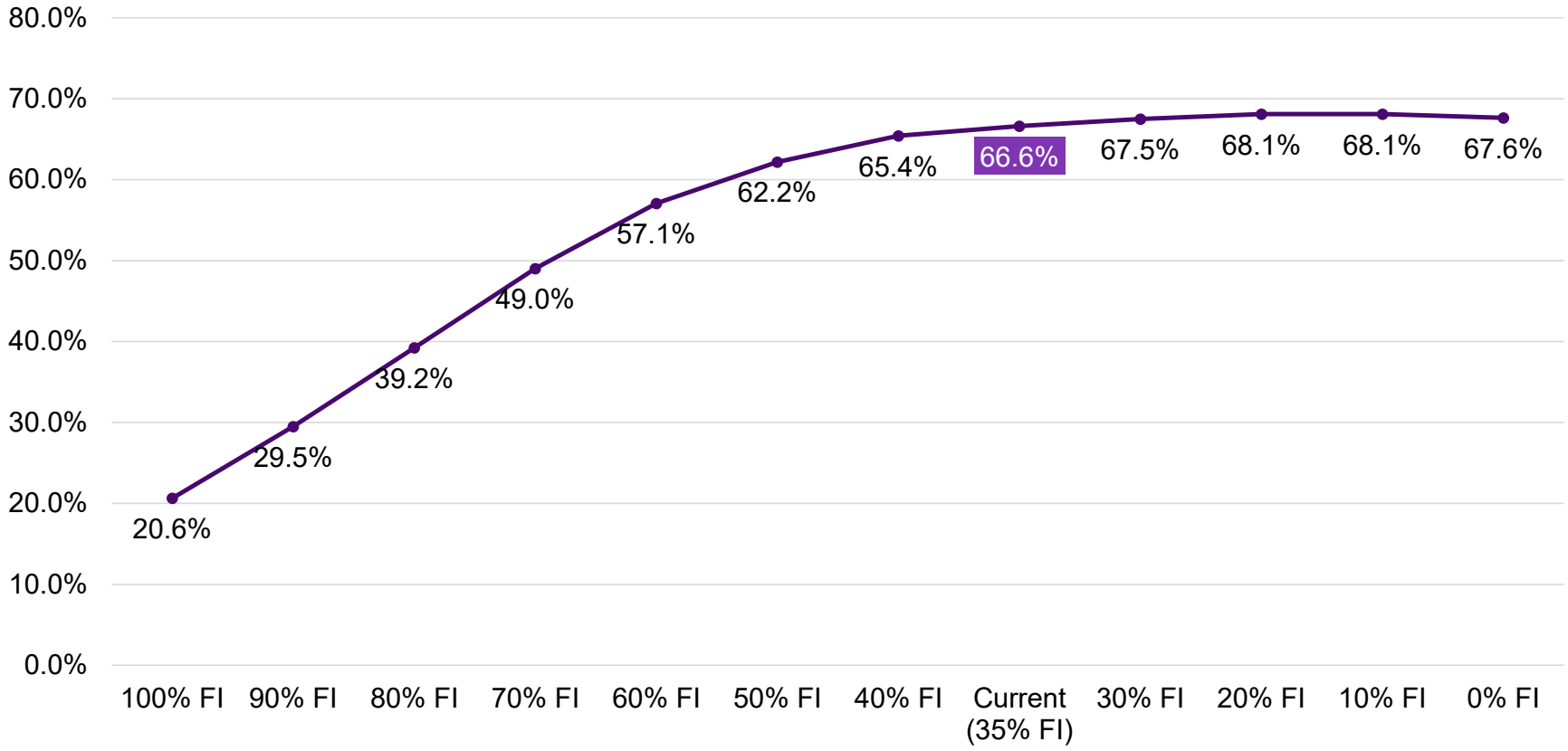
Annualized Total Trust Compound Return



Percentile	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052
5th	-11.0%	-9.4%	-6.3%	-4.7%	-3.2%	-2.6%	-1.8%	-1.3%	-0.7%	-0.5%	-0.2%	0.1%	0.4%	0.6%	0.7%	0.9%	1.1%	1.1%	1.2%	1.4%	1.5%	1.6%	1.7%	1.7%	1.8%	1.9%	1.9%	2.0%	2.1%	2.1%
25th	2.4%	3.5%	3.7%	3.6%	3.6%	3.6%	3.8%	3.9%	3.9%	4.0%	4.1%	4.2%	4.3%	4.4%	4.5%	4.6%	4.6%	4.6%	4.7%	4.7%	4.7%	4.7%	4.7%	4.7%	4.7%	4.7%	4.7%	4.7%	4.6%	4.6%
50th	8.8%	8.2%	7.8%	7.5%	7.3%	7.2%	7.0%	6.9%	6.9%	6.8%	6.8%	6.7%	6.7%	6.6%	6.6%	6.6%	6.6%	6.6%	6.6%	6.6%	6.6%	6.5%	6.5%	6.4%	6.4%	6.3%	6.3%	6.3%	6.2%	6.2%
75th	15.2%	12.8%	11.6%	10.9%	10.5%	10.2%	9.9%	9.6%	9.4%	9.2%	9.1%	9.0%	8.9%	8.8%	8.7%	8.7%	8.6%	8.6%	8.5%	8.5%	8.4%	8.3%	8.2%	8.1%	8.0%	7.9%	7.9%	7.8%	7.8%	7.8%
95th	24.9%	19.8%	17.3%	15.9%	14.9%	14.2%	13.5%	13.1%	12.6%	12.5%	12.2%	12.0%	11.9%	11.7%	11.6%	11.4%	11.3%	11.2%	11.1%	11.0%	10.8%	10.7%	10.5%	10.4%	10.3%	10.2%	10.1%	10.0%	9.9%	9.9%

Amended Attachment 4

Probability of Success – Asset Allocation



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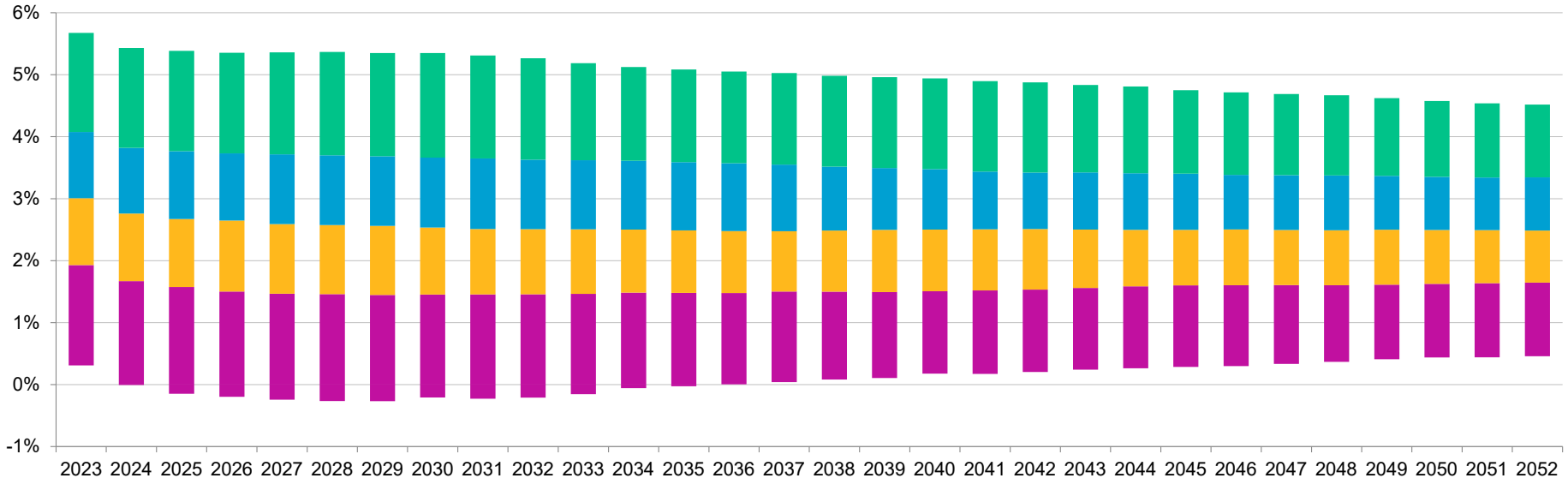
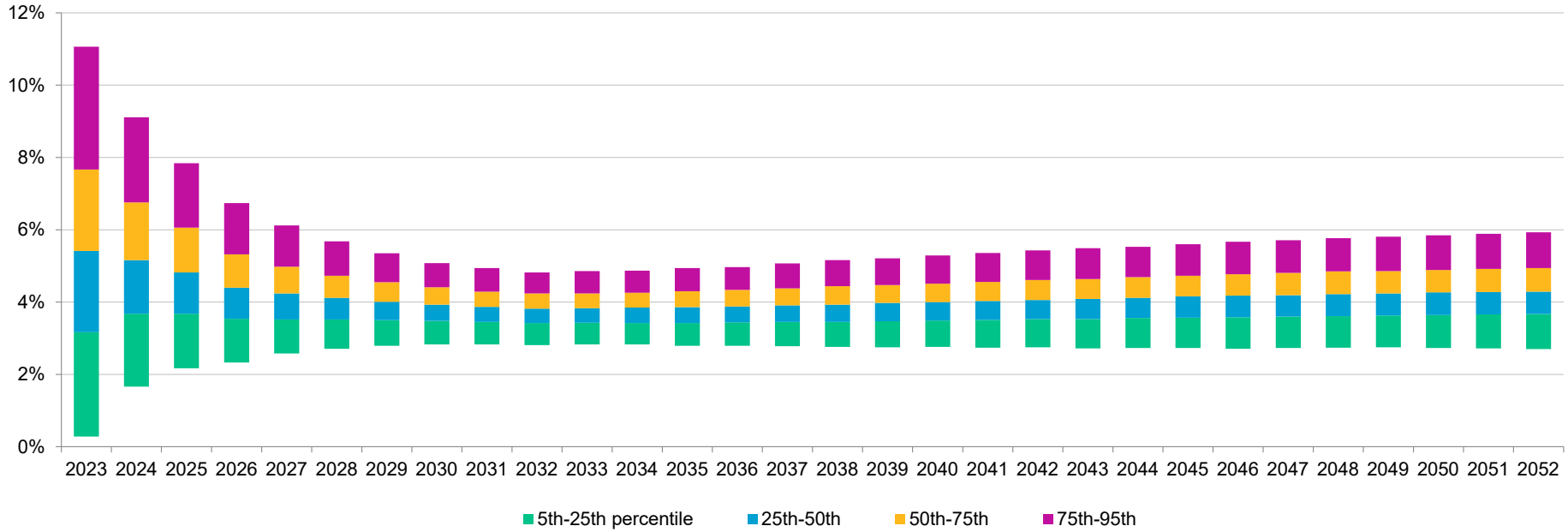
Annualized Inflation



Percentile	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052
5th	0.3%	0.0%	-0.1%	-0.2%	-0.2%	-0.3%	-0.3%	-0.2%	-0.2%	-0.2%	-0.2%	-0.1%	0.0%	0.0%	0.0%	0.1%	0.1%	0.2%	0.2%	0.2%	0.2%	0.3%	0.3%	0.3%	0.3%	0.4%	0.4%	0.4%	0.4%	0.5%
25th	1.9%	1.7%	1.6%	1.5%	1.5%	1.5%	1.4%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.6%	1.6%	1.6%	1.6%	1.6%	1.6%	1.6%	1.6%	1.6%	1.6%
50th	3.0%	2.8%	2.7%	2.6%	2.6%	2.6%	2.6%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%
75th	4.1%	3.8%	3.8%	3.7%	3.7%	3.7%	3.7%	3.7%	3.6%	3.6%	3.6%	3.6%	3.6%	3.6%	3.5%	3.5%	3.5%	3.5%	3.4%	3.4%	3.4%	3.4%	3.4%	3.4%	3.4%	3.4%	3.4%	3.4%	3.3%	3.3%
95th	5.7%	5.4%	5.4%	5.4%	5.4%	5.4%	5.3%	5.3%	5.3%	5.3%	5.2%	5.1%	5.1%	5.0%	5.0%	5.0%	5.0%	4.9%	4.9%	4.9%	4.8%	4.8%	4.7%	4.7%	4.7%	4.7%	4.6%	4.6%	4.5%	4.5%

Amended Attachment 4

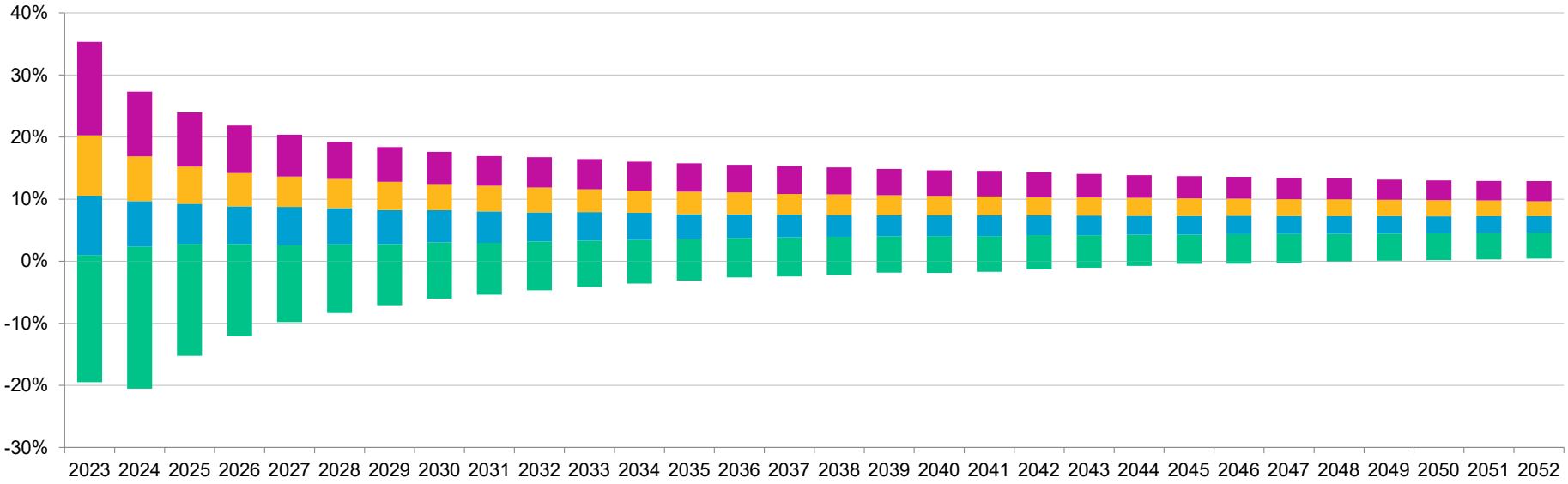
Annualized Bond Compound Return



Percentile	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052
5th	0.3%	1.7%	2.2%	2.3%	2.6%	2.7%	2.8%	2.8%	2.8%	2.8%	2.8%	2.8%	2.8%	2.8%	2.8%	2.8%	2.7%	2.8%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%
25th	3.2%	3.7%	3.7%	3.5%	3.5%	3.5%	3.5%	3.5%	3.4%	3.4%	3.4%	3.4%	3.4%	3.4%	3.4%	3.4%	3.5%	3.5%	3.5%	3.5%	3.5%	3.6%	3.6%	3.6%	3.6%	3.6%	3.6%	3.6%	3.7%	3.7%
50th	5.4%	5.2%	4.8%	4.4%	4.2%	4.1%	4.0%	3.9%	3.9%	3.8%	3.8%	3.8%	3.9%	3.9%	3.9%	3.9%	4.0%	4.0%	4.0%	4.1%	4.1%	4.1%	4.2%	4.2%	4.2%	4.2%	4.2%	4.3%	4.3%	4.3%
75th	7.7%	6.8%	6.1%	5.3%	5.0%	4.7%	4.5%	4.4%	4.3%	4.2%	4.2%	4.3%	4.3%	4.3%	4.4%	4.4%	4.5%	4.5%	4.6%	4.6%	4.6%	4.7%	4.7%	4.8%	4.8%	4.9%	4.9%	4.9%	4.9%	4.9%
95th	11.1%	9.1%	7.8%	6.7%	6.1%	5.7%	5.4%	5.1%	4.9%	4.8%	4.9%	4.9%	4.9%	5.0%	5.1%	5.2%	5.2%	5.3%	5.4%	5.4%	5.5%	5.5%	5.6%	5.7%	5.7%	5.8%	5.8%	5.8%	5.9%	5.9%

Amended Attachment 4

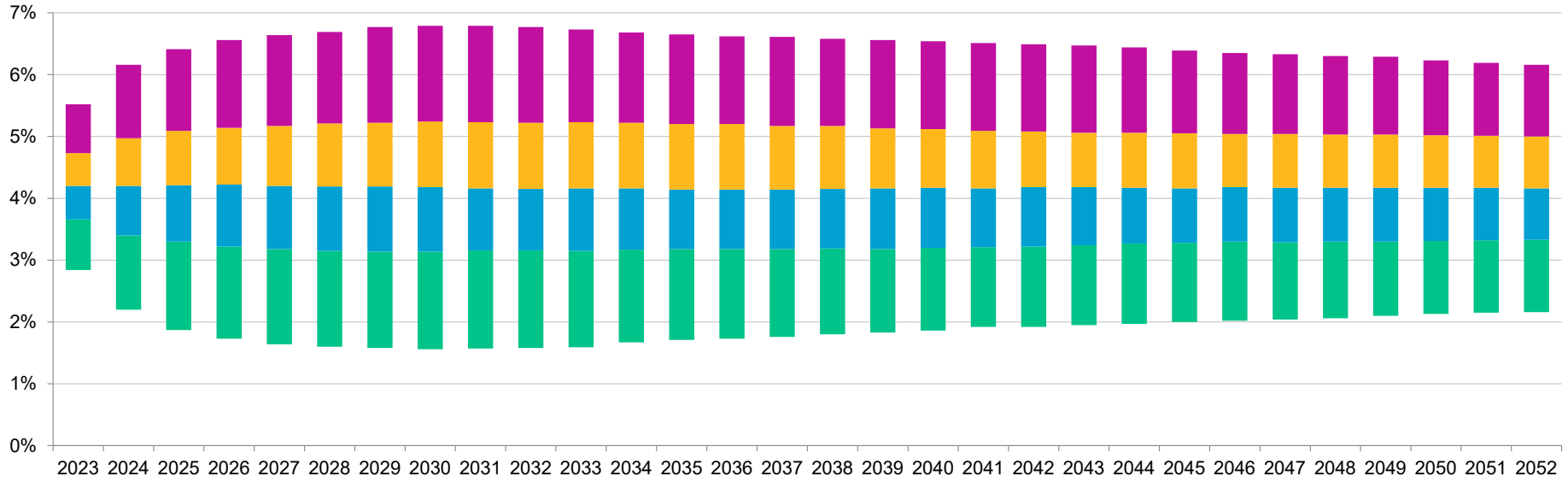
Annualized Equity Compound Return



Percentile	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052
5th	-19.5%	-20.5%	-15.2%	-12.1%	-9.8%	-8.3%	-7.1%	-6.0%	-5.4%	-4.7%	-4.2%	-3.6%	-3.1%	-2.6%	-2.4%	-2.2%	-1.8%	-1.9%	-1.7%	-1.3%	-1.0%	-0.8%	-0.4%	-0.4%	-0.3%	-0.1%	0.1%	0.2%	0.3%	0.4%
25th	1.0%	2.4%	2.8%	2.8%	2.6%	2.7%	2.8%	3.1%	3.0%	3.2%	3.3%	3.4%	3.6%	3.8%	3.8%	3.9%	4.0%	4.1%	4.1%	4.2%	4.2%	4.3%	4.3%	4.4%	4.4%	4.4%	4.4%	4.5%	4.5%	4.6%
50th	10.6%	9.7%	9.3%	8.9%	8.7%	8.6%	8.3%	8.2%	8.0%	7.9%	7.9%	7.8%	7.6%	7.5%	7.5%	7.5%	7.4%	7.4%	7.4%	7.4%	7.4%	7.3%	7.3%	7.3%	7.3%	7.3%	7.3%	7.2%	7.3%	7.2%
75th	20.3%	16.9%	15.2%	14.2%	13.6%	13.2%	12.8%	12.4%	12.2%	11.9%	11.6%	11.3%	11.2%	11.1%	10.8%	10.8%	10.6%	10.5%	10.4%	10.3%	10.3%	10.2%	10.1%	10.1%	10.0%	10.0%	9.9%	9.8%	9.8%	9.7%
95th	35.3%	27.3%	24.0%	21.9%	20.4%	19.2%	18.4%	17.6%	16.9%	16.7%	16.4%	16.0%	15.8%	15.5%	15.3%	15.1%	14.8%	14.6%	14.5%	14.3%	14.0%	13.9%	13.7%	13.6%	13.4%	13.3%	13.1%	13.0%	12.9%	12.9%

Amended Attachment 4

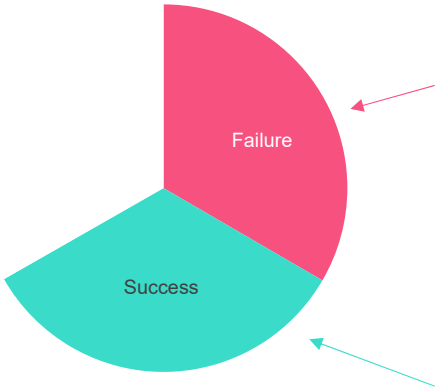
Annualized Cost Escalation



Percentile	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052
5th	2.8%	2.2%	1.9%	1.7%	1.6%	1.6%	1.6%	1.6%	1.6%	1.6%	1.6%	1.7%	1.7%	1.7%	1.8%	1.8%	1.8%	1.9%	1.9%	1.9%	2.0%	2.0%	2.0%	2.0%	2.0%	2.1%	2.1%	2.1%	2.2%	2.2%
25th	3.7%	3.4%	3.3%	3.2%	3.2%	3.2%	3.1%	3.1%	3.2%	3.2%	3.2%	3.2%	3.2%	3.2%	3.2%	3.2%	3.2%	3.2%	3.2%	3.2%	3.2%	3.3%	3.3%	3.3%	3.3%	3.3%	3.3%	3.3%	3.3%	3.3%
50th	4.2%	4.2%	4.2%	4.2%	4.2%	4.2%	4.2%	4.2%	4.2%	4.1%	4.2%	4.2%	4.1%	4.1%	4.1%	4.1%	4.2%	4.2%	4.2%	4.2%	4.2%	4.2%	4.2%	4.2%	4.2%	4.2%	4.2%	4.2%	4.2%	4.2%
75th	4.7%	5.0%	5.1%	5.1%	5.2%	5.2%	5.2%	5.2%	5.2%	5.2%	5.2%	5.2%	5.2%	5.2%	5.2%	5.2%	5.1%	5.1%	5.1%	5.1%	5.1%	5.1%	5.1%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
95th	5.5%	6.2%	6.4%	6.6%	6.6%	6.7%	6.8%	6.8%	6.8%	6.8%	6.7%	6.7%	6.7%	6.6%	6.6%	6.6%	6.6%	6.5%	6.5%	6.5%	6.5%	6.4%	6.4%	6.4%	6.3%	6.3%	6.3%	6.2%	6.2%	6.2%

Amended Attachment 4

Contribution Justification – 20 CSR 4240.20.070



Of the 5,000 simulations examined, 1,669 (33%) did not have enough assets to fund all costs. Of the failure simulations, the average cost remaining was $132 million in 2023 dollars

When looking at the next 1,669 simulations (in surplus order) the average asset surplus was $142 million in 2023 dollars

WTW does not believe the trust is over funded since the asset surplus level of the first third of successful simulations is a similar level as the remaining costs in the scenarios where there were not sufficient assets

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