



Draft Water Resources Management Plan 2024

Technical Appendix X - Investment Model
Outputs



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Background and Introduction

- X.1 Appendix X provides additional information and summary outputs produced by the WRSE Investment Model (IVM).
- X.2 There are two sub-sections:
- Regional supply demand balance outputs
 - IVM run dossiers

Regional Supply Demand Balance Outputs

- X.3 Section 6 of the main report identified the baseline supply demand balance (SDB) deficits which we face based on the situation tree selected as the basis for the draft WRMP24.
- X.4 Below we show the before and after SDB position (DYAA, 1:500) of the Overall Best Value Plan across the region. It clearly shows that with the regional plan proposals in place, of which the dWRMP24 is a breakdown, the forecast significant deficits are met and overcome.
- X.5 The key for the figures is as follows – with the numbers being supply demand balance surplus or deficits, in Ml/d).

-200	-150	-100	-75	-50	-25	-10	-5	0	5	10	25	50
-200	-150	-100	-75	-50	-25	-10	-5	0	5	10	25	50

Figure X - 1: 2026 SDB by WRZ (DYAA 1:500) – BEFORE (left), AFTER (right)

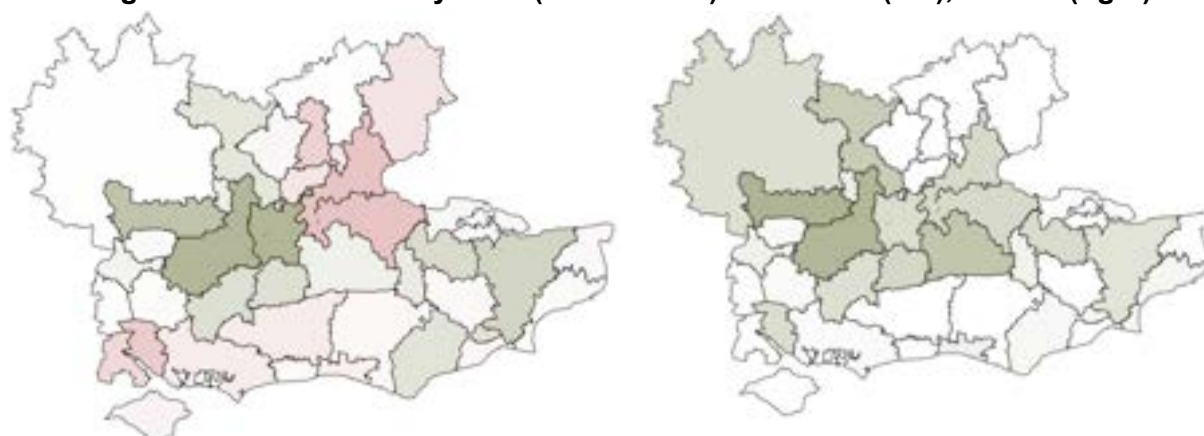


Figure X - 2: 2040 SDB by WRZ (DYAA 1:500) – BEFORE (left), AFTER (right)

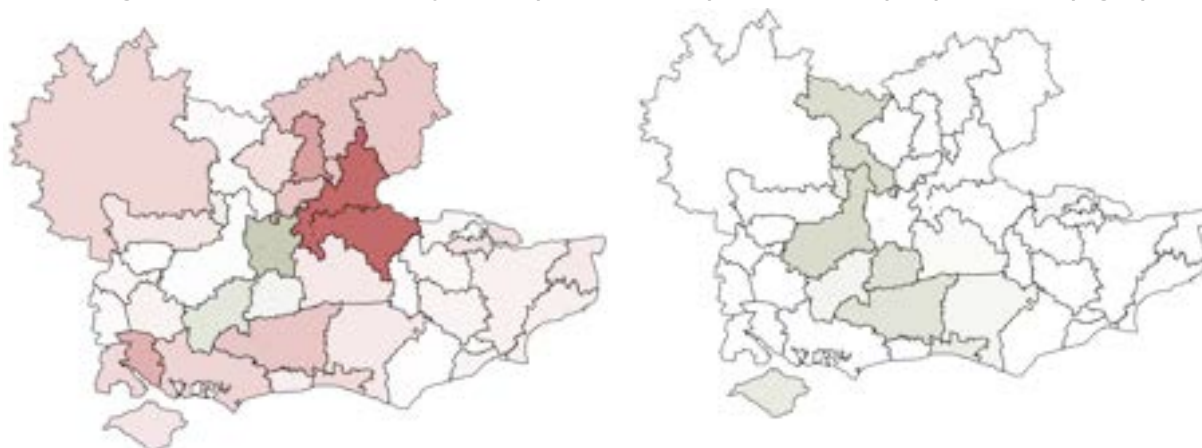


Figure X - 3: 2060 SDB by WRZ (DYAA 1:500) – BEFORE (left), AFTER (right)

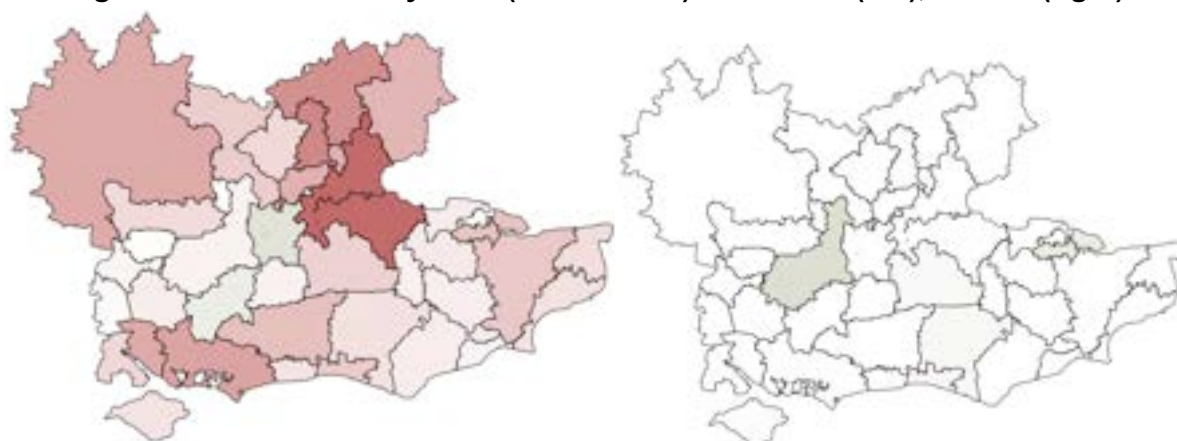
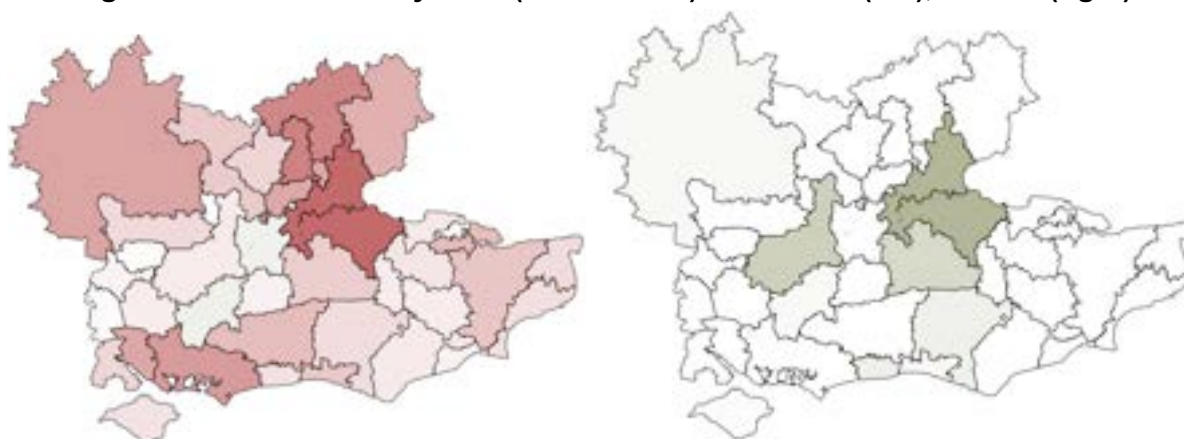


Figure X - 4: 2075 SDB by WRZ (DYAA 1:500) – BEFORE (left), AFTER (right)



IVM Run Dossiers

X.6 Each run dossier contains information from the IVM on:

- Metadata – How the run is configured
- Metrics – Information and breakdowns for all the metrics in the categories Cost, Environmental and Social (including Carbon) and Resilience
- Scheme plots – Bubble charts of options by pathway
- Option type utilisation
- Sankey plots
- Hex plots

X.7 Please note that the Metadata, metric information and Hex plots are **only available at regional-level**. The scheme plots, utilisation plots and Sankey plots are at **company-level**.

X.8 There is a dossier for each of the following model runs cited in Section 10:

- Overall Best Value Plan
- Cost-based
 - Least Cost Plan (STPR)
- Wider BVP Metric-based
 - Best Environmental and Social Plan
 - Resilience-focused Plan
 - General BVP Uplift Plan
- Sensitivity analysis
 - Option availability/capability:
 - No SESRO
 - No Teddington DRA
 - Only SESRO 125Mm³ available
 - Only SESRO 100Mm³ available
 - Only SESRO 75Mm³ available
 - Force STT300 pipeline
 - Force STT400 pipeline
 - Force STT500 pipeline
 - Gateway 50 MI/d
 - Gateway 50 MI/d (only SESRO 100Mm³ available)
 - Drought Resilience policy date changes



- 1:500 in 2035 (instead of 2040)
- 1:500 in 2045 (instead of 2040)
- 1:500 in 2050 (instead of 2040)
- 1:200 in 2034 (instead of 2030)
- Government-led Demand Management Policy
 - No Government-led savings
 - Gov-led A
 - Gov-led C
 - Gov-led D
 - Gov-led E
 - Gov-led F
 - Gov-led G

Interpreting the plots

Option selection plots

- X.9 These plots show when an option is first utilised by the model along each of the 9 pathways (shown from 1-9, top to bottom), over the planning period.
- X.10 Each dot represents a single scheme, with the dots coloured by type and sized by total capacity (not utilisation, which will vary across the planning period). The focus is on resource development/transfer options. Demand management is not shown.
- X.11 An option can only be selected once in each pathway.
- X.12 The Severn-Thames transfer is classified as a Direct River Abstraction (red dot), so for example, in the Overall BVP dossier you can see a large red dot in pathways 1 and 4 (representing the unsupported transfer and Netheridge sweetening flow), in 2050 and then further smaller red dots through to the early 2060s as additional support elements are utilised.

Sankey plots

- X.13 Sankey plots provide a high-level interpretation of the supply demand balance and the relative volumetric contribution of new options by option type.
- X.14 Four time-slices are shown: 2026, 2040, 2050 and 2075.
- X.15 The colour-coding is automatic and is not consistent/relevant for this plot type.
- X.16 The option types, for clarity, include:
- Loss reduction = Demand management measures
 - Change in levels of service = Drought intervention measures (e.g. TUBs and NEUBs)
 - Direct River Abstraction includes Teddington DRA and the STT options
 - Reclaimed water = Effluent re-use

- Exports includes the Thames to Southern and Thames to Affinity transfers, although it is likely that they would not be an export from 'TW' to either company, but an arrangement based on part-ownership of different assets.

Hex plots

X.17 The hex plots illustrate how water moves into and around the region, and how this will change under the proposals in our draft plan. The hexagons in the plots are either:

- The individual water resource zones (WRZs) in the South East region, and WRZ outside of the region that provide a transfer of water either into or out of the region.
- Zones have been included for investment modelling purposes only, which represent transfer and distribution constraints in the WRSE network.

X.18 Four time-slices are shown: 2026, 2040, 2050 and 2075.

X.19 Each of the plots shows transfers at a particular point in time, under our 1:500 DYAA planning scenario. The thicker the lines between the WRZ, the larger the transfer. The plots demonstrate how increased connectivity within the region, and from other regions, will significantly increase the flow of water that is transferred over time. All of the plots represent the position under our reported pathway – situation 4.

X.20 A key for the abbreviations used in the plots is provided in the table below.

Table X - 1: Hex plot abbreviations

WRZ	Water Company	Zone Name
AZ1	Affinity Water	Misbourne
AZ2		Colne
AZ3		Lee
AZ4		Pinn
AZ5		Stort
AZ6		Wey
AZ7		Dour
PRT	Portsmouth Water	Portsmouth
SES	SES Water	SES
RZ1	South East Water	Tunbridge Wells
RZ2		Haywards Heath
RZ3		Eastbourne
RZ4		Bracknell
RZ5		Farnham
RZ6		Maidstone
RZ7		Cranbrook
RZ8		Ashford
HAZ	Southern Water	Hampshire Andover
HKZ		Hampshire Kingsclere
HRZ		Hampshire Rural
HSE		Hampshire Southampton East
HSW		Hampshire Southampton West
HWZ		Hampshire Winchester
IOW		Isle of Wight



WRZ	Water Company	Zone Name
KME		Kent Medway East
KMW		Kent Medway West
KTZ		Kent Thanet
SBZ		Sussex Brighton
SHZ		Sussex Hasting
SNZ		Sussex North
SWZ		Sussex Worthing
GUI	Thames Water	Guildford
HEN		Henley
KVZ		Kennet Valley
LON		London
SWA		Slough, Wycombe and Aylesbury
SWX		Swindon and Oxfordshire

Zone	Water Company	Zone Name
HON	Modelling purposes only	Honor Oak Junction
HTE		Havant Thicket Exchange
KGV		King George V Junction
OTT		Otterbourne Junction
PWE		Portsmouth Water East
RA4		Raw AZ4 Junction
STR		Strategic Thames Resource
STT		Severn Thames Junction
T2S		Thames to Southern Junction
TWD		Testwood Junction
TWJ		Thames-Weirwood Junction
UTC		Upper Thames Constrained
UTJ		Upper Thames Junction
WLJ		West London Junction
WWD		Weirwood Junction

IVM RUN DOSSIER

OVERALL BEST VALUE PLAN

IVM Summary: Thames Water

Metadata

General Settings

Name	st-hybrid-dy-w1-tree16.05-options-v37-gov-led-hybridb-only-sesro100-excl-twul-rsr-2075-bvp-01_00
Created at	17/08/2022, 00:29:34
Tree	tree16.05: Root and branch tree 16.05: Stage 1 - Begins Hplan and LOW LCED, Stage 2 - Branches on growth (OxCam1a, Hplan and ONS18c), Stage 3 - Branches on licenced capped environmental destination, climate change and further growth scenarios (Hmax and Hmin) 
Setting name	options-v37-gov-led-hybridb-only-sesro100-excl-twul-rsr 
Setting description	Emergency options in HSE, SBZ, and PRT. Only SESRO 100 Mm3 available. Excludes TWUL reservoirs.
Optimised discount rate	STPR

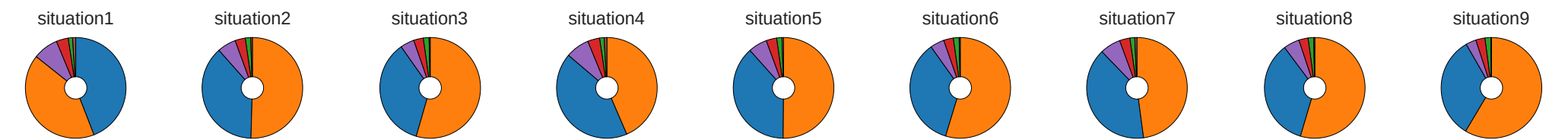
Metrics

Net present value (Cost)

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Cost w/ deficit (STPR)	16,453	12,790	11,655	15,587	12,879	11,604	13,543	11,663	10,749	(£m)
Cost w/o deficit (STPR)	16,453	12,790	11,655	15,587	12,879	11,604	13,543	11,663	10,749	(£m)
Cost w/ deficit (IGEQ)	26,544	19,742	17,666	24,913	19,919	17,578	21,289	17,791	16,103	(£m)
Cost w/o deficit (IGEQ)	26,544	19,742	17,666	24,913	19,919	17,578	21,289	17,791	16,103	(£m)
Cost w/ deficit (LTDR)	18,367	14,126	12,817	17,361	14,231	12,759	15,022	12,844	11,787	(£m)
Cost w/o deficit (LTDR)	18,367	14,126	12,817	17,361	14,231	12,759	15,022	12,844	11,787	(£m)

Cost breakdown (STPR)

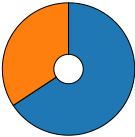
Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Capex	7,254	4,858	4,167	6,652	4,926	4,115	5,403	4,104	3,559	(£m)
Fixed opex	6,842	6,452	6,348	6,784	6,456	6,347	6,485	6,367	6,293	(£m)
Fixed operational carbon	233	223	219	231	221	220	216	209	205	(£m)
Embedded carbon	635	423	361	602	437	359	451	349	318	(£m)
Variable opex	1,325	764	519	1,183	774	521	896	594	352	(£m)
Variable carbon opex	164	70	40	134	66	41	93	40	20	(£m)



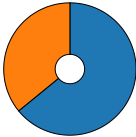
Emissions breakdown

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Capital emissions	4,063,385	2,590,399	2,176,191	3,826,117	2,669,899	2,165,614	2,828,853	2,112,622	1,901,815	(tonnes)
Operational emissions	2,118,082	1,450,845	1,279,772	1,918,402	1,417,911	1,290,727	1,557,675	1,181,092	1,064,074	(tonnes)

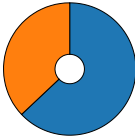
situation1



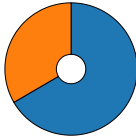
situation2



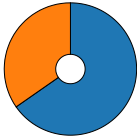
situation3



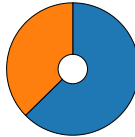
situation4



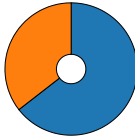
situation5



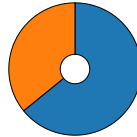
situation6



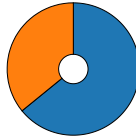
situation7



situation8



situation9



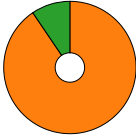
Electricity breakdown

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Generated (on site)	0	0	0	0	0	0	0	0	0	(GWh)
Grid	25,684	13,732	6,638	21,554	13,070	6,704	16,809	10,574	4,873	(GWh)
Renewable	1,986	1,436	600	1,921	1,458	626	1,347	785	162	(GWh)

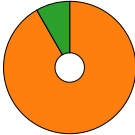
situation1



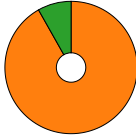
situation2



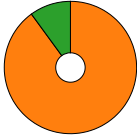
situation3



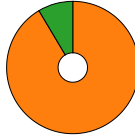
situation4



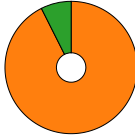
situation5



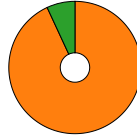
situation6



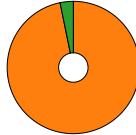
situation7



situation8



situation9



Environmental

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
SEA environmental benefit	84,252.00	78,877.00	77,171.00	83,476.00	77,480.00	77,065.00	80,836.00	76,897.00	76,642.00	
SEA environmental disbenefit	122,674.00	90,711.00	82,025.00	112,972.00	88,106.00	80,826.00	103,672.00	81,489.00	72,999.00	
Natural capital	10,163,502.36	11,611,978.30	11,979,384.83	10,790,008.09	11,946,114.20	12,223,620.49	11,408,615.74	13,632,458.24	16,165,209.99	
Bio-diversity net gain	-260,076.00	-190,310.00	-185,348.00	-260,076.00	-223,408.00	-169,801.00	-202,077.00	-159,159.00	-148,418.00	

Social

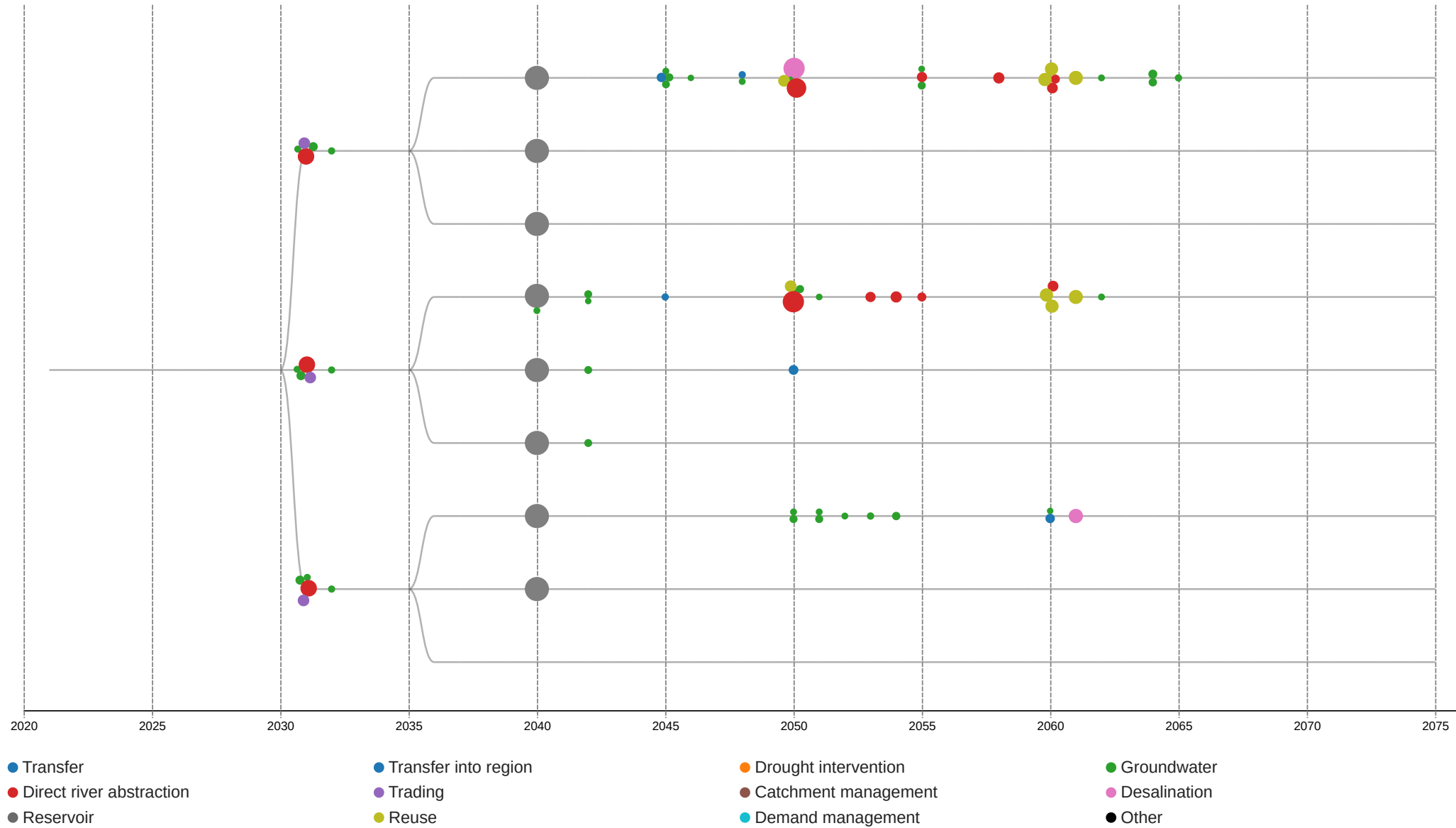
Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Customer preference	36,131.00	34,218.00	33,668.00	35,620.00	34,015.00	33,668.00	35,057.00	33,614.00	33,203.00	

Reliability

[illegible]

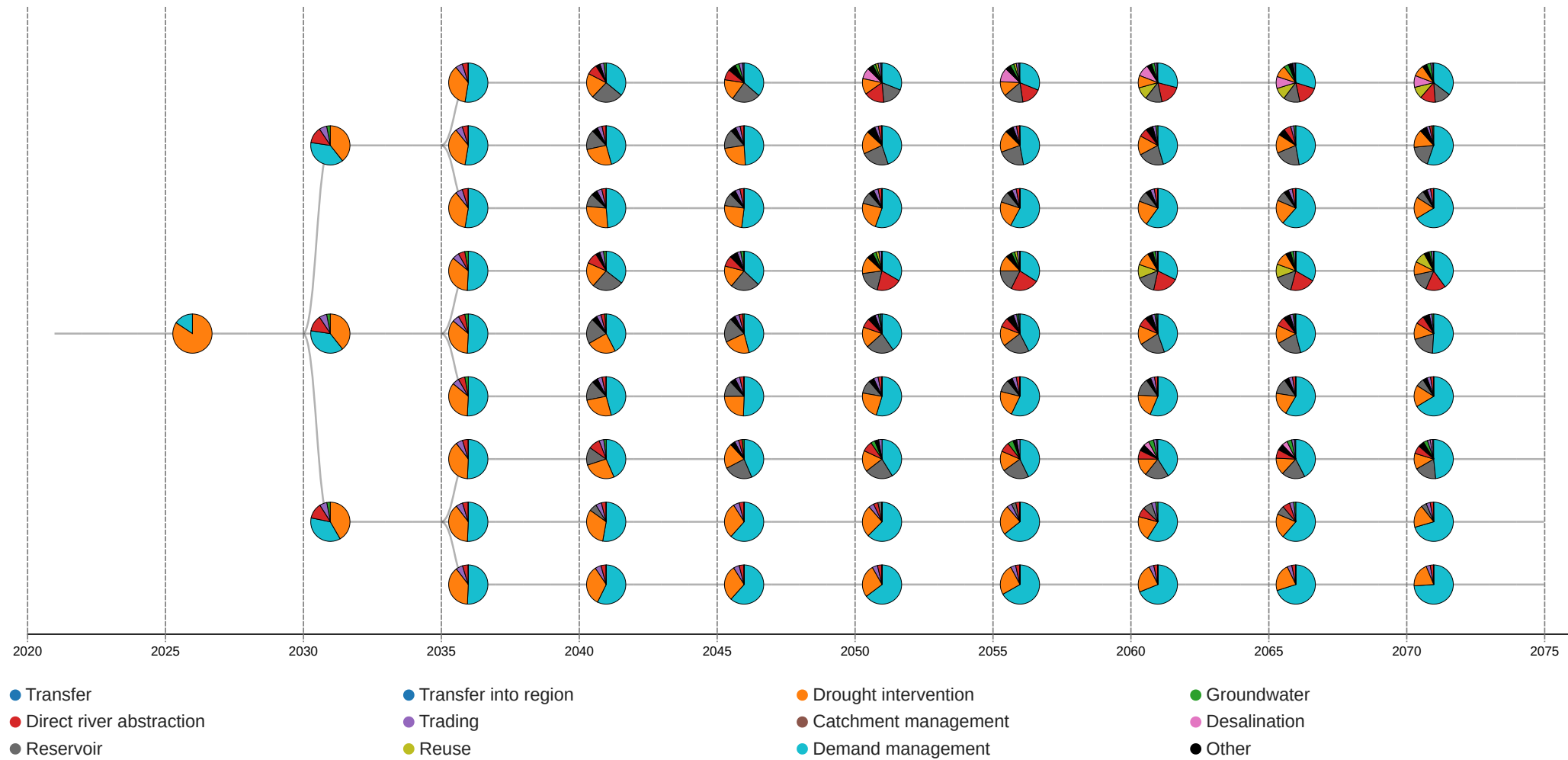
Adaptability										
Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Adaptability	19.76	21.63	24.09	20.60	21.77	23.84	21.59	23.58	27.64	
A3: Operational complexity and flexibility	10.15	10.90	12.01	10.48	10.92	11.94	10.84	11.74	13.86	
A4: WRZ connectivity	9.58	10.71	12.06	10.08	10.83	11.88	10.73	11.82	13.76	
A7: Customer relations support engagement with demand management	0.04	0.02	0.02	0.04	0.02	0.02	0.02	0.02	0.02	
Evolvability										
Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Evolvability	29.33	29.89	32.41	29.89	30.09	32.25	30.02	32.15	37.40	
E1: Scaleability and modularity of proposed changes	12.25	12.84	13.98	12.48	12.93	13.93	12.87	13.91	16.18	
E2: Intervention lead times	7.27	6.72	7.11	7.39	6.78	7.07	6.82	7.15	8.27	
E3: Reliance on external bodies to deliver changes	9.74	10.29	11.27	9.94	10.33	11.21	10.29	11.05	12.91	
E5: Collaborative land management	0.07	0.04	0.04	0.07	0.04	0.04	0.04	0.04	0.04	

Option Selection (Thames Water)

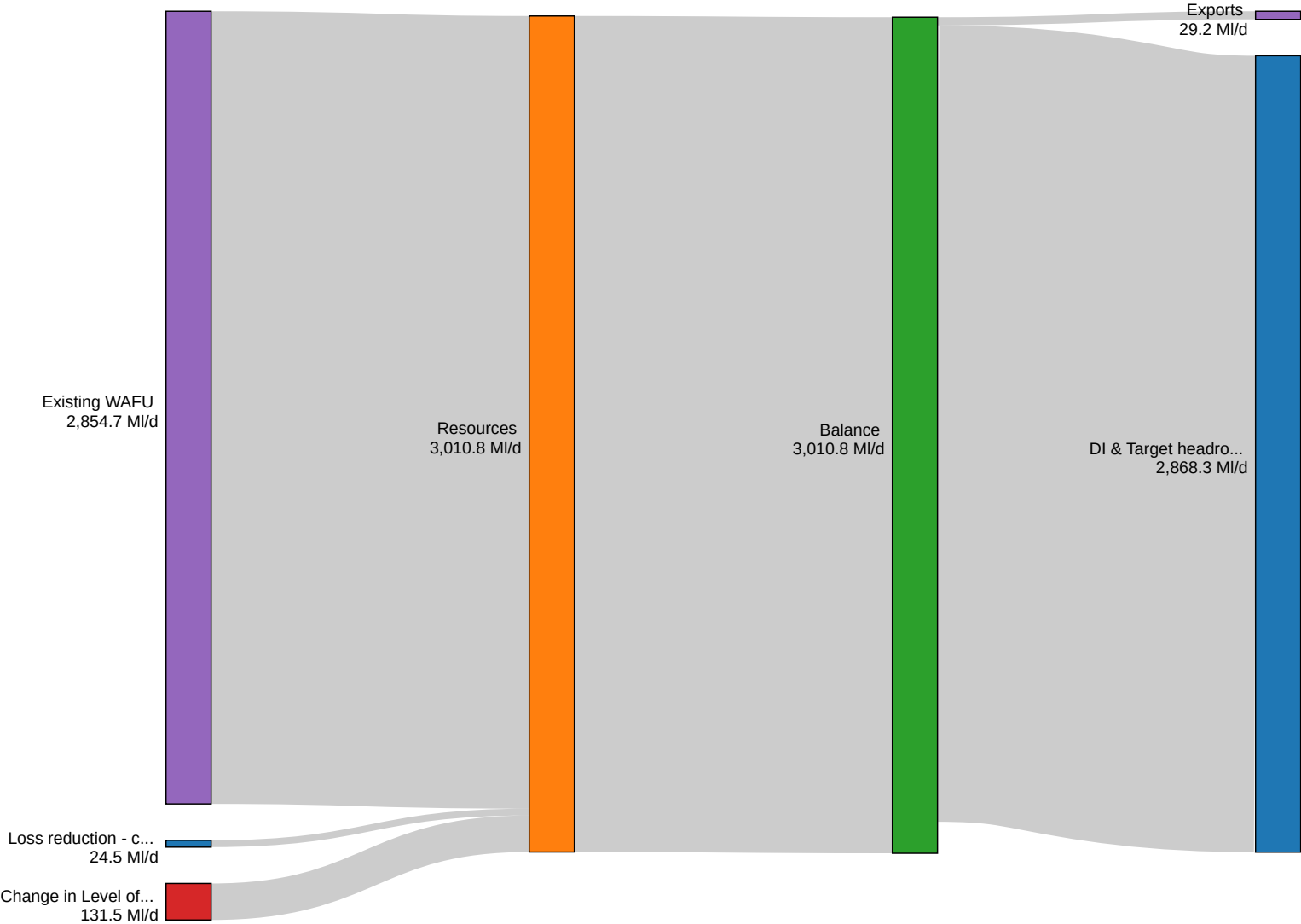


Utilisation (Thames Water)

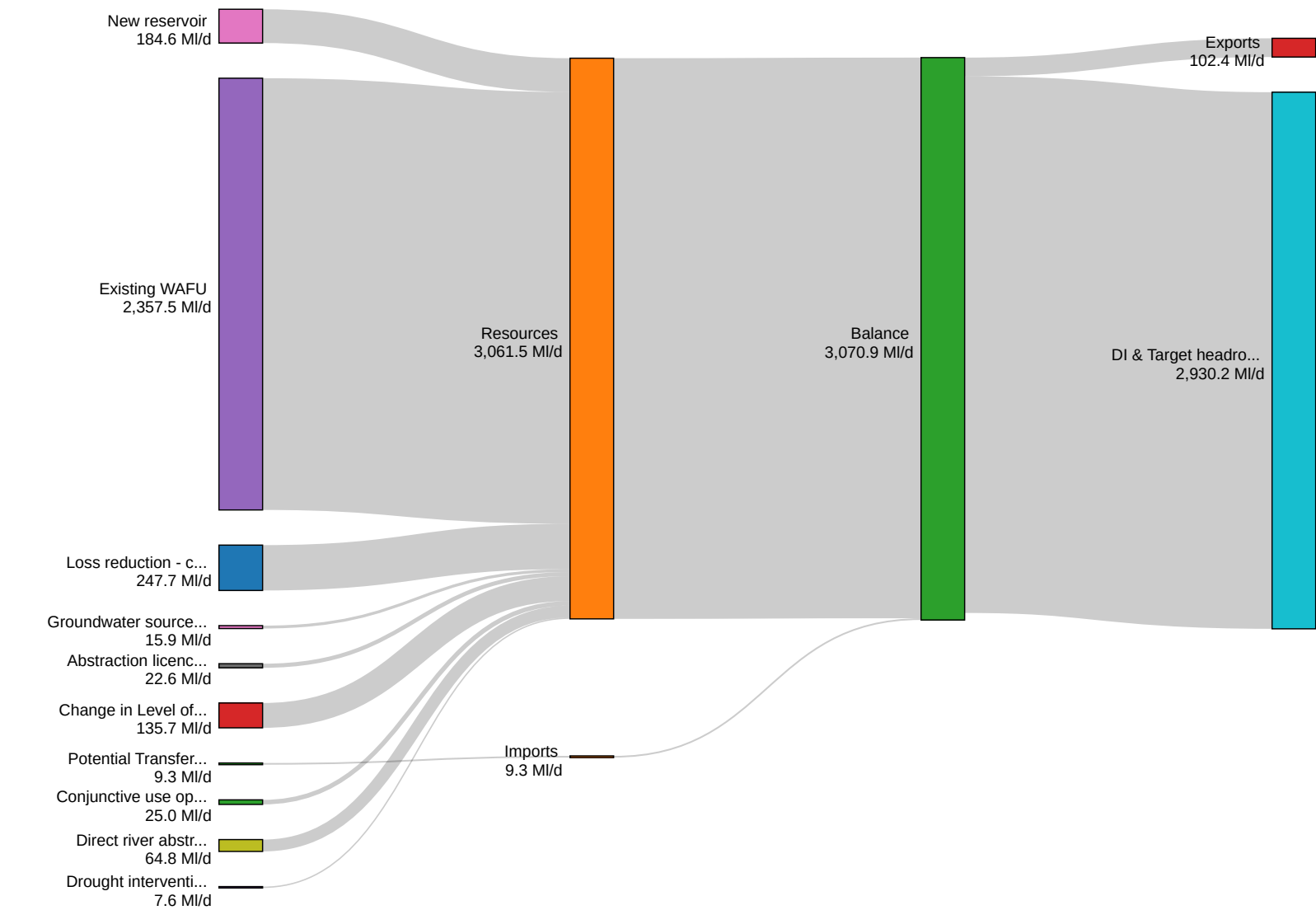
Pie charts show the breakdown of option utilisation by option category.



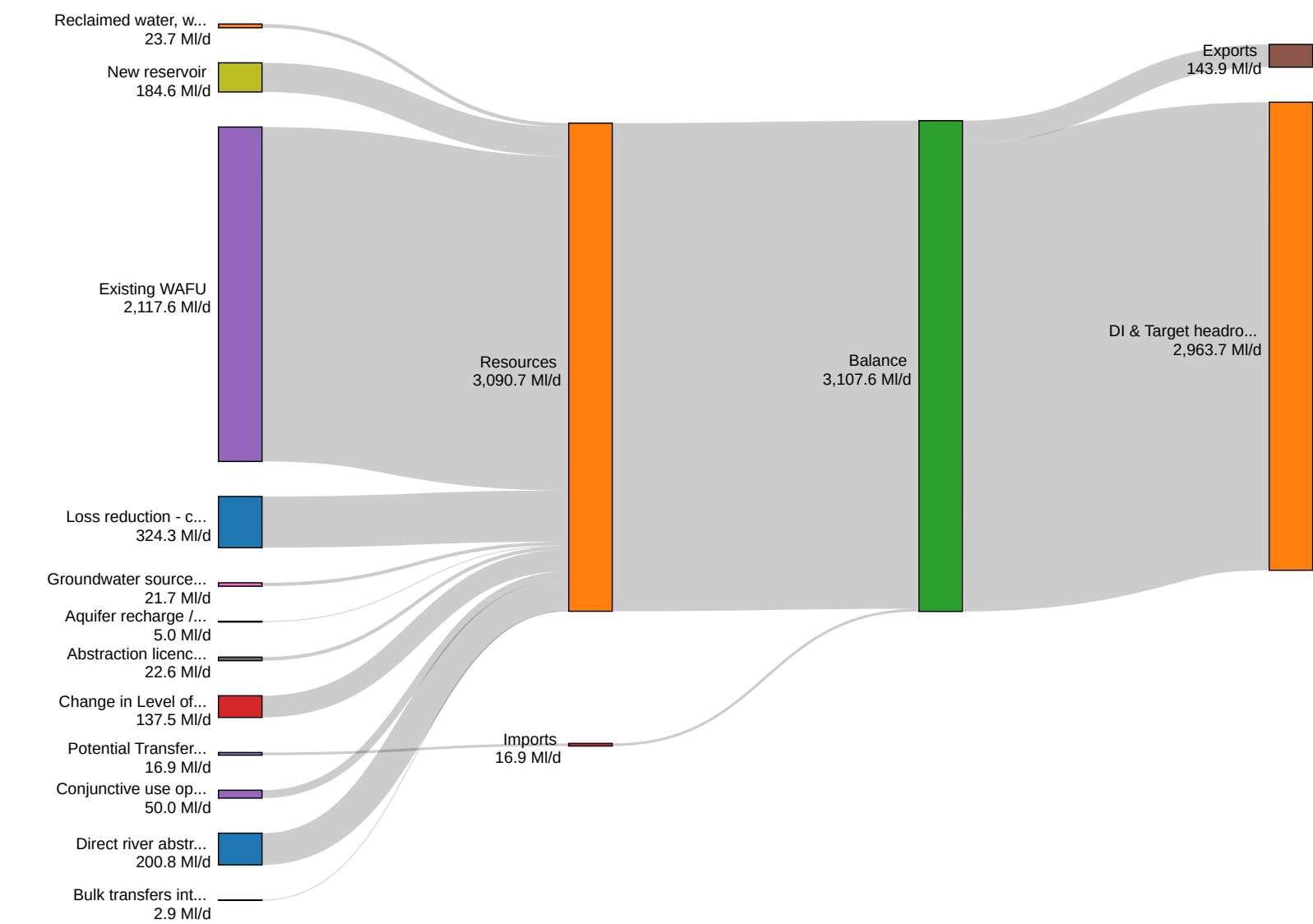
Situation 4 - 2026 (Thames Water)



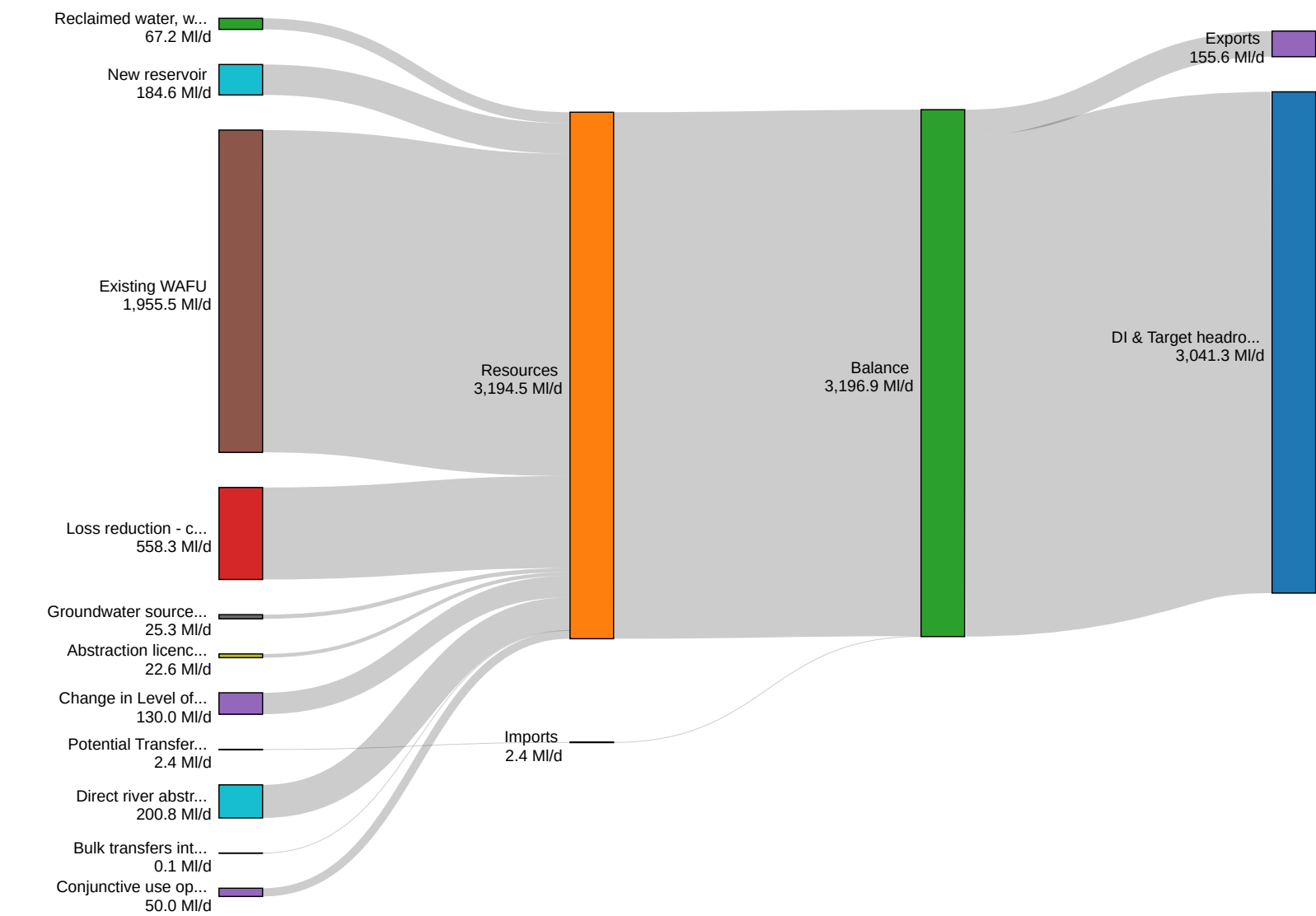
Situation 4 - 2040 (Thames Water)



Situation 4 - 2050 (Thames Water)

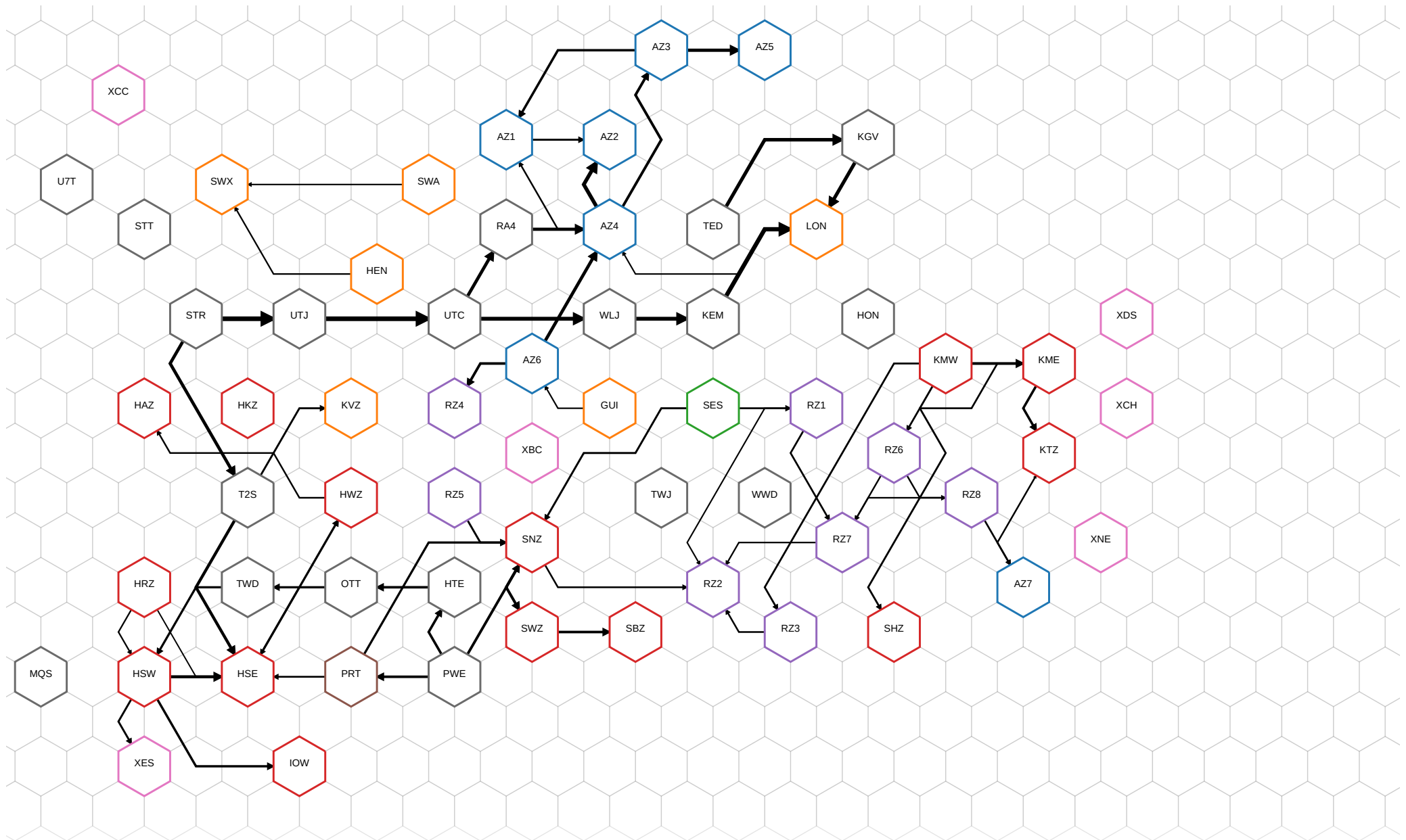


Situation 4 - 2075 (Thames Water)

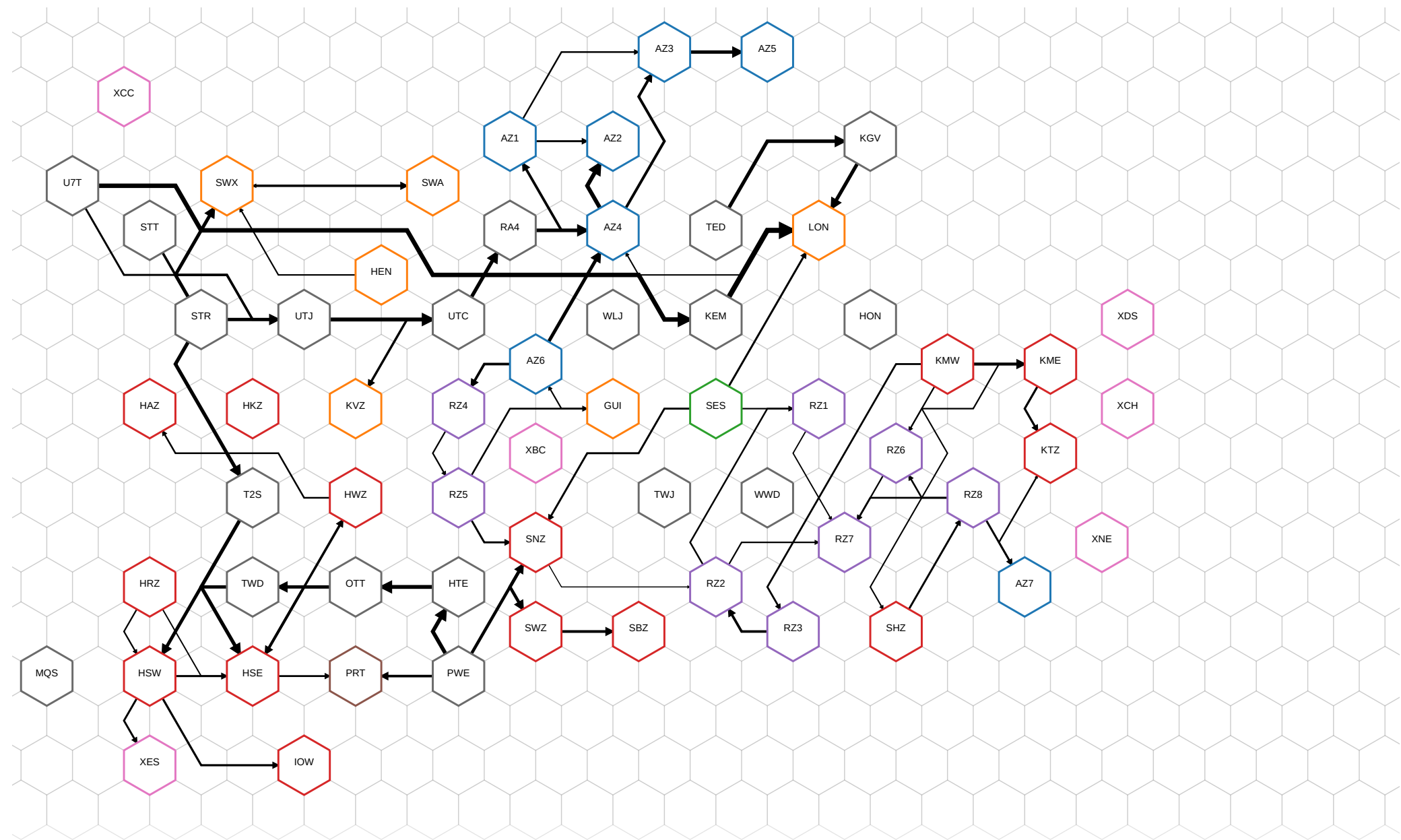


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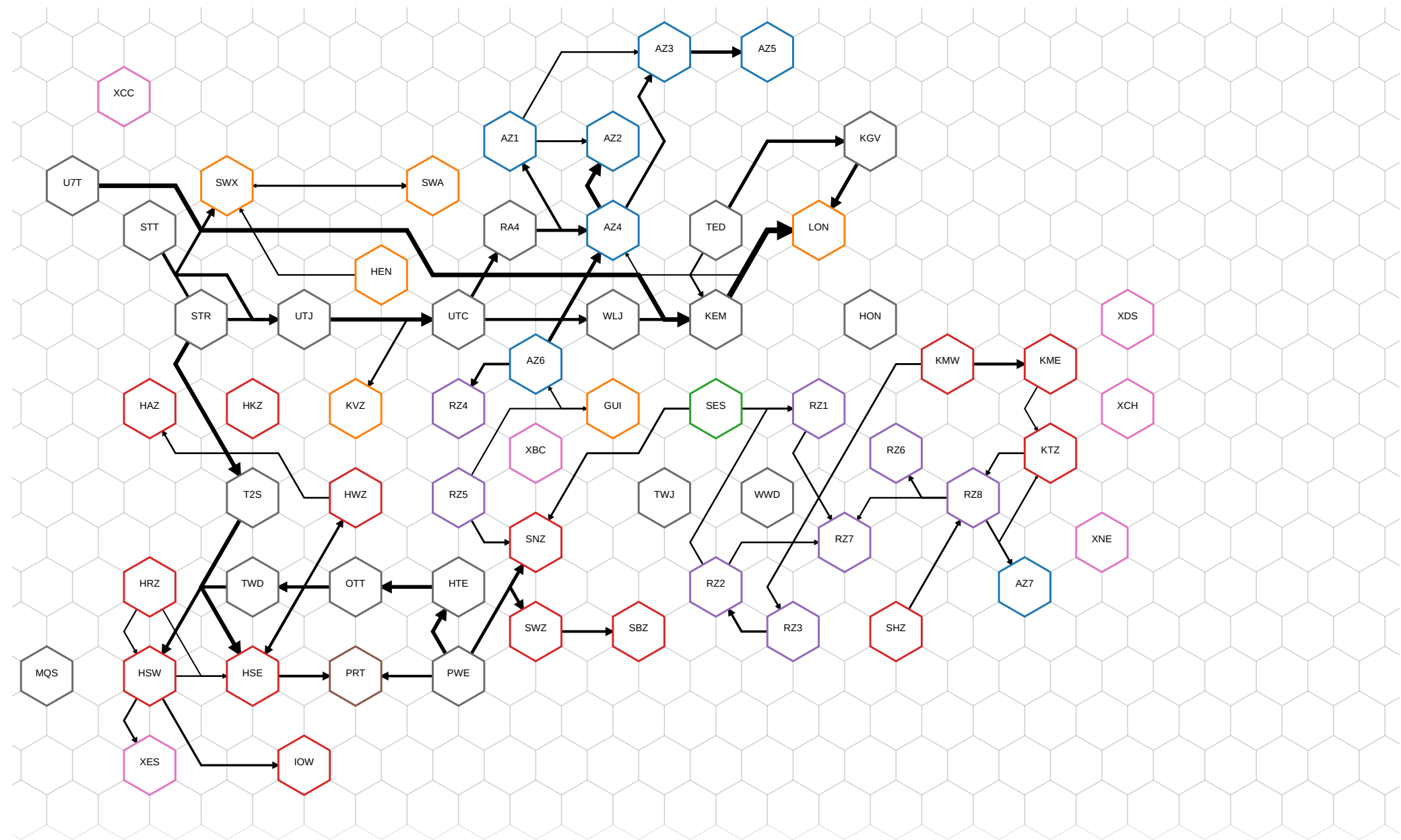
Situation 4 - 2040



Situation 4 - 2050



Situation 4 - 2075



IVM RUN DOSSIER

LEAST COST PLAN (STPR)

IVM Summary: Thames Water

[Home](#) / [jet-20220805-000002](#) / [st-hybrid-dy-w1-tree16.05-options-v37-gov-led-hybridb-2075](#)

Metadata

General Settings

Name	st-hybrid-dy-w1-tree16.05-options-v37-gov-led-hybridb-2075
Created at	15/08/2022, 16:25:06
Tree	tree16.05: Root and branch tree 16.05: Stage 1 - Begins Hplan and LOW LCED, Stage 2 - Branches on growth (OxCam1a, Hplan and ONS18c), Stage 3 - Branches on licenced capped environmental destination, climate change and further growth scenarios (Hmax and Hmin) ↗
Setting name	options-v37-gov-led-hybridb ↗
Setting description	Emergency options in HSE, SBZ, and PRT.
Optimised discount rate	STPR

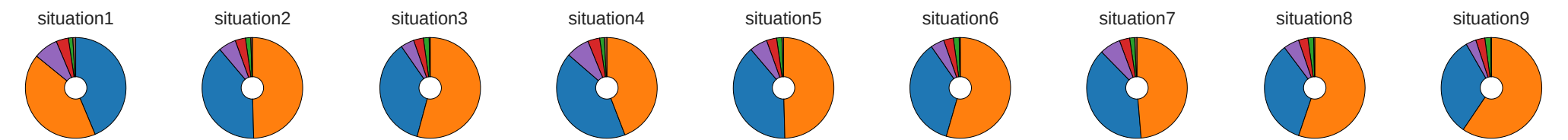
Metrics

Net present value (Cost)

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Cost w/ deficit (STPR)	16,240	13,062	11,770	15,370	13,060	11,706	13,400	11,572	10,614	(£m)
Cost w/o deficit (STPR)	16,240	13,062	11,770	15,370	13,060	11,706	13,400	11,572	10,614	(£m)
Cost w/ deficit (IGEQ)	26,158	20,183	17,839	24,491	20,145	17,737	21,079	17,688	15,935	(£m)
Cost w/o deficit (IGEQ)	26,158	20,183	17,839	24,491	20,145	17,737	21,079	17,688	15,935	(£m)
Cost w/ deficit (LTDR)	18,121	14,431	12,943	17,106	14,424	12,872	14,866	12,751	11,645	(£m)
Cost w/o deficit (LTDR)	18,121	14,431	12,943	17,106	14,424	12,872	14,866	12,751	11,645	(£m)

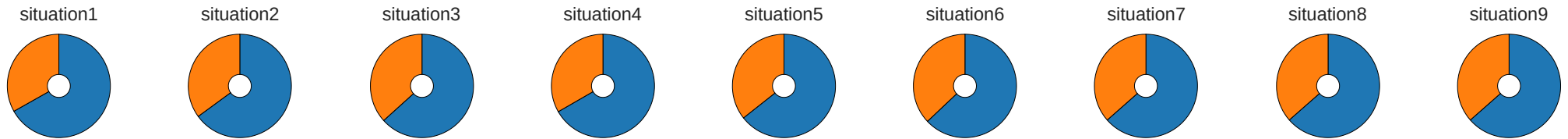
Cost breakdown (STPR)

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Capex	7,095	5,124	4,253	6,485	5,120	4,192	5,222	3,999	3,421	(£m)
Fixed opex	6,848	6,477	6,379	6,785	6,476	6,377	6,521	6,386	6,311	(£m)
Fixed operational carbon	233	223	220	230	223	220	218	211	206	(£m)
Embedded carbon	642	435	369	591	428	364	444	350	311	(£m)
Variable opex	1,272	735	508	1,152	745	511	898	582	345	(£m)
Variable carbon opex	150	67	40	127	68	41	97	44	20	(£m)



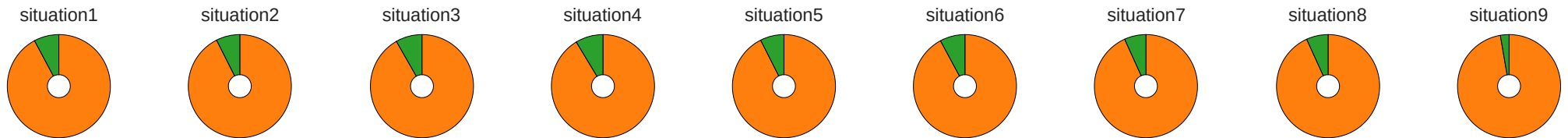
Emissions breakdown

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Capital emissions	4,105,396	2,671,856	2,225,314	3,741,893	2,621,292	2,196,831	2,782,641	2,128,821	1,863,909	(tonnes)
Operational emissions	2,035,763	1,440,987	1,288,471	1,868,508	1,450,496	1,291,717	1,597,546	1,220,897	1,069,776	(tonnes)



Electricity breakdown

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Generated (on site)	0	0	0	0	0	0	0	0	0	(GWh)
Grid	24,348	12,936	6,554	20,565	12,880	6,909	16,700	10,564	4,727	(GWh)
Renewable	2,064	1,041	589	1,946	1,038	589	1,212	772	132	(GWh)



Environmental

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
SEA environmental benefit	86,220.00	79,709.00	78,217.00	84,475.00	79,727.00	78,071.00	81,584.00	77,143.00	75,842.00	
SEA environmental disbenefit	124,026.00	91,292.00	82,358.00	115,629.00	91,160.00	83,196.00	103,105.00	80,300.00	71,530.00	
Natural capital	7,278,532.71	7,887,030.52	8,533,578.93	7,494,194.78	8,557,242.02	8,544,439.94	11,380,568.54	14,765,373.55	16,048,010.36	
Bio-diversity net gain	-262,703.00	-143,687.00	-132,152.00	-258,496.00	-144,728.00	-129,938.00	-202,457.00	-167,965.00	-145,901.00	

Social

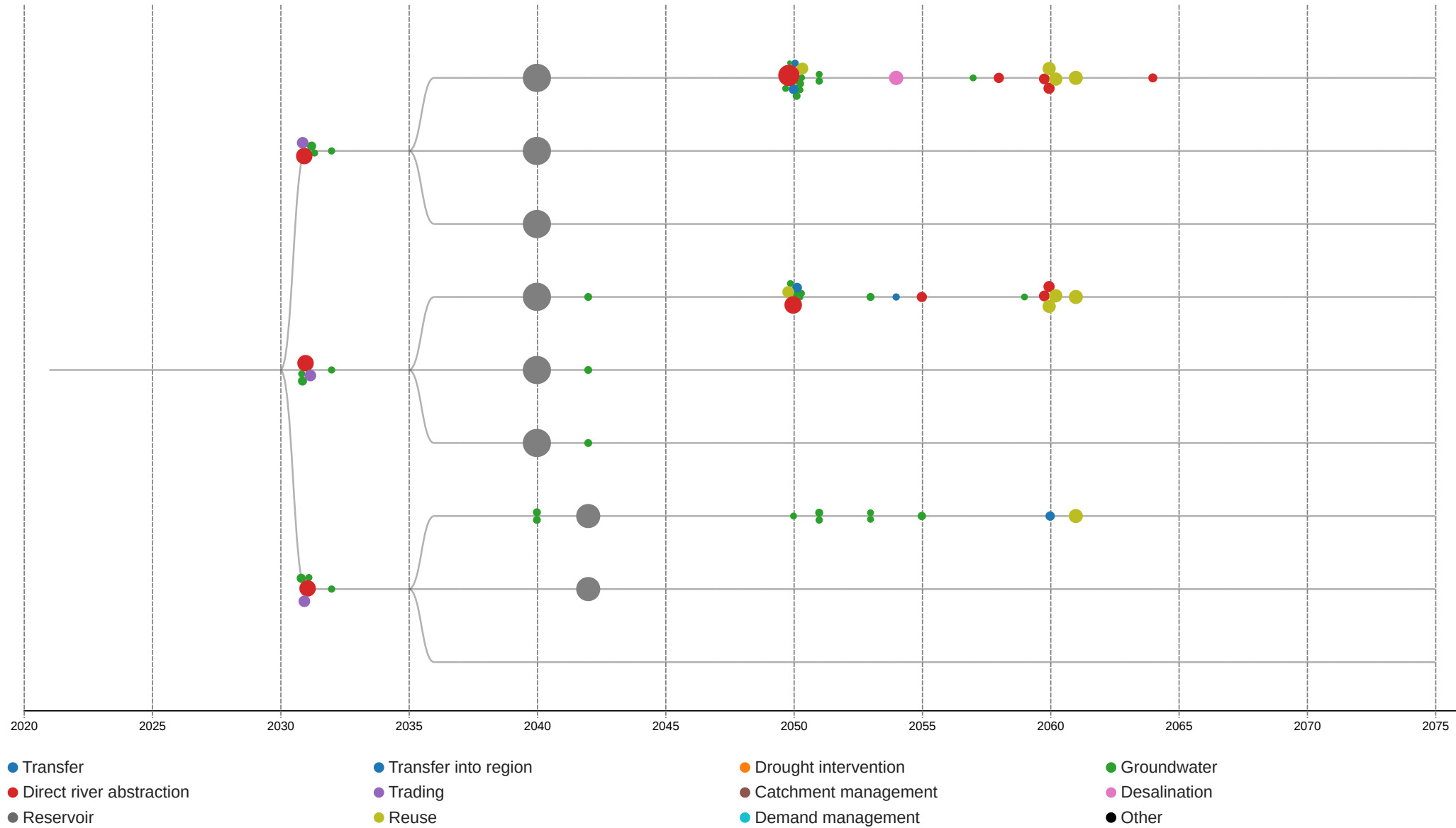
Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Customer preference	32,870.00	30,760.00	30,204.00	32,452.00	30,876.00	30,268.00	31,729.00	29,968.00	29,372.00	

Reliability

[illegible]

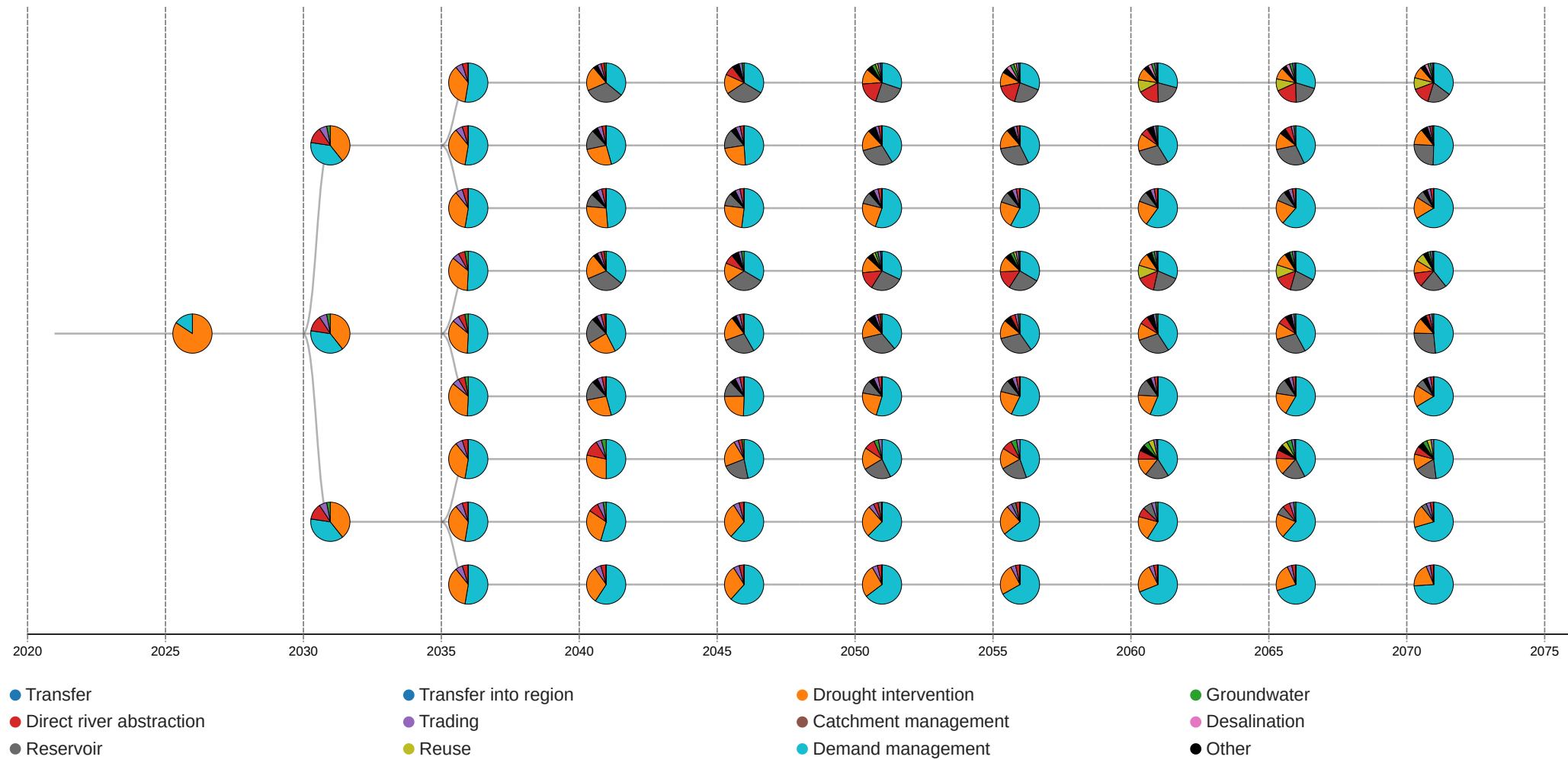
Adaptability										
Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Adaptability	18.67	21.20	22.66	19.05	21.16	22.26	19.92	21.52	25.11	
A3: Operational complexity and flexibility	9.24	9.99	10.72	9.31	9.91	10.64	9.24	9.79	11.55	
A4: WRZ connectivity	9.38	11.20	11.92	9.70	11.20	11.60	10.63	11.71	13.54	
A7: Customer relations support engagement with demand management	0.05	0.02	0.02	0.04	0.04	0.02	0.04	0.02	0.02	
Evolvability										
Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Evolvability	27.17	27.69	29.42	26.87	27.63	29.22	27.32	28.70	33.31	
E1: Scaleability and modularity of proposed changes	10.94	11.50	12.29	10.91	11.46	12.20	11.52	12.24	14.18	
E2: Intervention lead times	7.43	6.91	7.29	7.19	6.89	7.25	6.98	7.21	8.36	
E3: Reliance on external bodies to deliver changes	8.69	9.23	9.81	8.70	9.20	9.73	8.75	9.21	10.73	
E5: Collaborative land management	0.10	0.04	0.04	0.07	0.07	0.04	0.07	0.04	0.04	

Option Selection (Thames Water)

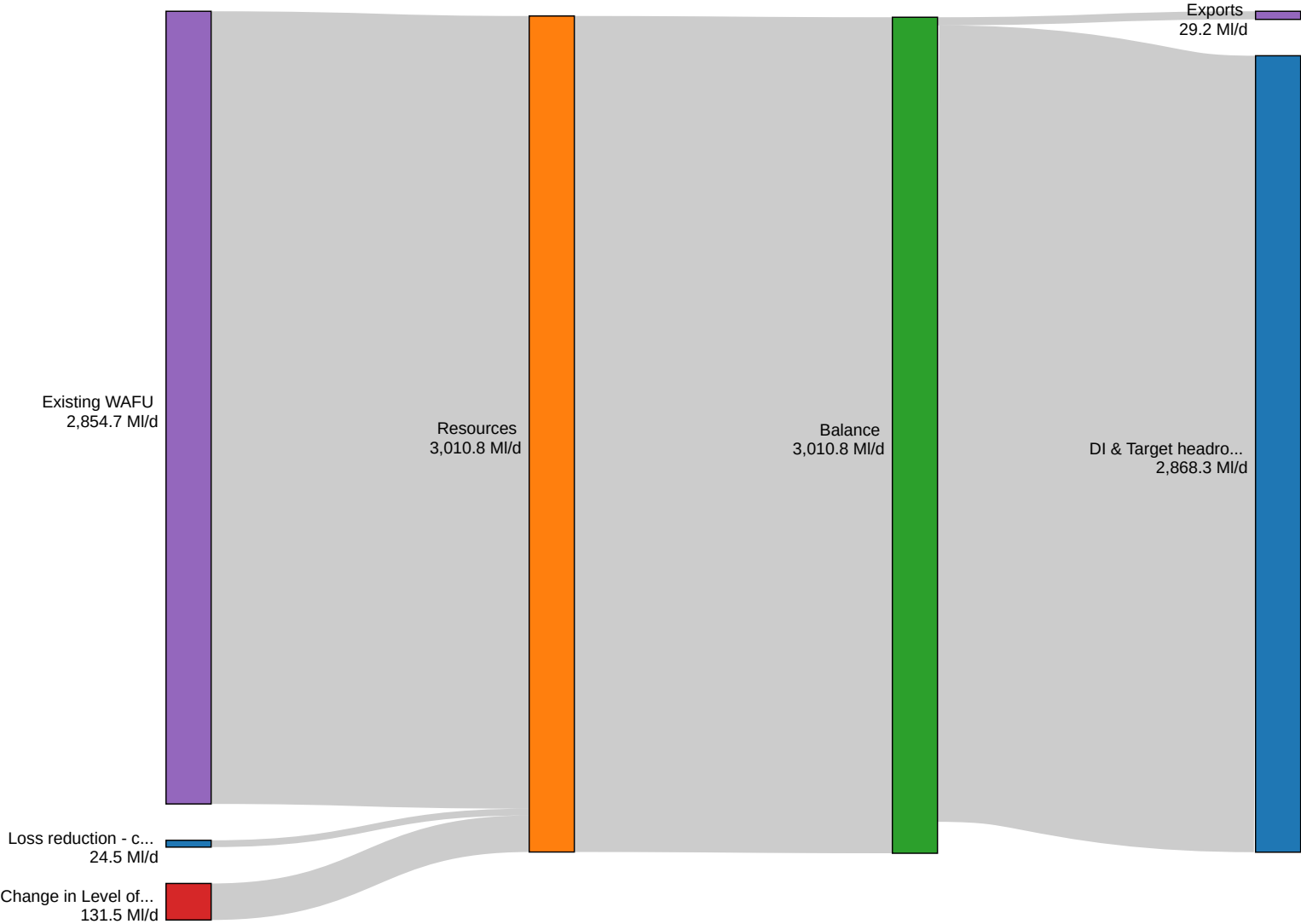


Utilisation (Thames Water)

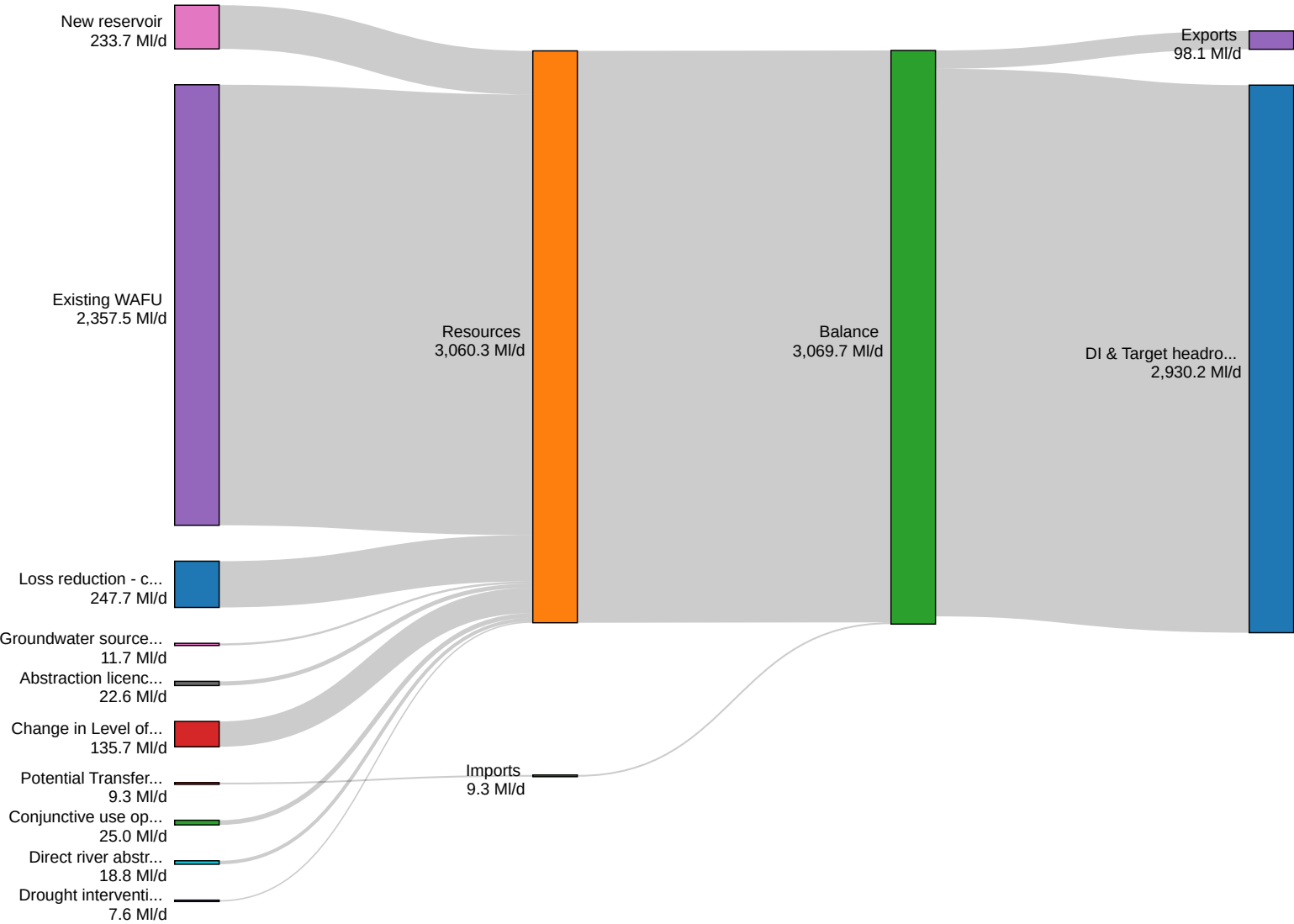
Pie charts show the breakdown of option utilisation by option category.



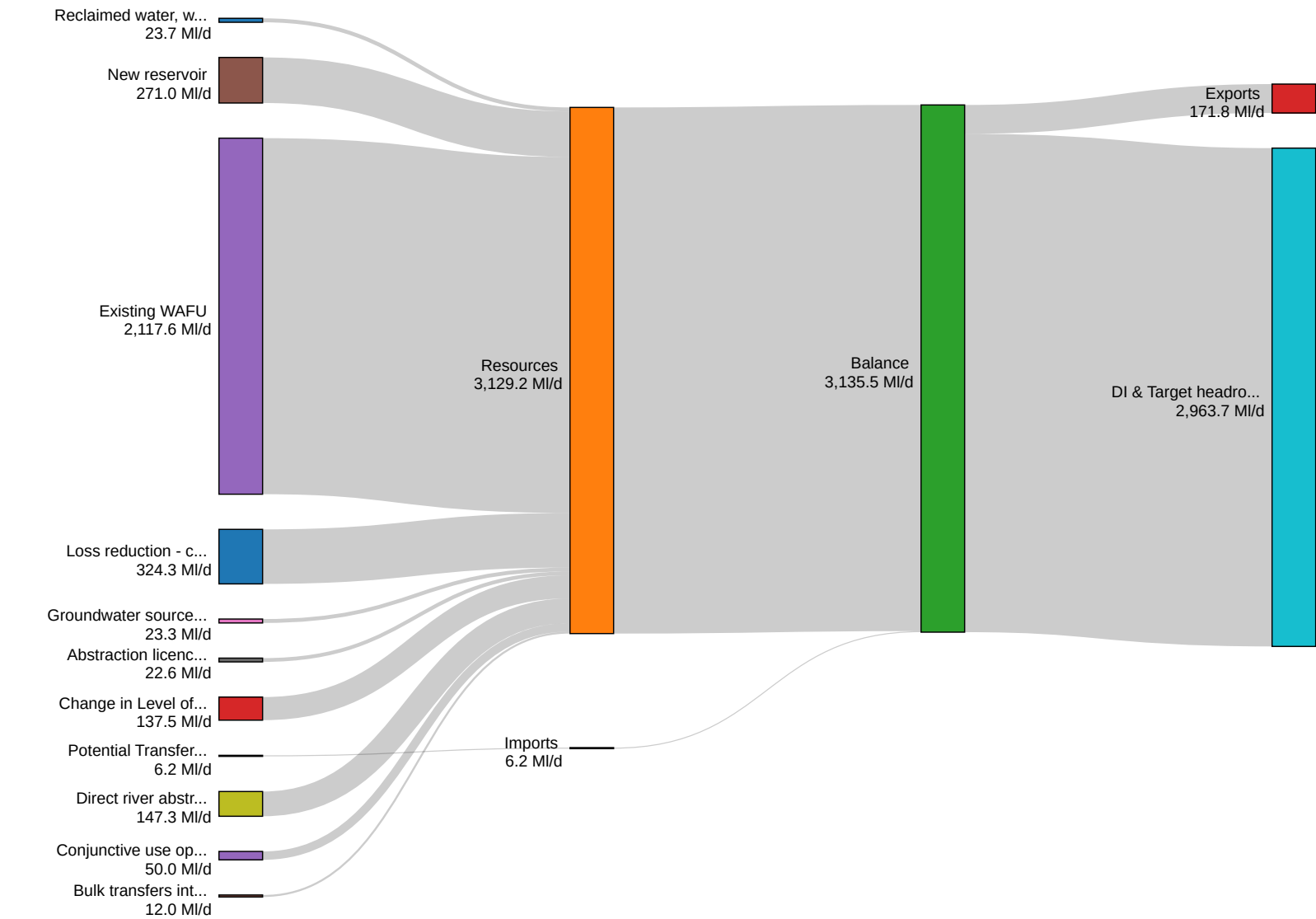
Situation 4 - 2026 (Thames Water)



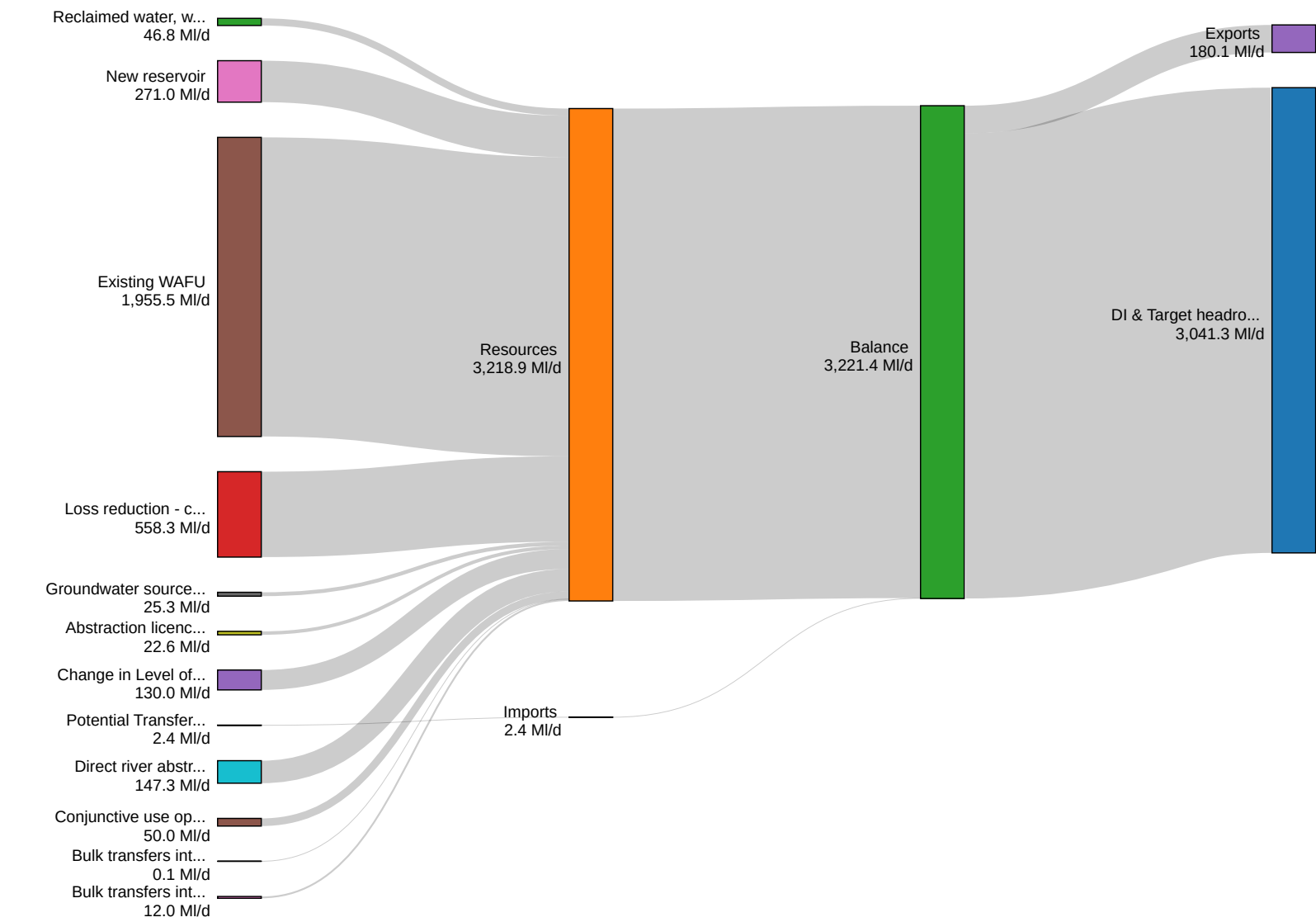
Situation 4 - 2040 (Thames Water)



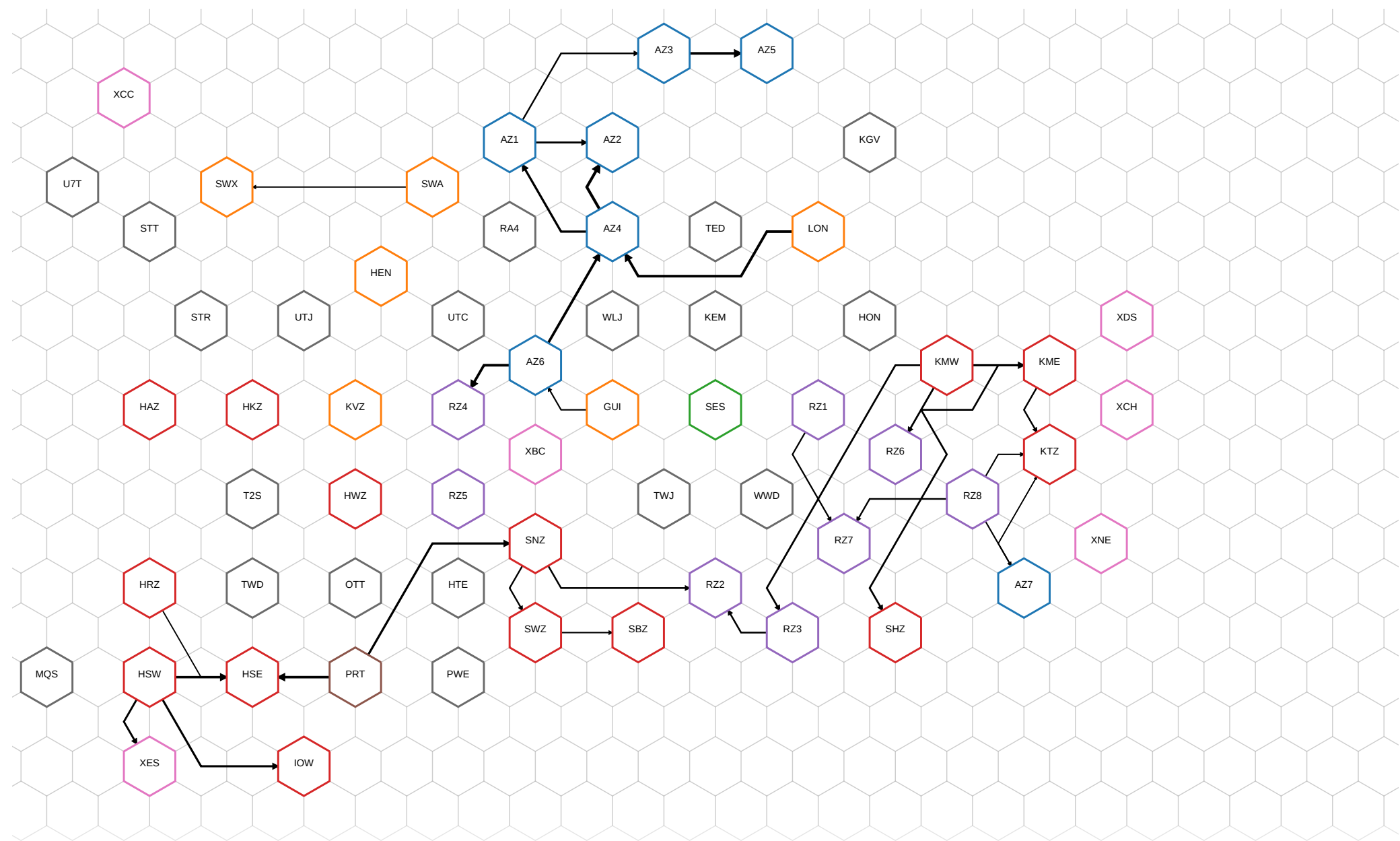
Situation 4 - 2050 (Thames Water)



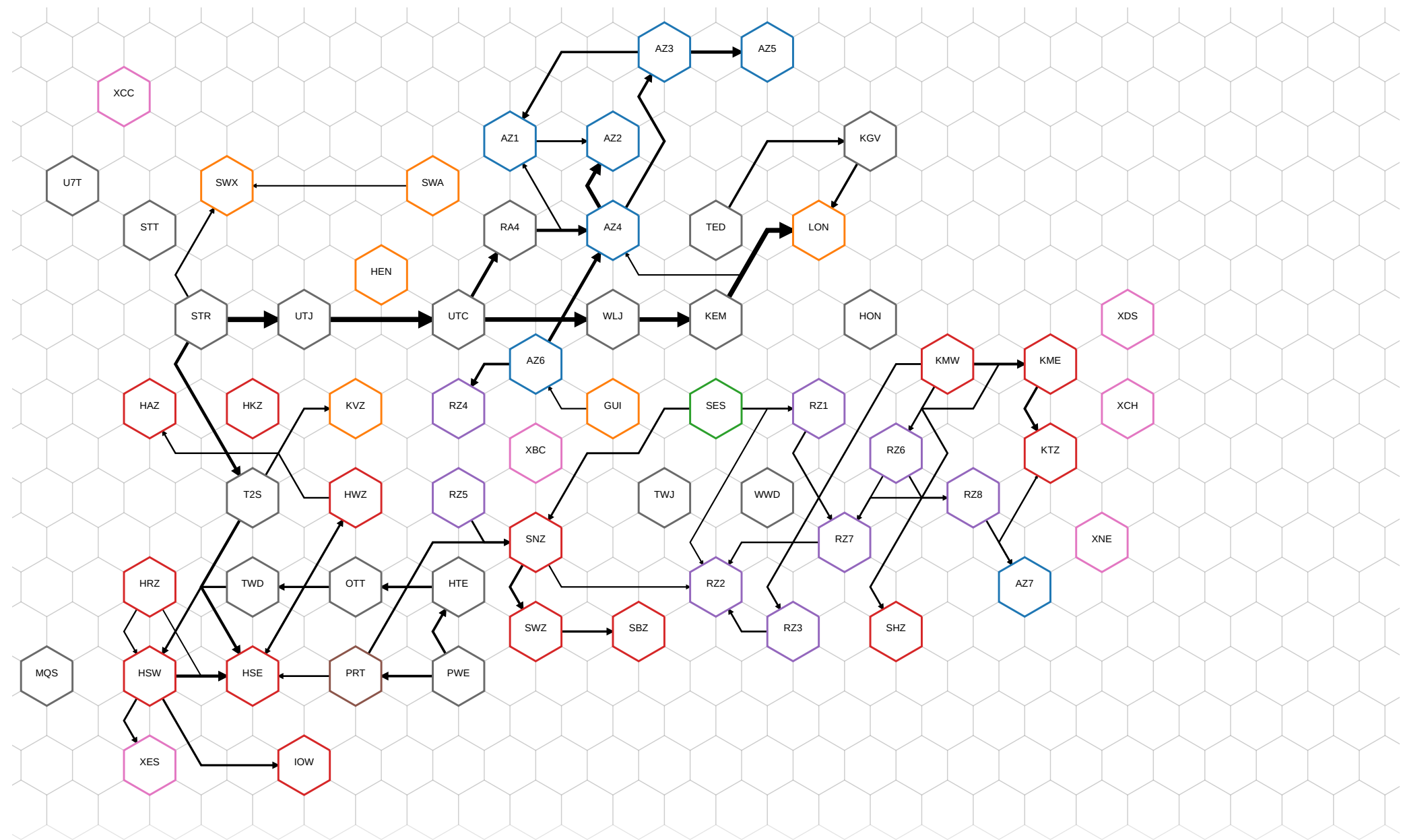
Situation 4 - 2075 (Thames Water)



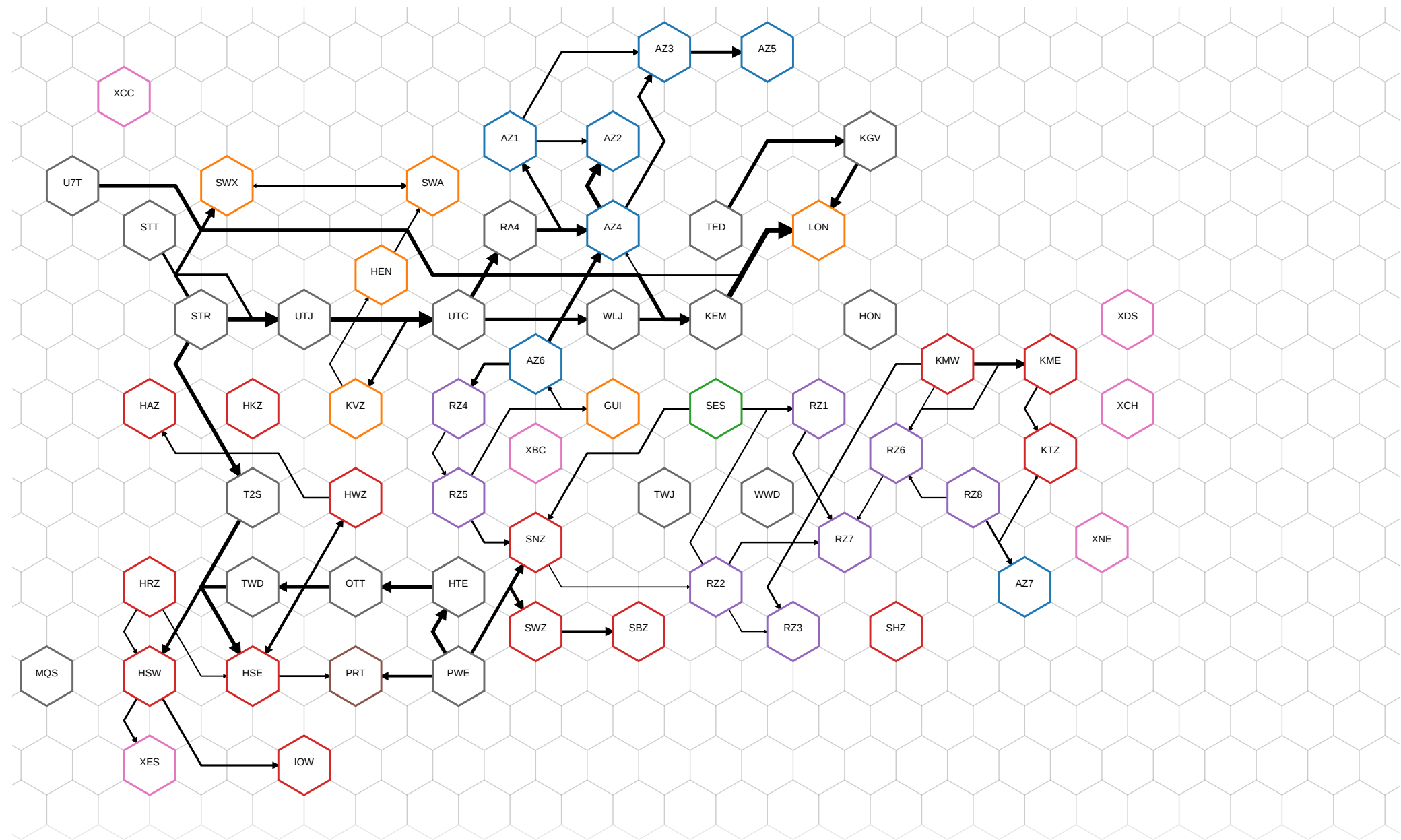
Situation 4 - 2026



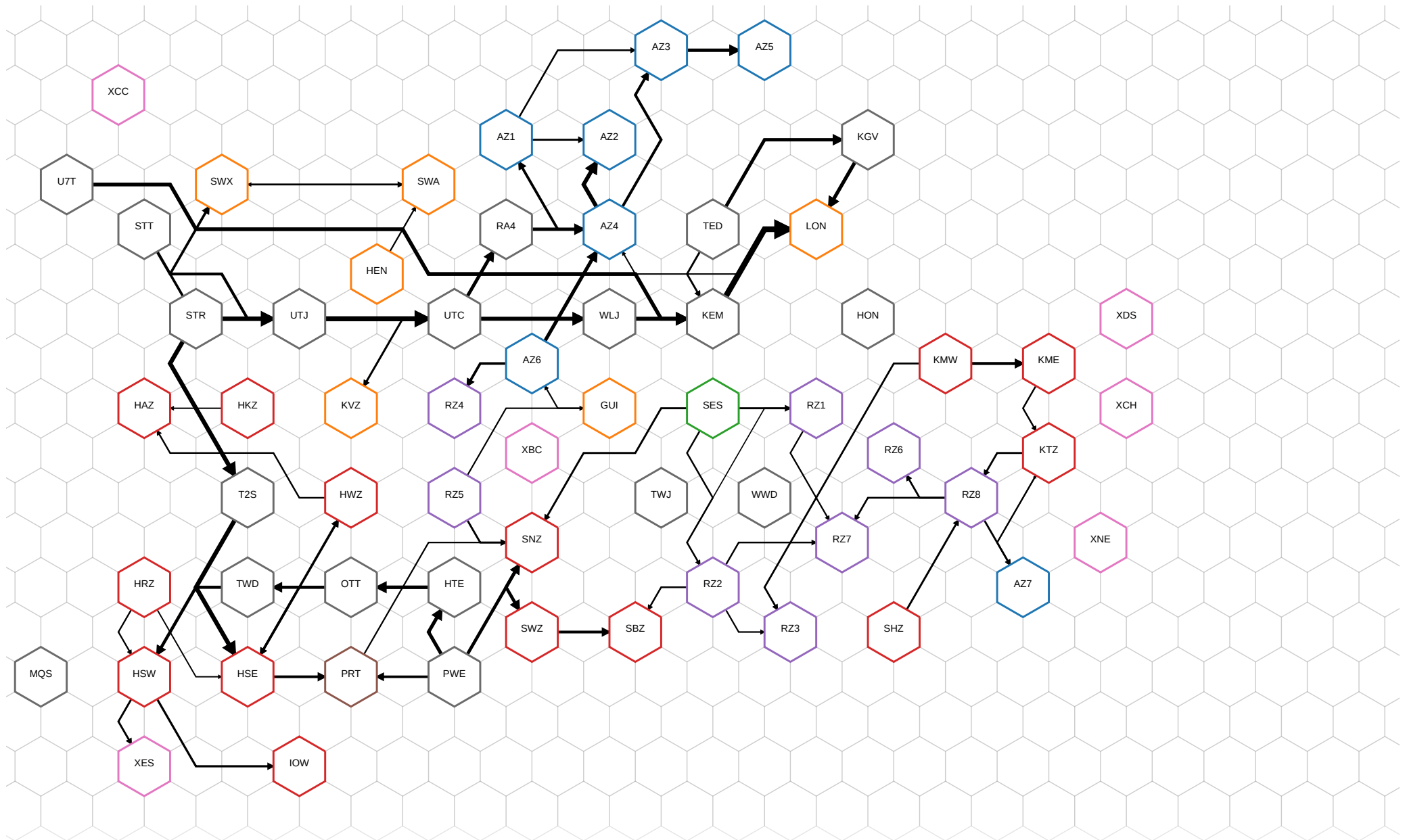
Situation 4 - 2040



Situation 4 - 2050



Situation 4 - 2075



IVM RUN DOSSIER

BEST ENVIRONMENTAL & SOCIAL PLAN

IVM Summary: Thames Water

Metadata

General Settings

Name	st-hybrid-dy-w1-tree16.05-options-v37-gov-led-hybridb-2075-envsoc-01_00
Created at	24/08/2022, 09:05:13
Tree	tree16.05: Root and branch tree 16.05: Stage 1 - Begins Hplan and LOW LCED, Stage 2 - Branches on growth (OxCam1a, Hplan and ONS18c), Stage 3 - Branches on licenced capped environmental destination, climate change and further growth scenarios (Hmax and Hmin) 
Setting name	options-v37-gov-led-hybridb 
Setting description	Emergency options in HSE, SBZ, and PRT.
Optimised discount rate	STPR

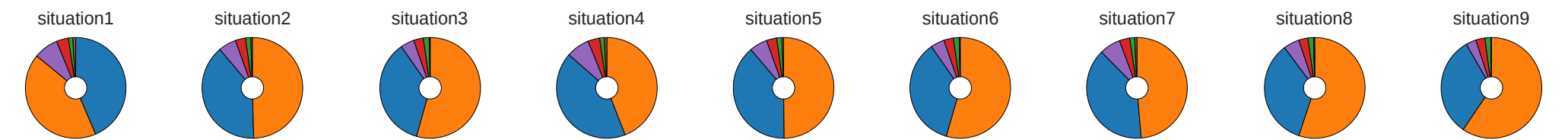
Metrics

Net present value (Cost)

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Cost w/ deficit (STPR)	16,210	13,048	11,730	15,398	12,993	11,717	13,407	11,594	10,614	(£m)
Cost w/o deficit (STPR)	16,210	13,048	11,730	15,398	12,993	11,717	13,407	11,594	10,614	(£m)
Cost w/ deficit (IGEQ)	26,103	20,130	17,772	24,562	20,046	17,748	21,087	17,735	15,935	(£m)
Cost w/o deficit (IGEQ)	26,103	20,130	17,772	24,562	20,046	17,748	21,087	17,735	15,935	(£m)
Cost w/ deficit (LTDR)	18,086	14,410	12,898	17,141	14,350	12,883	14,874	12,777	11,645	(£m)
Cost w/o deficit (LTDR)	18,086	14,410	12,898	17,141	14,350	12,883	14,874	12,777	11,645	(£m)

Cost breakdown (STPR)

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Capex	7,058	5,119	4,215	6,519	5,059	4,199	5,221	4,013	3,420	(£m)
Fixed opex	6,871	6,469	6,376	6,787	6,472	6,382	6,521	6,390	6,311	(£m)
Fixed operational carbon	233	223	219	232	225	220	217	211	206	(£m)
Embedded carbon	631	428	366	580	424	362	449	344	311	(£m)
Variable opex	1,268	741	513	1,150	745	515	903	591	345	(£m)
Variable carbon opex	149	67	40	129	68	40	95	45	20	(£m)



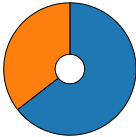
Emissions breakdown

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Capital emissions	4,034,367	2,622,749	2,207,619	3,687,535	2,597,435	2,184,881	2,816,168	2,084,410	1,863,597	(tonnes)
Operational emissions	2,020,833	1,443,941	1,280,550	1,889,533	1,462,127	1,278,182	1,582,840	1,225,596	1,069,550	(tonnes)

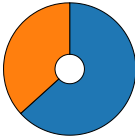
situation1



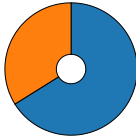
situation2



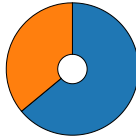
situation3



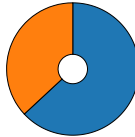
situation4



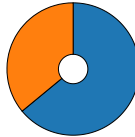
situation5



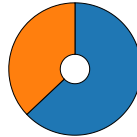
situation6



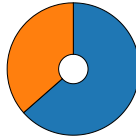
situation7



situation8



situation9



Electricity breakdown

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Generated (on site)	0	0	0	0	0	0	0	0	0	(GWh)
Grid	24,616	12,475	6,815	21,028	12,873	7,156	16,634	10,890	4,727	(GWh)
Renewable	2,021	1,038	527	1,768	1,058	456	1,330	773	132	(GWh)

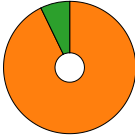
situation1



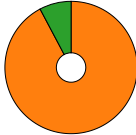
situation2



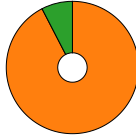
situation3



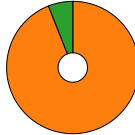
situation4



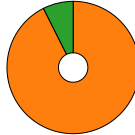
situation5



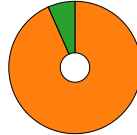
situation6



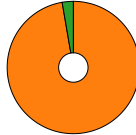
situation7



situation8



situation9



Environmental

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
SEA environmental benefit	85,993.00	78,561.00	79,222.00	84,103.00	80,114.00	78,593.00	81,403.00	76,981.00	76,668.00	
SEA environmental disbenefit	122,594.00	87,922.00	83,482.00	115,980.00	89,745.00	81,152.00	102,862.00	78,112.00	70,090.00	
Natural capital	8,404,628.35	9,447,628.43	12,042,429.64	7,681,916.61	8,712,554.18	8,582,430.71	12,054,448.12	15,174,590.48	16,048,010.36	
Bio-diversity net gain	-235,231.00	-147,489.00	-131,154.00	-240,648.00	-133,929.00	-123,858.00	-223,096.00	-169,691.00	-145,901.00	

Social

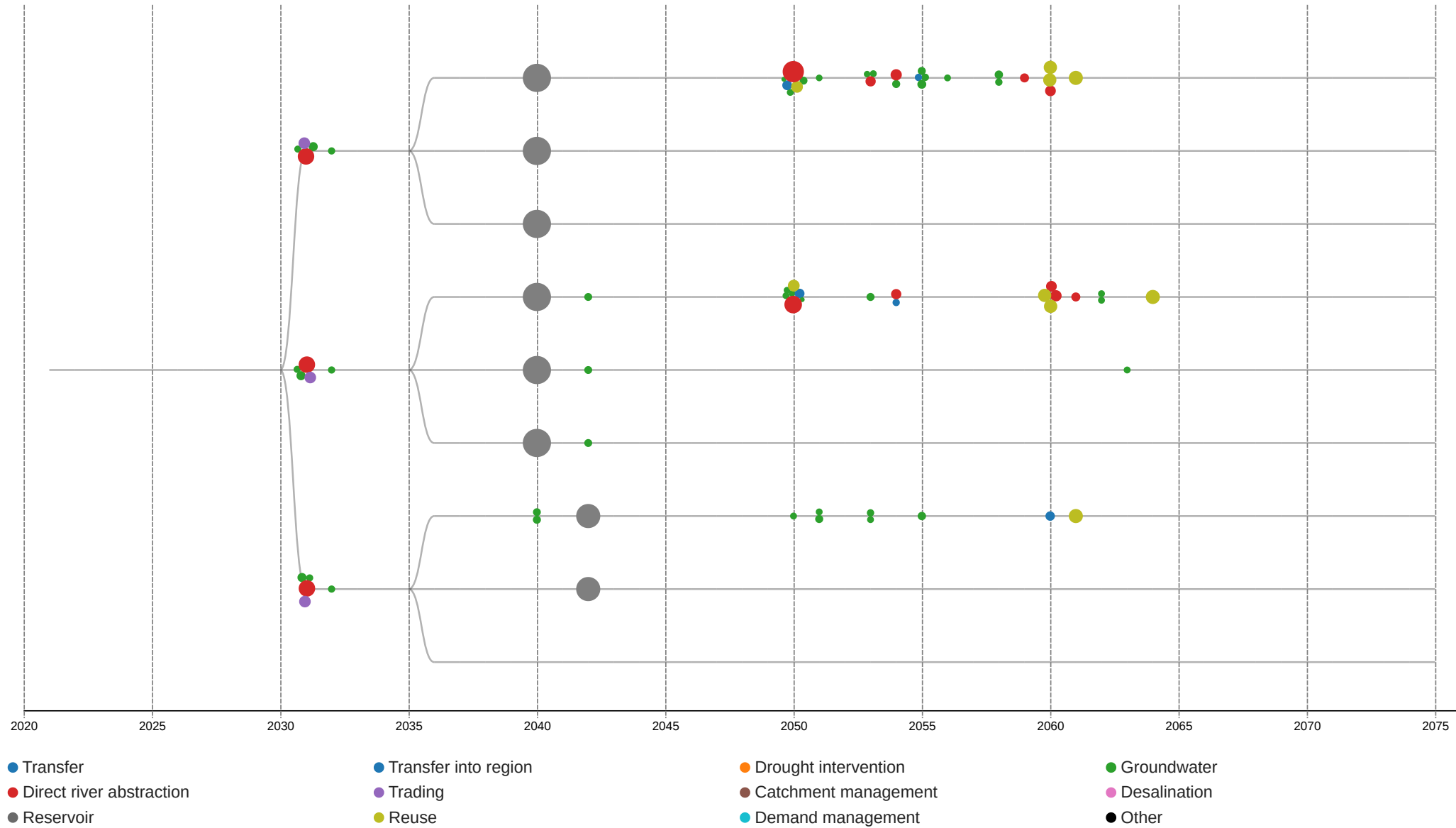
Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Customer preference	35,831.00	33,445.00	33,423.00	35,365.00	33,774.00	33,217.00	34,662.00	32,843.00	32,445.00	

Reliability

[illegible]

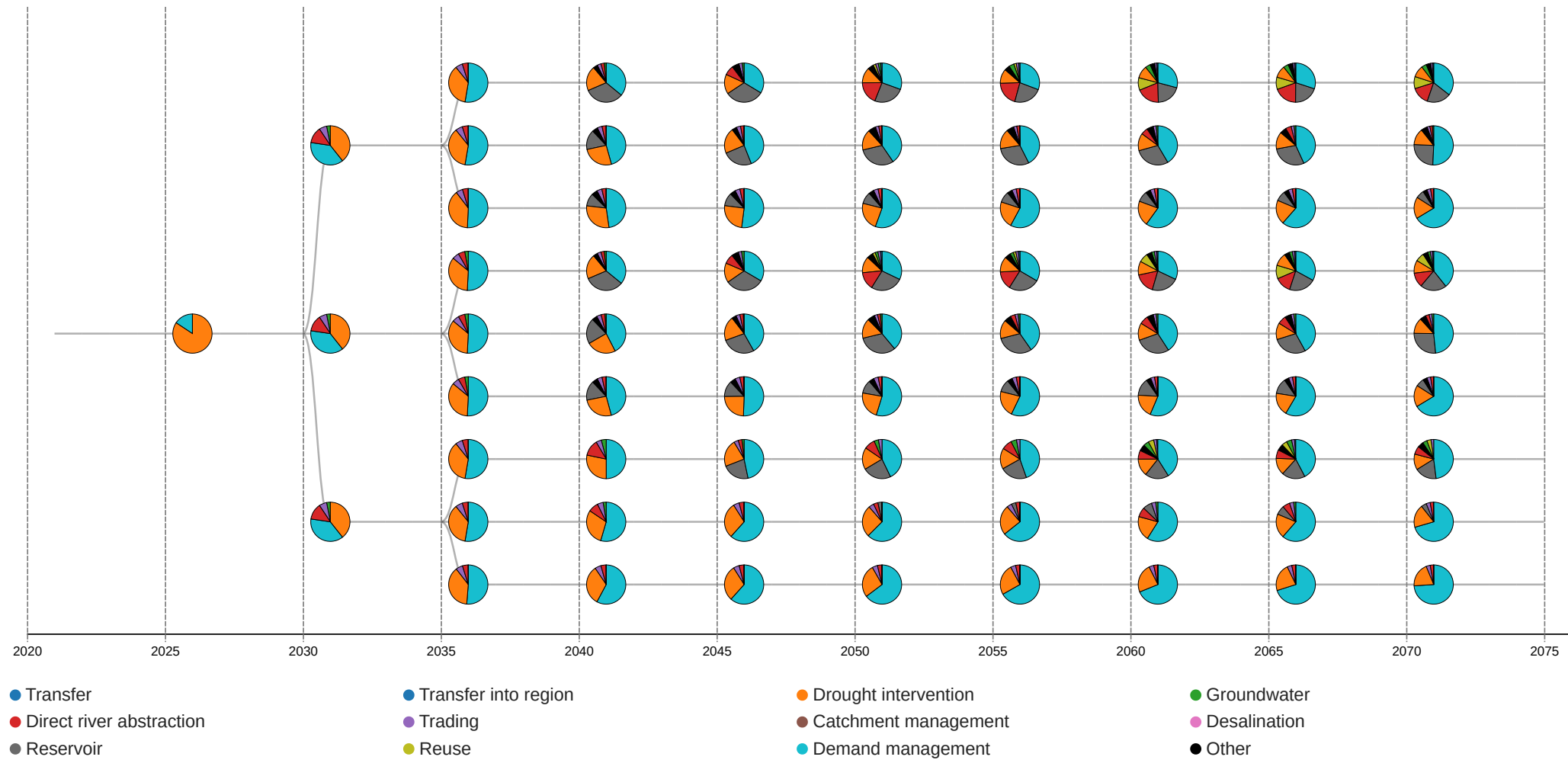
Adaptability										
Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Adaptability	19.61	22.13	23.72	20.01	22.24	23.55	21.10	22.85	26.77	
A3: Operational complexity and flexibility	10.13	10.96	11.93	10.24	10.99	11.87	10.31	11.05	13.11	
A4: WRZ connectivity	9.43	11.15	11.77	9.74	11.24	11.66	10.75	11.79	13.63	
A7: Customer relations support engagement with demand management	0.05	0.02	0.02	0.04	0.02	0.02	0.04	0.02	0.02	
Evolvability										
Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Evolvability	28.97	29.66	31.82	28.72	29.73	31.69	29.48	31.37	36.44	
E1: Scaleability and modularity of proposed changes	11.83	12.51	13.47	11.85	12.53	13.42	12.62	13.58	15.75	
E2: Intervention lead times	7.51	6.88	7.30	7.21	6.88	7.27	6.96	7.24	8.36	
E3: Reliance on external bodies to deliver changes	9.53	10.23	11.01	9.60	10.28	10.96	9.83	10.52	12.30	
E5: Collaborative land management	0.10	0.04	0.04	0.07	0.04	0.04	0.07	0.04	0.04	

Option Selection (Thames Water)

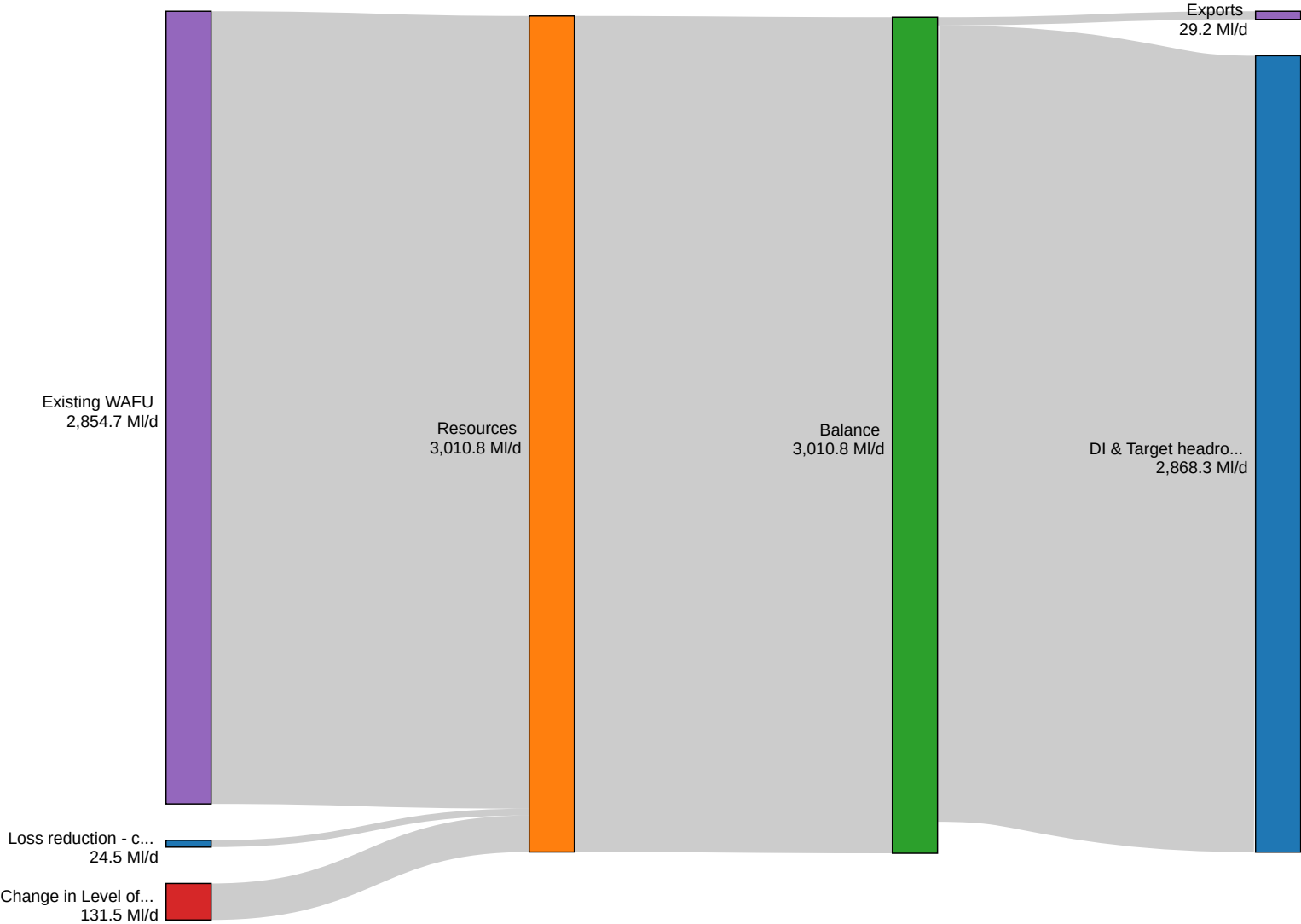


Utilisation (Thames Water)

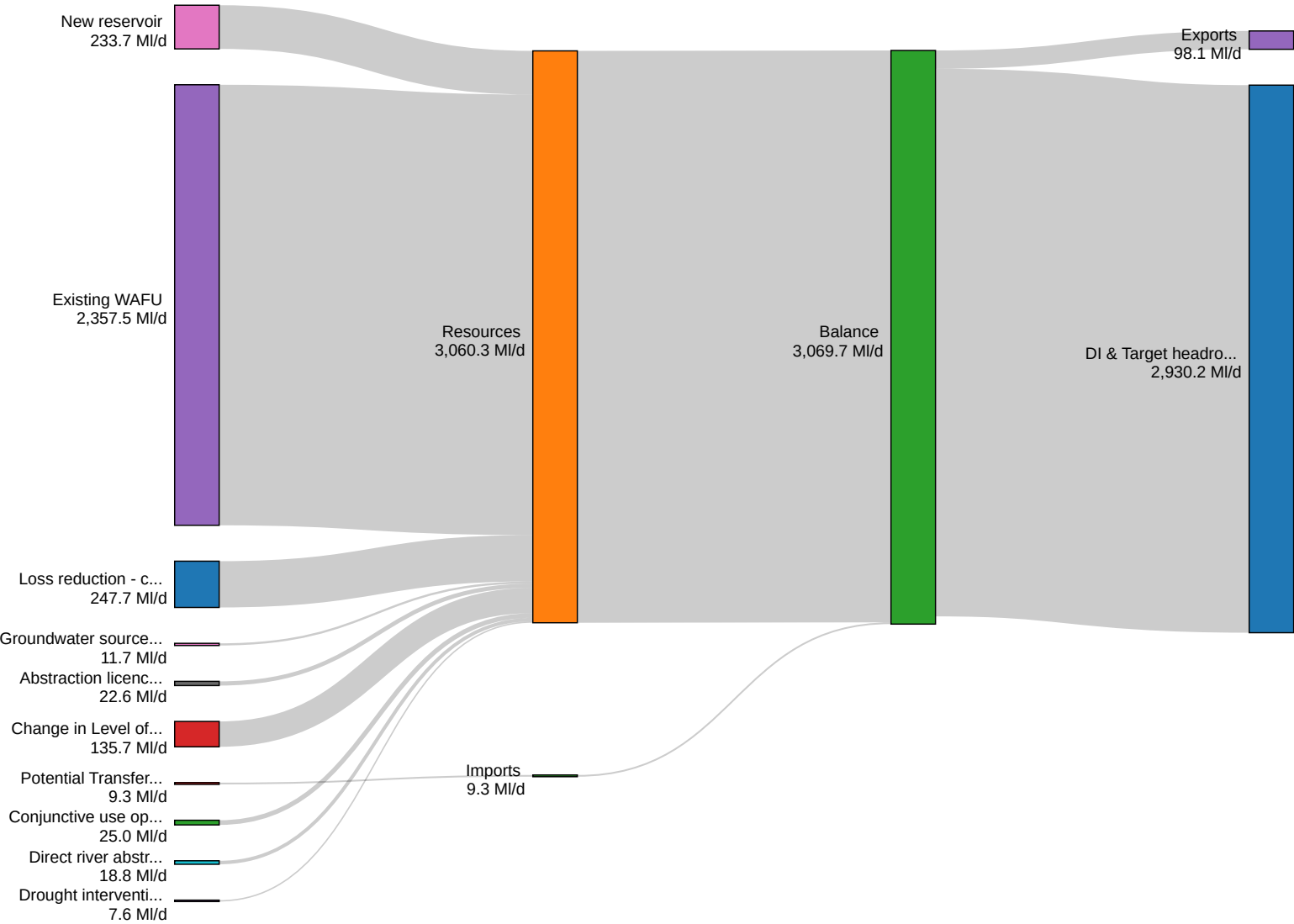
Pie charts show the breakdown of option utilisation by option category.



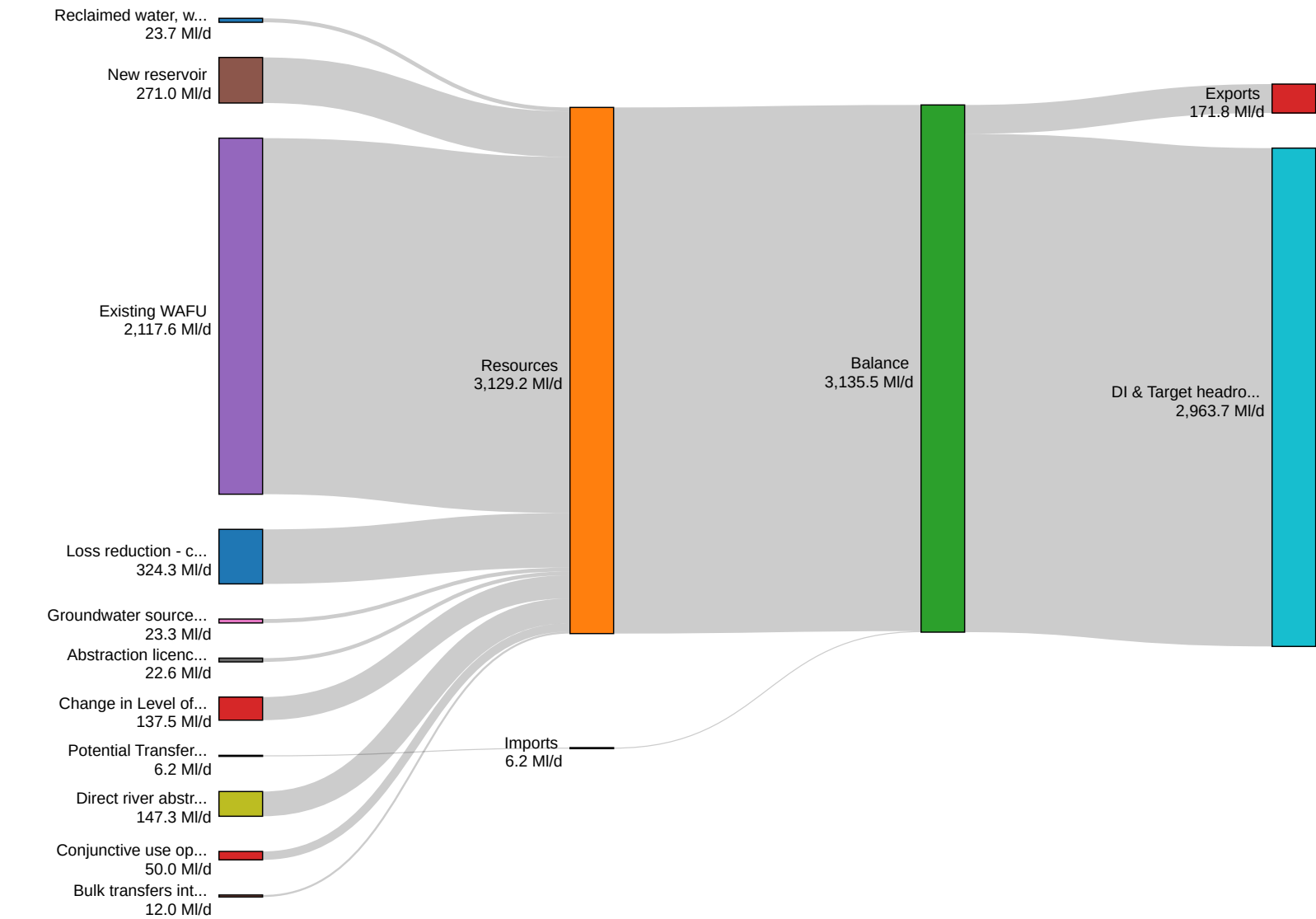
Situation 4 - 2026 (Thames Water)



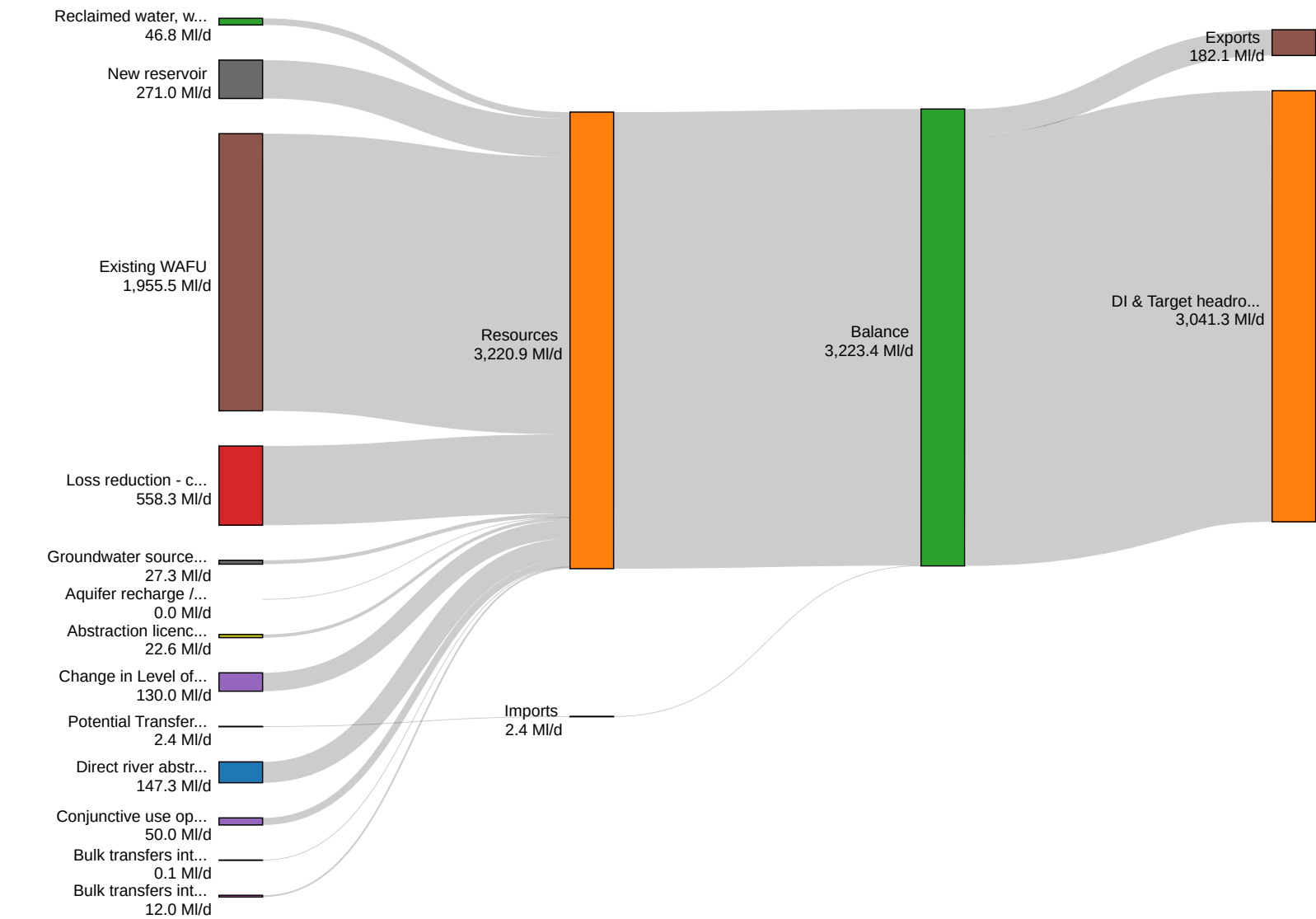
Situation 4 - 2040 (Thames Water)



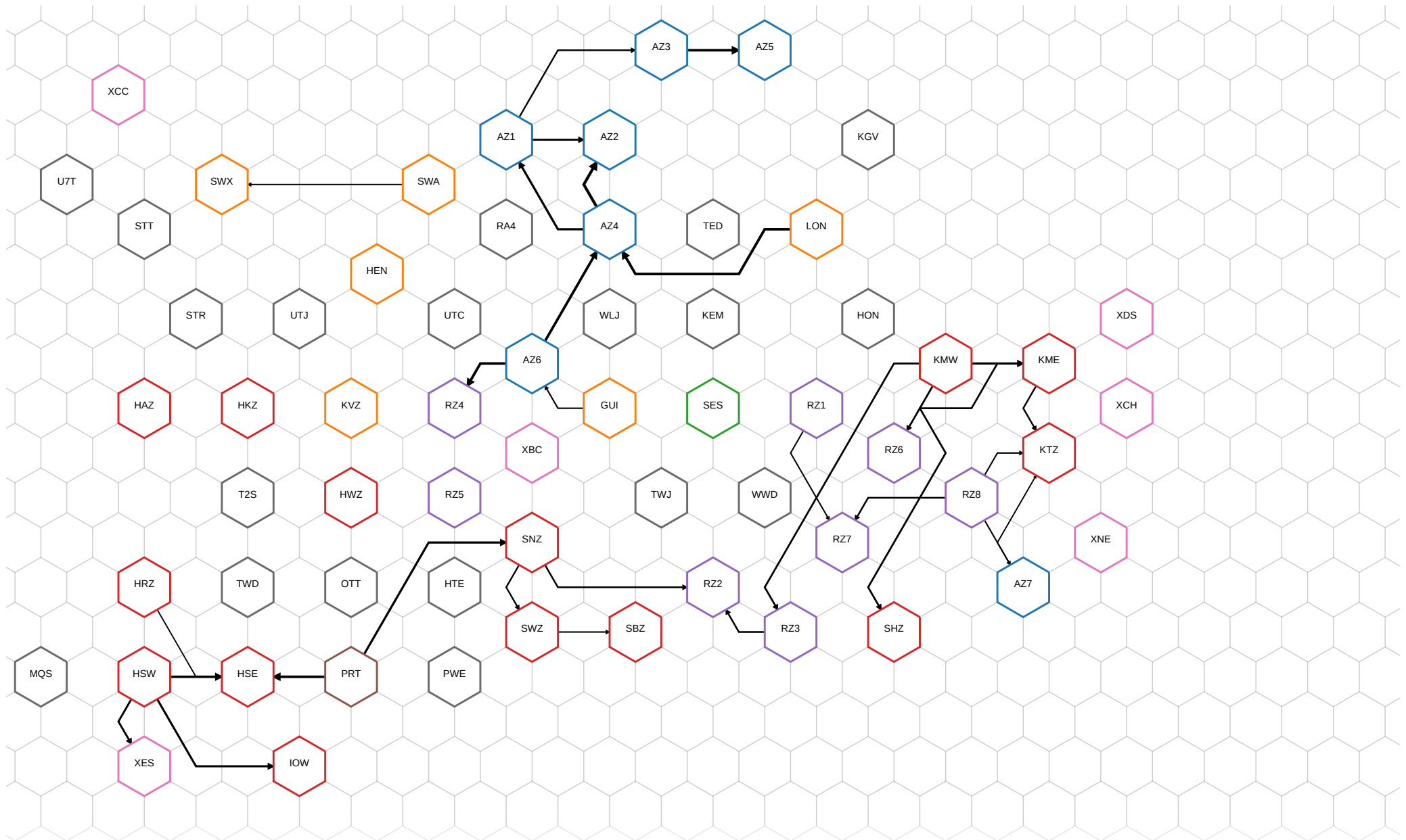
Situation 4 - 2050 (Thames Water)



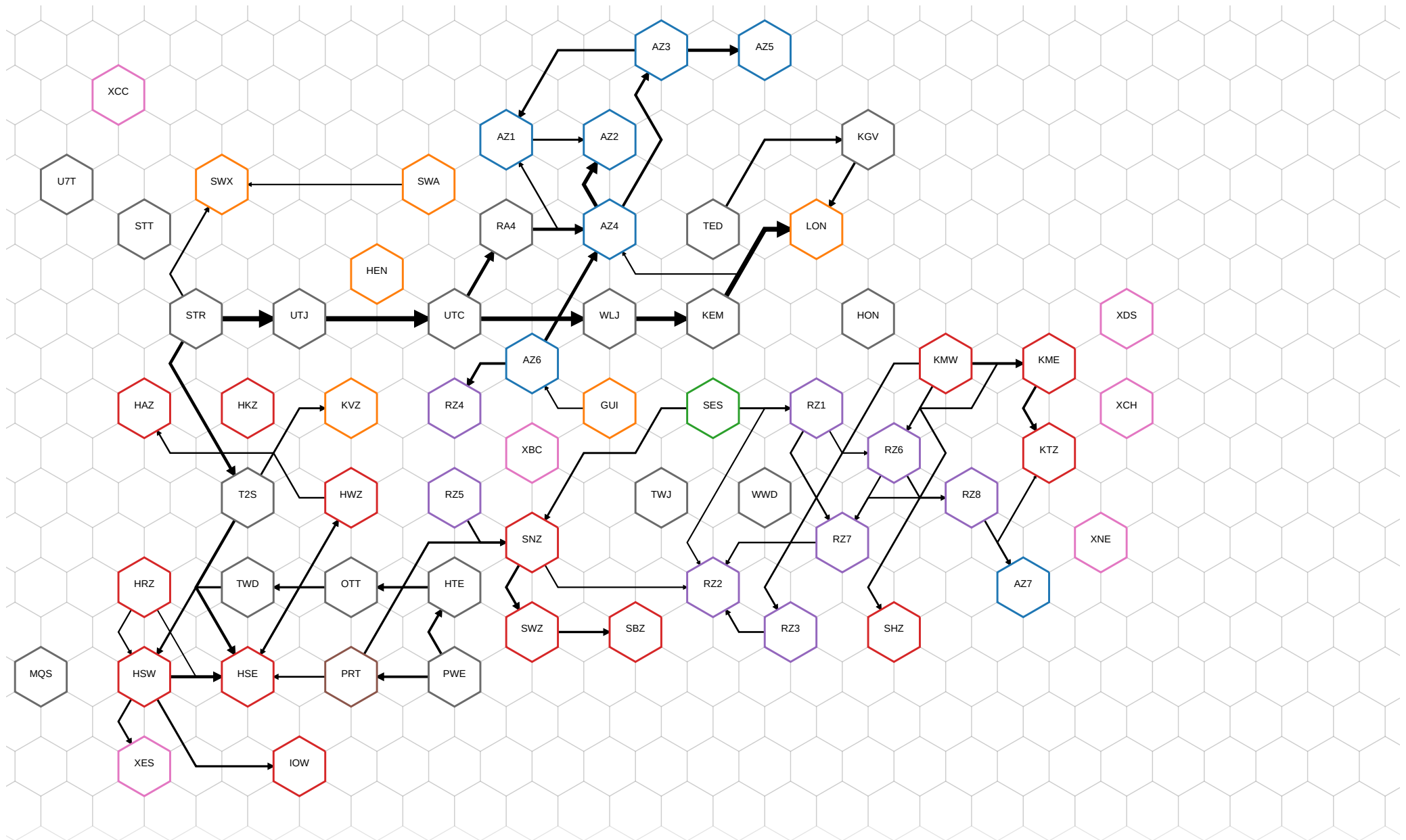
Situation 4 - 2075 (Thames Water)



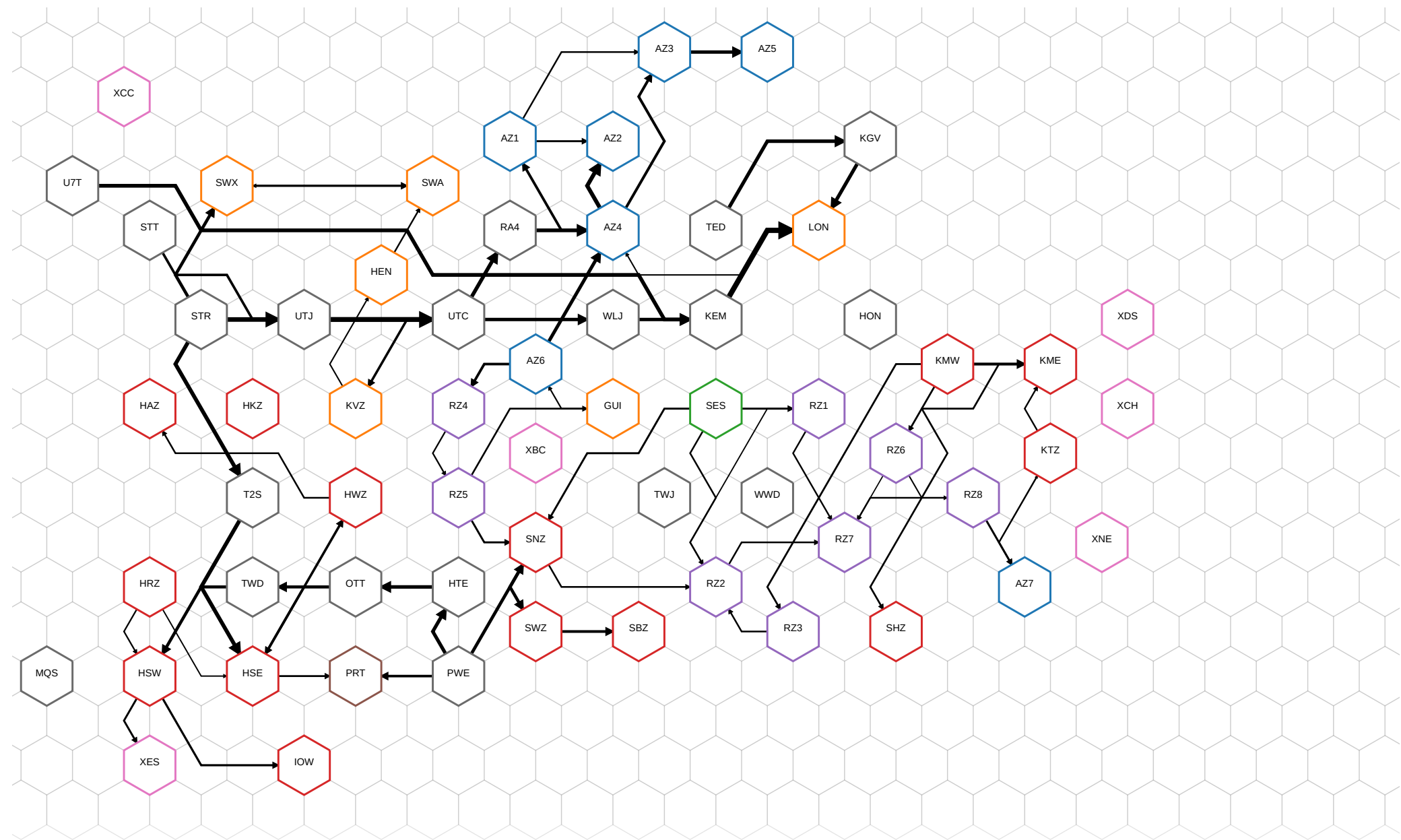
Situation 4 - 2026



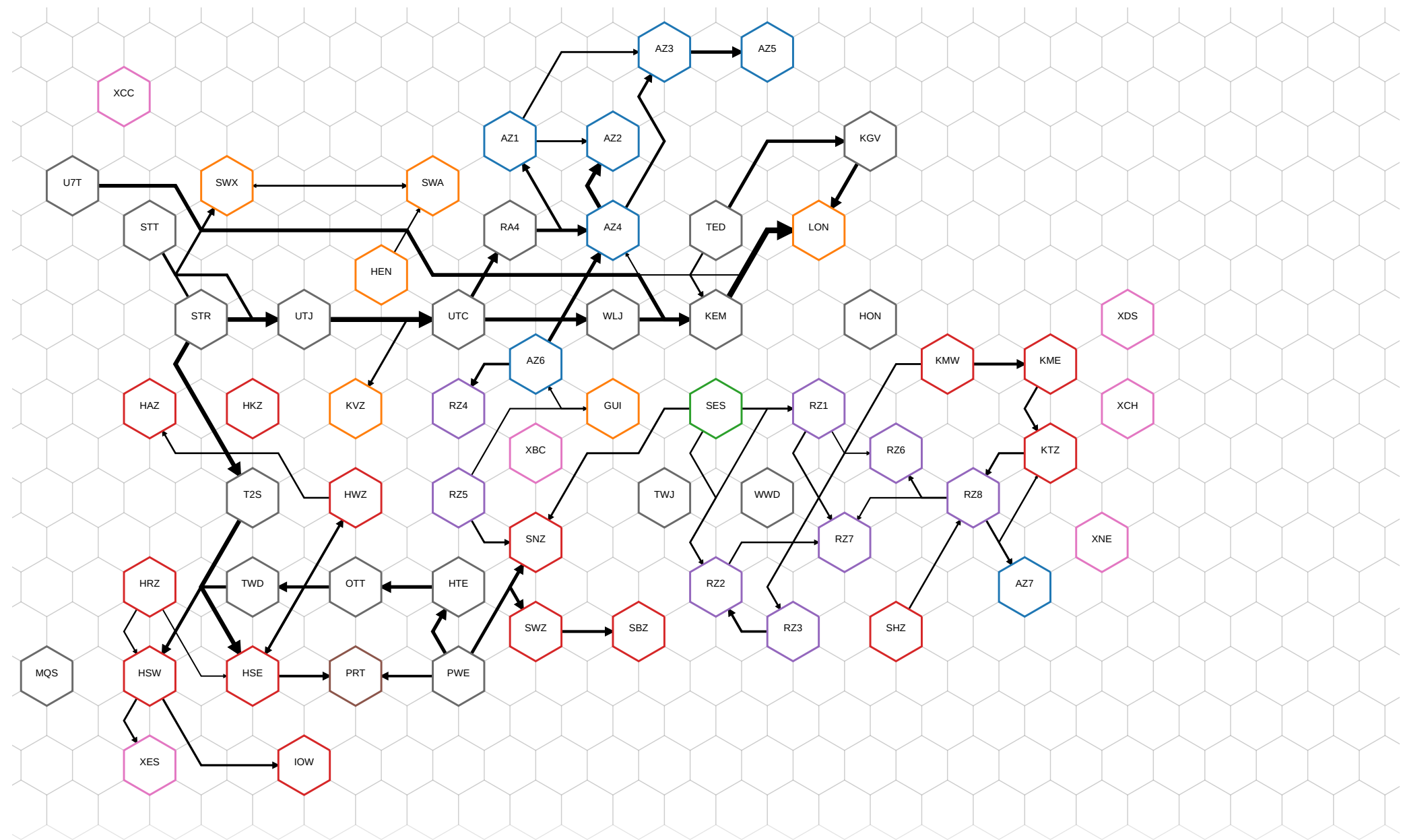
Situation 4 - 2040



Situation 4 - 2050



Situation 4 - 2075



IVM RUN DOSSIER

RESILIENCE-FOCUSED PLAN

IVM Summary: Thames Water

Metadata

General Settings

Name	st-hybrid-dy-w1-tree16.05-options-v37-gov-led-hybridb-2075-resilience-01_00
Created at	24/08/2022, 09:05:42
Tree	tree16.05: Root and branch tree 16.05: Stage 1 - Begins Hplan and LOW LCED, Stage 2 - Branches on growth (OxCam1a, Hplan and ONS18c), Stage 3 - Branches on licenced capped environmental destination, climate change and further growth scenarios (Hmax and Hmin) ↗
Setting name	options-v37-gov-led-hybridb ↗
Setting description	Emergency options in HSE, SBZ, and PRT.
Optimised discount rate	STPR

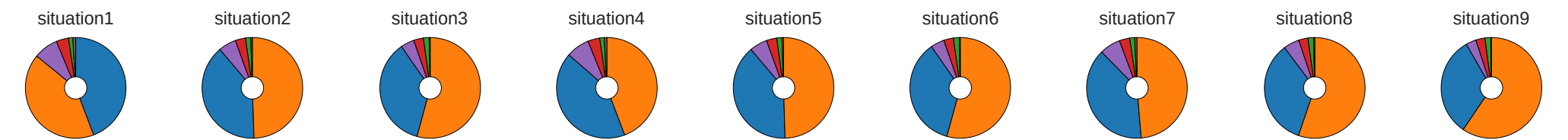
Metrics

Net present value (Cost)

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Cost w/ deficit (STPR)	16,235	13,090	11,773	15,337	13,089	11,750	13,408	11,565	10,615	(£m)
Cost w/o deficit (STPR)	16,235	13,090	11,773	15,337	13,089	11,750	13,408	11,565	10,615	(£m)
Cost w/ deficit (IGEQ)	26,159	20,194	17,850	24,409	20,234	17,813	21,090	17,672	15,936	(£m)
Cost w/o deficit (IGEQ)	26,159	20,194	17,850	24,409	20,234	17,813	21,090	17,672	15,936	(£m)
Cost w/ deficit (LTDR)	18,117	14,457	12,947	17,064	14,462	12,921	14,875	12,742	11,646	(£m)
Cost w/o deficit (LTDR)	18,117	14,457	12,947	17,064	14,462	12,921	14,875	12,742	11,646	(£m)

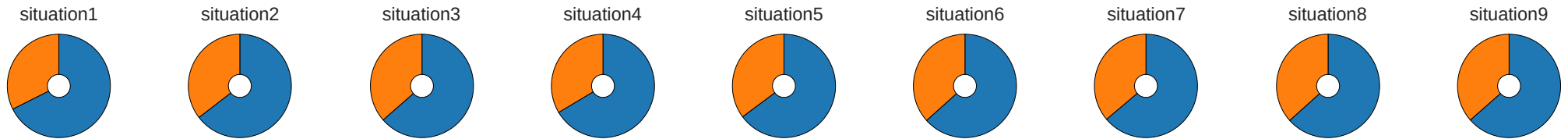
Cost breakdown (STPR)

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Capex	7,178	5,152	4,256	6,463	5,141	4,231	5,228	3,992	3,421	(£m)
Fixed opex	6,768	6,476	6,380	6,784	6,482	6,379	6,520	6,387	6,312	(£m)
Fixed operational carbon	229	223	219	230	223	220	218	211	206	(£m)
Embedded carbon	645	430	369	585	433	368	449	348	311	(£m)
Variable opex	1,267	740	509	1,147	742	512	898	583	345	(£m)
Variable carbon opex	148	67	39	128	67	40	96	44	20	(£m)



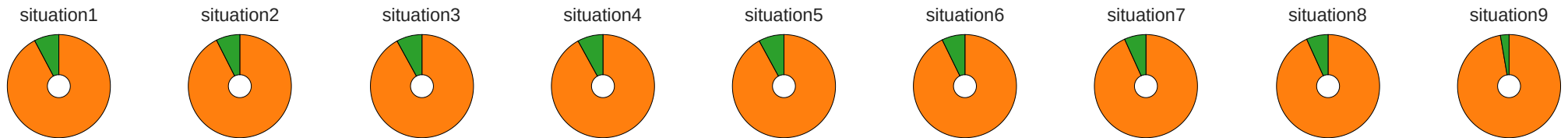
Emissions breakdown

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Capital emissions	4,137,310	2,633,371	2,225,877	3,689,521	2,664,816	2,218,115	2,816,566	2,113,848	1,863,954	(tonnes)
Operational emissions	1,983,180	1,445,323	1,275,383	1,863,568	1,446,176	1,282,919	1,595,677	1,222,026	1,069,550	(tonnes)



Electricity breakdown

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Generated (on site)	0	0	0	0	0	0	0	0	0	(GWh)
Grid	24,145	12,771	6,586	21,050	12,435	6,768	16,543	10,579	4,727	(GWh)
Renewable	2,034	1,031	575	1,835	1,076	530	1,205	772	132	(GWh)



Environmental

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
SEA environmental benefit	87,311.00	81,256.00	80,017.00	85,768.00	80,980.00	79,677.00	83,410.00	78,832.00	77,586.00	
SEA environmental disbenefit	124,203.00	91,311.00	84,591.00	115,339.00	90,240.00	81,225.00	104,531.00	80,520.00	71,956.00	
Natural capital	7,374,783.42	8,552,014.37	8,535,203.37	7,475,040.61	8,701,388.00	8,547,747.32	11,385,609.07	14,765,547.55	16,048,010.36	
Bio-diversity net gain	-245,866.00	-145,895.00	-134,717.00	-246,876.00	-140,537.00	-125,981.00	-213,670.00	-166,624.00	-145,901.00	

Social

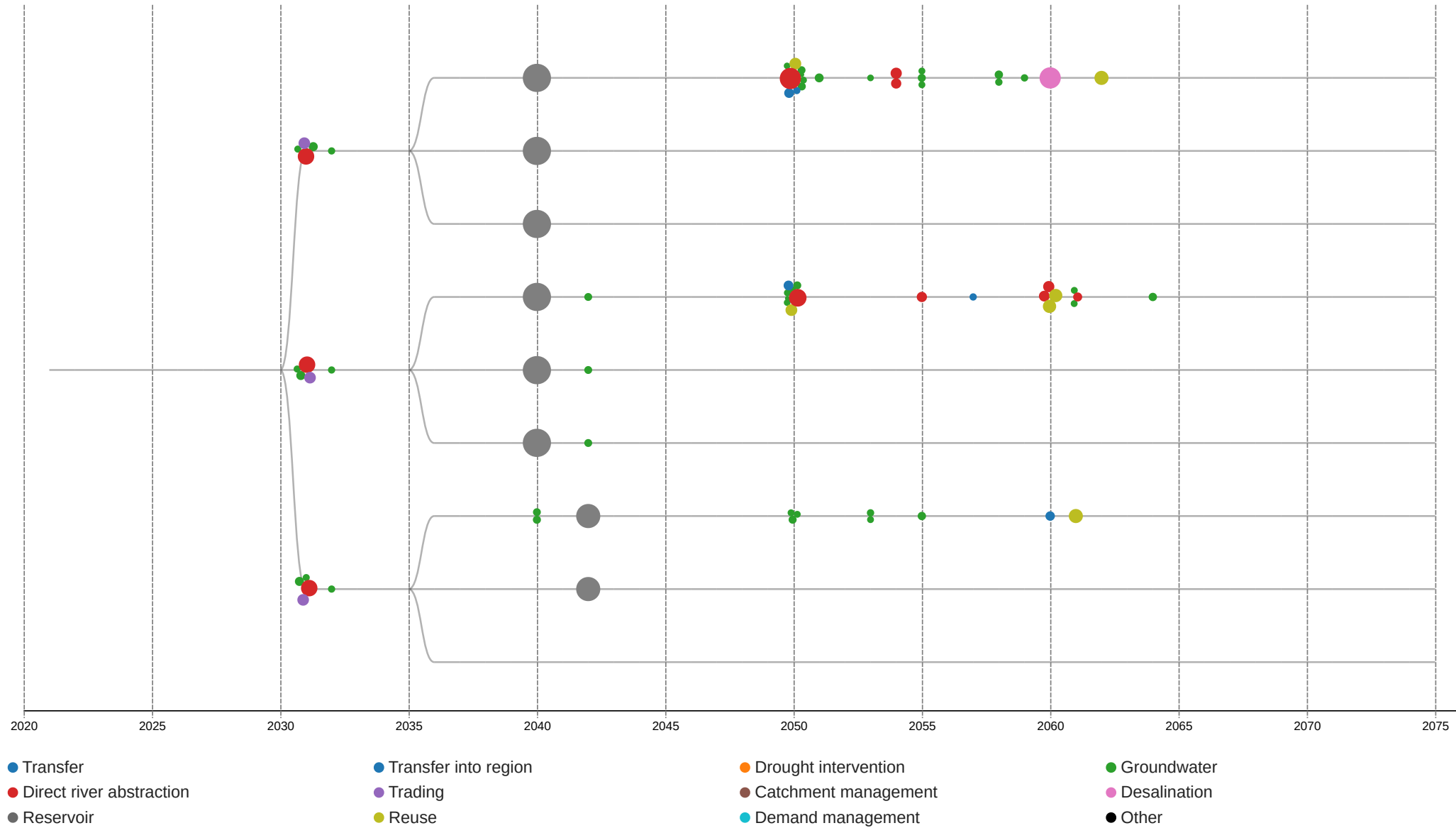
Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Customer preference	34,423.00	32,295.00	31,832.00	33,868.00	32,234.00	31,668.00	33,321.00	31,535.00	30,952.00	

Reliability

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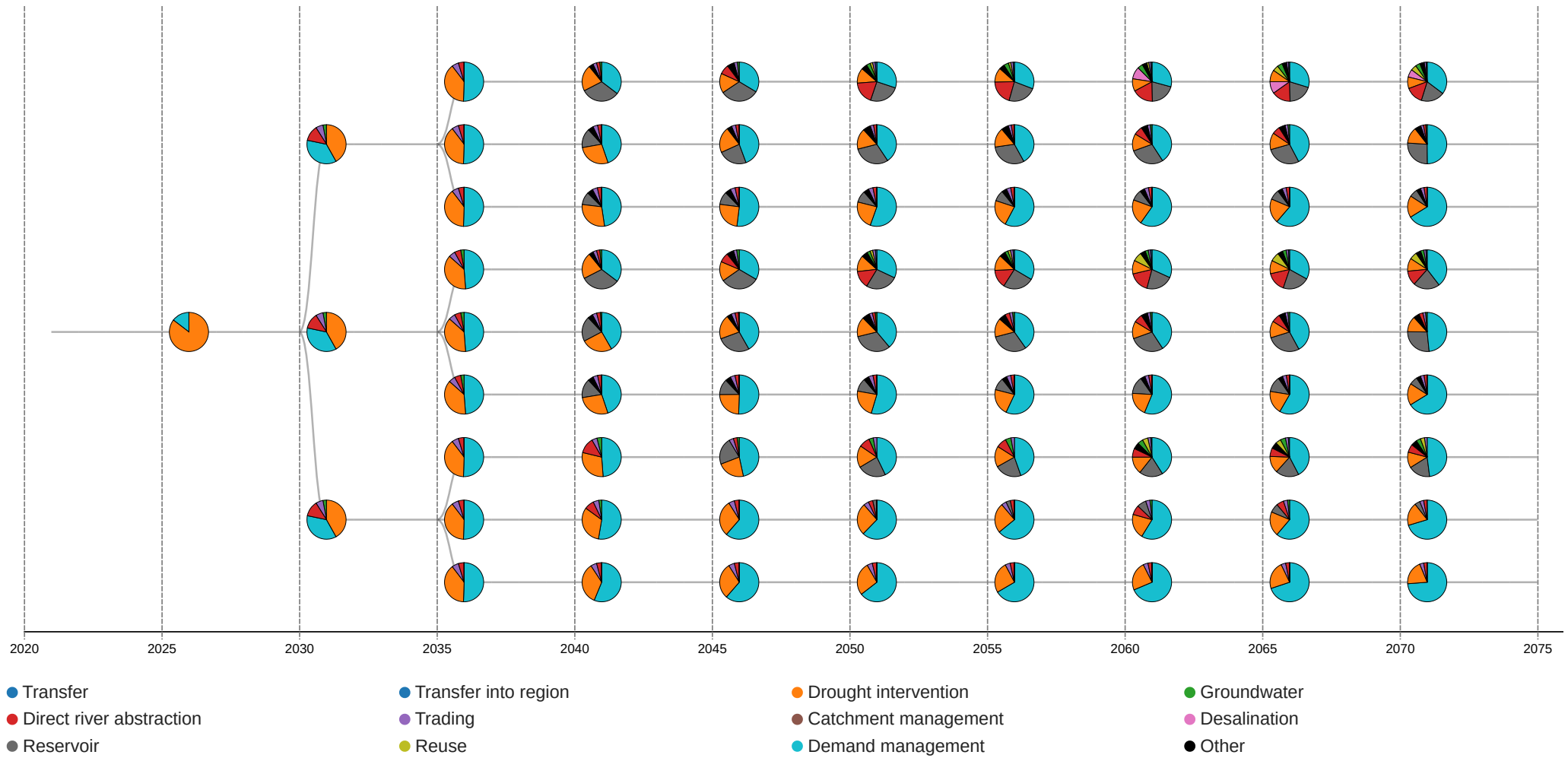
Adaptability										
Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Adaptability	19.81	22.88	24.43	20.38	22.69	24.17	21.54	23.41	27.39	
A3: Operational complexity and flexibility	10.27	11.40	12.34	10.55	11.35	12.27	10.68	11.52	13.62	
A4: WRZ connectivity	9.48	11.47	12.08	9.80	11.33	11.88	10.82	11.87	13.75	
A7: Customer relations support engagement with demand management	0.05	0.02	0.02	0.04	0.02	0.02	0.04	0.02	0.02	
Evolvability										
Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Evolvability	29.16	30.62	32.65	29.23	30.51	32.52	30.18	32.18	37.46	
E1: Scaleability and modularity of proposed changes	12.02	12.96	13.88	12.10	12.92	13.84	12.96	13.98	16.25	
E2: Intervention lead times	7.31	6.92	7.31	7.18	6.91	7.27	6.96	7.22	8.37	
E3: Reliance on external bodies to deliver changes	9.74	10.69	11.41	9.89	10.64	11.37	10.19	10.94	12.80	
E5: Collaborative land management	0.10	0.04	0.04	0.07	0.04	0.04	0.07	0.04	0.04	

Option Selection (Thames Water)

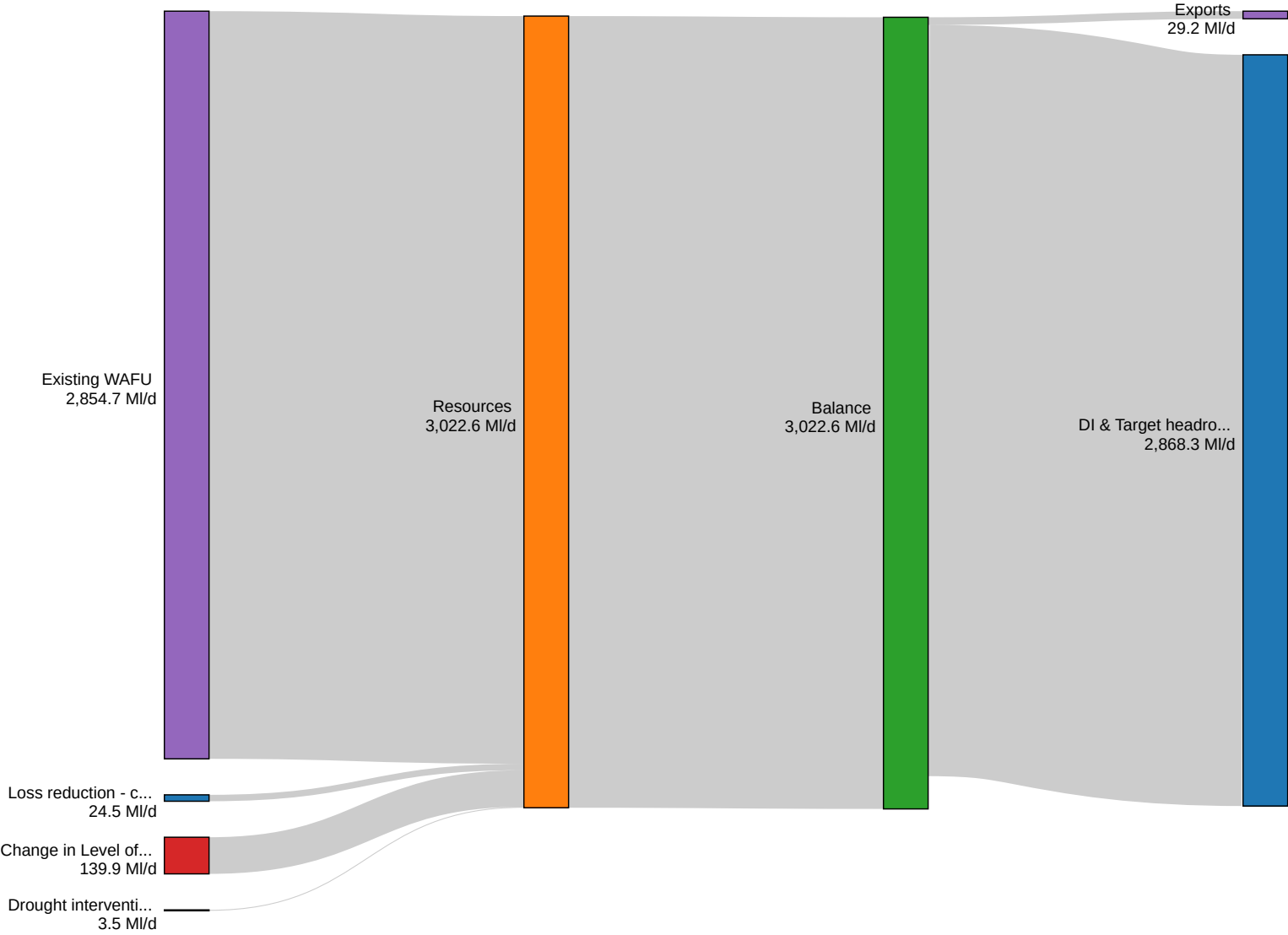


Utilisation (Thames Water)

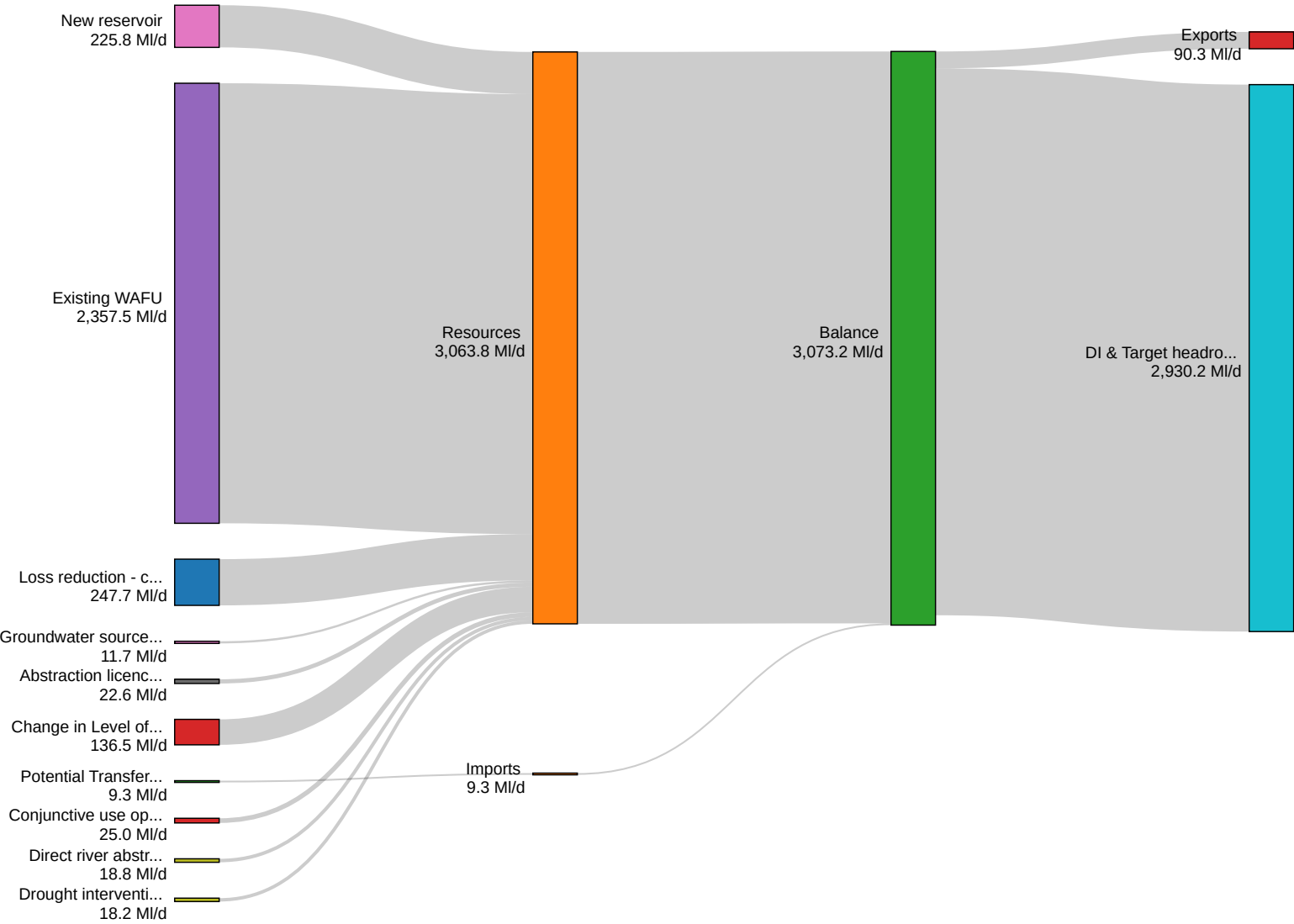
Pie charts show the breakdown of option utilisation by option category.



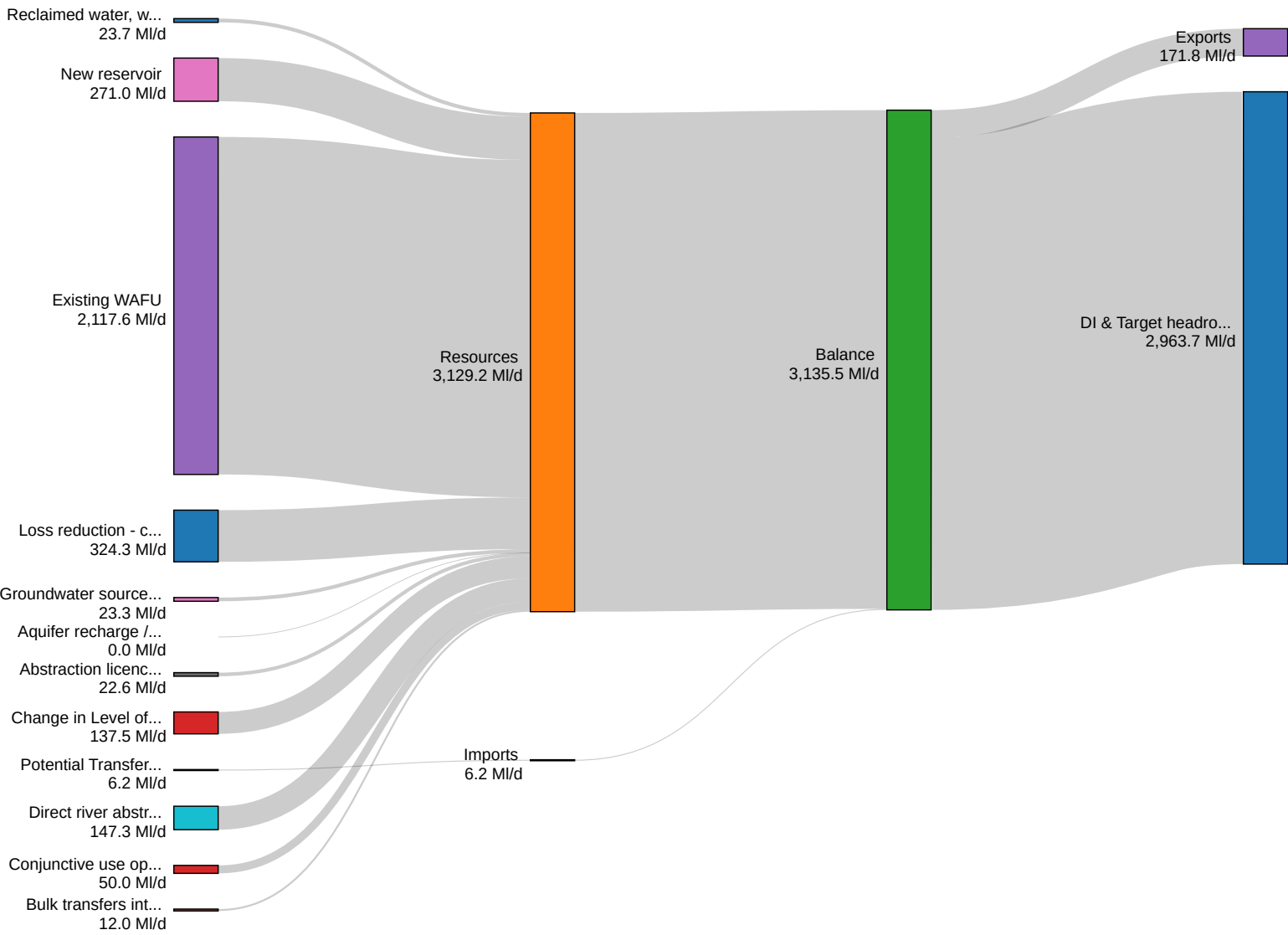
Situation 4 - 2026 (Thames Water)



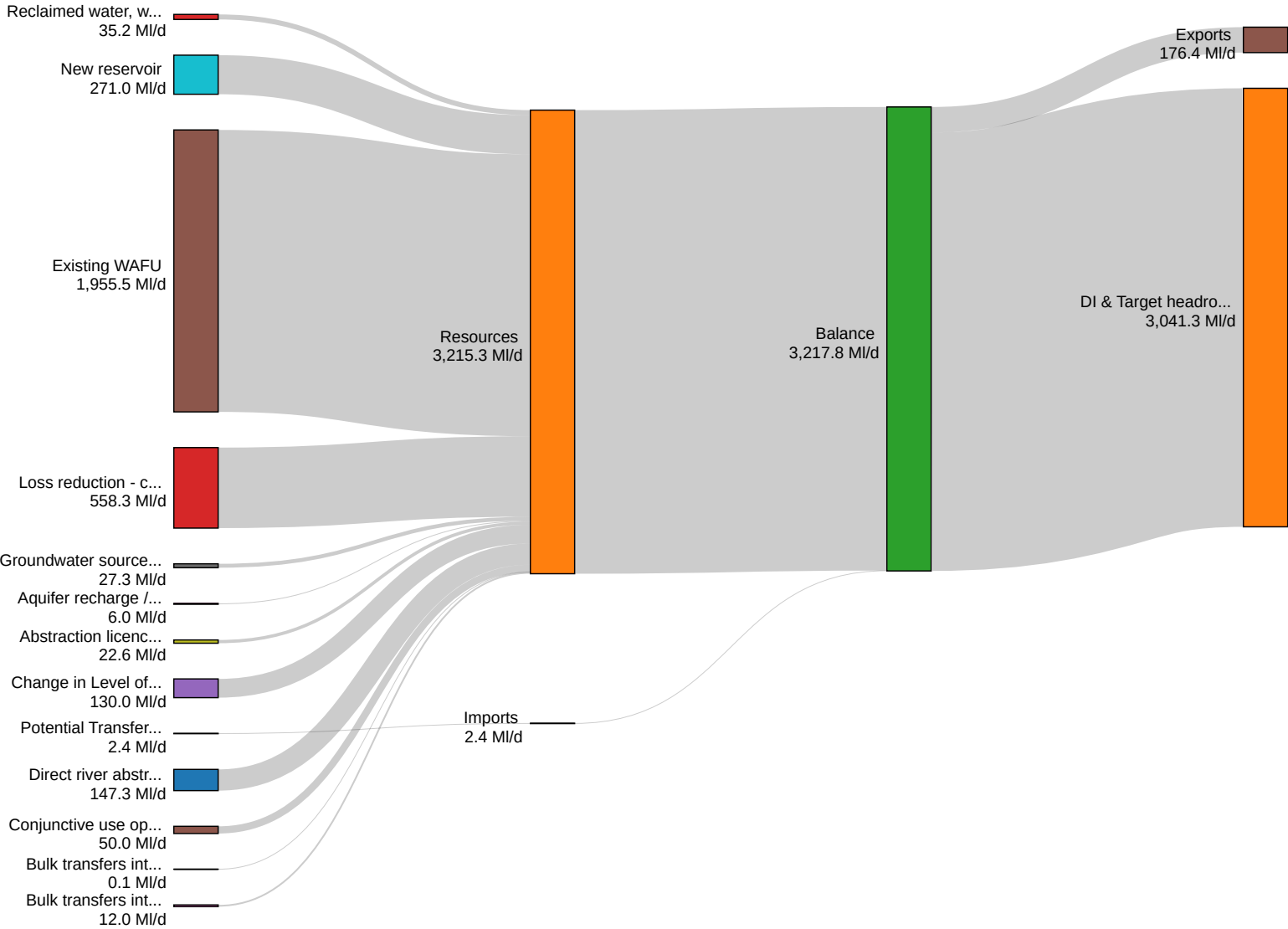
Situation 4 - 2040 (Thames Water)



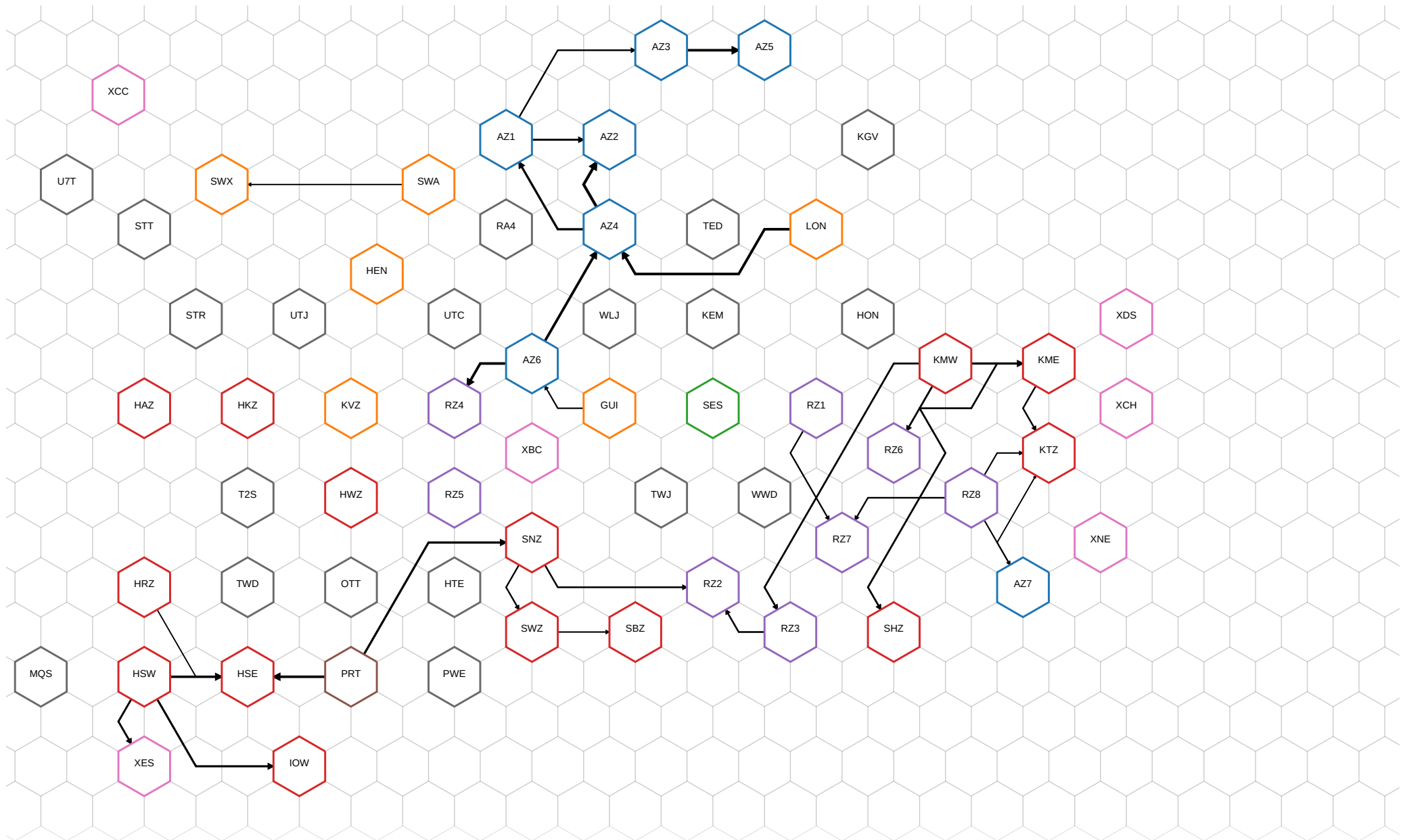
Situation 4 - 2050 (Thames Water)



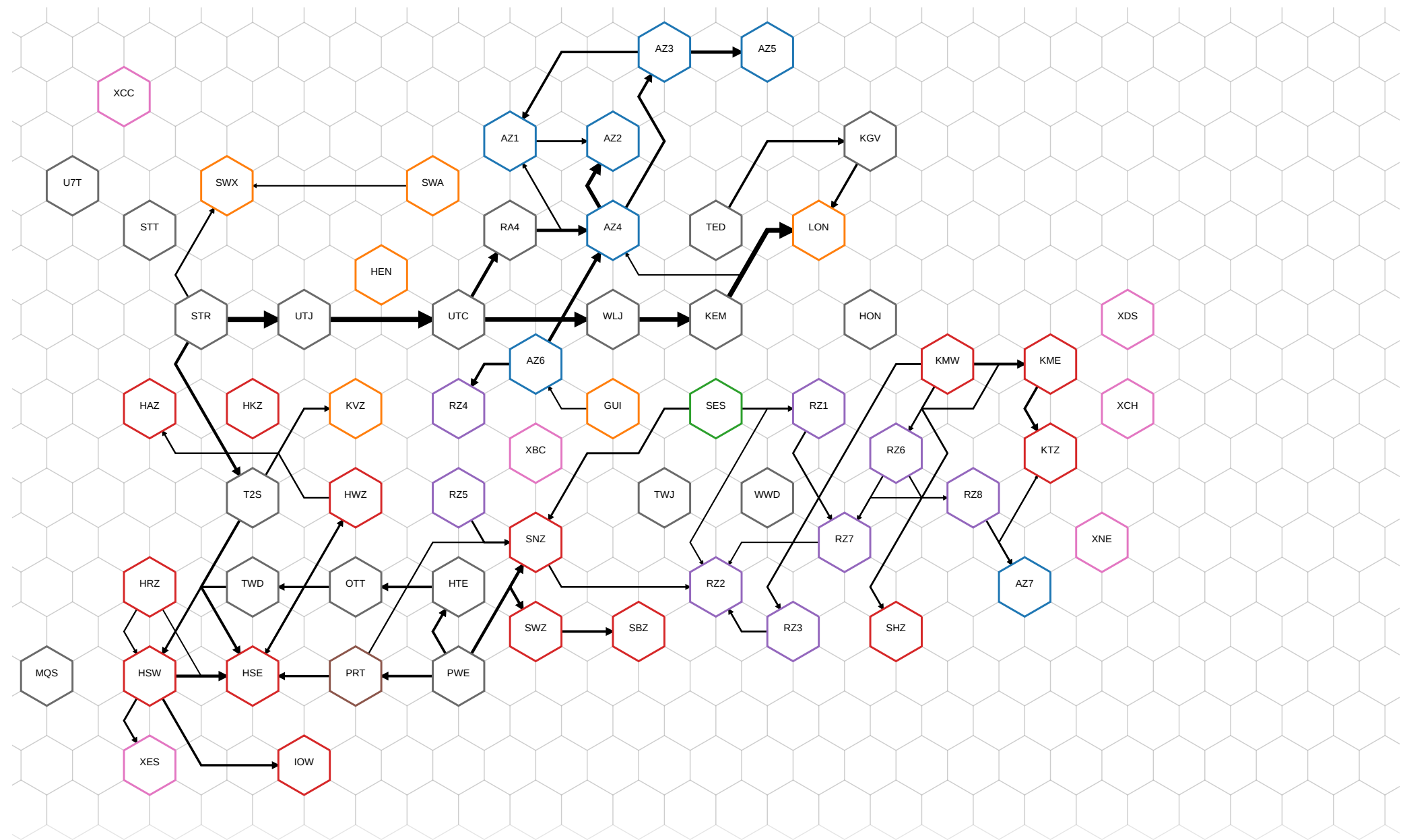
Situation 4 - 2075 (Thames Water)



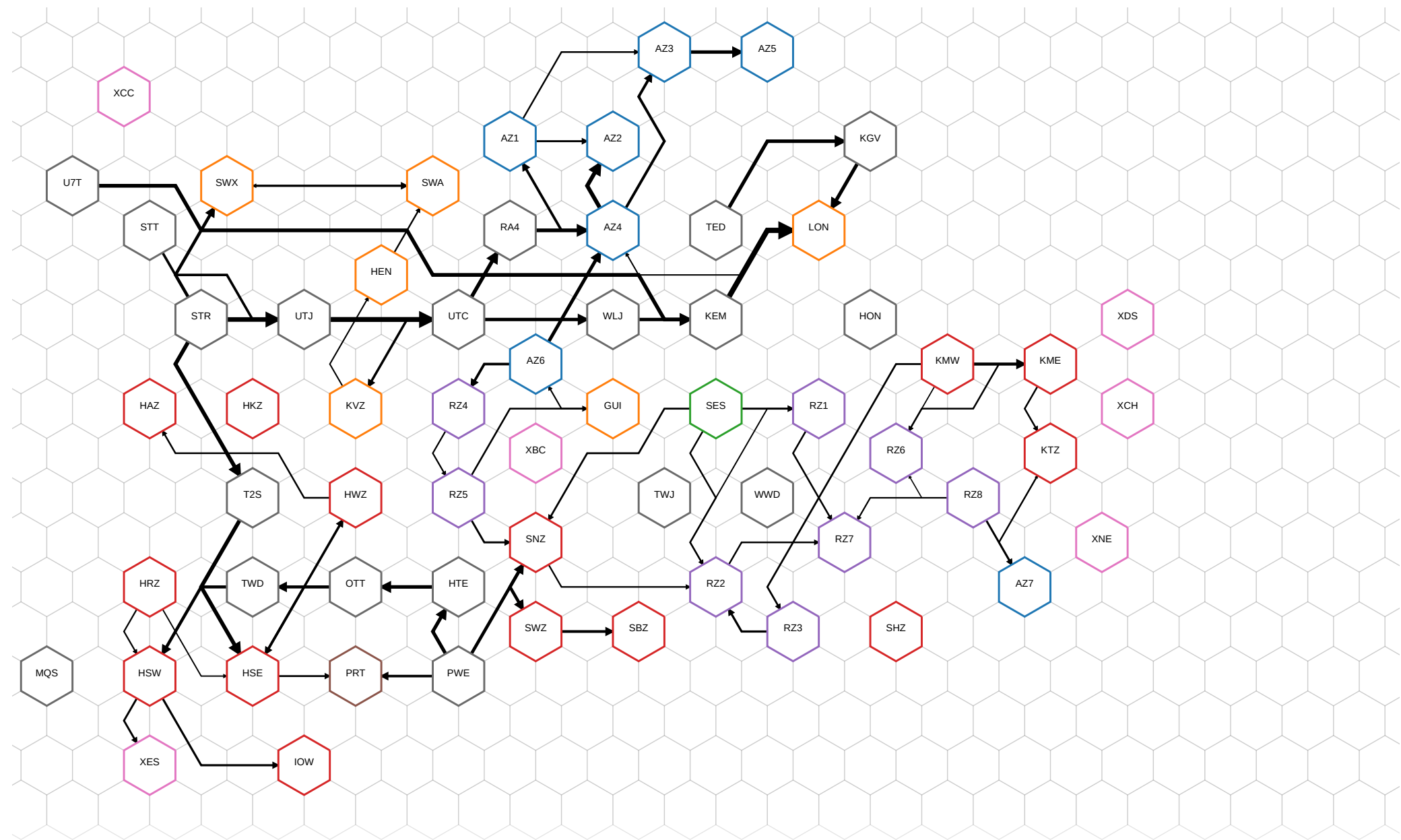
Situation 4 - 2026



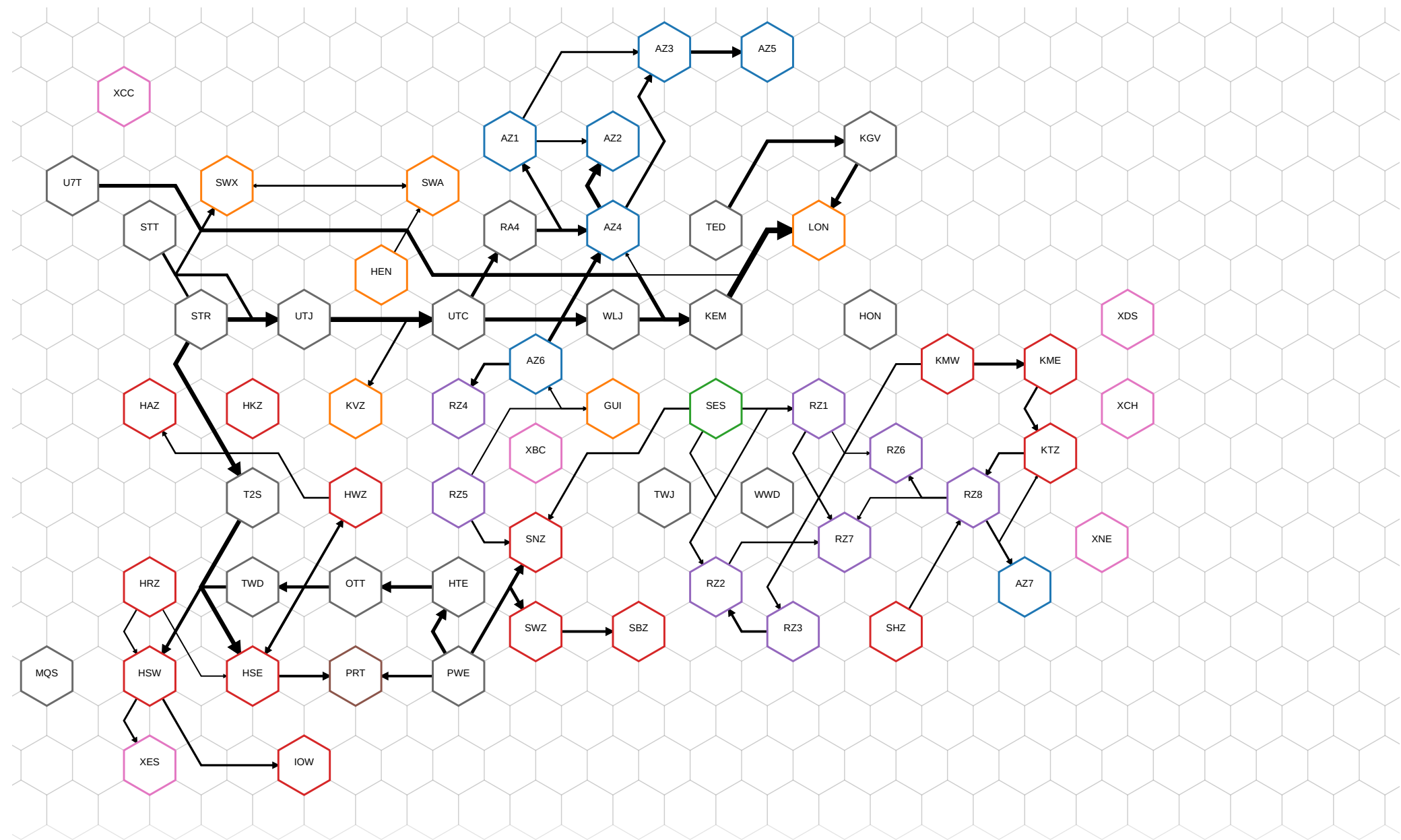
Situation 4 - 2040



Situation 4 - 2050



Situation 4 - 2075



IVM RUN DOSSIER

GENERAL BVP UPLIFT PLAN

IVM Summary: Thames Water

Metadata

General Settings

Name	st-hybrid-dy-w1-tree16.05-options-v37-gov-led-hybridb-2075-bvp-01_00
Created at	17/08/2022, 00:29:30
Tree	tree16.05: Root and branch tree 16.05: Stage 1 - Begins Hplan and LOW LCED, Stage 2 - Branches on growth (OxCam1a, Hplan and ONS18c), Stage 3 - Branches on licenced capped environmental destination, climate change and further growth scenarios (Hmax and Hmin) 
Setting name	options-v37-gov-led-hybridb 
Setting description	Emergency options in HSE, SBZ, and PRT.
Optimised discount rate	STPR

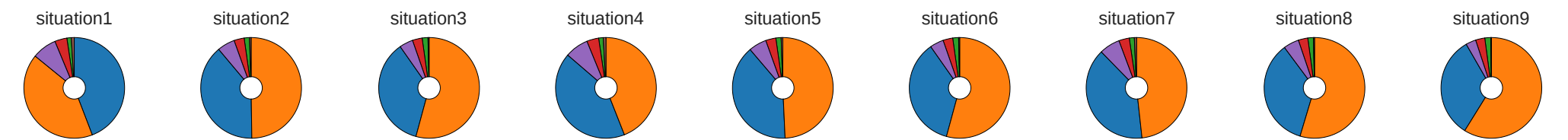
Metrics

Net present value (Cost)

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Cost w/ deficit (STPR)	16,273	12,962	11,727	15,385	13,099	11,718	13,455	11,664	10,691	(£m)
Cost w/o deficit (STPR)	16,273	12,962	11,727	15,385	13,099	11,718	13,455	11,664	10,691	(£m)
Cost w/ deficit (IGEQ)	26,205	19,974	17,766	24,524	20,219	17,755	21,101	17,834	16,038	(£m)
Cost w/o deficit (IGEQ)	26,205	19,974	17,766	24,524	20,219	17,755	21,101	17,834	16,038	(£m)
Cost w/ deficit (LTDR)	18,157	14,312	12,894	17,124	14,468	12,885	14,918	12,852	11,728	(£m)
Cost w/o deficit (LTDR)	18,157	14,312	12,894	17,124	14,468	12,885	14,918	12,852	11,728	(£m)

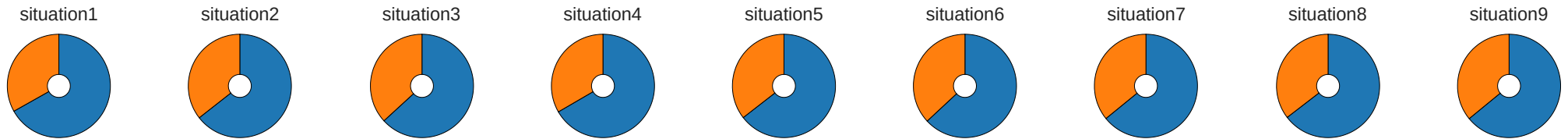
Cost breakdown (STPR)

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Capex	7,189	5,070	4,232	6,504	5,173	4,223	5,304	4,105	3,510	(£m)
Fixed opex	6,786	6,451	6,356	6,773	6,454	6,354	6,493	6,372	6,292	(£m)
Fixed operational carbon	231	223	220	230	223	220	218	211	206	(£m)
Embedded carbon	638	425	367	591	431	366	454	357	317	(£m)
Variable opex	1,277	728	511	1,157	749	514	892	579	346	(£m)
Variable carbon opex	152	66	41	130	69	40	94	40	20	(£m)



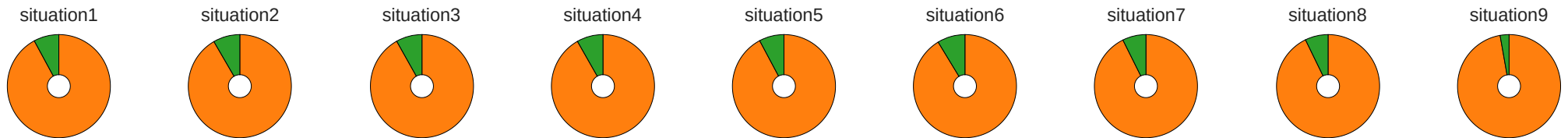
Emissions breakdown

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Capital emissions	4,088,250	2,597,915	2,211,939	3,745,372	2,638,613	2,204,375	2,835,925	2,171,038	1,900,748	(tonnes)
Operational emissions	2,025,434	1,433,821	1,287,266	1,875,284	1,451,868	1,289,131	1,585,578	1,190,476	1,065,046	(tonnes)



Electricity breakdown

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Generated (on site)	0	0	0	0	0	0	0	0	0	(GWh)
Grid	24,856	12,104	6,878	20,892	12,805	6,605	15,835	10,348	4,746	(GWh)
Renewable	2,133	1,108	610	1,875	1,084	629	1,260	805	136	(GWh)



Environmental

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
SEA environmental benefit	84,106.00	79,041.00	78,472.00	83,304.00	79,407.00	78,110.00	81,615.00	77,258.00	76,604.00	
SEA environmental disbenefit	122,774.00	91,237.00	83,333.00	114,314.00	91,319.00	82,012.00	104,042.00	80,761.00	71,340.00	
Natural capital	7,674,162.20	8,691,428.35	8,529,239.16	7,487,611.06	8,664,883.56	8,504,623.22	7,525,980.52	9,518,471.51	12,295,818.30	
Bio-diversity net gain	-229,669.00	-144,981.00	-132,069.00	-249,703.00	-137,272.00	-127,908.00	-214,655.00	-161,101.00	-146,380.00	

Social

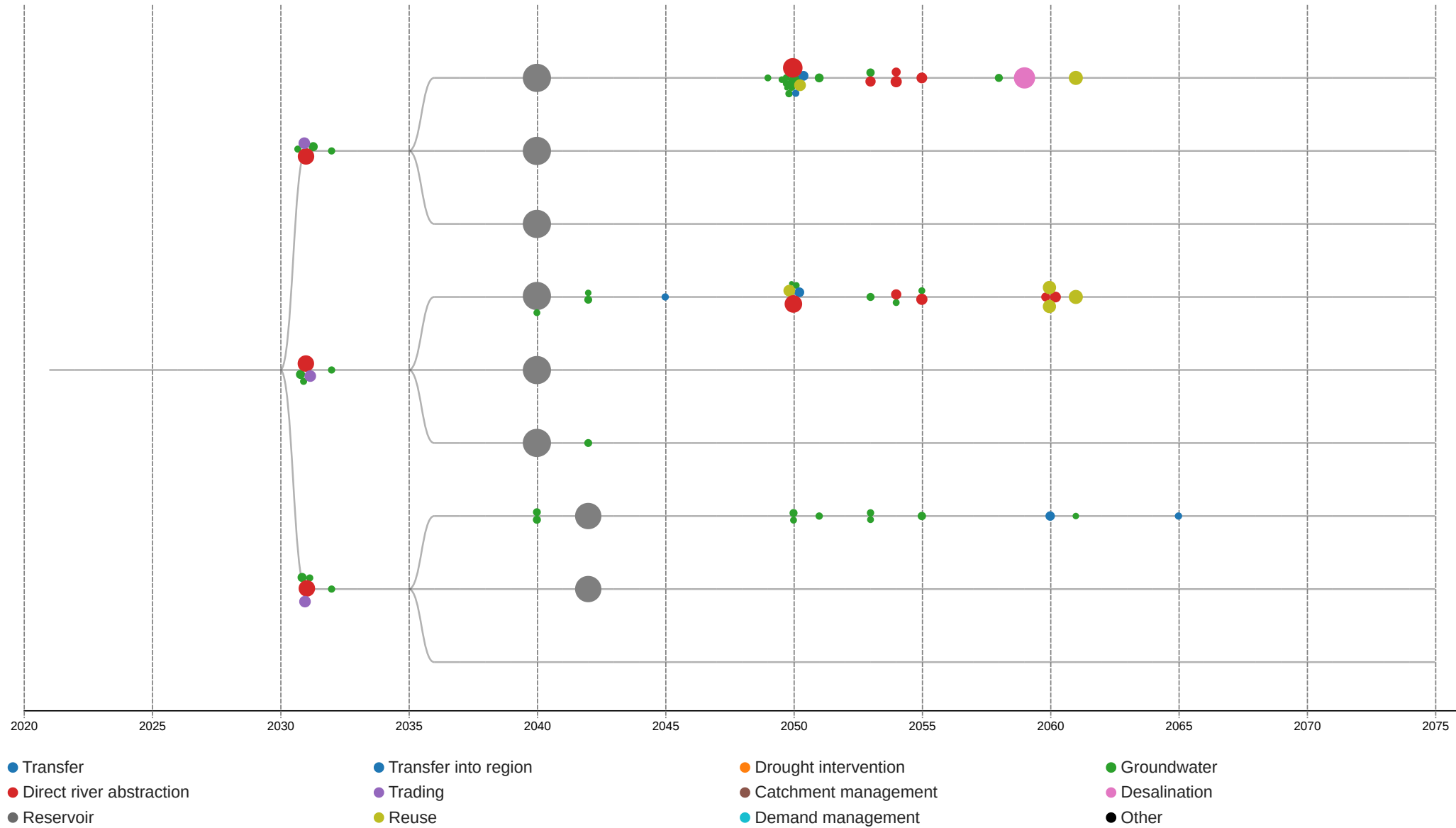
Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Customer preference	36,288.00	34,296.00	33,904.00	35,764.00	34,300.00	33,770.00	35,378.00	33,553.00	33,137.00	

Reliability

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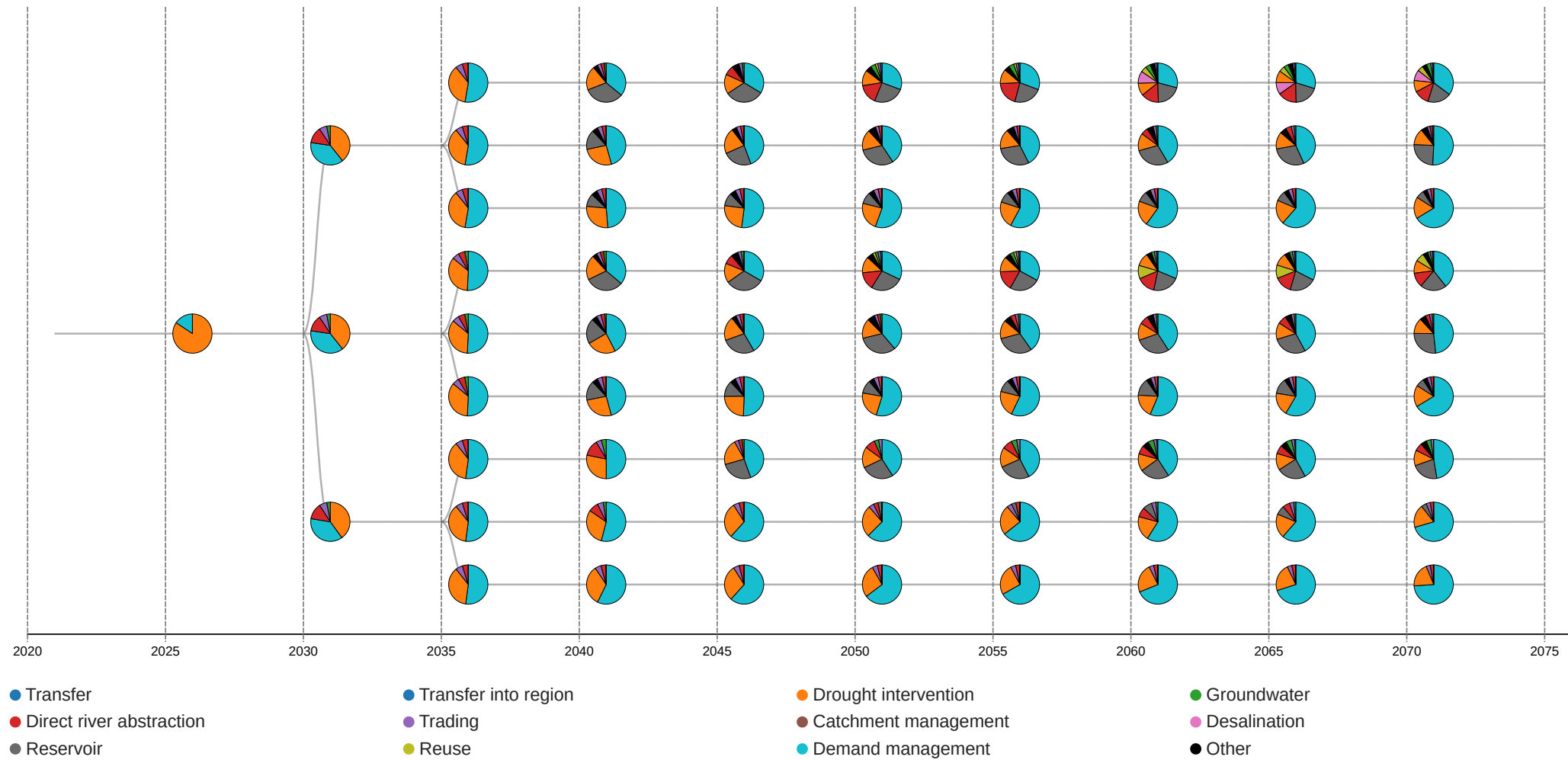
Adaptability										
Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Adaptability	19.74	22.41	24.30	20.37	22.75	24.13	22.01	23.70	27.69	
A3: Operational complexity and flexibility	10.25	11.29	12.35	10.55	11.38	12.27	11.02	11.87	13.94	
A4: WRZ connectivity	9.45	11.10	11.93	9.78	11.36	11.84	10.95	11.81	13.72	
A7: Customer relations support engagement with demand management	0.04	0.02	0.02	0.04	0.02	0.02	0.04	0.02	0.02	
Evolvability										
Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Evolvability	29.05	30.33	32.68	29.35	30.56	32.54	30.32	32.25	37.46	
E1: Scaleability and modularity of proposed changes	12.00	12.85	13.91	12.16	12.94	13.85	12.86	13.81	16.02	
E2: Intervention lead times	7.25	6.88	7.29	7.22	6.90	7.26	6.99	7.28	8.44	
E3: Reliance on external bodies to deliver changes	9.73	10.56	11.44	9.90	10.68	11.38	10.40	11.12	12.96	
E5: Collaborative land management	0.07	0.04	0.04	0.07	0.04	0.04	0.07	0.04	0.04	

Option Selection (Thames Water)

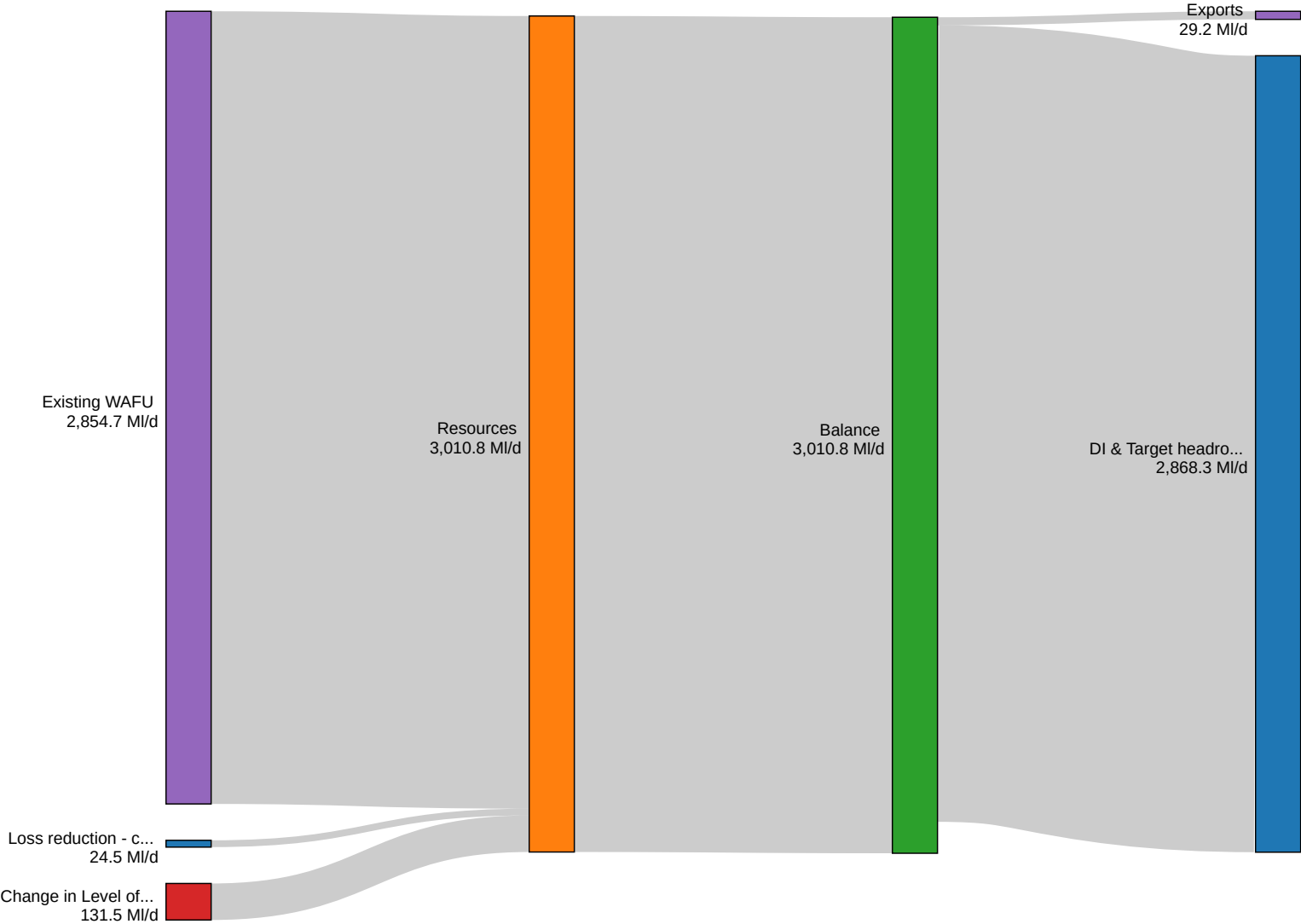


Utilisation (Thames Water)

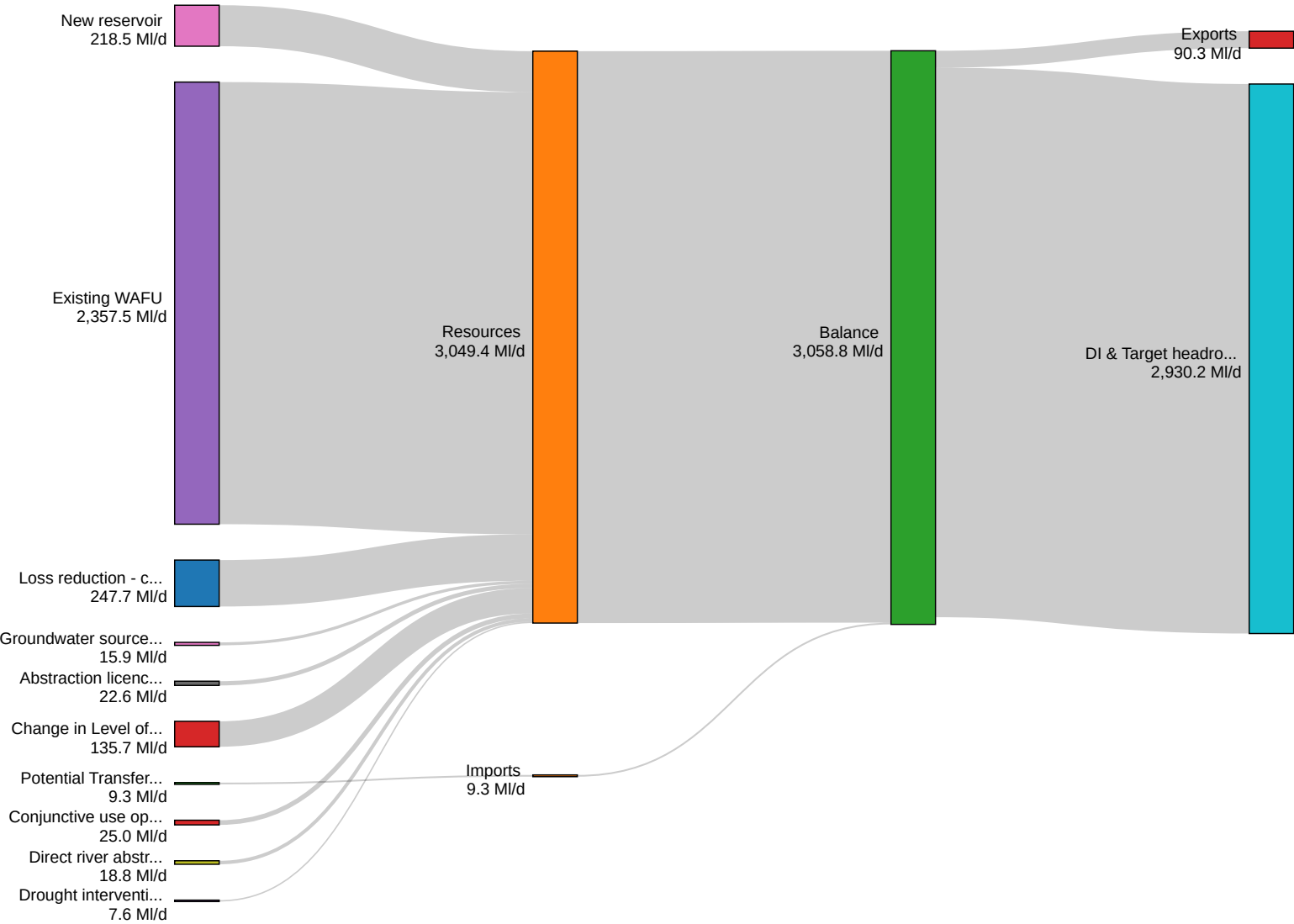
Pie charts show the breakdown of option utilisation by option category.



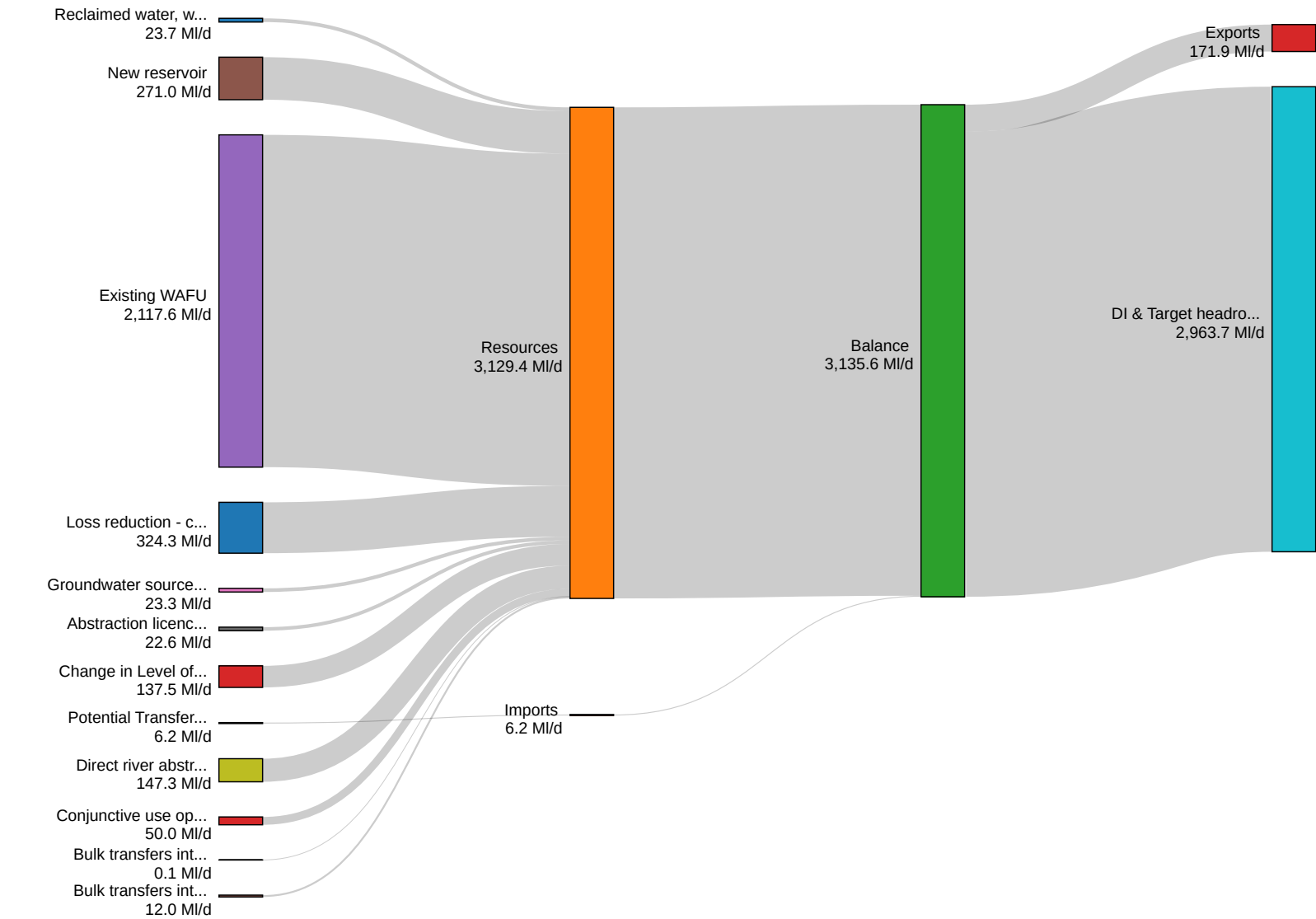
Situation 4 - 2026 (Thames Water)



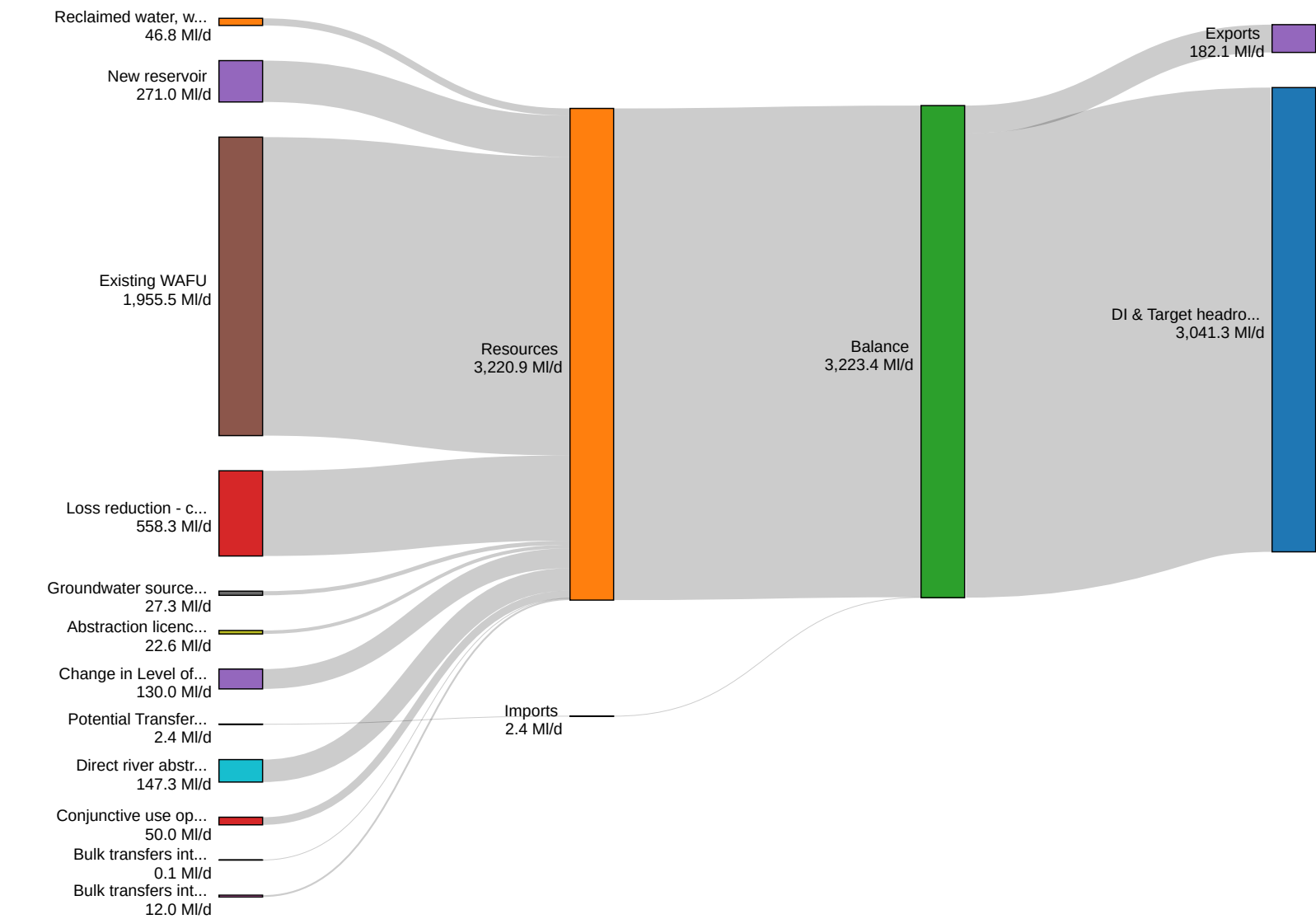
Situation 4 - 2040 (Thames Water)



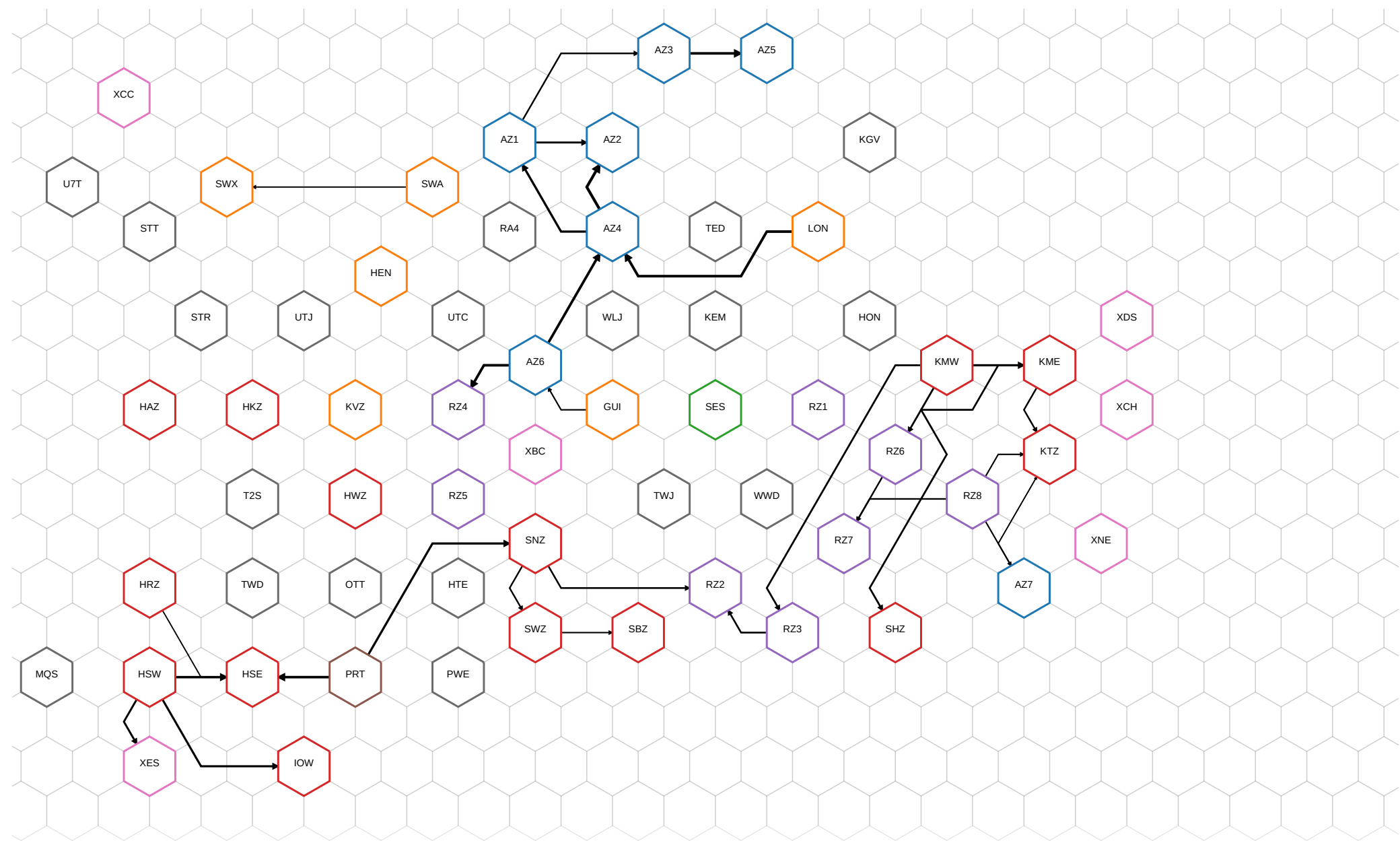
Situation 4 - 2050 (Thames Water)



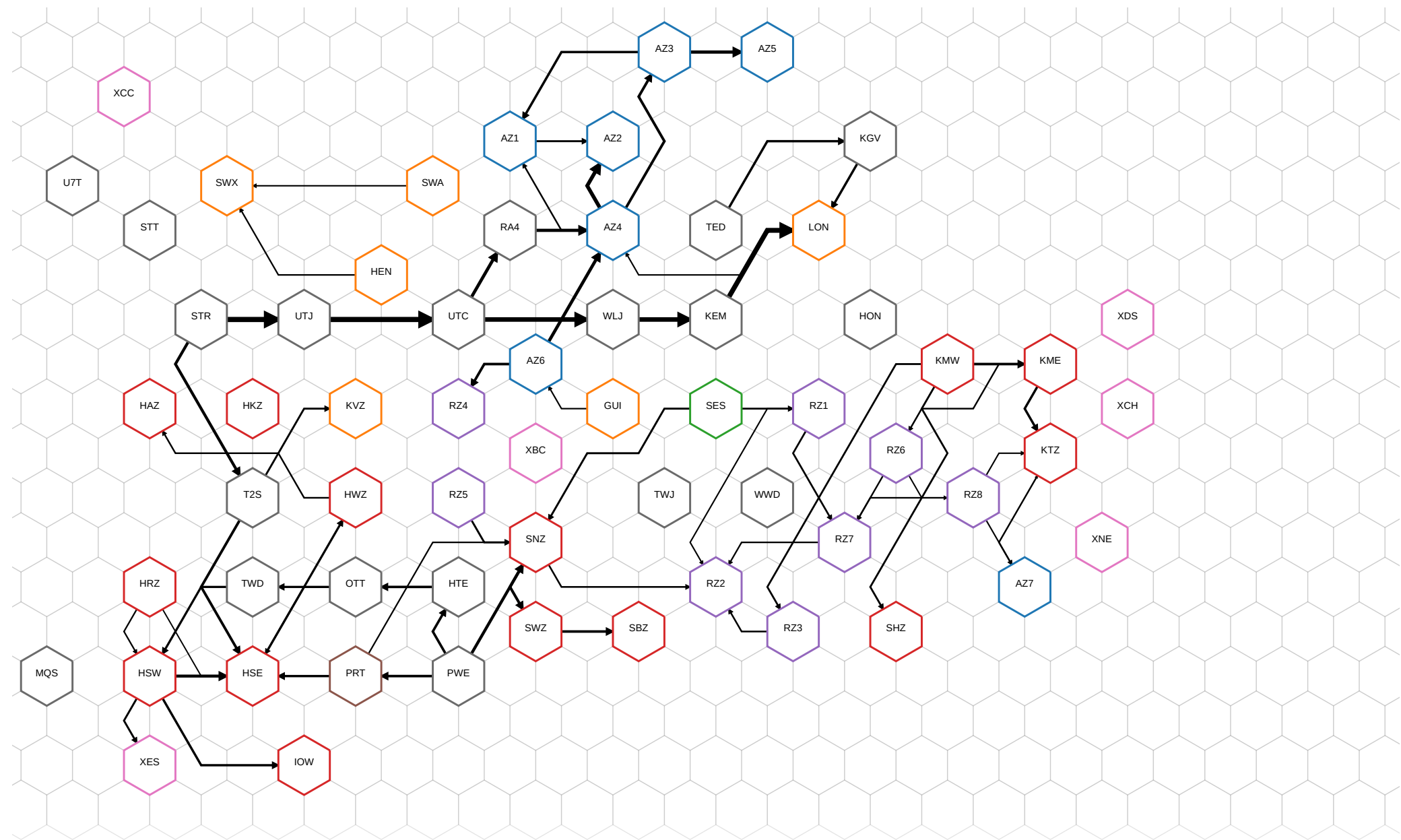
Situation 4 - 2075 (Thames Water)



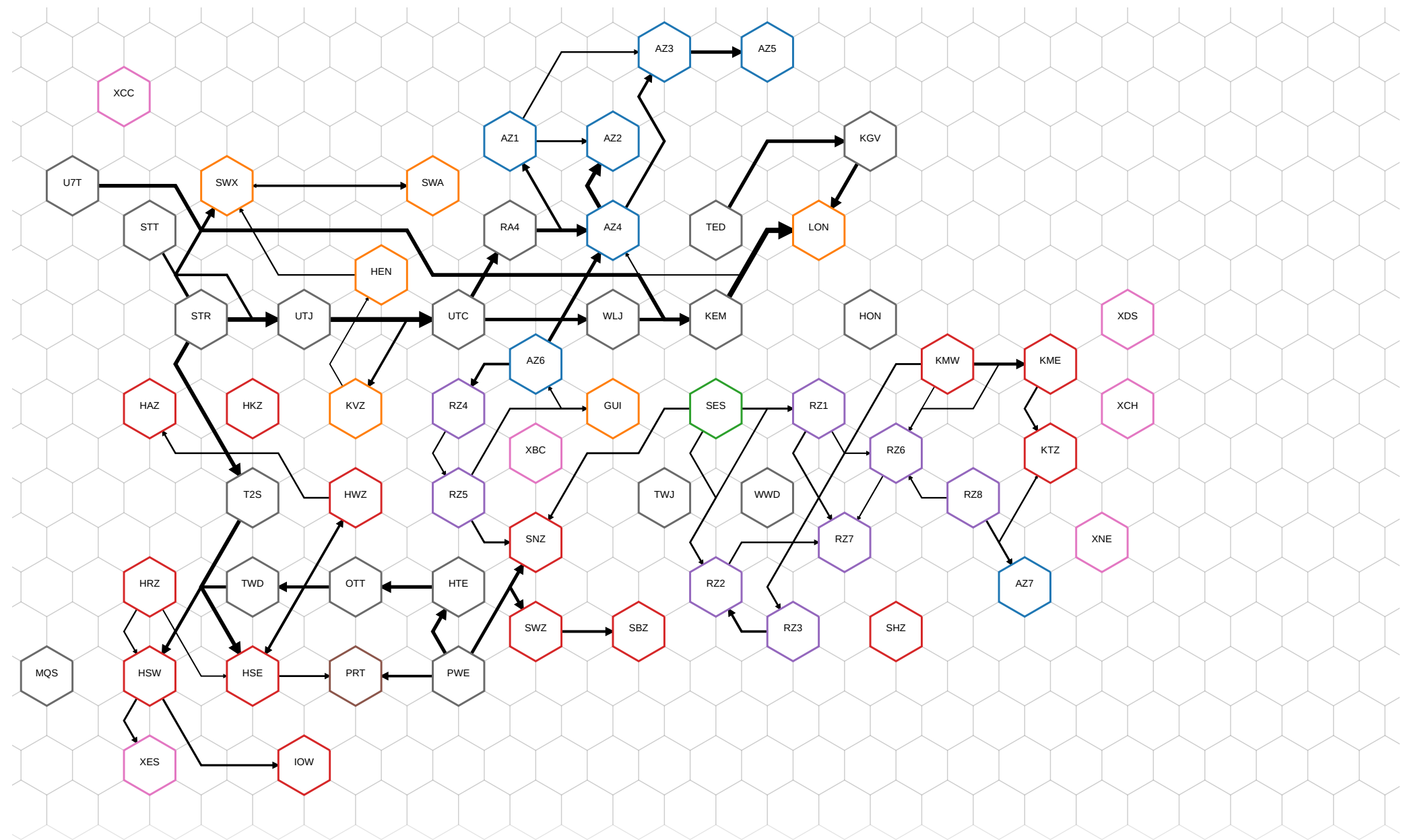
Situation 4 - 2026



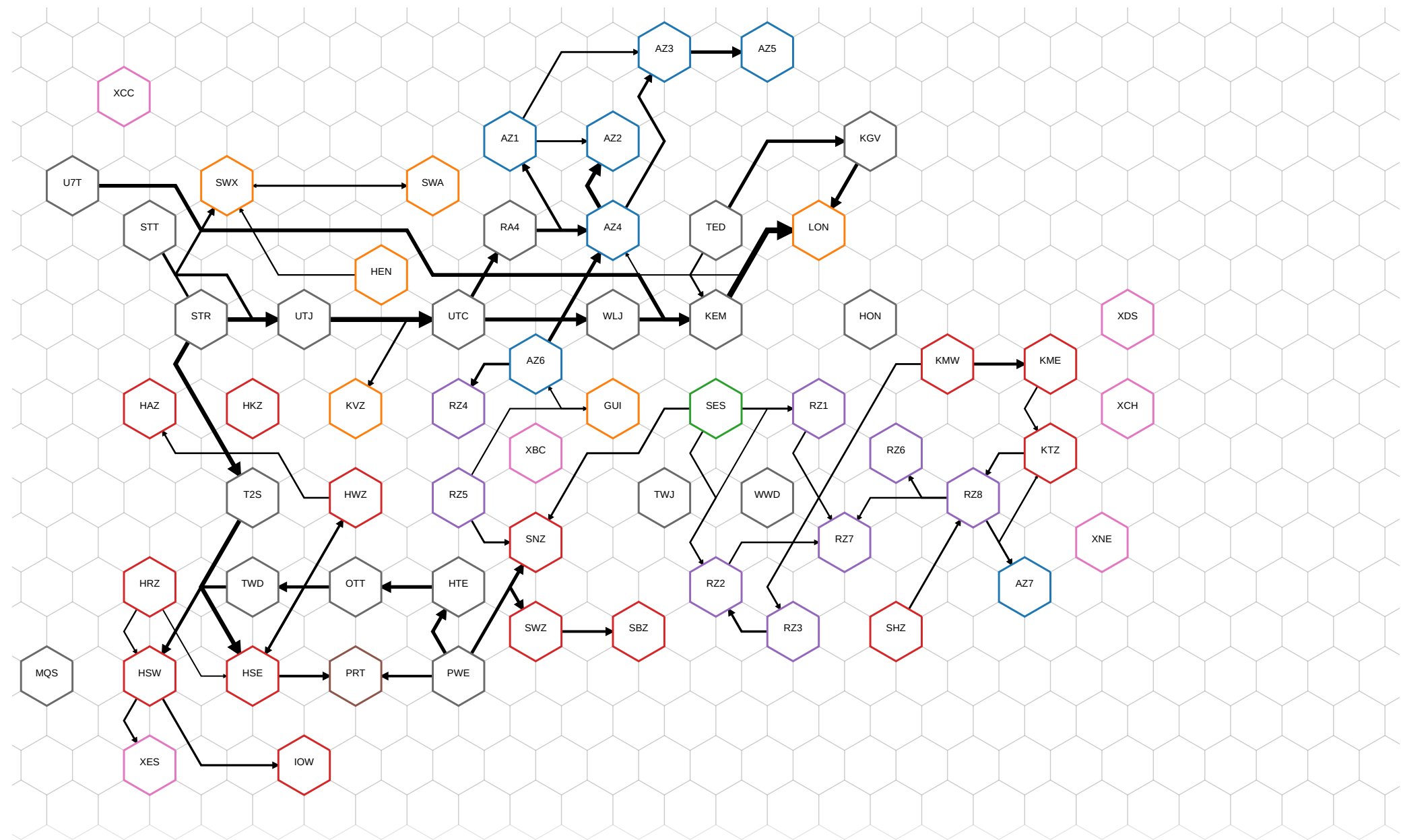
Situation 4 - 2040



Situation 4 - 2050



Situation 4 - 2075



IVM RUN DOSSIER

NO SESRO

IVM Summary: Thames Water

Metadata

General Settings

Name	st-hybrid-dy-w1-tree16.05-options-v37-gov-led-hybridb-excl-sesro-twul-rsr-all-stt-2075
Created at	18/08/2022, 03:01:02
Tree	tree16.05: Root and branch tree 16.05: Stage 1 - Begins Hplan and LOW LCED, Stage 2 - Branches on growth (OxCam1a, Hplan and ONS18c), Stage 3 - Branches on licenced capped environmental destination, climate change and further growth scenarios (Hmax and Hmin) 🔗
Setting name	options-v37-gov-led-hybridb-excl-sesro-twul-rsr-all-stt 🔗
Setting description	Emergency options in HSE, SBZ, and PRT. Excludes SESRO and TWUL reservoirs (and associated unsupported STT bypasses and Affinity conjunctive use). Include all STT options.
Optimised discount rate	STPR

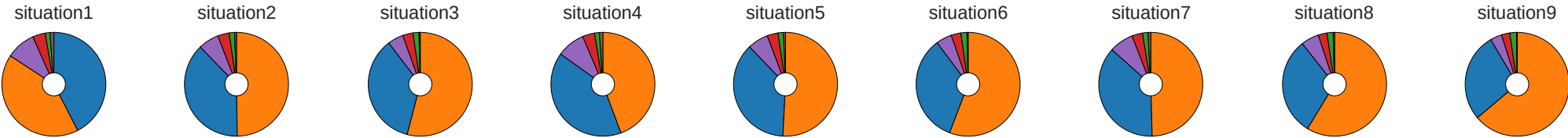
Metrics

Net present value (Cost)

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Cost w/ deficit (STPR)	17,175	13,057	11,757	15,936	12,842	11,349	13,633	10,766	9,779	(£m)
Cost w/o deficit (STPR)	17,175	13,057	11,757	15,936	12,842	11,349	13,633	10,766	9,779	(£m)
Cost w/ deficit (IGEQ)	27,915	20,238	17,867	25,622	19,973	17,213	21,581	16,360	14,546	(£m)
Cost w/o deficit (IGEQ)	27,915	20,238	17,867	25,622	19,973	17,213	21,581	16,360	14,546	(£m)
Cost w/ deficit (LTDR)	19,209	14,436	12,938	17,777	14,208	12,481	15,148	11,845	10,704	(£m)
Cost w/o deficit (LTDR)	19,209	14,436	12,938	17,777	14,208	12,481	15,148	11,845	10,704	(£m)

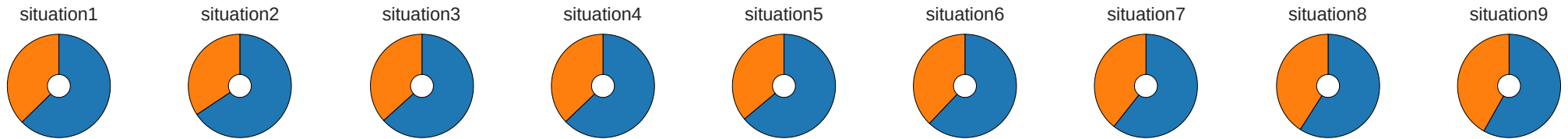
Cost breakdown (STPR)

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Capex	7,289	4,961	4,188	6,468	4,757	3,864	5,051	3,303	2,709	(£m)
Fixed opex	7,178	6,497	6,355	7,064	6,525	6,330	6,757	6,317	6,242	(£m)
Fixed operational carbon	258	221	219	246	221	216	233	210	205	(£m)
Embedded carbon	675	466	379	600	437	344	451	295	253	(£m)
Variable opex	1,568	836	569	1,387	822	552	1,022	596	350	(£m)
Variable carbon opex	208	77	47	171	80	42	118	45	20	(£m)



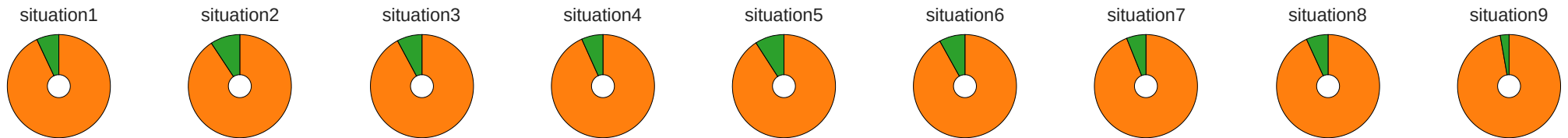
Emissions breakdown

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Capital emissions	4,317,420	2,853,697	2,289,752	3,798,782	2,698,970	2,070,926	2,843,896	1,759,920	1,477,210	(tonnes)
Operational emissions	2,571,020	1,490,552	1,324,871	2,242,945	1,522,563	1,264,089	1,843,462	1,219,684	1,063,942	(tonnes)



Electricity breakdown

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Generated (on site)	0	0	0	0	0	0	0	0	0	(GWh)
Grid	30,456	14,446	7,485	27,620	14,195	7,231	19,428	10,690	4,757	(GWh)
Renewable	2,294	1,483	638	1,996	1,426	636	1,260	788	135	(GWh)



Environmental

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
SEA environmental benefit	86,999.00	79,080.00	76,777.00	85,359.00	80,425.00	75,932.00	82,237.00	75,095.00	73,589.00	
SEA environmental disbenefit	133,224.00	95,894.00	85,495.00	122,912.00	99,835.00	83,673.00	107,468.00	77,986.00	69,186.00	
Natural capital	6,890,904.27	7,787,131.16	10,877,737.37	6,477,558.43	6,911,922.14	7,430,902.46	6,958,031.84	10,555,496.97	11,759,995.46	
Bio-diversity net gain	-373,152.00	-275,782.00	-230,403.00	-351,987.00	-278,652.00	-225,247.00	-265,901.00	-197,945.00	-174,303.00	

Social

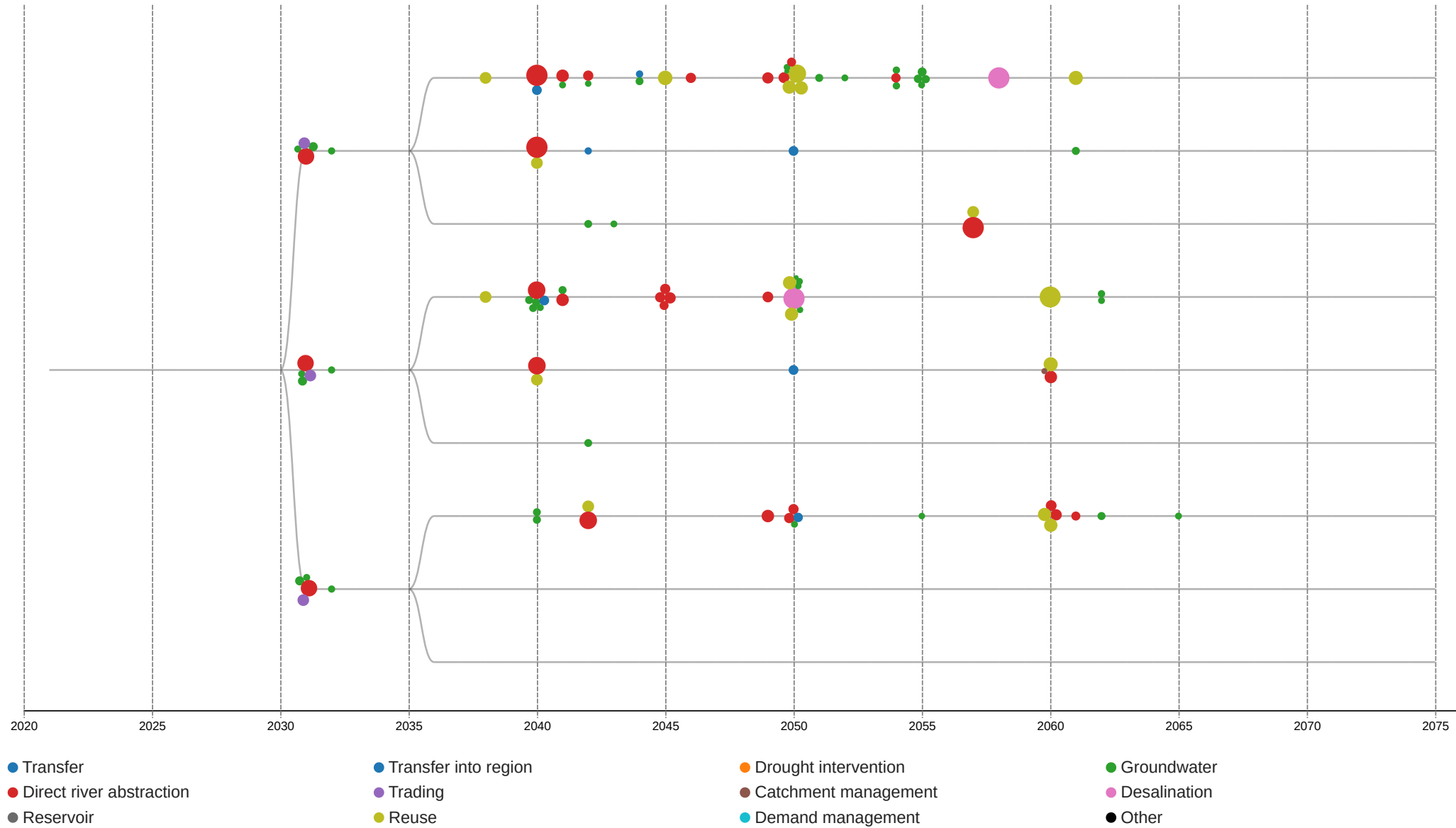
Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Customer preference	33,453.00	30,743.00	30,198.00	32,894.00	31,260.00	30,163.00	31,877.00	29,712.00	29,088.00	

Reliability

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Reliability	36.40	36.65	38.03	35.67	36.01	36.81	37.23	36.21	41.08	
R1: Uncertainty of option supply/demand benefit	10.95	10.62	11.03	10.51	10.36	10.60	10.88	10.25	11.60	
R3: Risk of service failure due to other physical hazards	9.35	9.62	10.06	9.16	9.36	9.65	9.65	9.49	10.93	
R4: Availability of additional headroom	6.56	6.90	6.97	6.59	6.82	6.91	6.91	7.19	7.69	
R5: Catchment/raw water quality risks (incl. climate change)	0.74	0.36	0.30	0.75	0.55	0.37	0.57	0.31	0.41	
R6: Capacity of catchment services	0.05	0.02	0.02	0.05	0.04	0.02	0.03	0.02	0.02	
R7: Risk of service failure to other exceptional events	8.72	9.13	9.63	8.59	8.87	9.24	9.16	8.94	10.43	
R8: Soil health	0.02	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01	

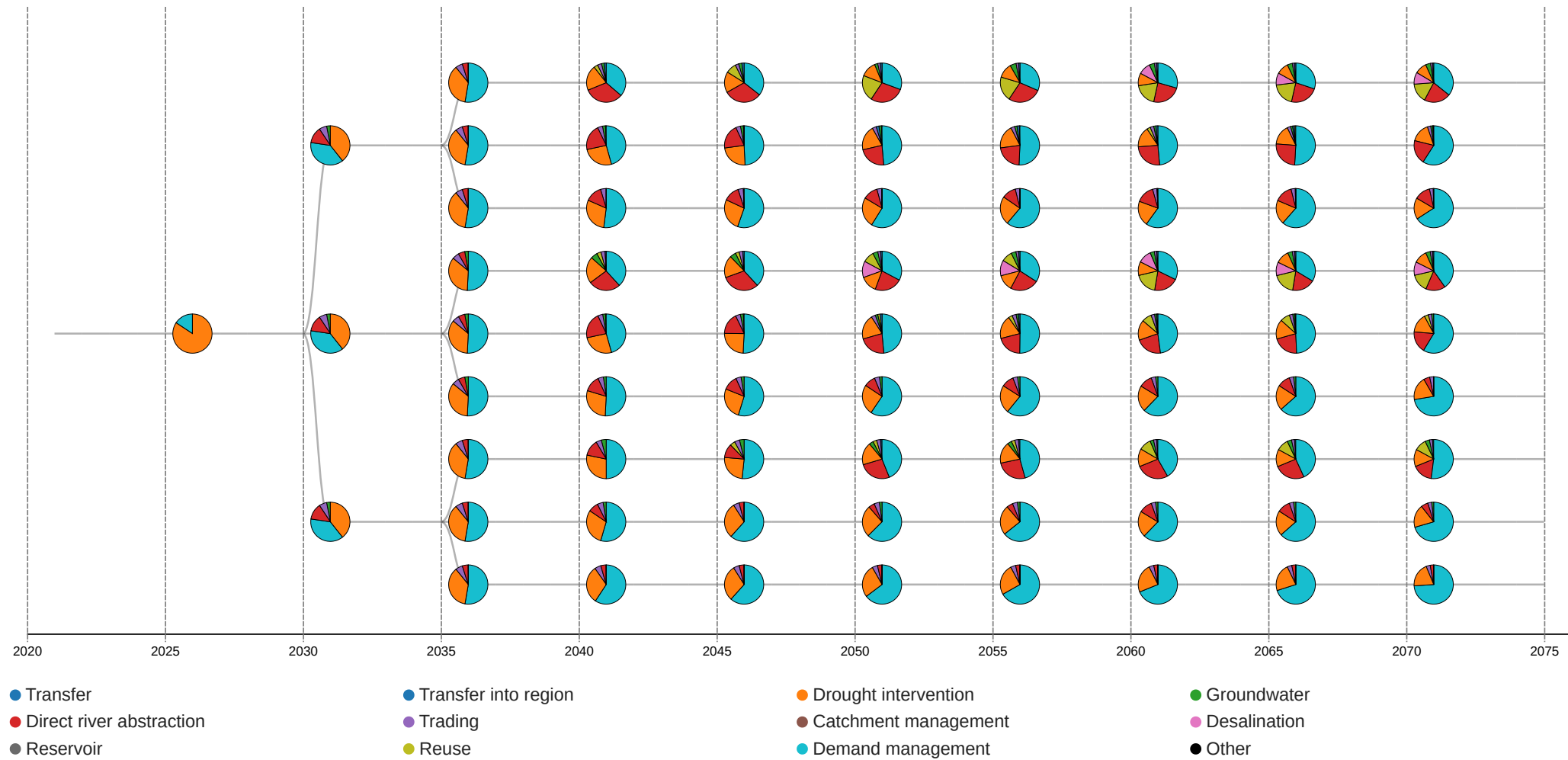
Adaptability										
Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Adaptability	18.05	19.66	21.24	18.10	19.26	20.56	19.62	20.56	23.87	
A3: Operational complexity and flexibility	8.58	9.10	9.69	8.45	8.82	9.28	9.10	8.97	10.53	
A4: WRZ connectivity	9.42	10.55	11.53	9.59	10.38	11.26	10.47	11.57	13.32	
A7: Customer relations support engagement with demand management	0.06	0.02	0.02	0.06	0.06	0.02	0.04	0.02	0.02	
Evolvability										
Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Evolvability	28.06	28.49	29.76	27.04	27.47	28.15	28.41	27.59	31.67	
E1: Scaleability and modularity of proposed changes	11.44	11.59	12.21	11.07	11.32	11.83	11.59	11.76	13.48	
E2: Intervention lead times	8.00	7.90	8.05	7.49	7.43	7.25	7.87	6.98	7.95	
E3: Reliance on external bodies to deliver changes	8.53	8.96	9.46	8.38	8.65	9.03	8.88	8.81	10.20	
E5: Collaborative land management	0.10	0.04	0.04	0.10	0.08	0.04	0.07	0.04	0.04	

Option Selection (Thames Water)

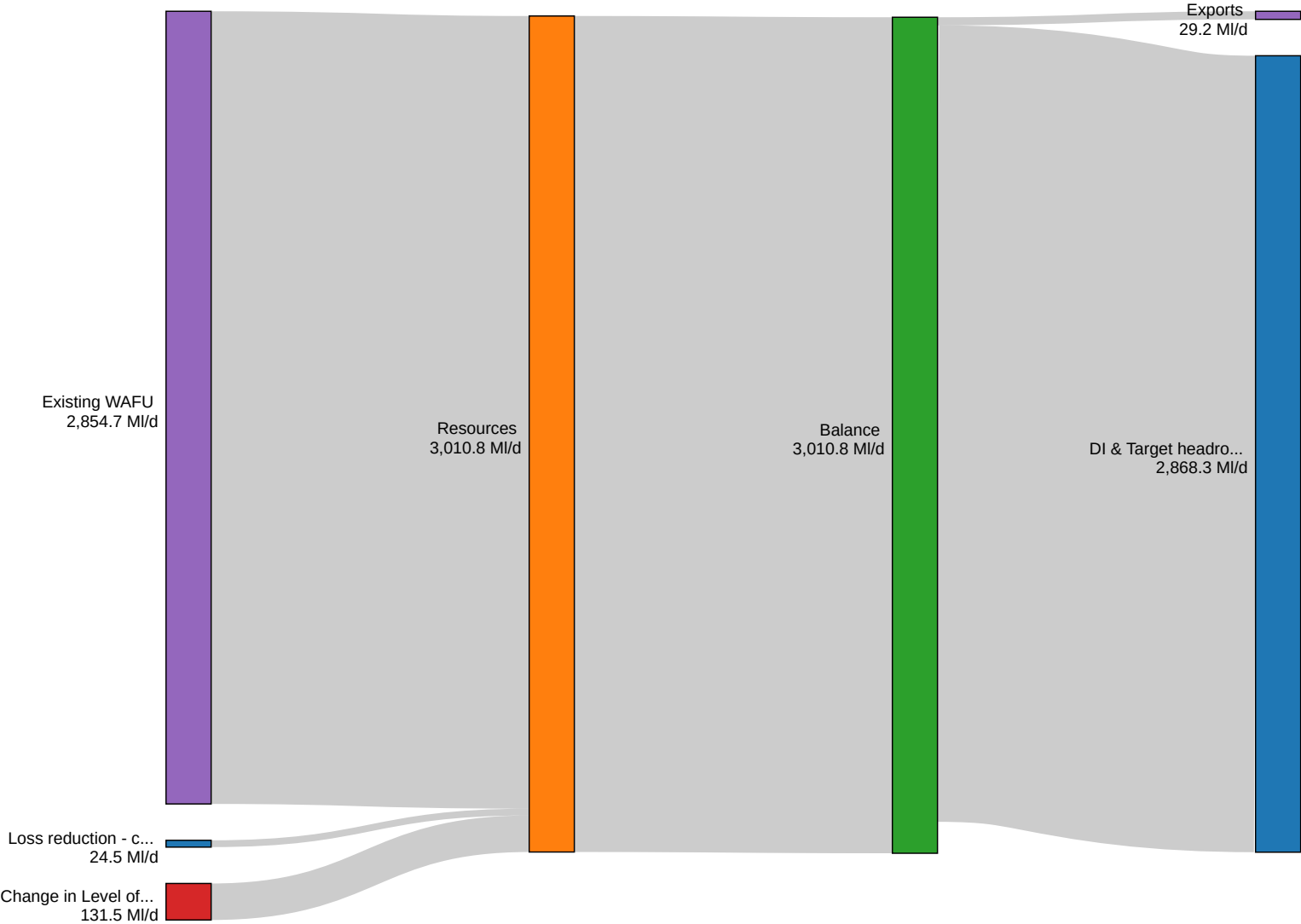


Utilisation (Thames Water)

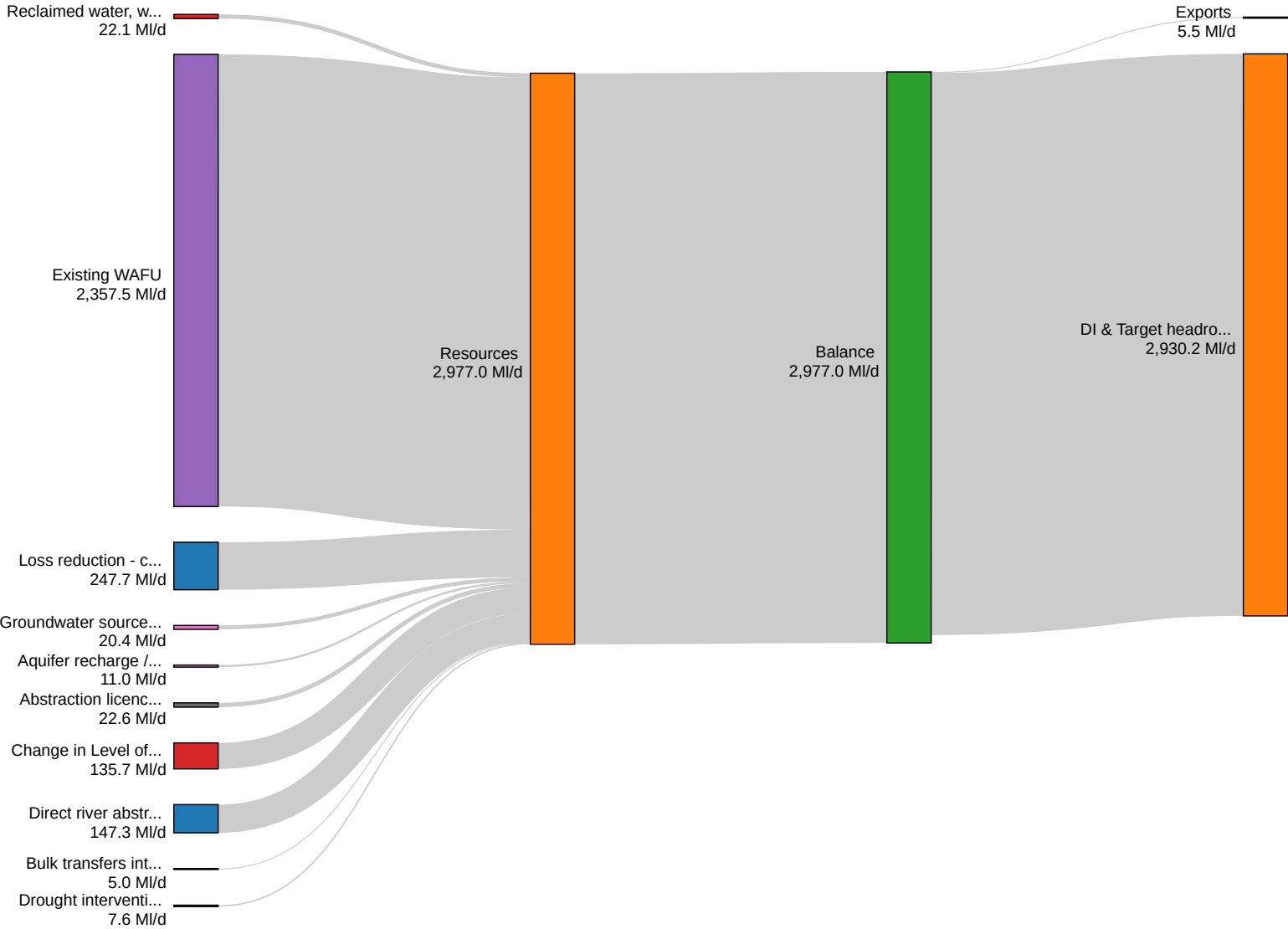
Pie charts show the breakdown of option utilisation by option category.



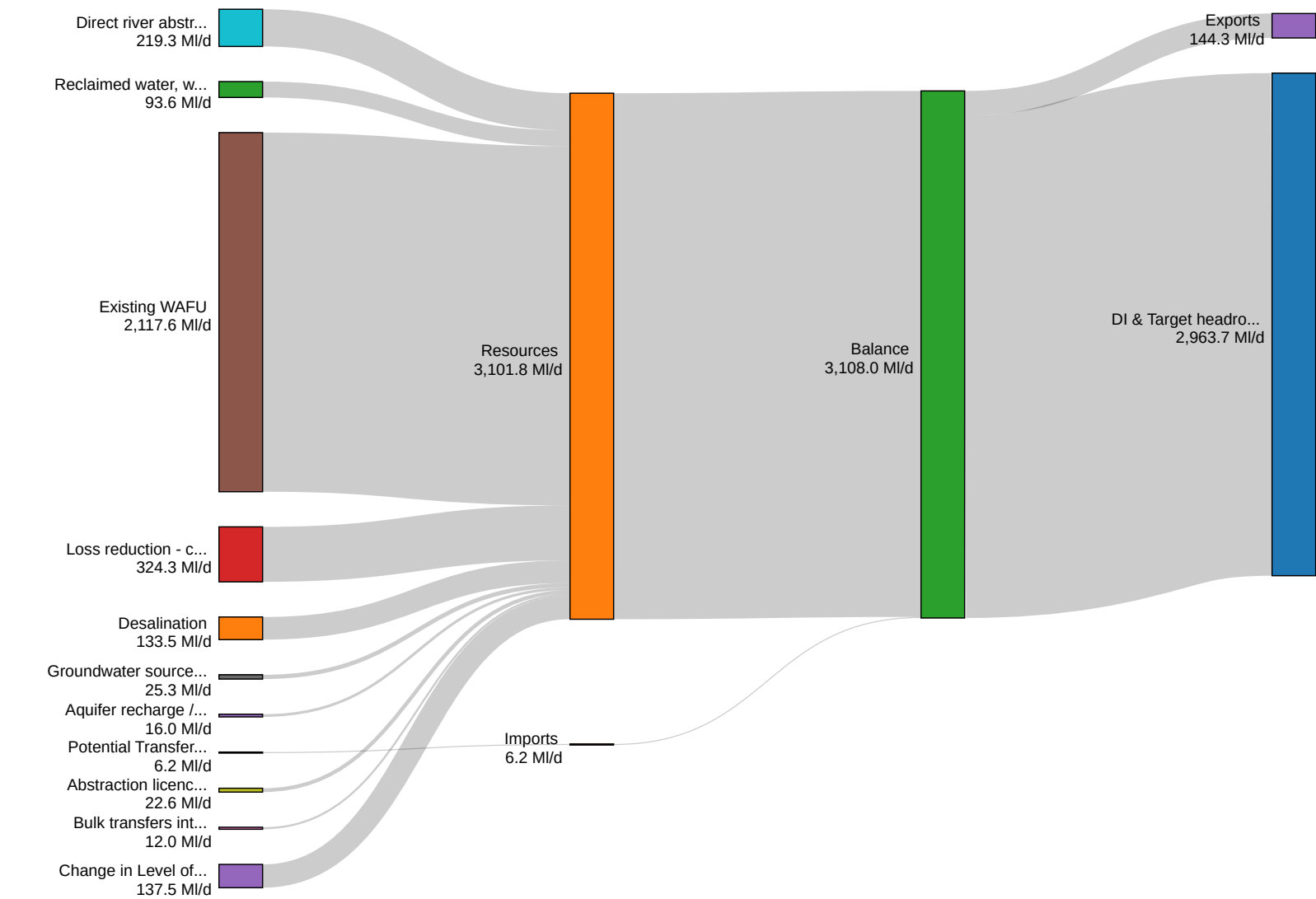
Situation 4 - 2026 (Thames Water)



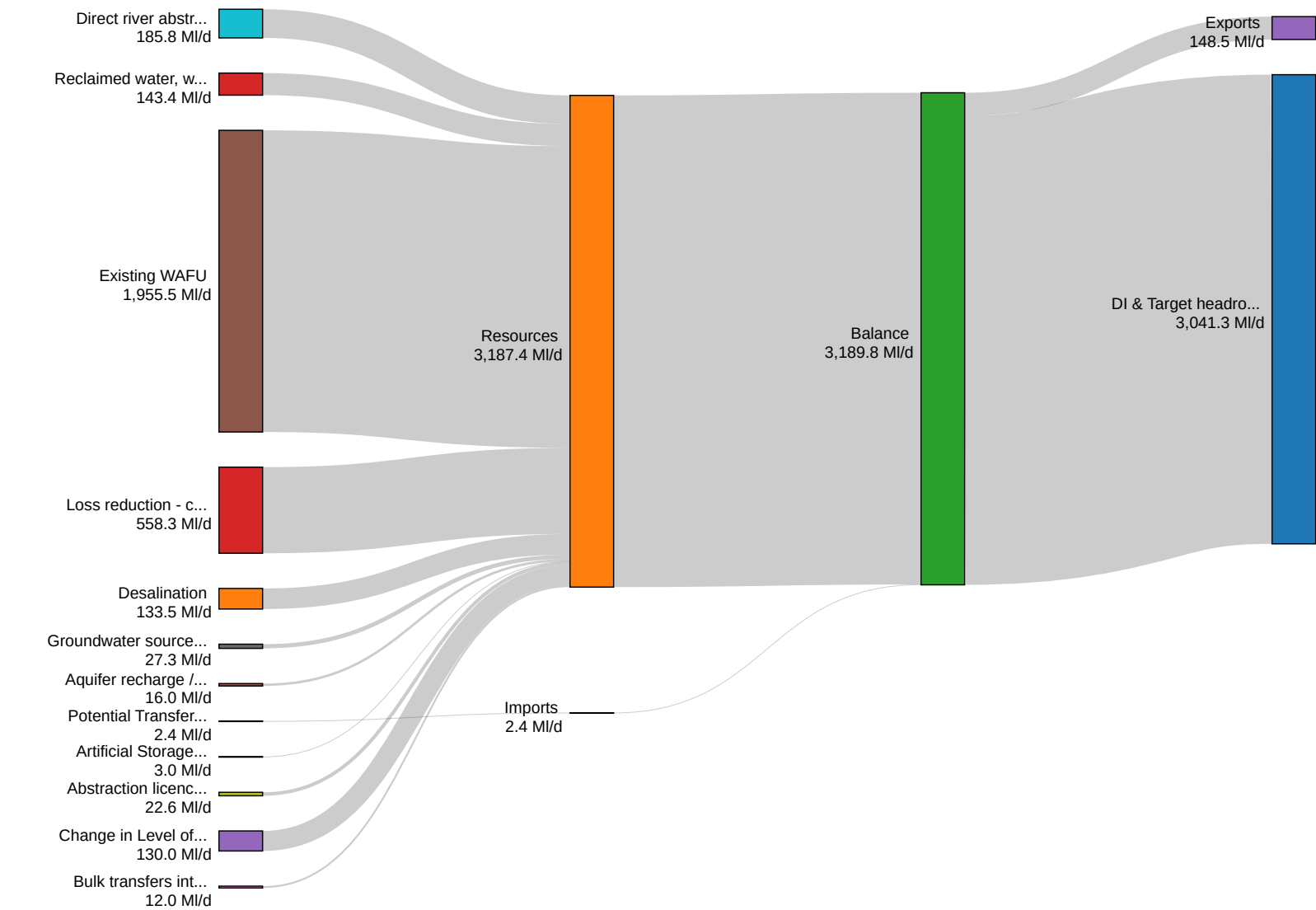
Situation 4 - 2040 (Thames Water)



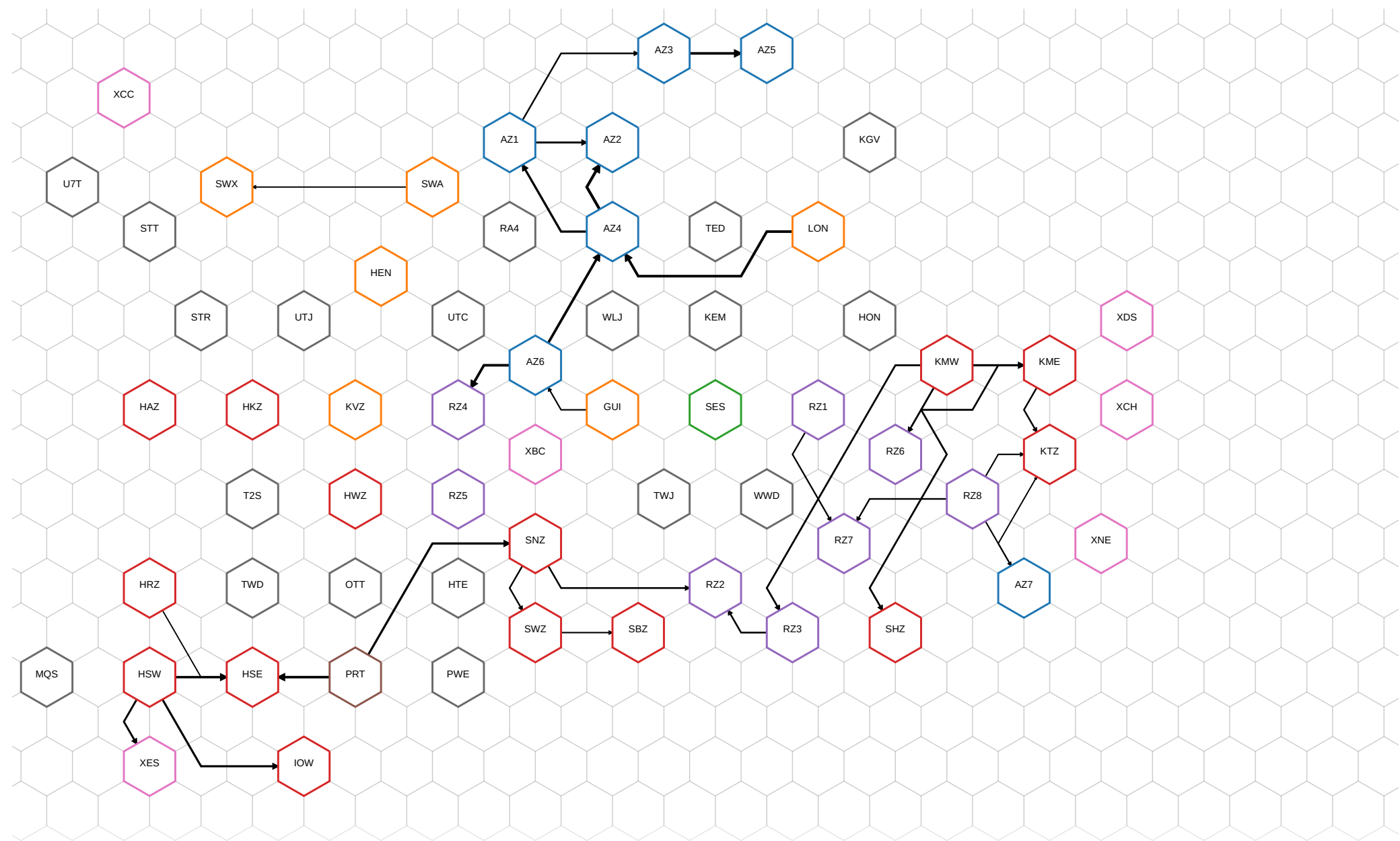
Situation 4 - 2050 (Thames Water)



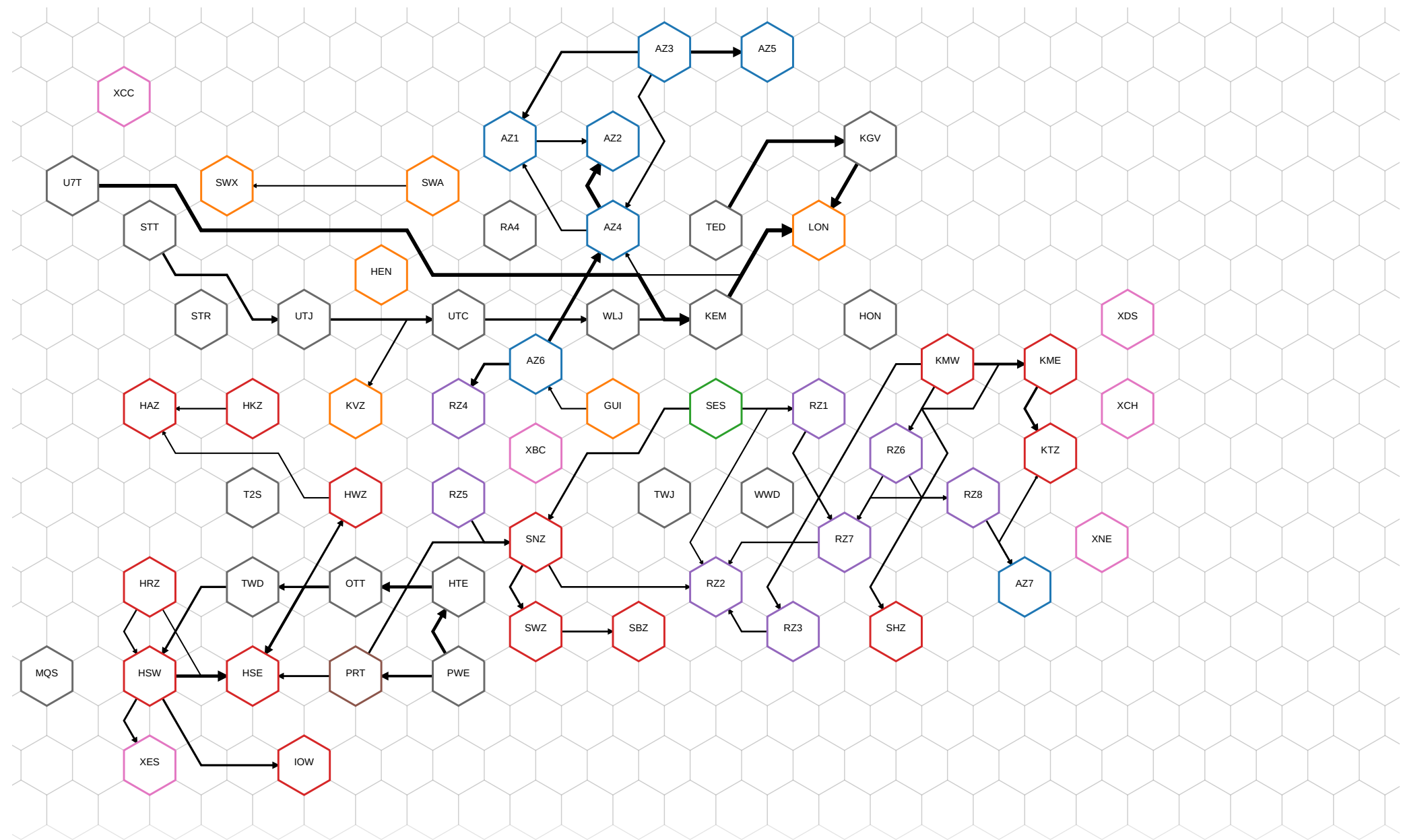
Situation 4 - 2075 (Thames Water)



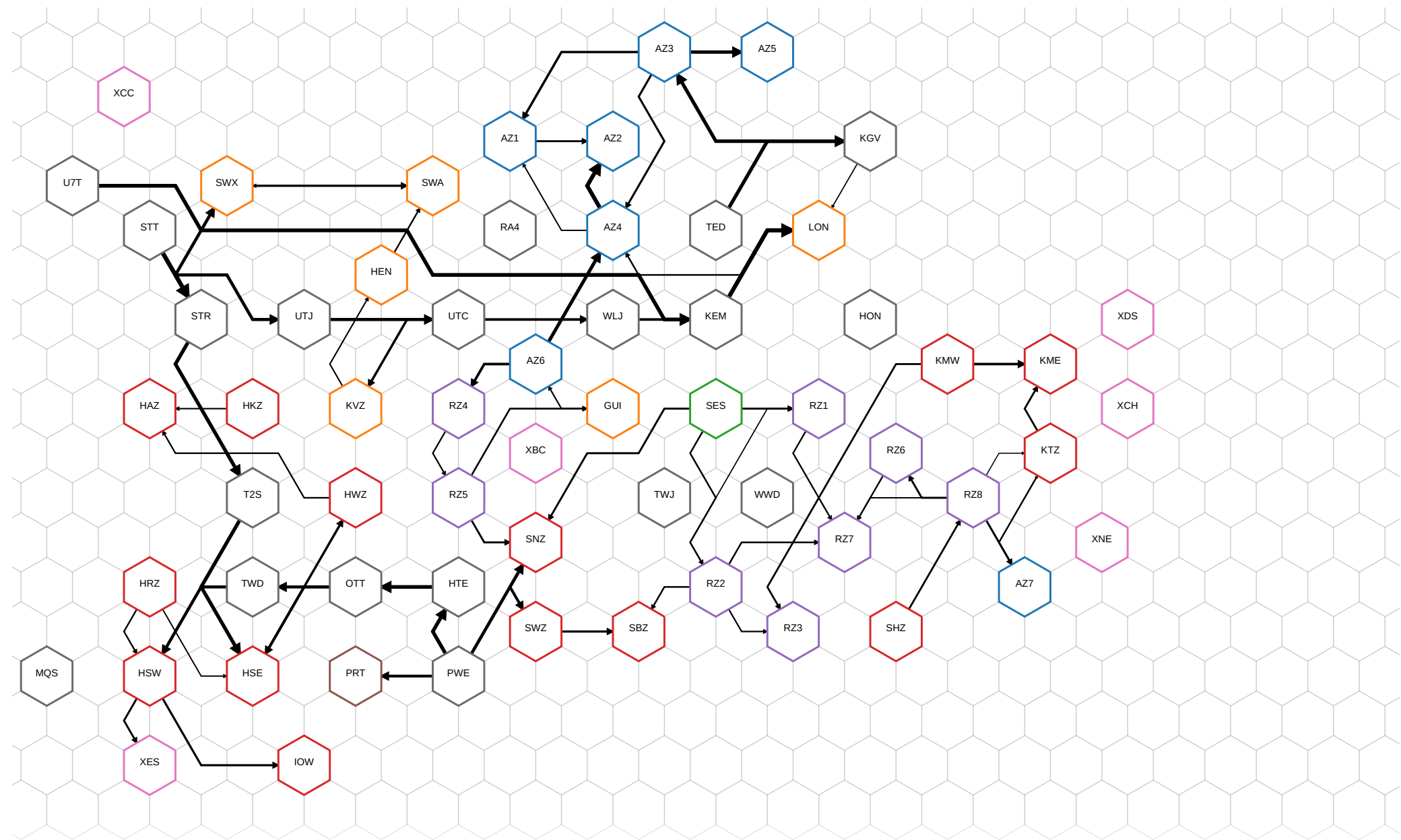
Situation 4 - 2026



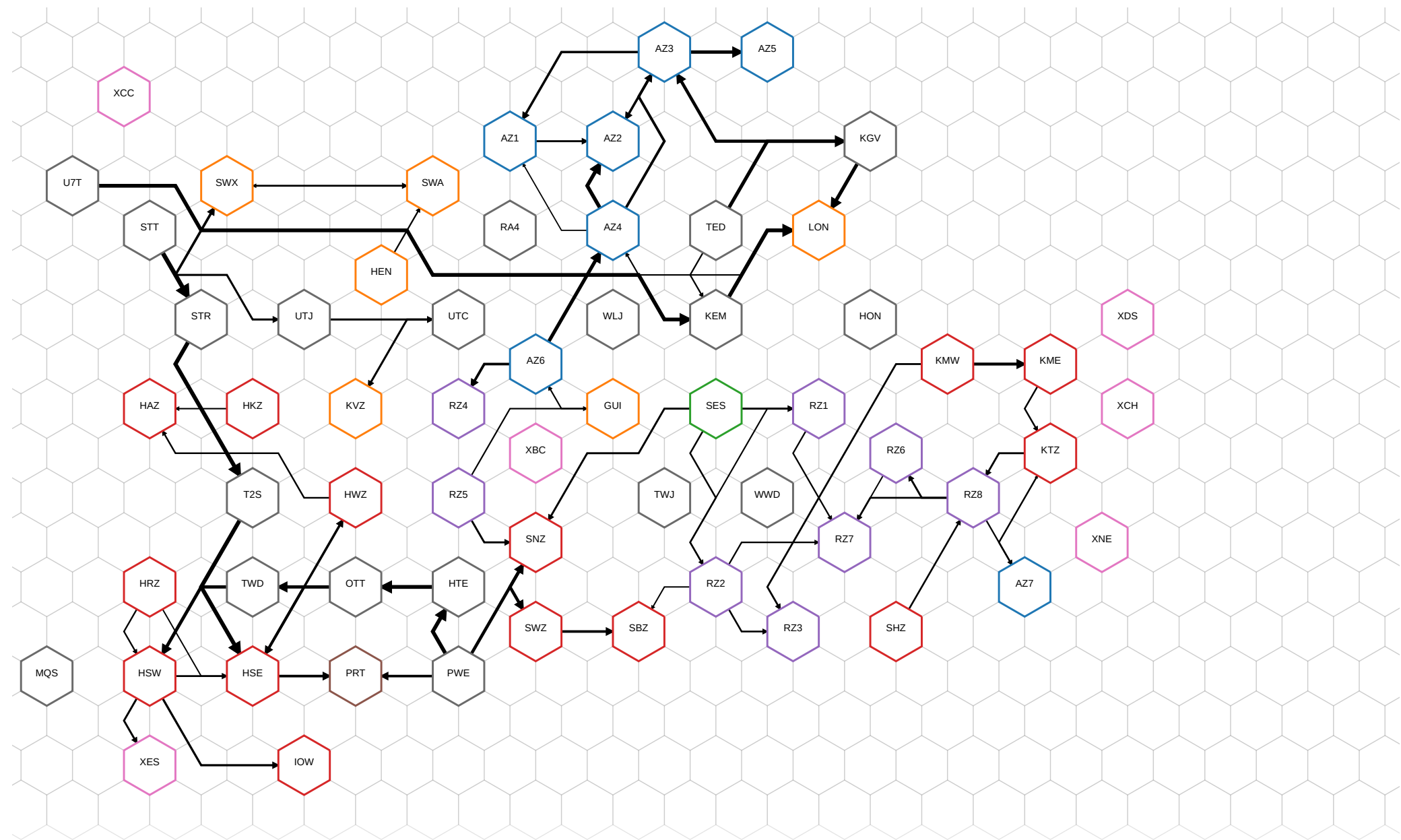
Situation 4 - 2040



Situation 4 - 2050



Situation 4 - 2075



IVM RUN DOSSIER

NO TEDDINGTON DRA

IVM Summary: Thames Water

Metadata

General Settings

Name	st-hybrid-dy-w1-tree16.05-options-v37-gov-led-hybridb-excl-ted-dra-2075
Created at	08/09/2022, 10:25:51
Tree	tree16.05: Root and branch tree 16.05: Stage 1 - Begins Hplan and LOW LCED, Stage 2 - Branches on growth (OxCam1a, Hplan and ONS18c), Stage 3 - Branches on licenced capped environmental destination, climate change and further growth scenarios (Hmax and Hmin) 🔗
Setting name	options-v37-gov-led-hybridb-excl-ted-dra 🔗
Setting description	Emergency options in HSE, SBZ, and PRT. Excludes Teddington DRA.
Optimised discount rate	STPR

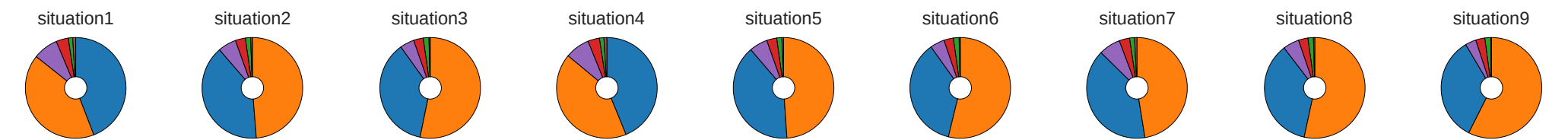
Metrics

Net present value (Cost)

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Cost w/ deficit (STPR)	16,583	13,338	12,025	15,818	13,284	11,891	13,773	12,036	11,046	(£m)
Cost w/o deficit (STPR)	16,583	13,338	12,025	15,818	13,284	11,891	13,773	12,036	11,046	(£m)
Cost w/ deficit (IGEQ)	26,716	20,571	18,217	25,240	20,502	17,991	21,561	18,396	16,585	(£m)
Cost w/o deficit (IGEQ)	26,716	20,571	18,217	25,240	20,502	17,991	21,561	18,396	16,585	(£m)
Cost w/ deficit (LTDR)	18,504	14,730	13,222	17,611	14,672	13,070	15,264	13,262	12,119	(£m)
Cost w/o deficit (LTDR)	18,504	14,730	13,222	17,611	14,672	13,070	15,264	13,262	12,119	(£m)

Cost breakdown (STPR)

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Capex	7,322	5,325	4,434	6,931	5,285	4,322	5,496	4,359	3,759	(£m)
Fixed opex	6,887	6,501	6,402	6,675	6,500	6,396	6,535	6,424	6,344	(£m)
Fixed operational carbon	239	227	224	231	223	221	224	215	210	(£m)
Embedded carbon	651	434	372	590	430	362	460	365	325	(£m)
Variable opex	1,325	778	547	1,243	775	546	953	623	381	(£m)
Variable carbon opex	158	73	46	148	71	43	104	50	26	(£m)



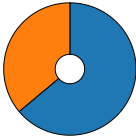
Emissions breakdown

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Capital emissions	4,168,929	2,660,086	2,245,258	3,749,740	2,638,101	2,177,979	2,869,295	2,220,806	1,954,336	(tonnes)
Operational emissions	2,118,338	1,502,695	1,343,743	2,006,405	1,458,432	1,299,565	1,681,921	1,279,651	1,124,262	(tonnes)

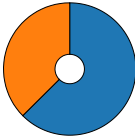
situation1



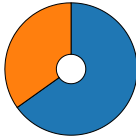
situation2



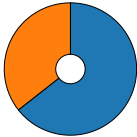
situation3



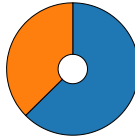
situation4



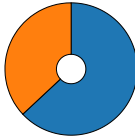
situation5



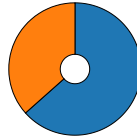
situation6



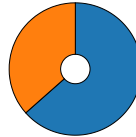
situation7



situation8



situation9



Electricity breakdown

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Generated (on site)	0	0	0	0	0	0	0	0	0	(GWh)
Grid	25,157	12,806	6,991	21,814	13,021	7,377	16,266	11,045	5,197	(GWh)
Renewable	2,072	1,077	600	2,015	1,085	617	1,347	780	133	(GWh)

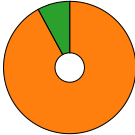
situation1



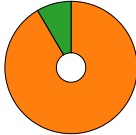
situation2



situation3



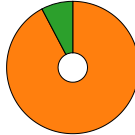
situation4



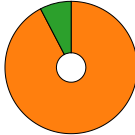
situation5



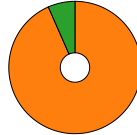
situation6



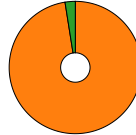
situation7



situation8



situation9



Environmental

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
SEA environmental benefit	86,141.00	80,037.00	78,538.00	83,795.00	80,347.00	78,472.00	81,211.00	77,837.00	76,185.00	
SEA environmental disbenefit	126,957.00	93,898.00	84,502.00	118,320.00	95,069.00	84,733.00	104,413.00	83,157.00	73,798.00	
Natural capital	7,321,342.00	8,542,512.55	8,597,094.18	7,736,002.98	8,717,577.34	8,874,549.01	9,246,823.25	11,724,334.81	12,852,417.26	
Bio-diversity net gain	-261,374.00	-155,097.00	-132,826.00	-252,201.00	-146,200.00	-116,684.00	-172,143.00	-117,922.00	-94,506.00	

Social

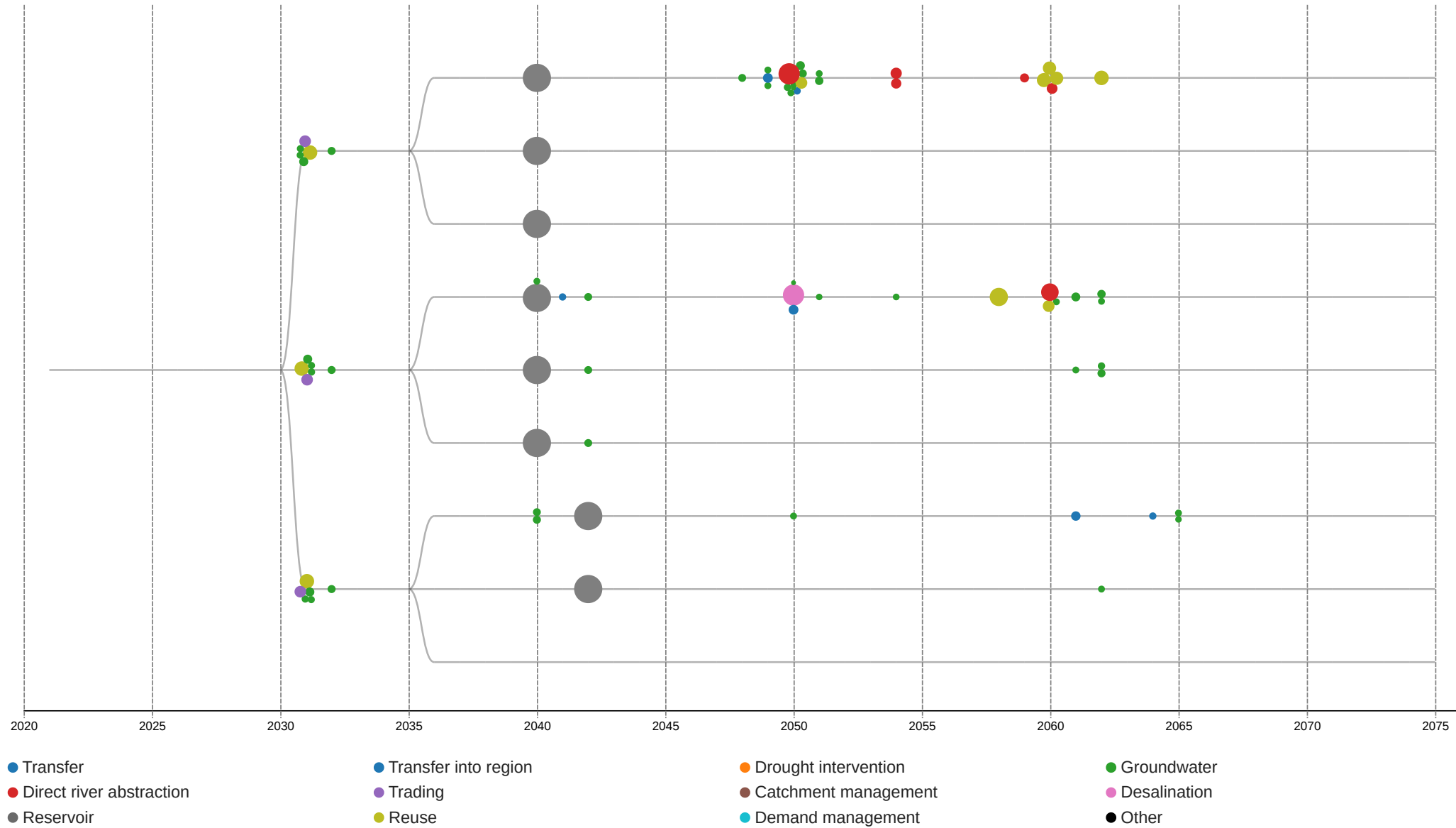
Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Customer preference	32,811.00	30,739.00	30,102.00	32,225.00	30,960.00	30,161.00	31,401.00	29,999.00	29,287.00	

Reliability

[illegible]

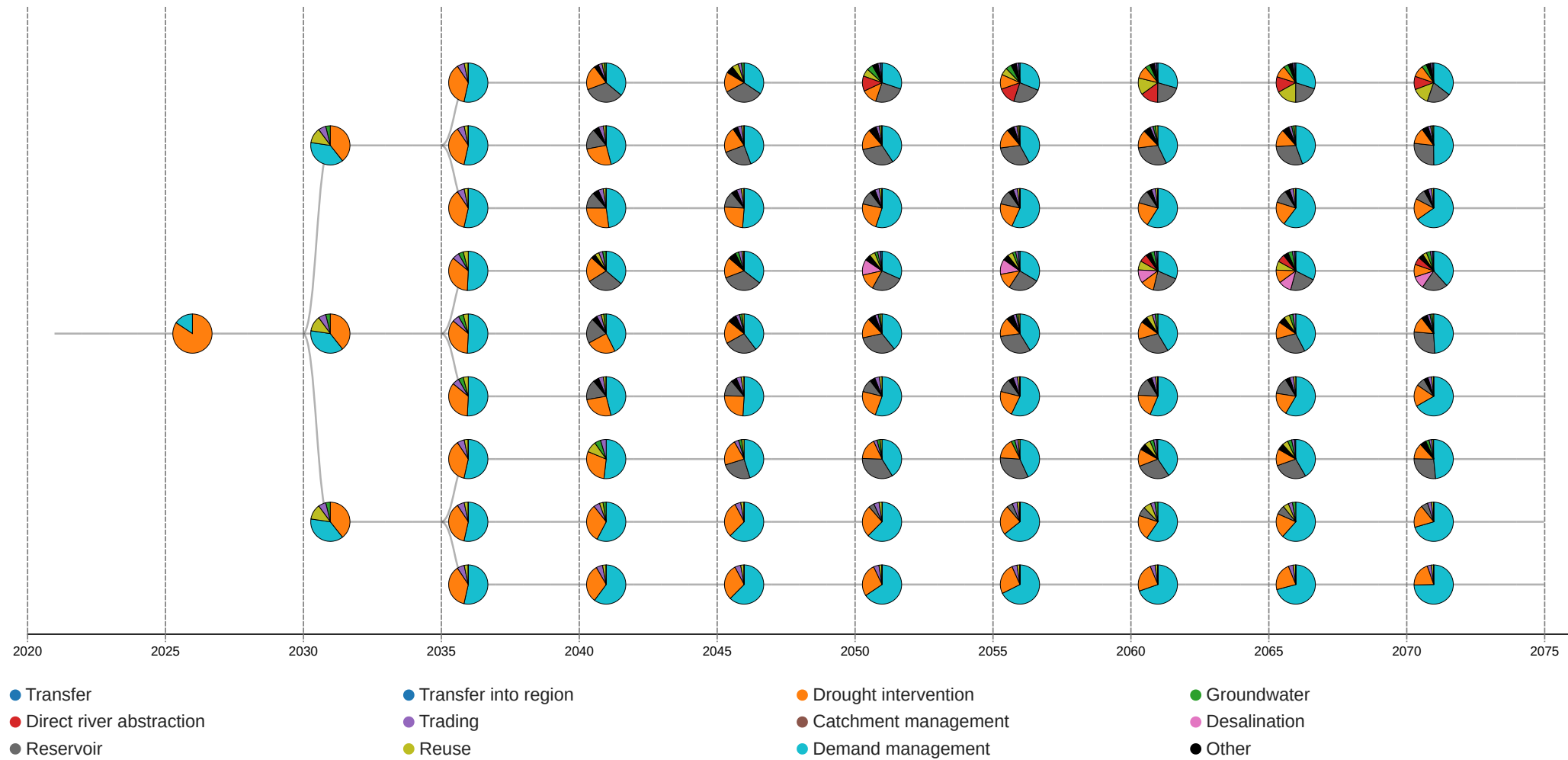
Adaptability										
Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Adaptability	18.31	20.75	22.00	18.22	20.43	21.37	20.19	21.51	25.00	
A3: Operational complexity and flexibility	9.14	9.78	10.51	8.81	9.56	10.24	9.66	10.10	11.92	
A4: WRZ connectivity	9.13	10.95	11.47	9.37	10.82	11.11	10.49	11.36	13.06	
A7: Customer relations support engagement with demand management	0.04	0.02	0.02	0.04	0.04	0.02	0.04	0.05	0.02	
Evolvability										
Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Evolvability	27.06	27.39	29.04	25.86	26.93	28.41	27.48	28.64	33.21	
E1: Scaleability and modularity of proposed changes	10.96	11.47	12.22	10.76	11.25	11.95	11.48	12.07	13.97	
E2: Intervention lead times	7.46	6.82	7.18	6.69	6.77	7.08	6.97	7.24	8.39	
E3: Reliance on external bodies to deliver changes	8.57	9.06	9.60	8.33	8.84	9.34	8.96	9.26	10.80	
E5: Collaborative land management	0.07	0.04	0.04	0.07	0.07	0.04	0.07	0.07	0.04	

Option Selection (Thames Water)

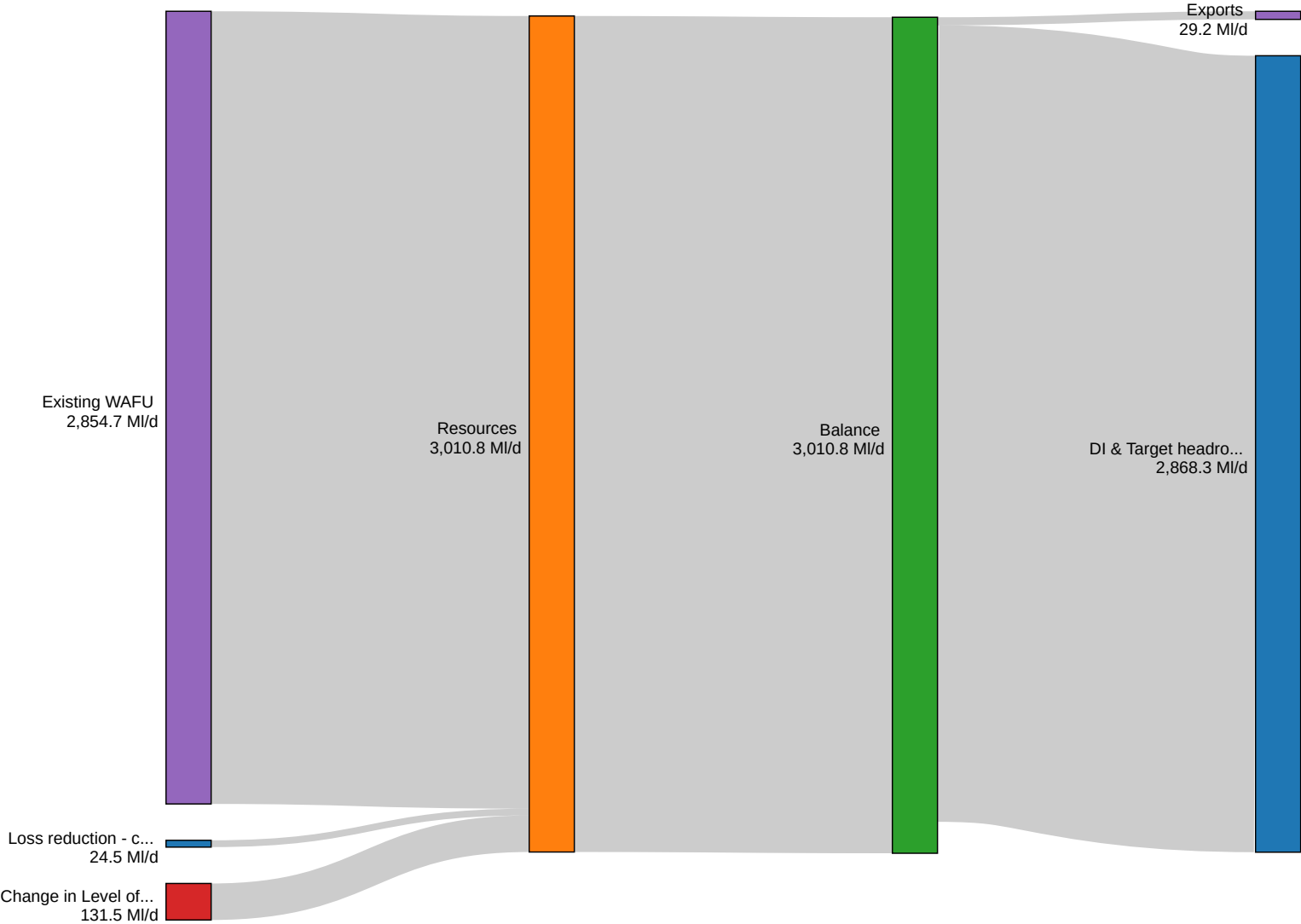


Utilisation (Thames Water)

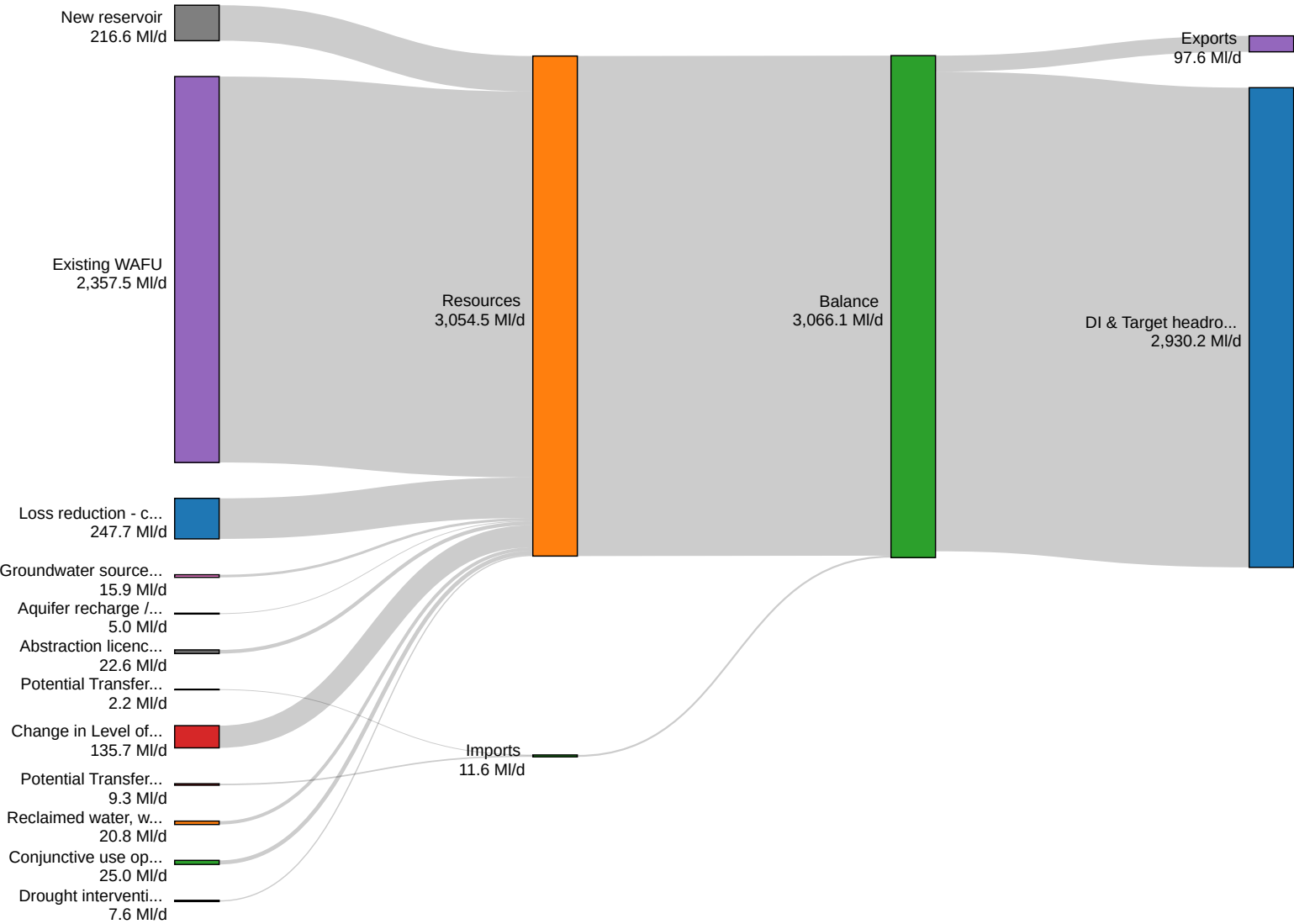
Pie charts show the breakdown of option utilisation by option category.



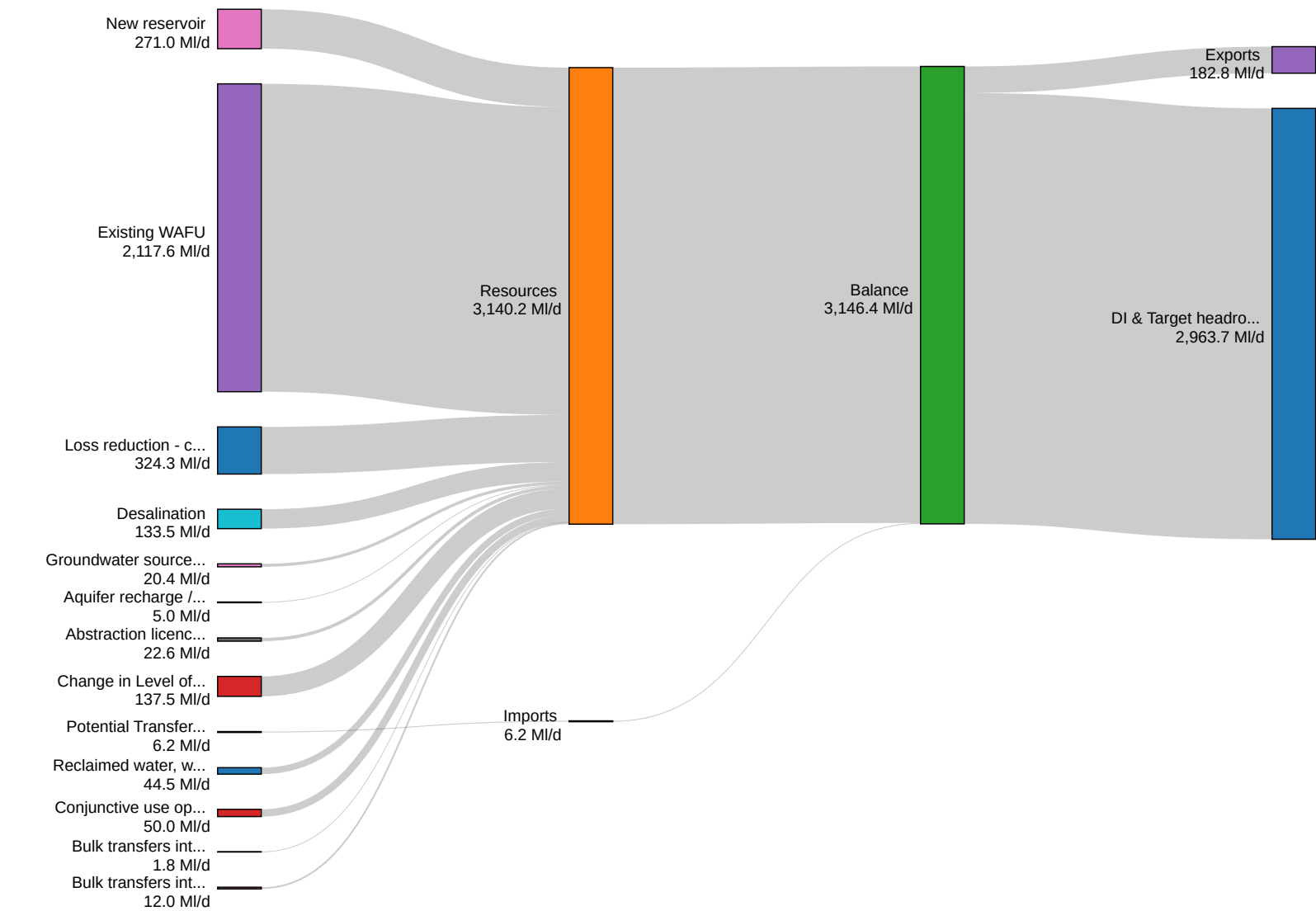
Situation 4 - 2026 (Thames Water)



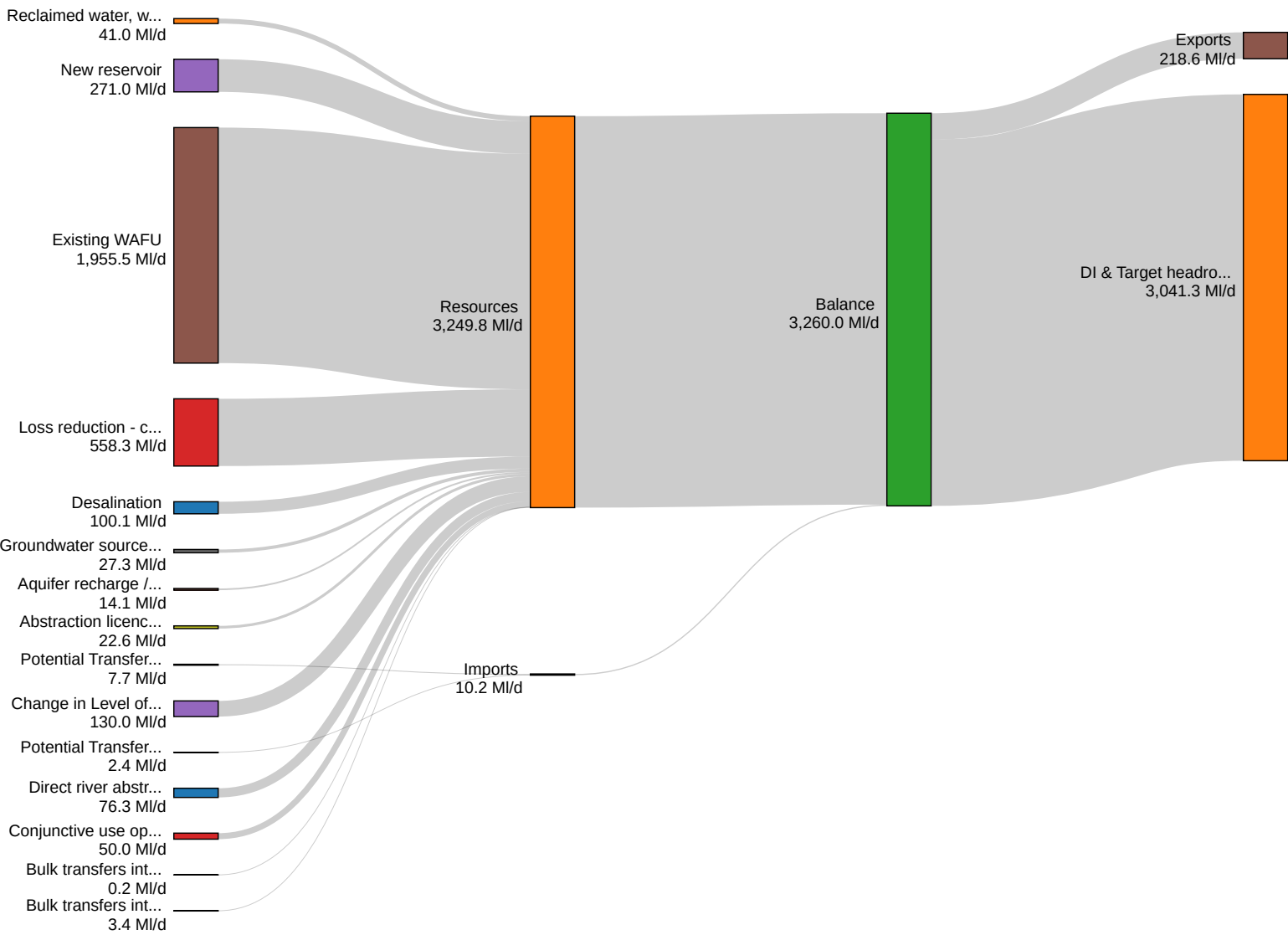
Situation 4 - 2040 (Thames Water)



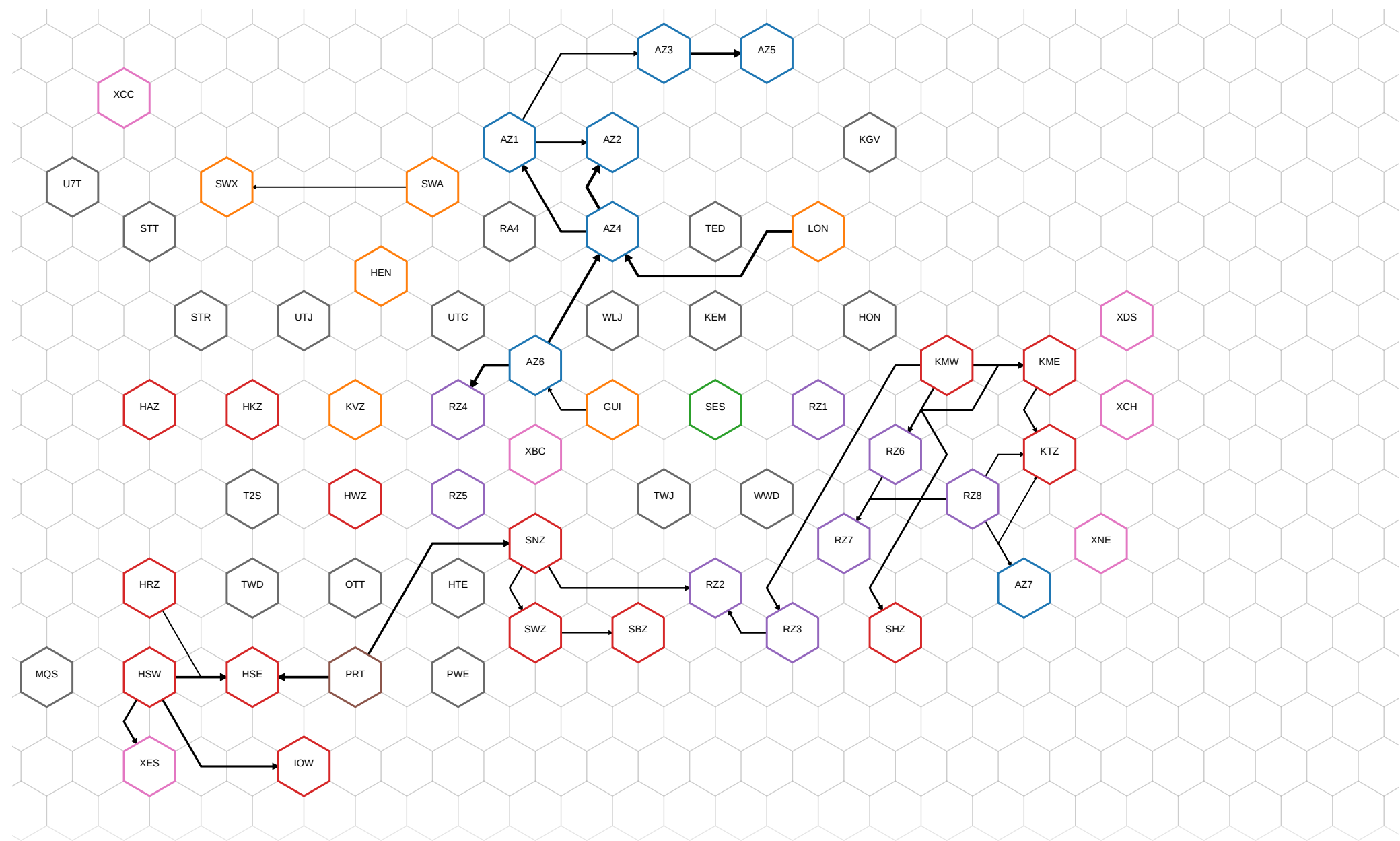
Situation 4 - 2050 (Thames Water)



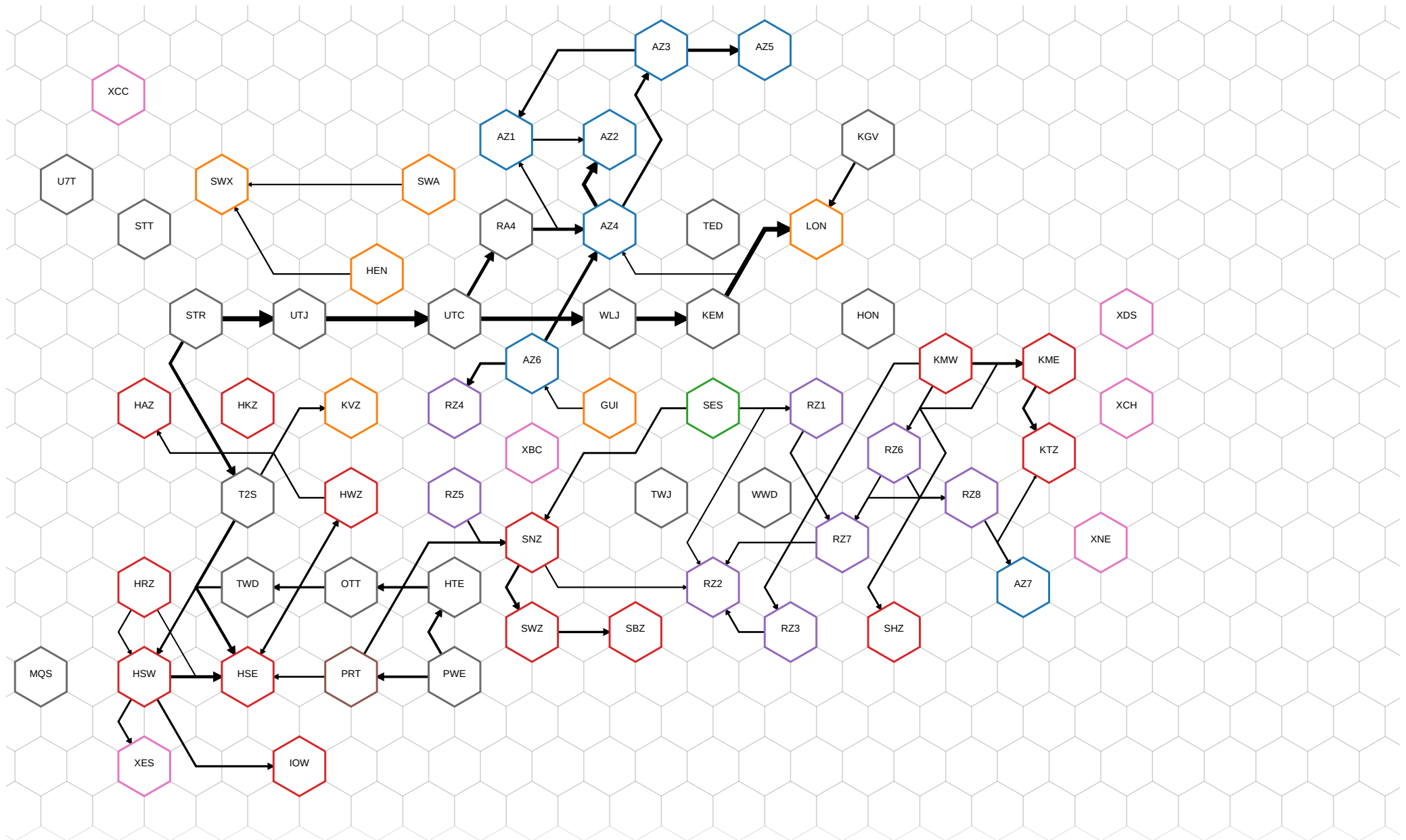
Situation 4 - 2075 (Thames Water)



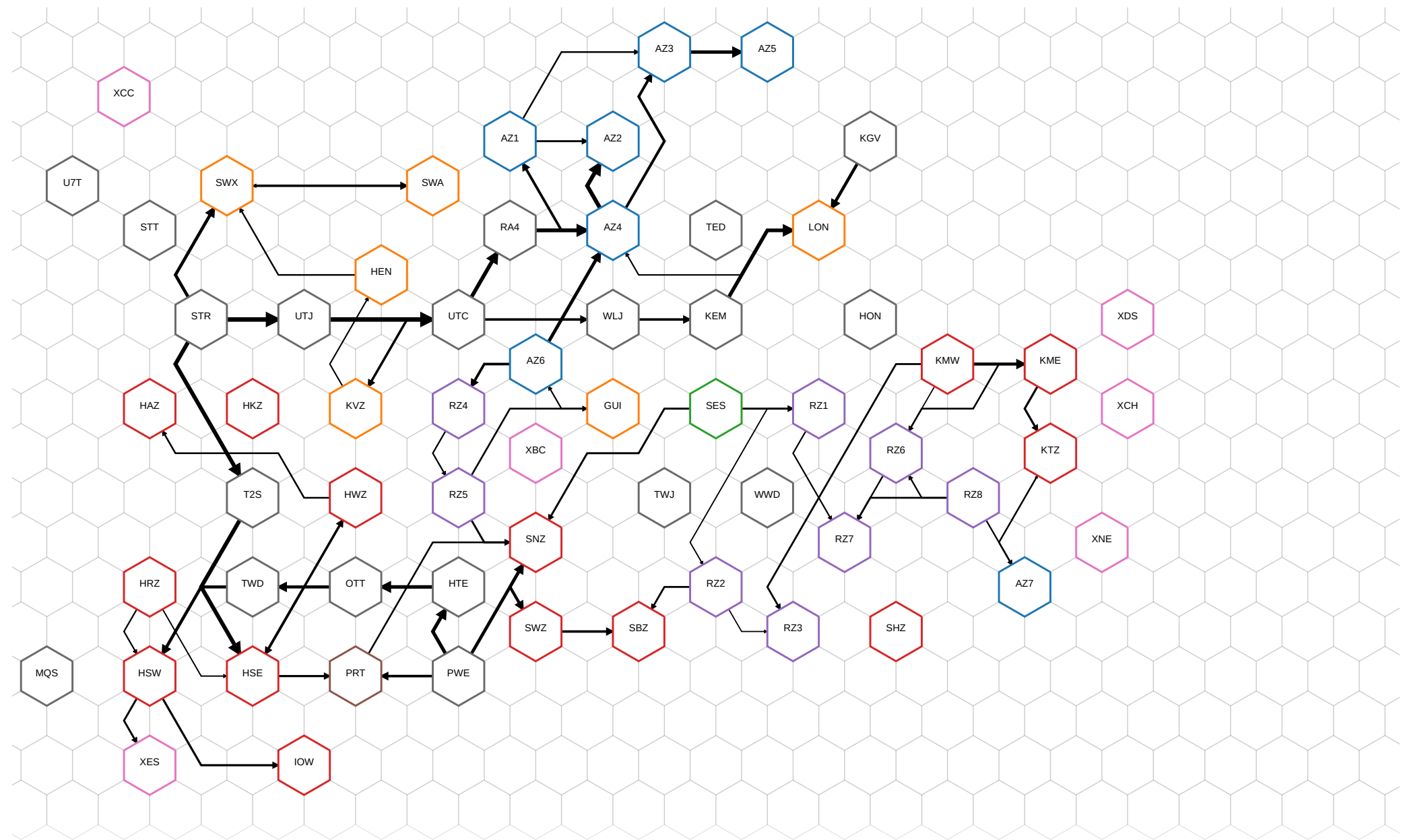
Situation 4 - 2026



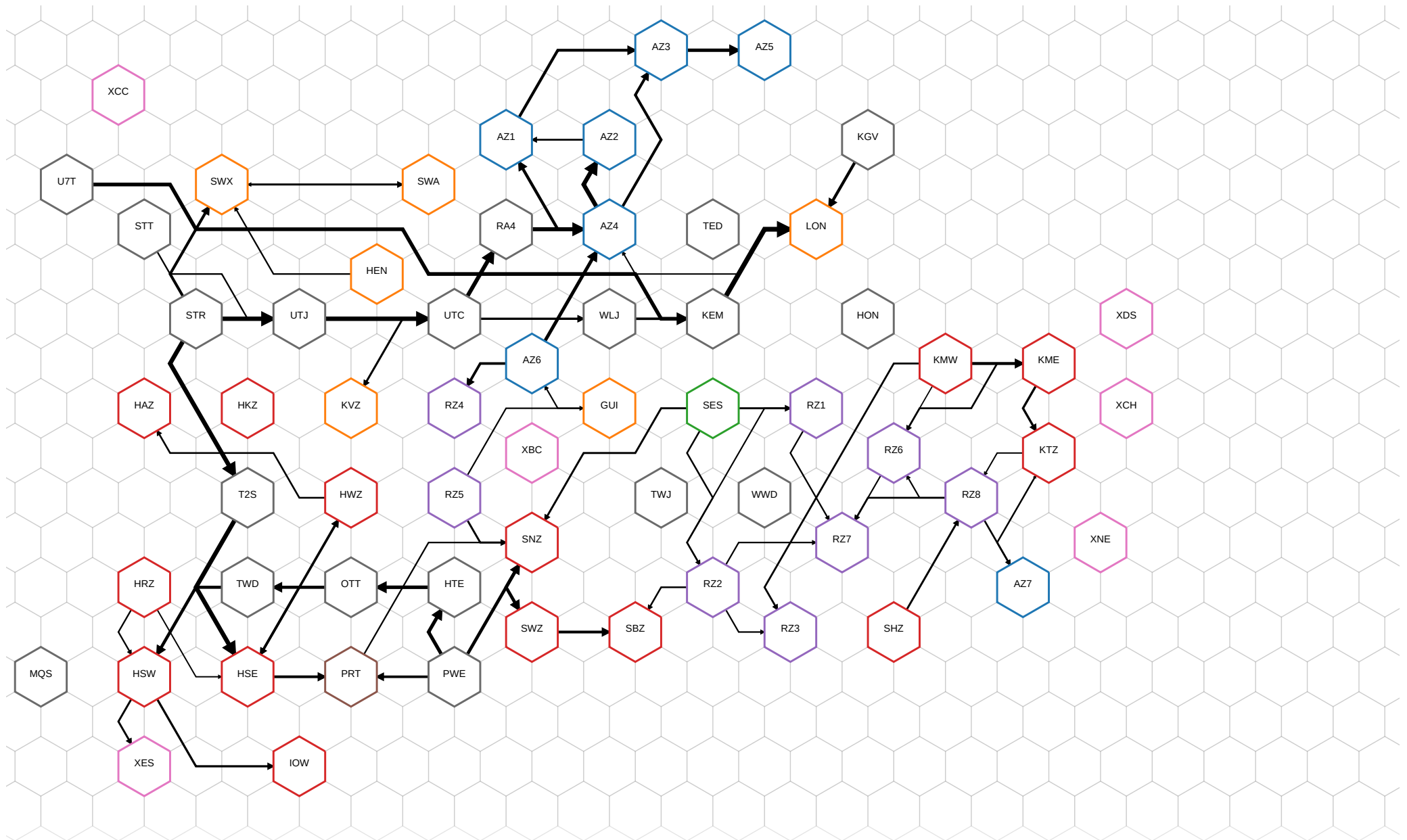
Situation 4 - 2040



Situation 4 - 2050



Situation 4 - 2075



IVM RUN DOSSIER

ONLY SESRO 125Mm³ AVAILABLE

IVM Summary: Thames Water

Metadata

General Settings

Name	st-hybrid-dy-w1-tree16.05-options-v37-gov-led-hybridb-only-sesro125-excl-twul-rsr-2075
Created at	15/08/2022, 16:25:11
Tree	tree16.05: Root and branch tree 16.05: Stage 1 - Begins Hplan and LOW LCED, Stage 2 - Branches on growth (OxCam1a, Hplan and ONS18c), Stage 3 - Branches on licenced capped environmental destination, climate change and further growth scenarios (Hmax and Hmin) 
Setting name	options-v37-gov-led-hybridb-only-sesro125-excl-twul-rsr 
Setting description	Emergency options in HSE, SBZ, and PRT. Only SESRO 125 Mm3 available. Excludes TWUL reservoirs.
Optimised discount rate	STPR

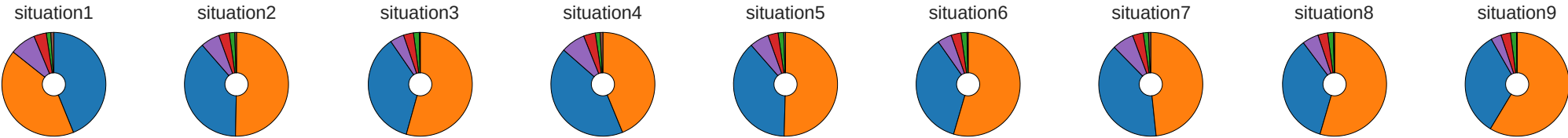
Metrics

Net present value (Cost)

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Cost w/ deficit (STPR)	16,369	12,897	11,762	15,454	12,855	11,719	13,504	11,741	10,801	(£m)
Cost w/o deficit (STPR)	16,369	12,897	11,762	15,454	12,855	11,719	13,504	11,741	10,801	(£m)
Cost w/ deficit (IGEQ)	26,368	19,929	17,835	24,642	19,846	17,759	21,160	17,931	16,217	(£m)
Cost w/o deficit (IGEQ)	26,368	19,929	17,835	24,642	19,846	17,759	21,160	17,931	16,217	(£m)
Cost w/ deficit (LTDR)	18,266	14,247	12,935	17,203	14,198	12,887	14,969	12,935	11,851	(£m)
Cost w/o deficit (LTDR)	18,266	14,247	12,935	17,203	14,198	12,887	14,969	12,935	11,851	(£m)

Cost breakdown (STPR)

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Capex	7,179	4,937	4,245	6,589	4,903	4,190	5,307	4,140	3,578	(£m)
Fixed opex	6,849	6,487	6,390	6,771	6,482	6,388	6,528	6,400	6,329	(£m)
Fixed operational carbon	232	220	214	233	225	222	221	211	206	(£m)
Embedded carbon	638	426	367	568	409	360	451	355	319	(£m)
Variable opex	1,316	757	510	1,160	765	518	899	593	349	(£m)
Variable carbon opex	155	70	35	133	72	41	97	42	20	(£m)



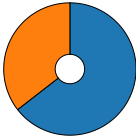
Emissions breakdown

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Capital emissions	4,082,922	2,613,354	2,216,892	3,618,159	2,505,355	2,168,232	2,808,553	2,158,263	1,911,813	(tonnes)
Operational emissions	2,056,898	1,438,718	1,207,918	1,913,879	1,479,911	1,303,484	1,618,988	1,202,783	1,071,225	(tonnes)

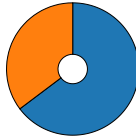
situation1



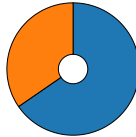
situation2



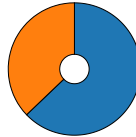
situation3



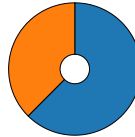
situation4



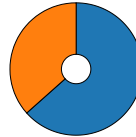
situation5



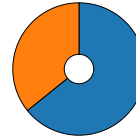
situation6



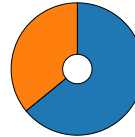
situation7



situation8



situation9



Electricity breakdown

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Generated (on site)	0	0	0	0	0	0	0	0	0	(GWh)
Grid	25,140	13,654	6,841	21,491	14,169	6,995	16,468	10,458	4,841	(GWh)
Renewable	2,060	1,319	435	1,426	1,063	582	1,196	762	155	(GWh)

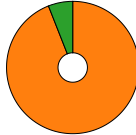
situation1



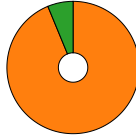
situation2



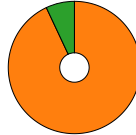
situation3



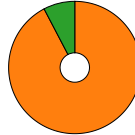
situation4



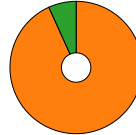
situation5



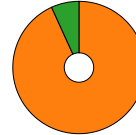
situation6



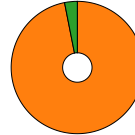
situation7



situation8



situation9



Environmental

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
SEA environmental benefit	86,654.00	80,686.00	79,068.00	85,461.00	80,476.00	79,270.00	82,429.00	78,219.00	76,707.00	
SEA environmental disbenefit	123,376.00	93,297.00	81,798.00	118,090.00	92,431.00	84,385.00	101,386.00	80,676.00	72,044.00	
Natural capital	7,135,872.07	7,510,925.00	8,022,245.30	6,094,151.92	7,747,182.37	8,065,553.58	7,455,939.94	10,083,170.59	12,214,046.28	
Bio-diversity net gain	-302,963.00	-203,036.00	-185,351.00	-294,132.00	-180,008.00	-181,965.00	-220,858.00	-165,111.00	-150,234.00	

Social

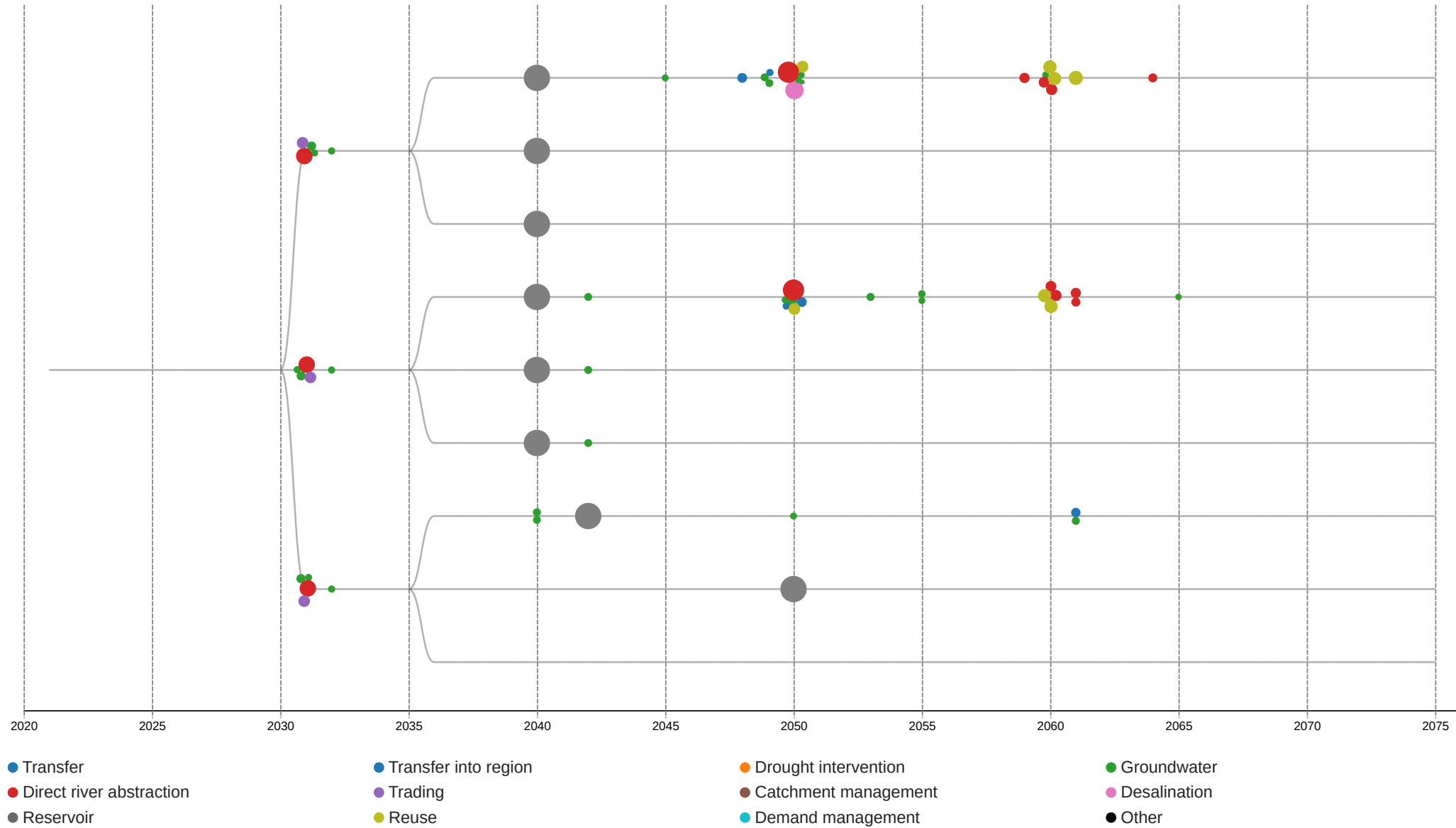
Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Customer preference	32,807.00	30,815.00	30,181.00	32,472.00	30,806.00	30,305.00	31,640.00	29,959.00	29,380.00	

Reliability

[illegible]

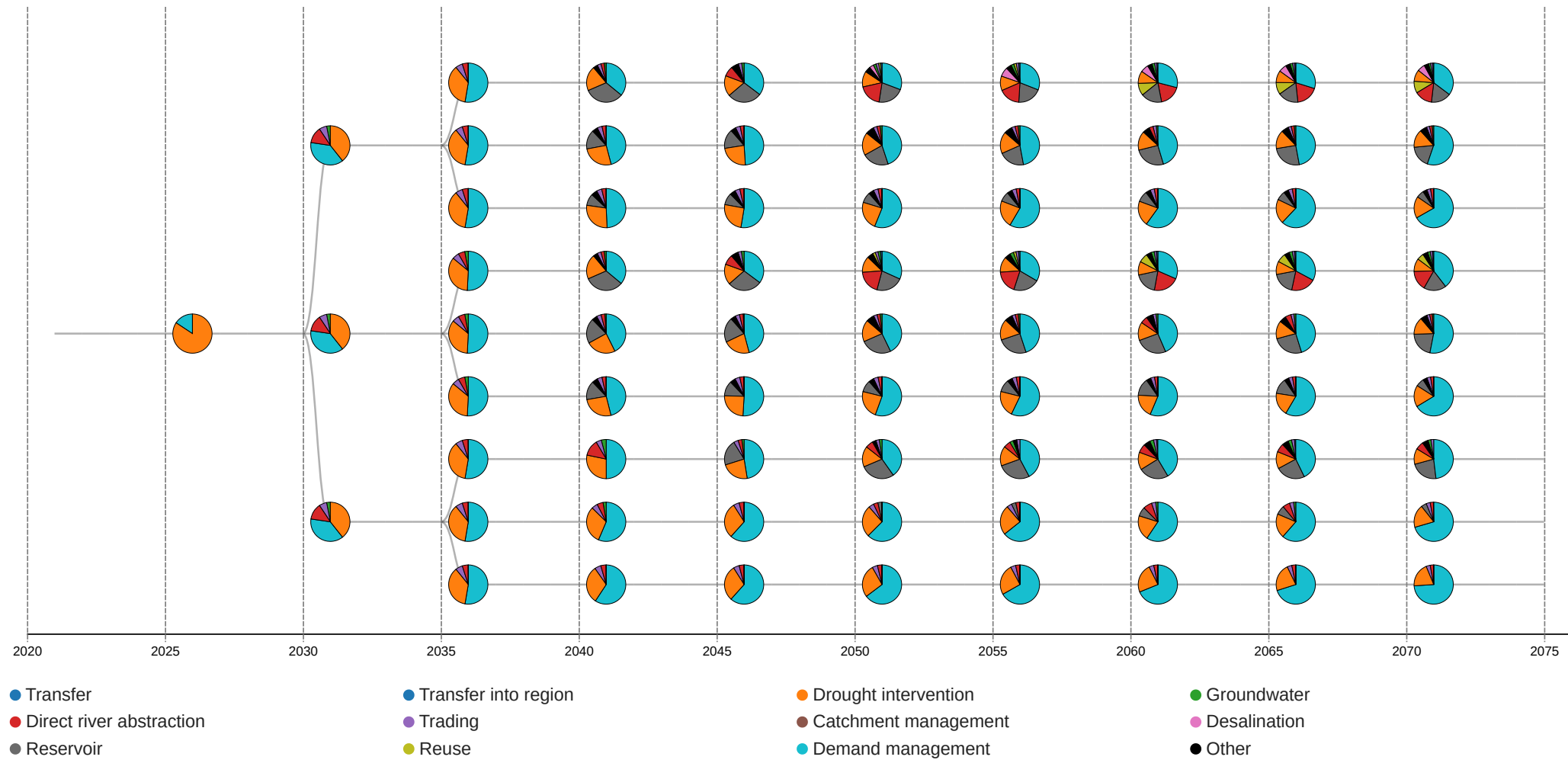
Adaptability										
Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Adaptability	18.52	20.09	22.35	19.06	20.05	22.17	20.48	22.04	25.60	
A3: Operational complexity and flexibility	9.15	9.55	10.48	9.38	9.65	10.62	9.72	10.30	12.12	
A4: WRZ connectivity	9.33	10.53	11.86	9.64	10.39	11.53	10.72	11.73	13.46	
A7: Customer relations support engagement with demand management	0.04	0.02	0.02	0.04	0.02	0.02	0.04	0.02	0.02	
Evolvability										
Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Evolvability	27.02	26.76	28.76	27.15	26.91	29.10	27.43	28.79	33.40	
E1: Scaleability and modularity of proposed changes	10.90	11.10	12.00	10.95	11.15	12.14	11.37	12.04	13.94	
E2: Intervention lead times	7.37	6.75	7.14	7.39	6.78	7.17	6.96	7.23	8.39	
E3: Reliance on external bodies to deliver changes	8.67	8.87	9.58	8.73	8.94	9.75	9.03	9.48	11.03	
E5: Collaborative land management	0.07	0.04	0.04	0.07	0.04	0.04	0.07	0.04	0.04	

Option Selection (Thames Water)

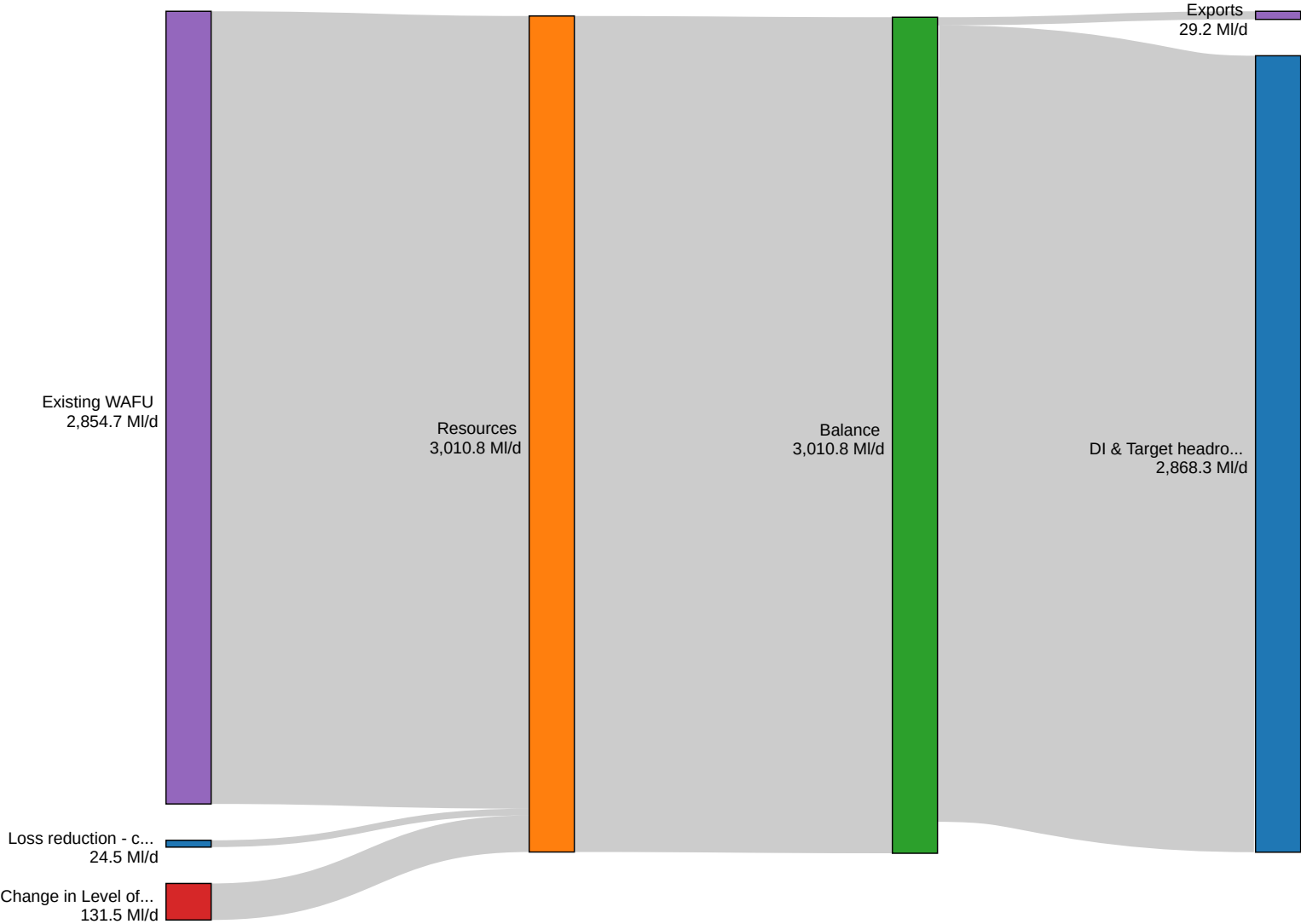


Utilisation (Thames Water)

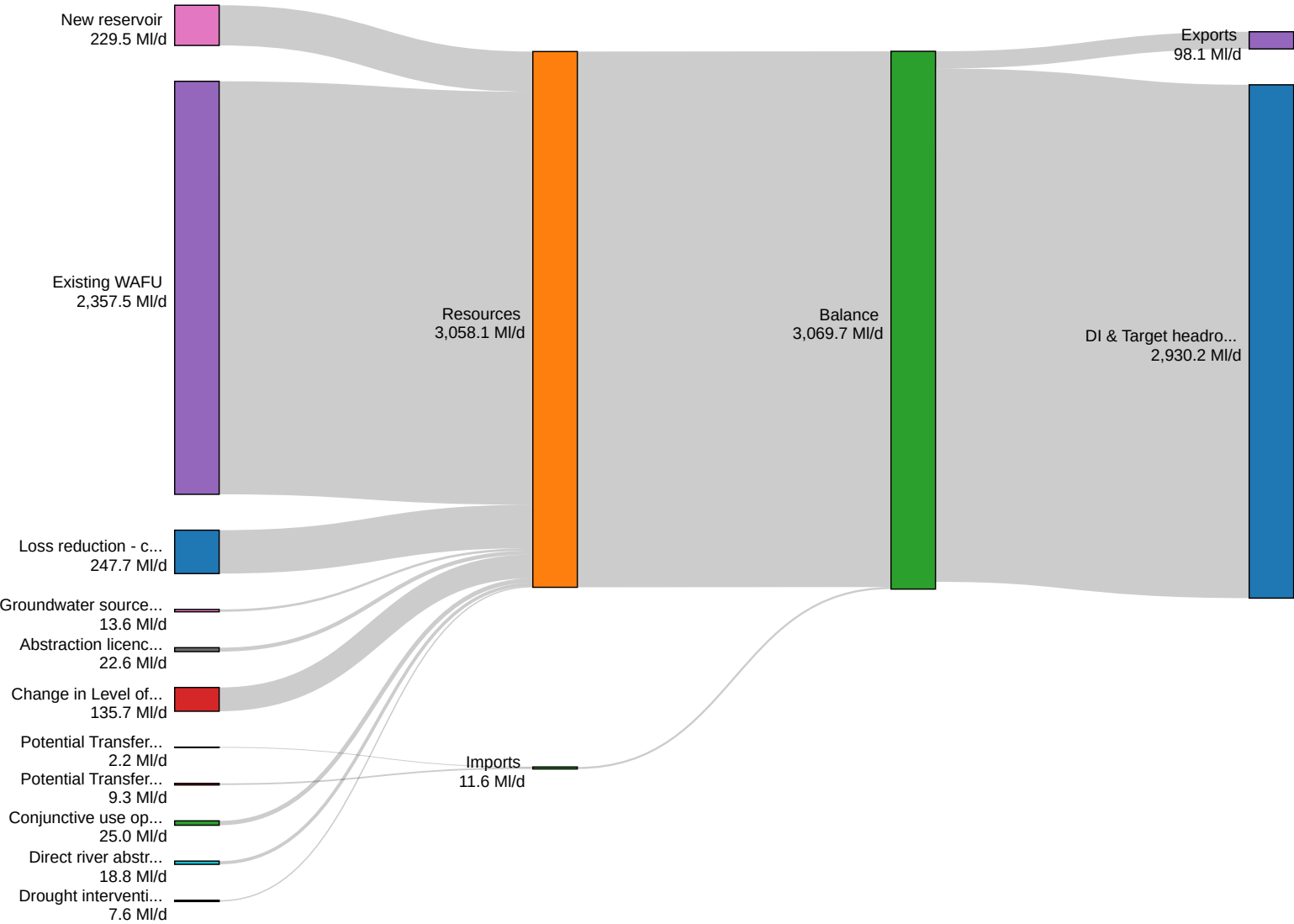
Pie charts show the breakdown of option utilisation by option category.



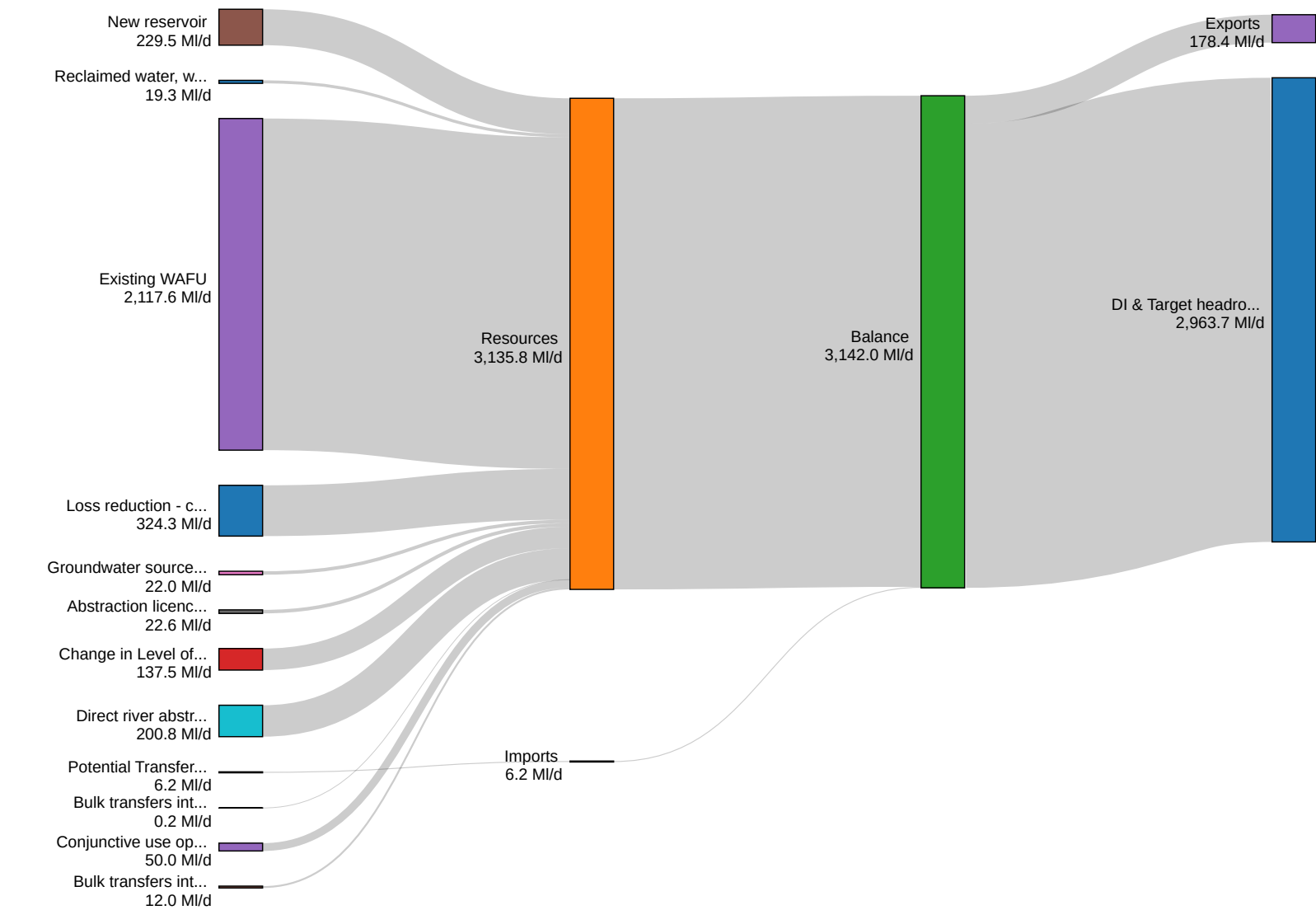
Situation 4 - 2026 (Thames Water)



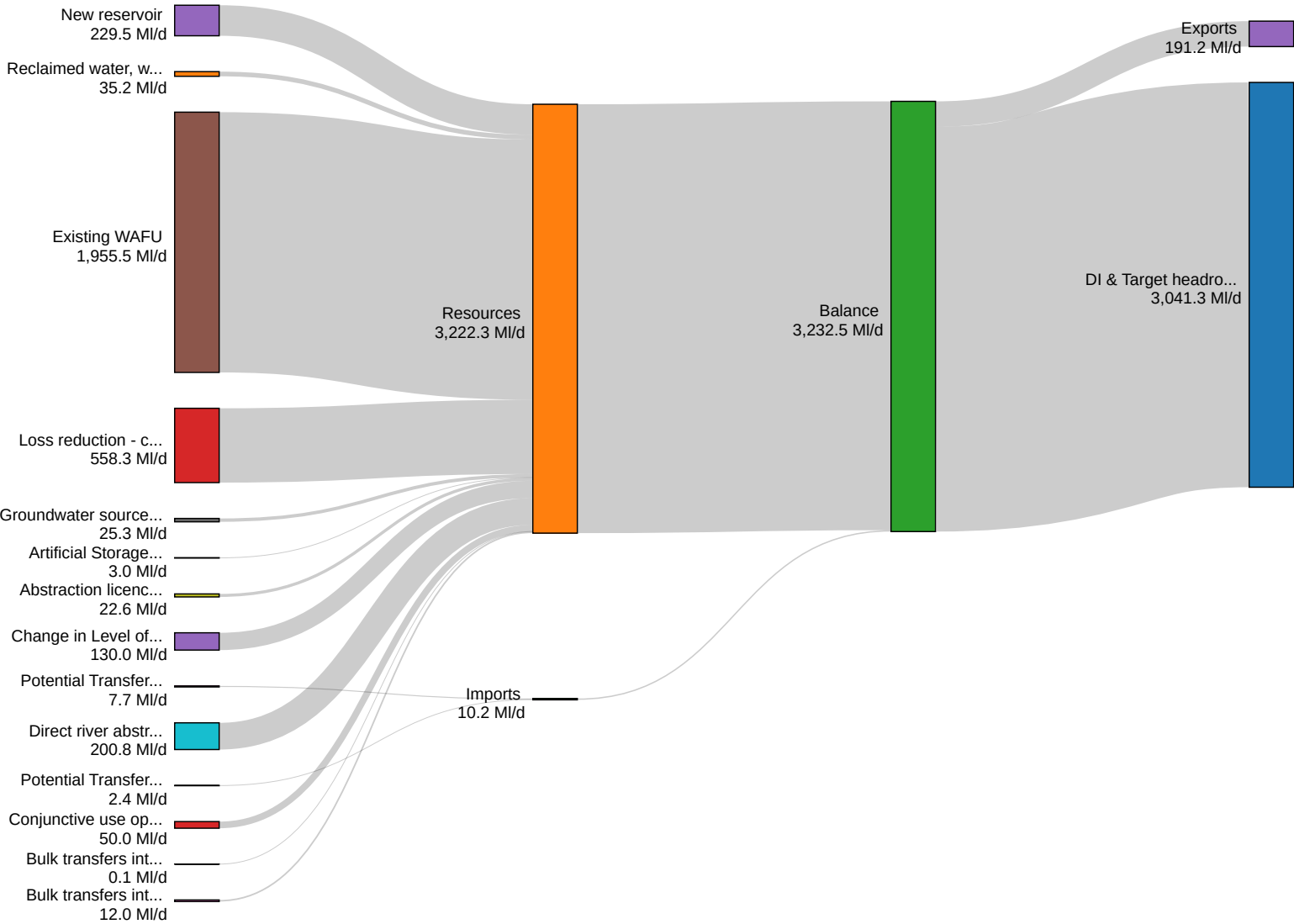
Situation 4 - 2040 (Thames Water)



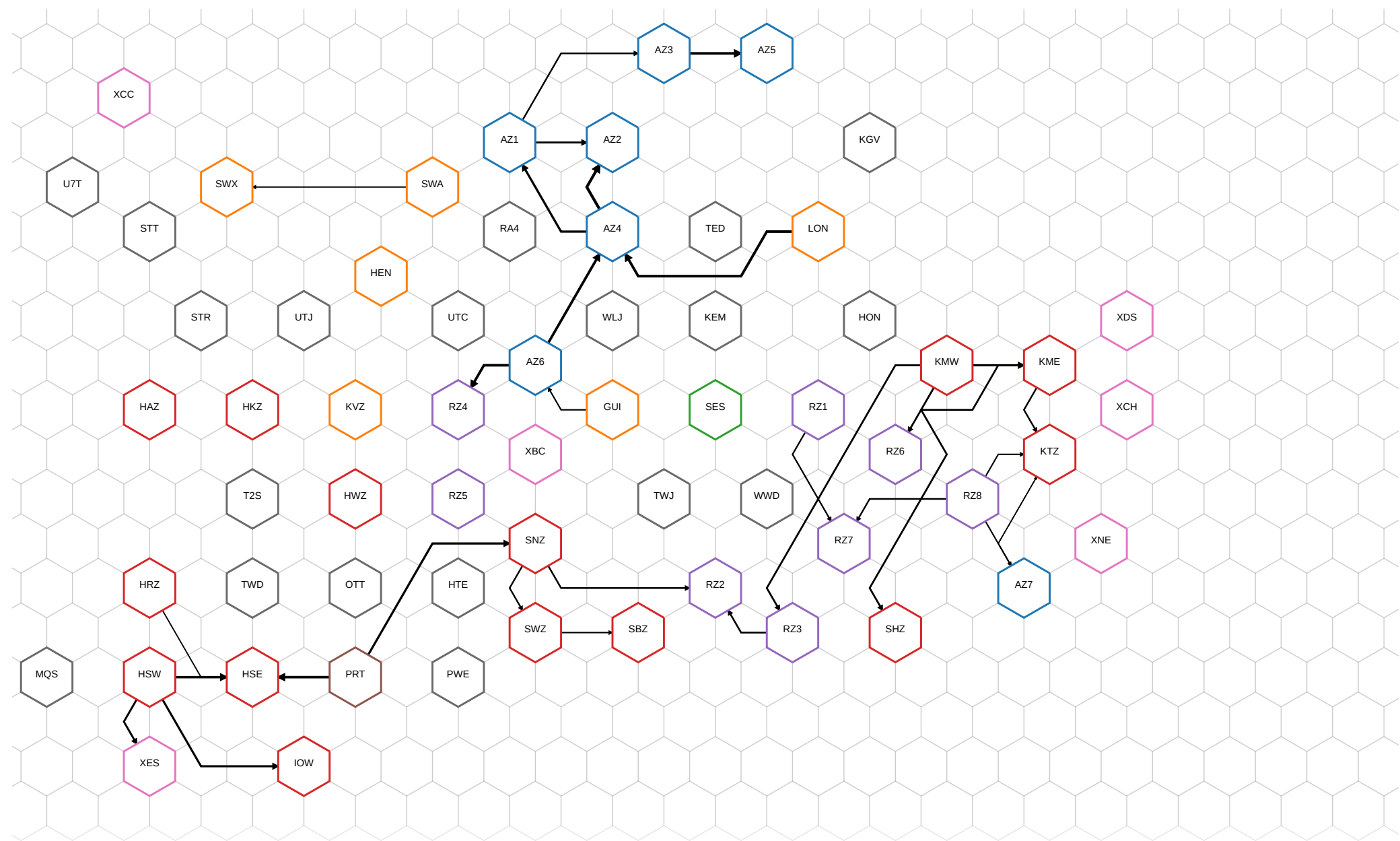
Situation 4 - 2050 (Thames Water)



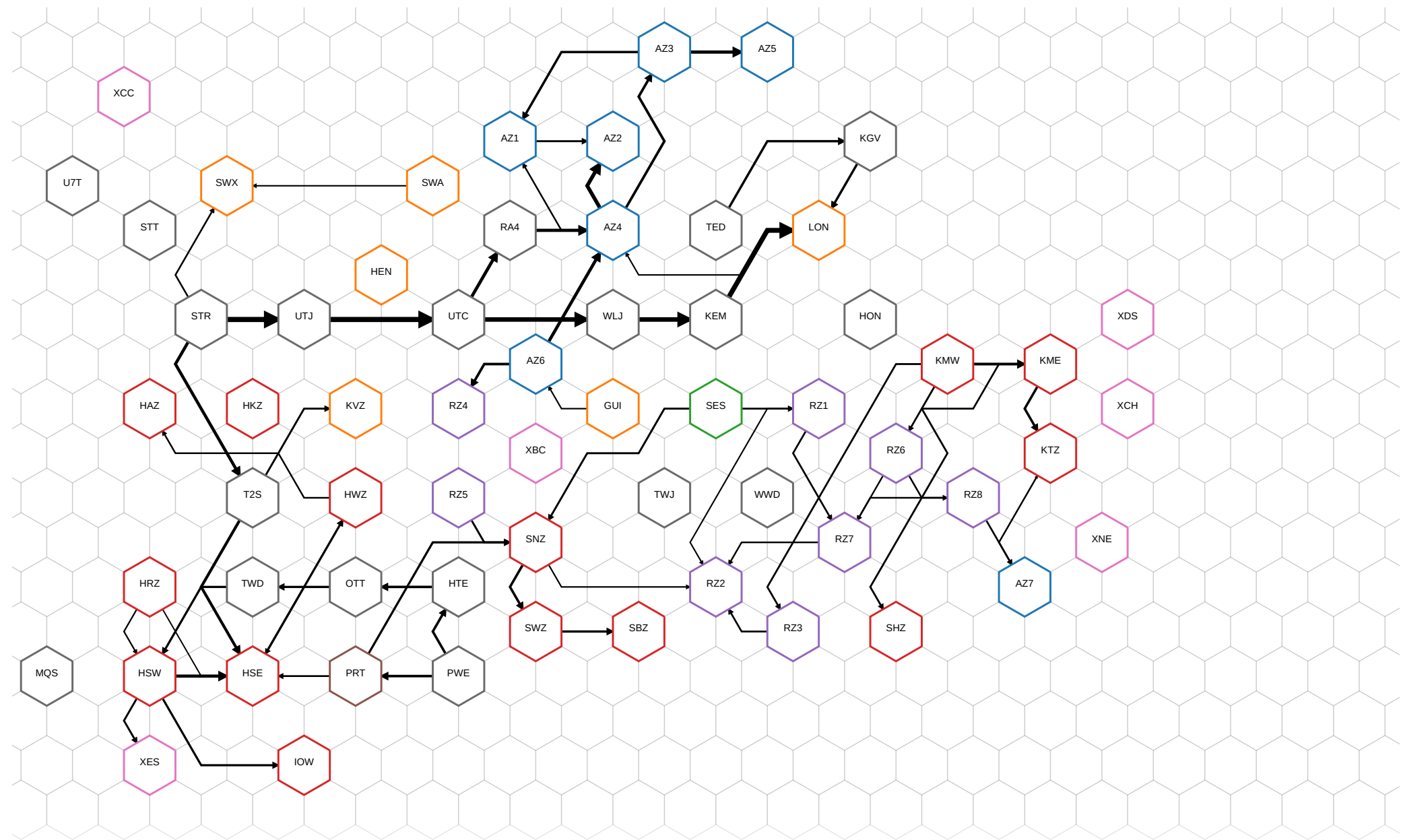
Situation 4 - 2075 (Thames Water)



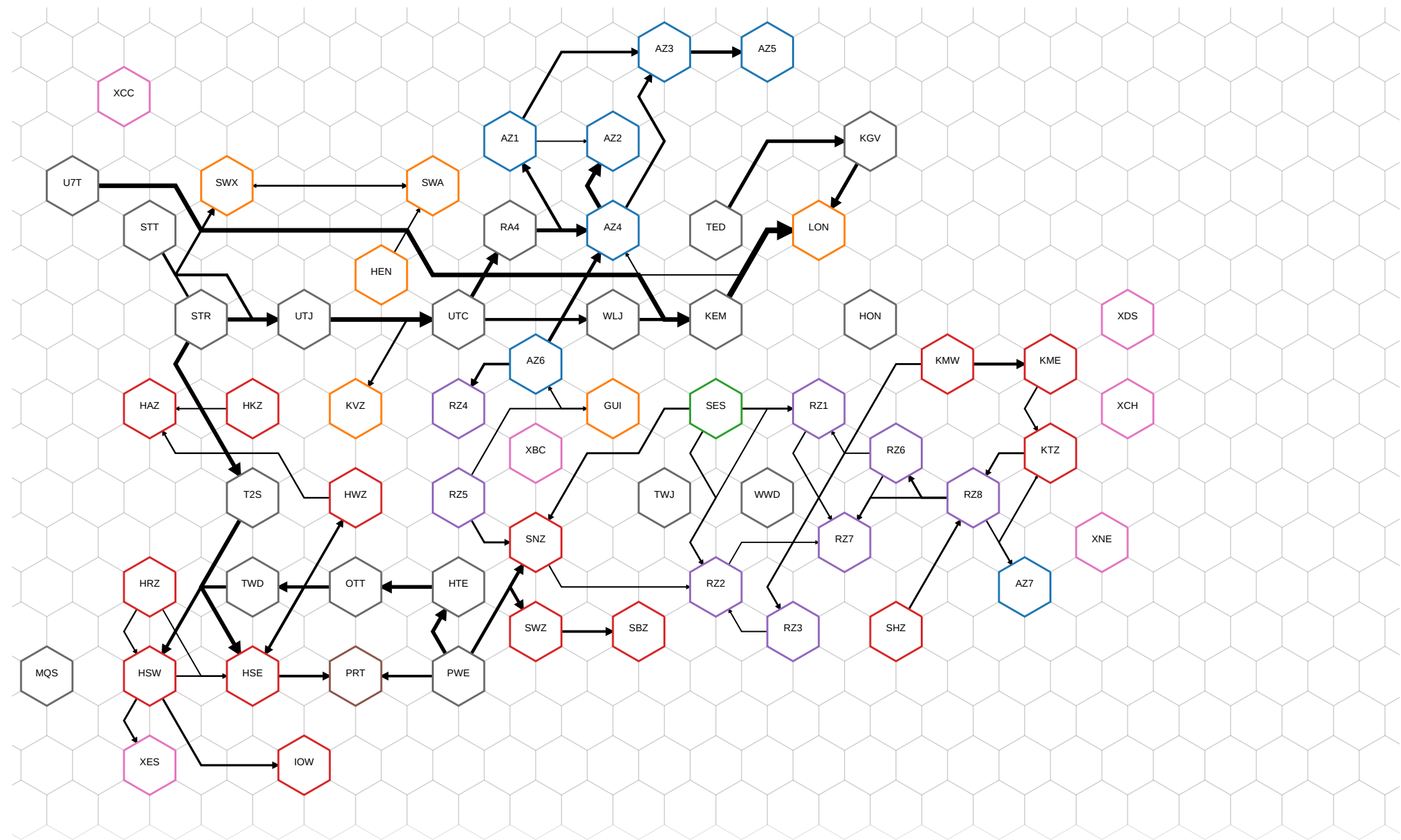
Situation 4 - 2026



Situation 4 - 2040



Situation 4 - 2075



IVM RUN DOSSIER

ONLY SESRO 100Mm³ AVAILABLE

IVM Summary: Thames Water

[Home](#) / [jet-20220805-000002](#) / [st-hybrid-dy-w1-tree16.05-options-v37-gov-led-hybridb-only-sesro100-excl-twul-rsr-2075](#)

Metadata

General Settings

Name	st-hybrid-dy-w1-tree16.05-options-v37-gov-led-hybridb-only-sesro100-excl-twul-rsr-2075
Created at	15/08/2022, 16:25:07
Tree	tree16.05: Root and branch tree 16.05: Stage 1 - Begins Hplan and LOW LCED, Stage 2 - Branches on growth (OxCam1a, Hplan and ONS18c), Stage 3 - Branches on licenced capped environmental destination, climate change and further growth scenarios (Hmax and Hmin) 
Setting name	options-v37-gov-led-hybridb-only-sesro100-excl-twul-rsr 
Setting description	Emergency options in HSE, SBZ, and PRT. Only SESRO 100 Mm3 available. Excludes TWUL reservoirs.
Optimised discount rate	STPR

Metrics

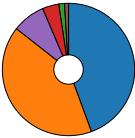
Net present value (Cost)

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Cost w/ deficit (STPR)	16,510	12,827	11,587	15,435	12,934	11,517	13,390	11,576	10,633	(£m)
Cost w/o deficit (STPR)	16,510	12,827	11,587	15,435	12,934	11,517	13,390	11,576	10,633	(£m)
Cost w/ deficit (IGEQ)	26,699	19,841	17,568	24,667	20,022	17,452	21,070	17,698	15,973	(£m)
Cost w/o deficit (IGEQ)	26,699	19,841	17,568	24,667	20,022	17,452	21,070	17,698	15,973	(£m)
Cost w/ deficit (LTDR)	18,441	14,174	12,743	17,191	14,296	12,664	14,856	12,756	11,668	(£m)
Cost w/o deficit (LTDR)	18,441	14,174	12,743	17,191	14,296	12,664	14,856	12,756	11,668	(£m)

Cost breakdown (STPR)

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Capex	7,327	4,891	4,093	6,499	4,998	4,025	5,211	4,004	3,436	(£m)
Fixed opex	6,802	6,483	6,370	6,805	6,476	6,368	6,524	6,387	6,312	(£m)
Fixed operational carbon	235	223	220	230	223	219	218	211	206	(£m)
Embedded carbon	663	415	358	596	425	352	444	350	313	(£m)
Variable opex	1,323	746	507	1,174	745	513	898	579	346	(£m)
Variable carbon opex	160	68	40	132	67	40	95	44	20	(£m)

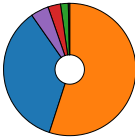
situation1



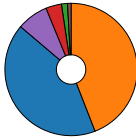
situation2



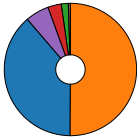
situation3



situation4



situation5



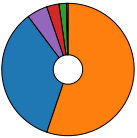
situation6



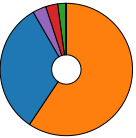
situation7



situation8

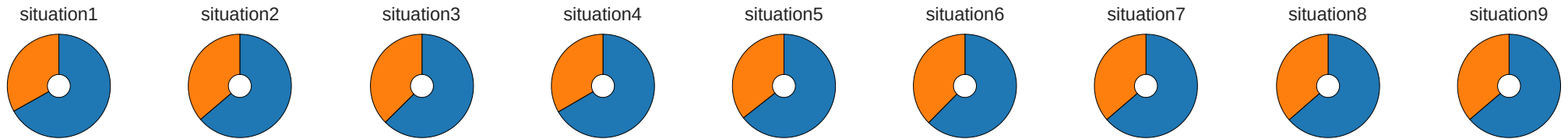


situation9



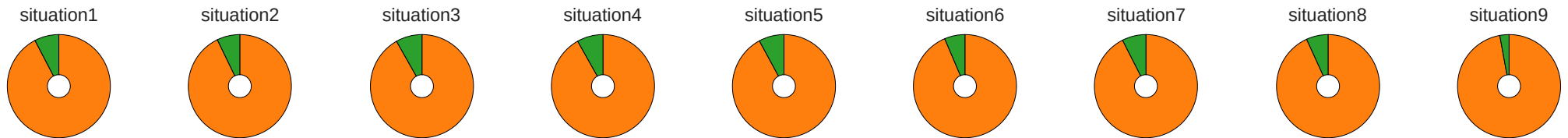
Emissions breakdown

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Capital emissions	4,269,976	2,546,400	2,154,422	3,783,207	2,615,172	2,119,928	2,781,970	2,133,736	1,880,174	(tonnes)
Operational emissions	2,113,033	1,445,186	1,287,273	1,893,587	1,445,251	1,275,497	1,583,999	1,220,157	1,067,772	(tonnes)



Electricity breakdown

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Generated (on site)	0	0	0	0	0	0	0	0	0	(GWh)
Grid	25,232	13,771	6,524	21,378	12,471	7,089	16,571	10,543	4,507	(GWh)
Renewable	2,092	1,066	584	1,897	1,071	486	1,341	773	134	(GWh)



Environmental

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
SEA environmental benefit	86,927.00	80,985.00	79,348.00	85,385.00	81,070.00	78,981.00	82,633.00	78,238.00	76,958.00	
SEA environmental disbenefit	124,006.00	96,464.00	83,578.00	115,662.00	93,392.00	82,811.00	105,271.00	80,335.00	71,407.00	
Natural capital	10,684,526.75	11,447,559.27	11,958,408.14	10,847,786.43	12,047,940.41	11,934,067.30	12,067,516.31	14,763,727.47	16,043,483.70	
Bio-diversity net gain	-323,881.00	-219,895.00	-187,610.00	-305,256.00	-206,440.00	-179,191.00	-218,183.00	-169,387.00	-147,942.00	

Social

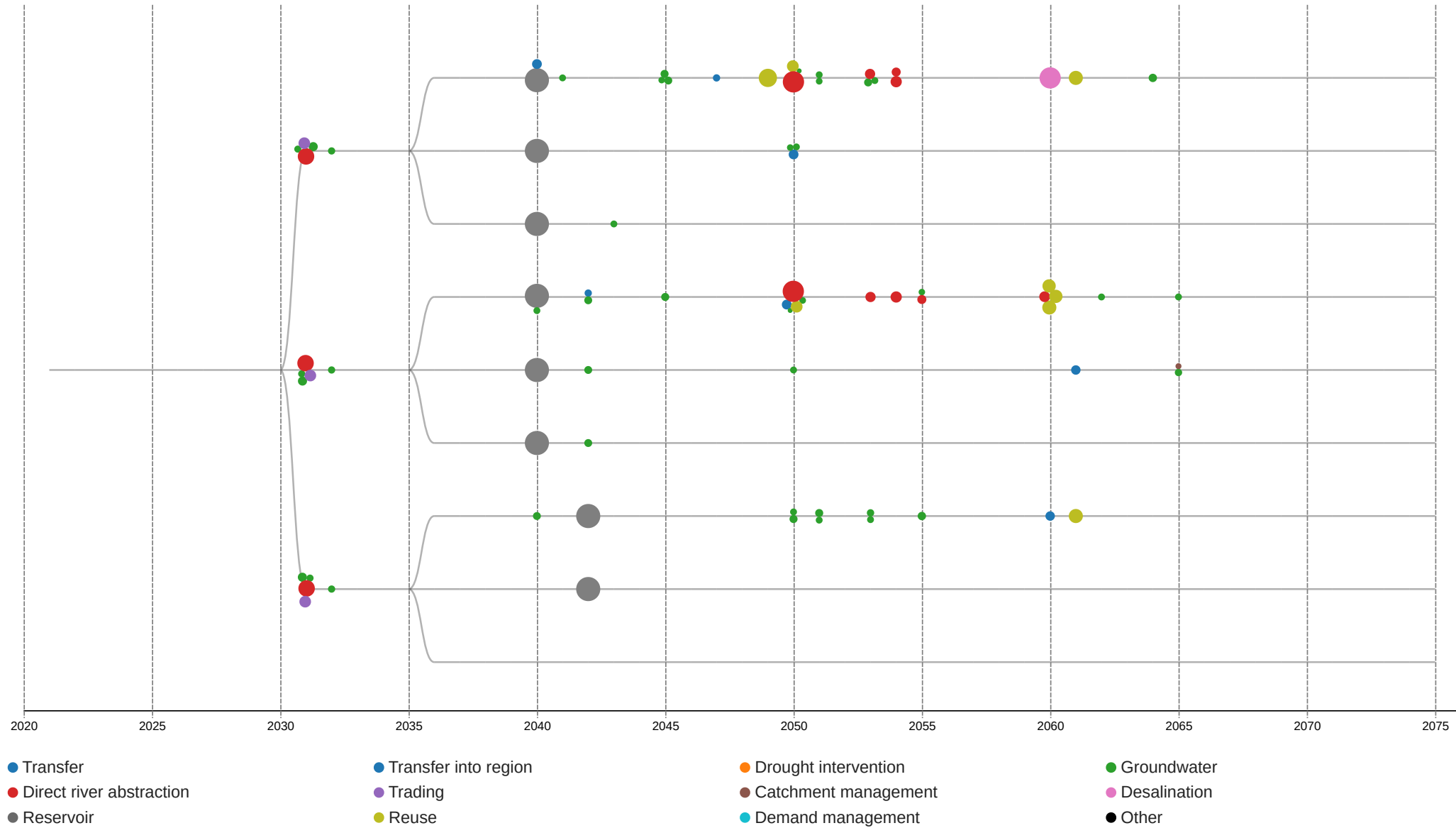
Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Customer preference	32,922.00	30,998.00	30,269.00	32,457.00	31,007.00	30,247.00	31,878.00	29,936.00	29,380.00	

Reliability

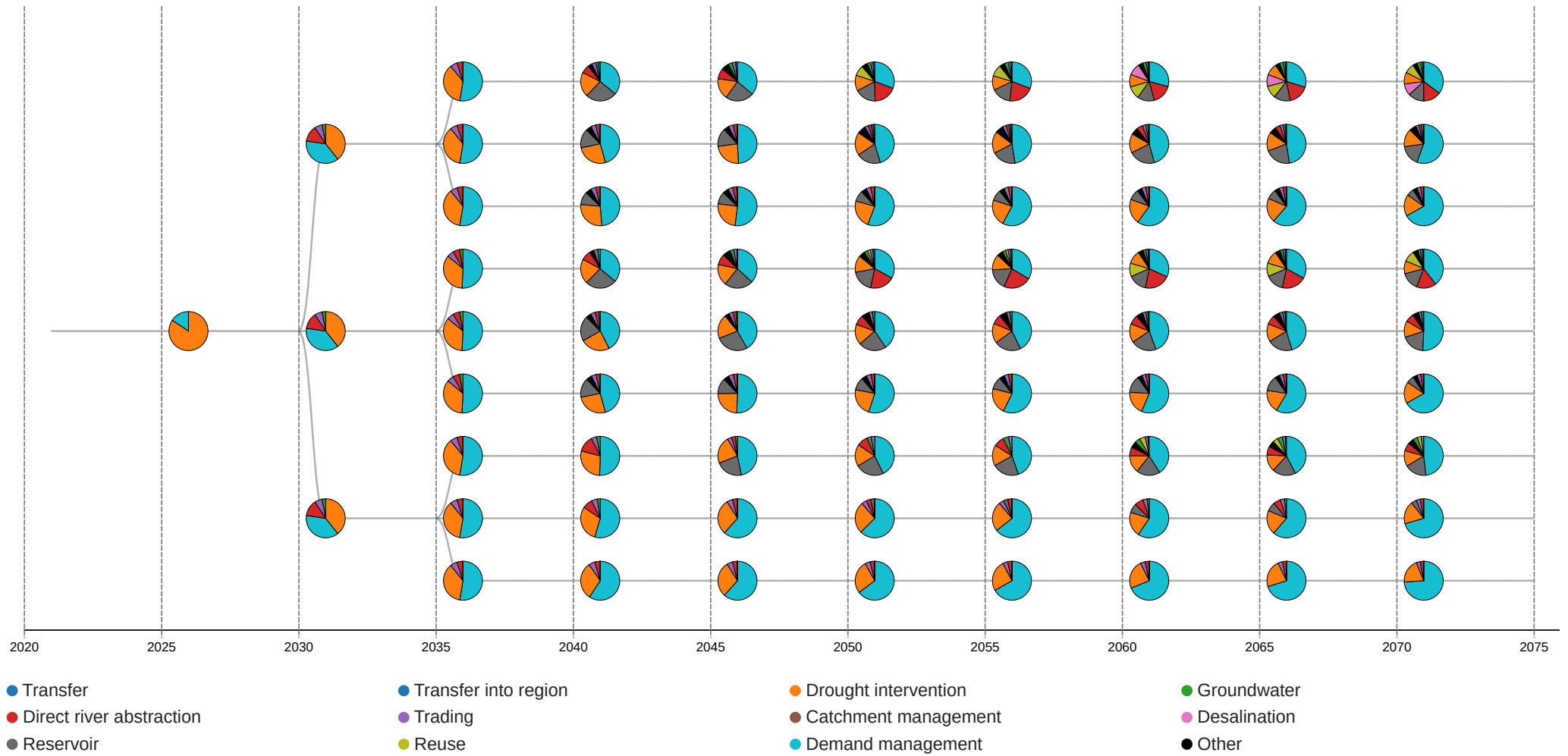
[illegible]

Adaptability										
Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Adaptability	18.31	19.92	22.13	18.79	20.78	21.71	19.91	21.50	25.28	
A3: Operational complexity and flexibility	8.75	9.33	10.23	9.06	9.52	10.14	9.23	9.80	11.56	
A4: WRZ connectivity	9.53	10.58	11.89	9.69	11.22	11.55	10.64	11.68	13.69	
A7: Customer relations support engagement with demand management	0.04	0.02	0.02	0.04	0.03	0.02	0.04	0.02	0.02	
Evolvability										
Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Evolvability	26.78	27.12	29.24	27.32	27.68	29.00	27.34	28.73	33.35	
E1: Scaleability and modularity of proposed changes	11.09	11.46	12.44	11.23	11.70	12.33	11.54	12.26	14.20	
E2: Intervention lead times	7.24	6.82	7.18	7.45	6.91	7.15	6.98	7.22	8.37	
E3: Reliance on external bodies to deliver changes	8.39	8.80	9.57	8.58	9.03	9.49	8.76	9.22	10.75	
E5: Collaborative land management	0.07	0.04	0.04	0.07	0.05	0.04	0.07	0.04	0.04	

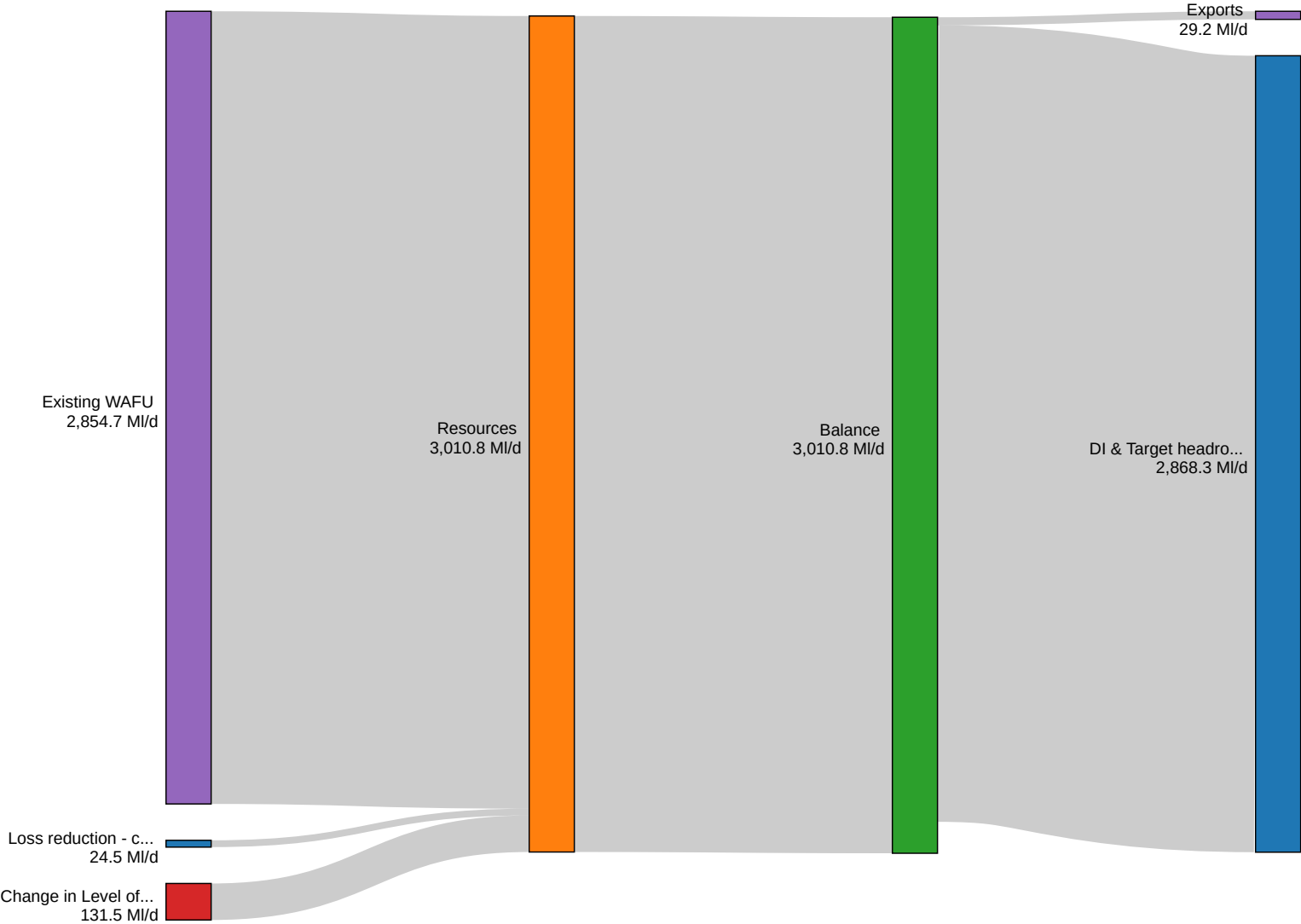
Option Selection (Thames Water)



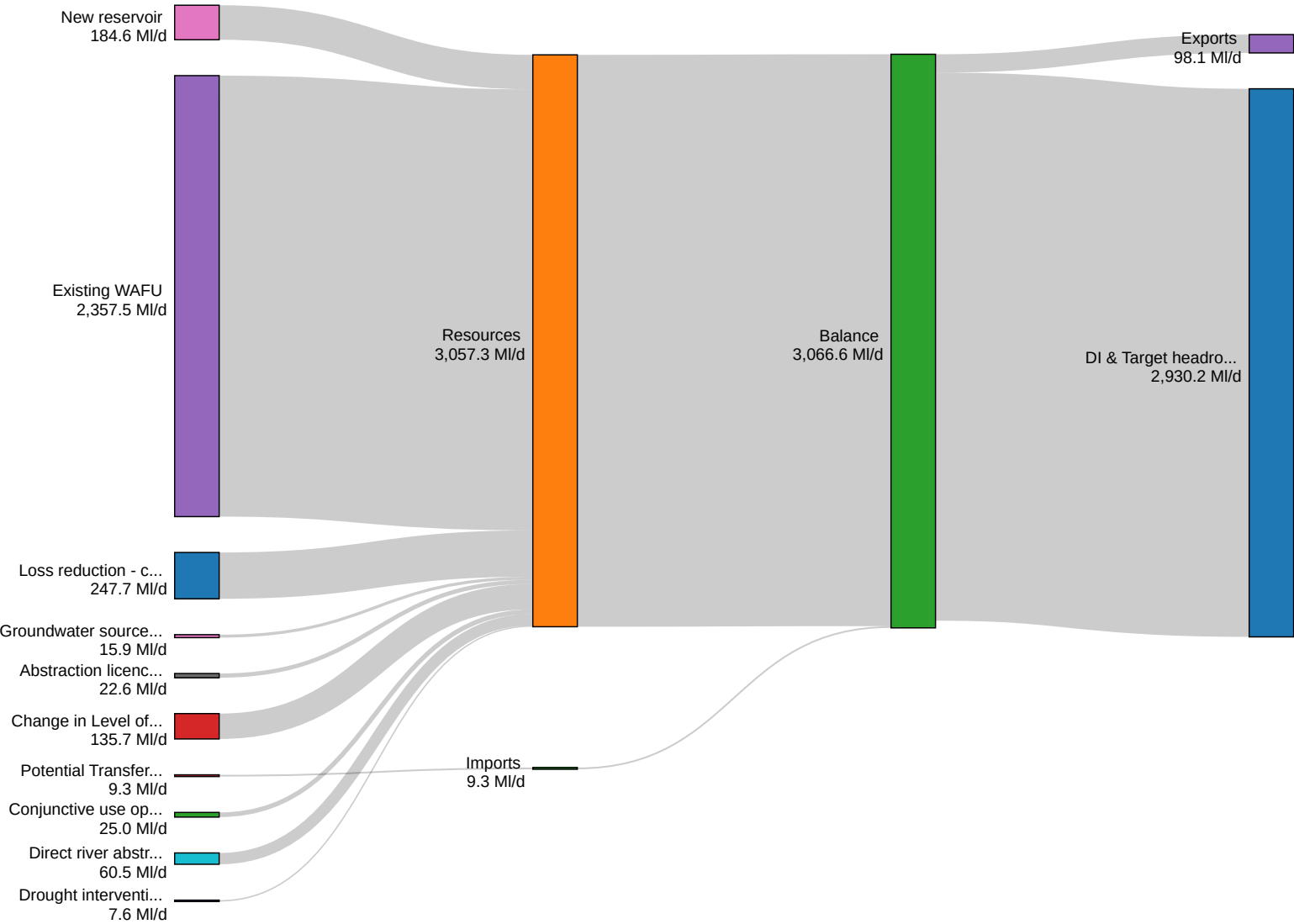
Pie charts show the breakdown of option utilisation by option category.



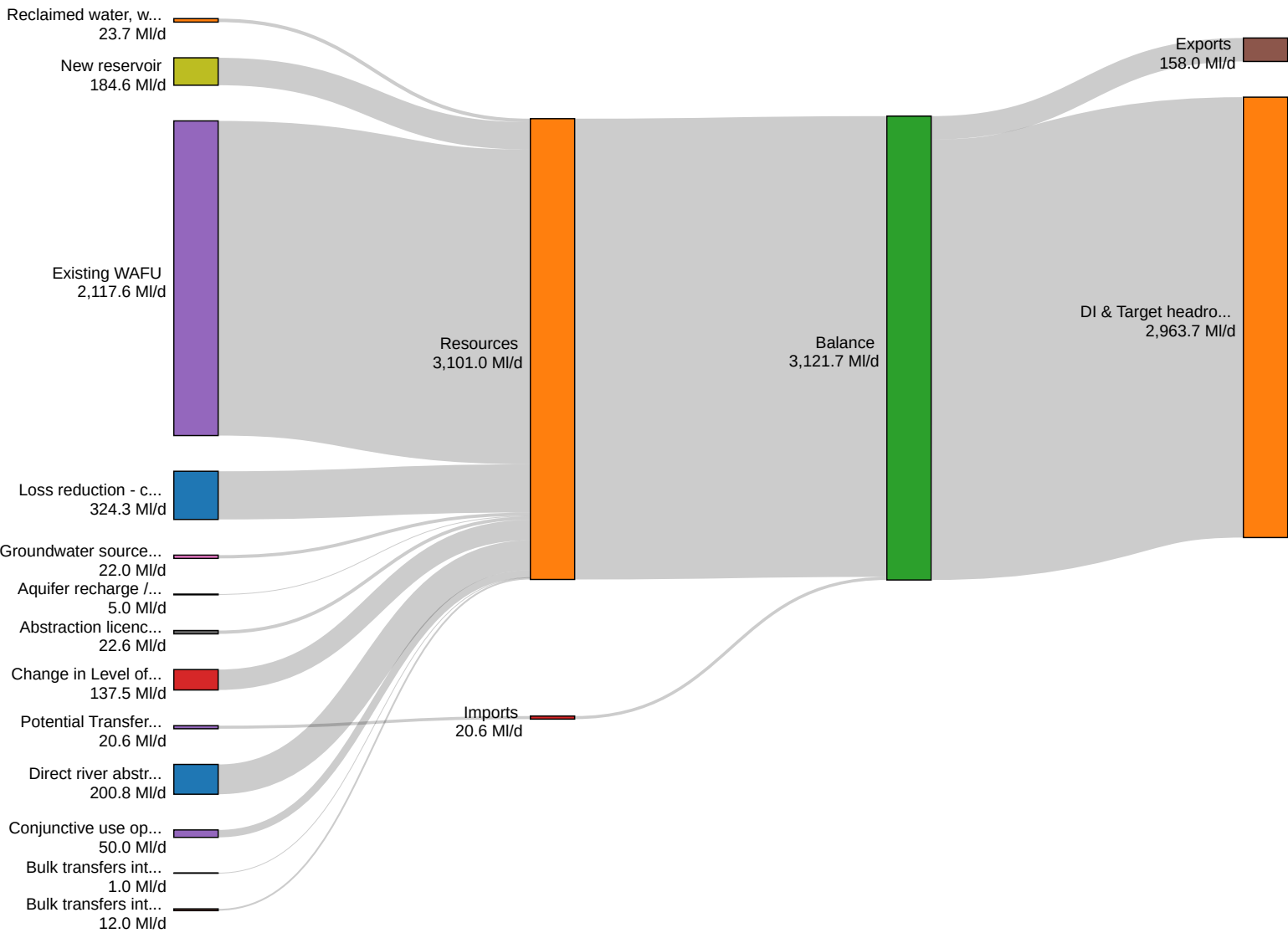
Situation 4 - 2026 (Thames Water)



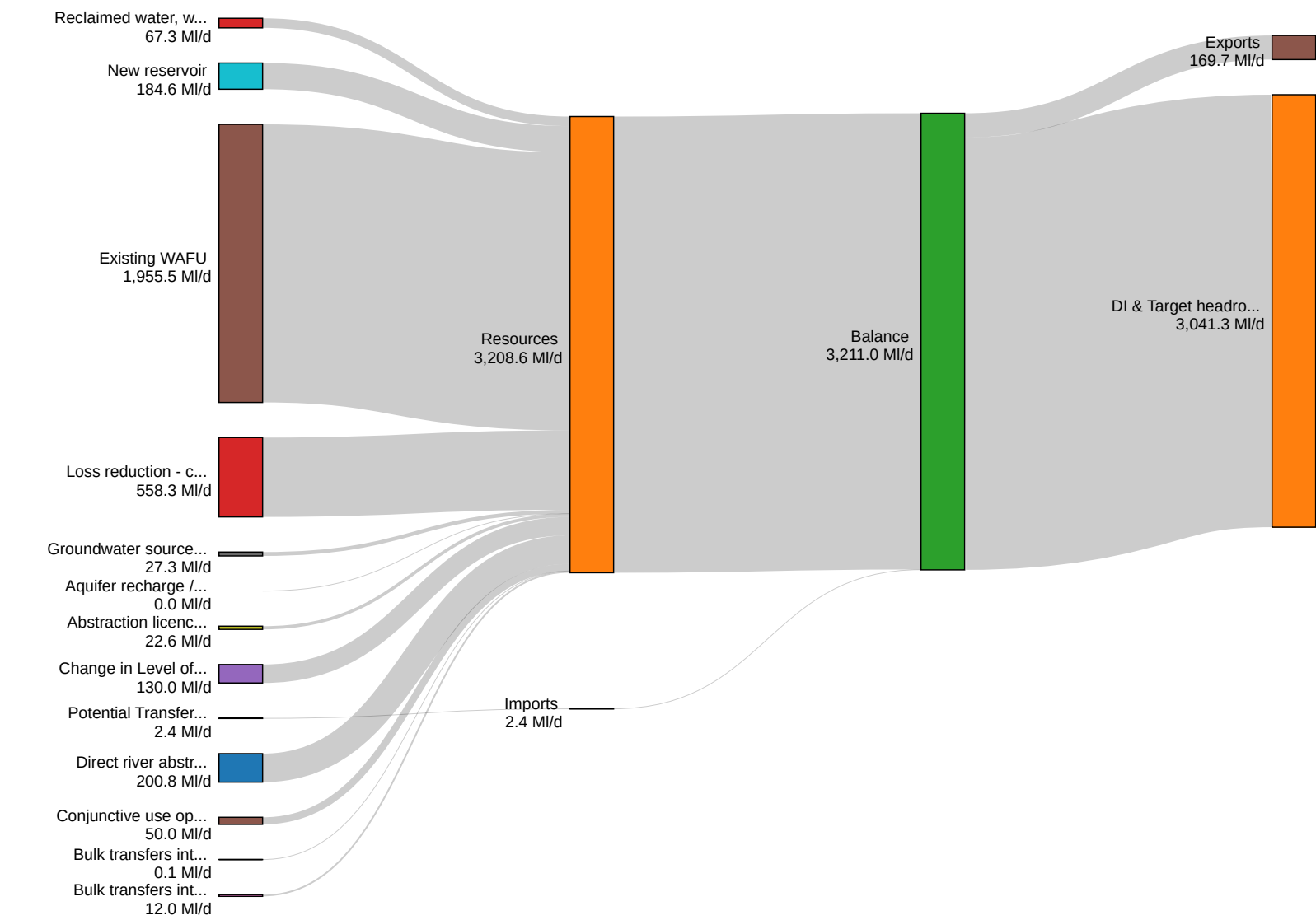
Situation 4 - 2040 (Thames Water)



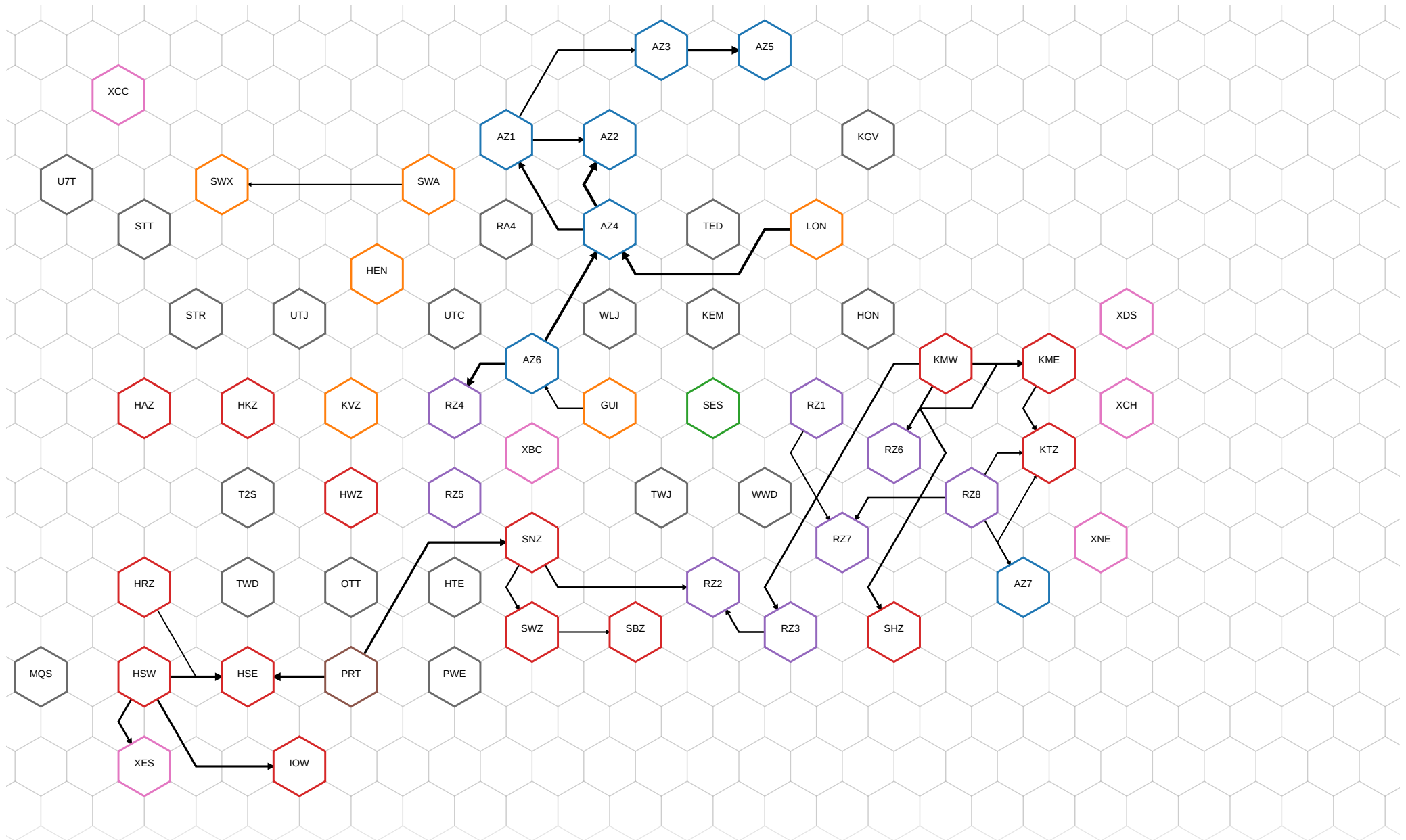
Situation 4 - 2050 (Thames Water)



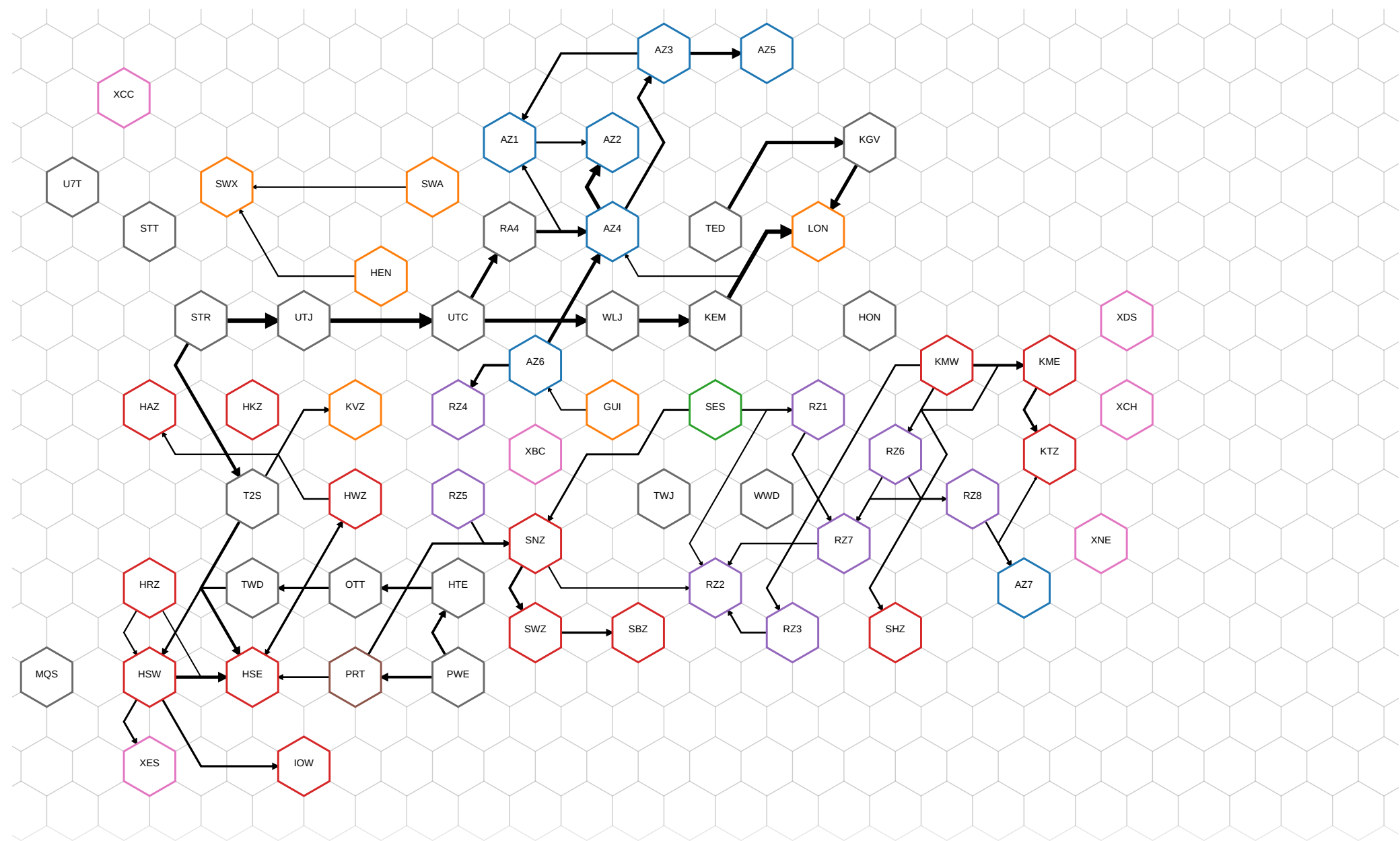
Situation 4 - 2075 (Thames Water)



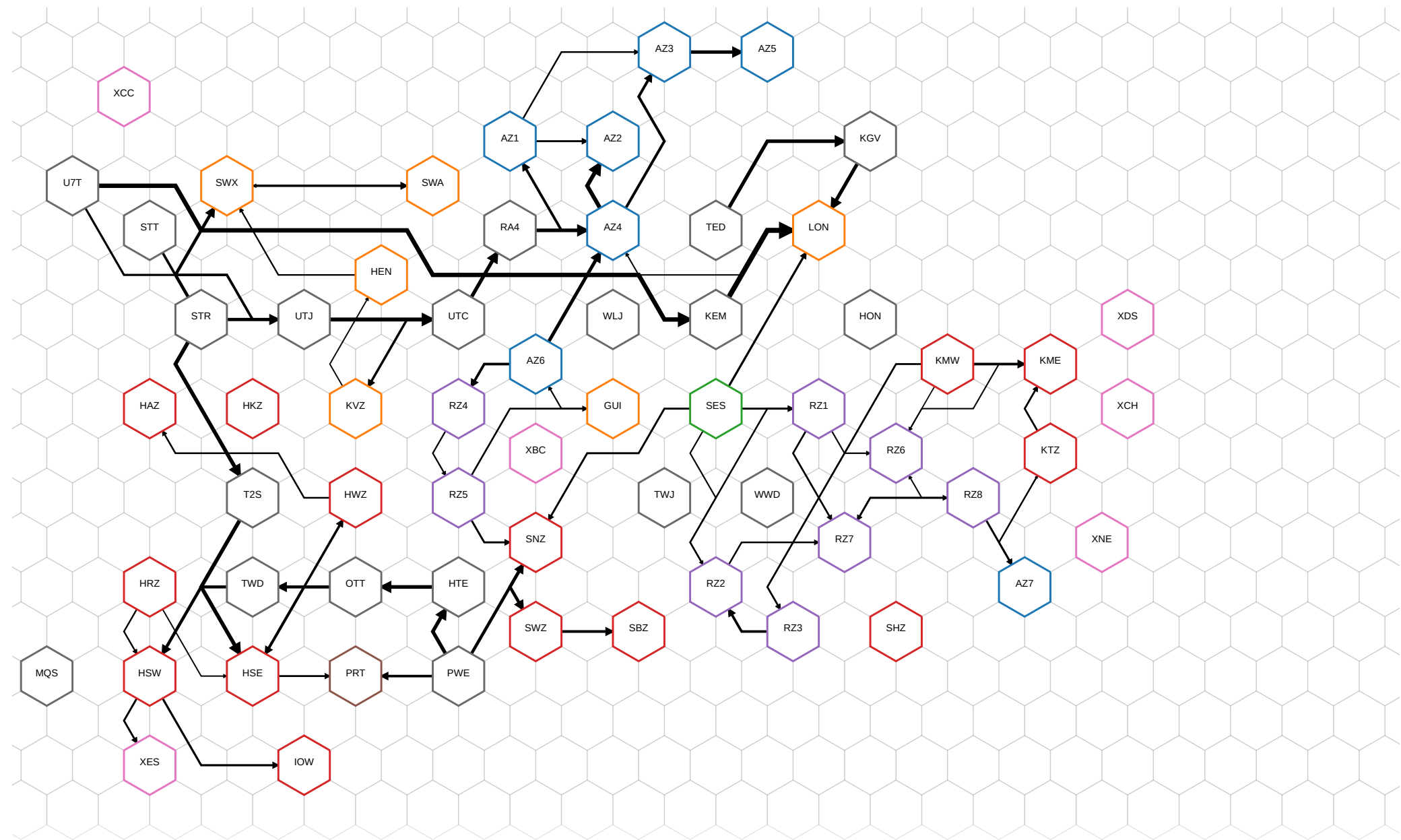
Situation 4 - 2026



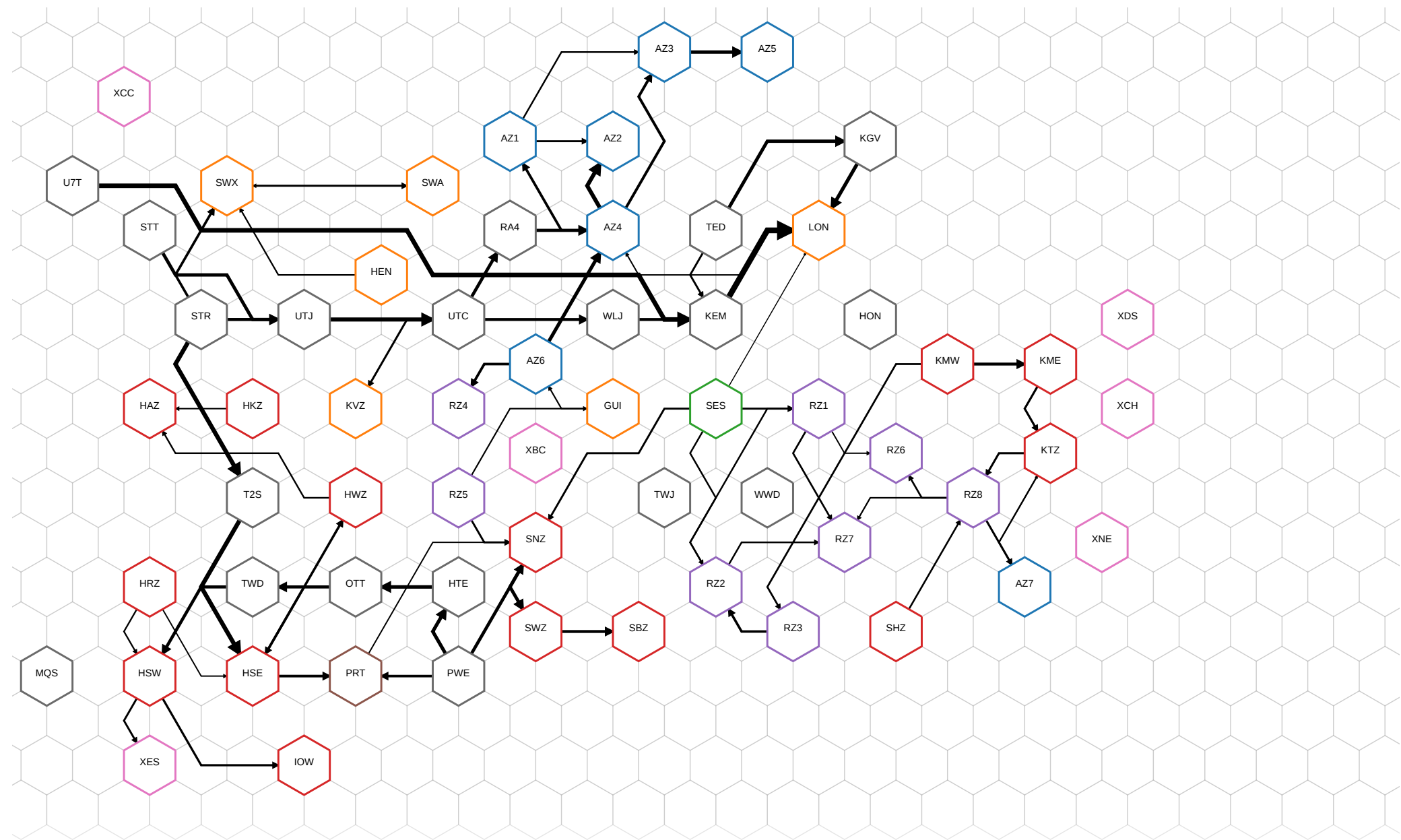
Situation 4 - 2040



Situation 4 - 2050



Situation 4 - 2075



IVM RUN DOSSIER

ONLY SESRO 75Mm³ AVAILABLE

IVM Summary: Thames Water

Metadata	
General Settings	
Name	st-hybrid-dy-w1-tree16.05-options-v37-gov-led-hybridb-only-sesro75-excl-twul-rsr-2075
Created at	15/08/2022, 16:25:15
Tree	tree16.05: Root and branch tree 16.05: Stage 1 - Begins Hplan and LOW LCED, Stage 2 - Branches on growth (OxCam1a, Hplan and ONS18c), Stage 3 - Branches on licenced capped environmental destination, climate change and further growth scenarios (Hmax and Hmin) ↗
Setting name	options-v37-gov-led-hybridb-only-sesro75-excl-twul-rsr ↗
Setting description	Emergency options in HSE, SBZ, and PRT. Only SESRO 75 Mm3 available. Excludes TWUL reservoirs.
Optimised discount rate	STPR

Metrics

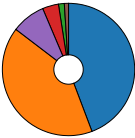
Net present value (Cost)

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Cost w/ deficit (STPR)	16,793	12,725	11,631	15,669	13,104	11,910	13,491	11,549	10,625	(£m)
Cost w/o deficit (STPR)	16,793	12,725	11,631	15,669	13,104	11,910	13,491	11,549	10,625	(£m)
Cost w/ deficit (IGEQ)	27,127	19,643	17,615	25,022	20,310	18,086	21,216	17,620	15,939	(£m)
Cost w/o deficit (IGEQ)	27,127	19,643	17,615	25,022	20,310	18,086	21,216	17,620	15,939	(£m)
Cost w/ deficit (LTDR)	18,754	14,054	12,788	17,449	14,487	13,103	14,966	12,720	11,655	(£m)
Cost w/o deficit (LTDR)	18,754	14,054	12,788	17,449	14,487	13,103	14,966	12,720	11,655	(£m)

Cost breakdown (STPR)

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Capex	7,430	4,826	4,147	6,733	5,095	4,339	5,292	3,980	3,433	(£m)
Fixed opex	6,906	6,464	6,367	6,775	6,493	6,391	6,525	6,378	6,308	(£m)
Fixed operational carbon	241	219	214	225	216	211	217	211	206	(£m)
Embedded carbon	660	405	356	562	413	360	447	345	308	(£m)
Variable opex	1,385	746	511	1,231	809	562	913	592	349	(£m)
Variable carbon opex	171	65	36	143	79	46	97	44	20	(£m)

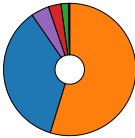
situation1



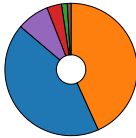
situation2



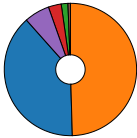
situation3



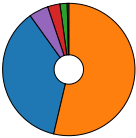
situation4



situation5



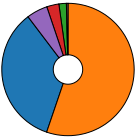
situation6



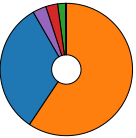
situation7



situation8

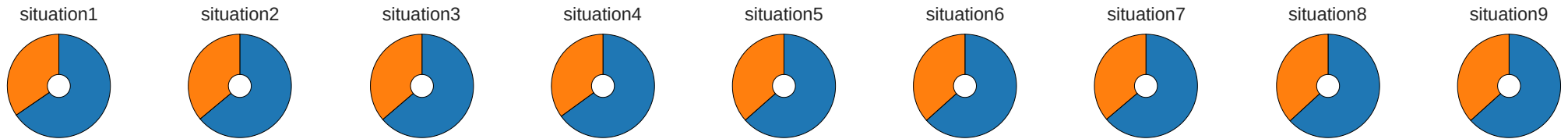


situation9



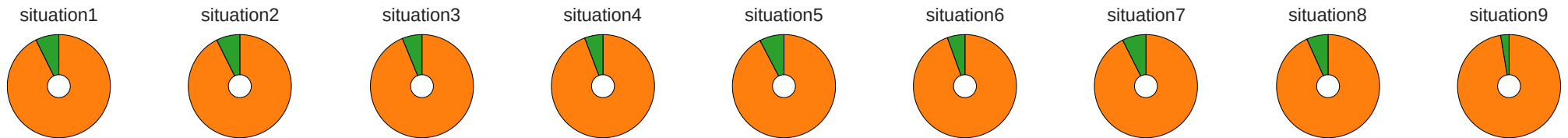
Emissions breakdown

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Capital emissions	4,233,988	2,473,903	2,136,004	3,577,100	2,540,297	2,170,115	2,805,480	2,091,010	1,846,513	(tonnes)
Operational emissions	2,233,143	1,392,827	1,214,221	1,924,656	1,460,415	1,253,492	1,589,219	1,218,072	1,068,440	(tonnes)



Electricity breakdown

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Generated (on site)	0	0	0	0	0	0	0	0	0	(GWh)
Grid	26,523	13,694	6,909	23,137	14,535	7,982	16,844	10,676	4,815	(GWh)
Renewable	2,089	1,092	456	1,419	1,209	467	1,357	771	129	(GWh)



Environmental

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
SEA environmental benefit	87,050.00	80,204.00	78,719.00	84,836.00	80,464.00	78,505.00	82,001.00	77,109.00	75,783.00	
SEA environmental disbenefit	126,279.00	94,916.00	82,722.00	119,687.00	96,756.00	84,636.00	106,550.00	78,975.00	70,341.00	
Natural capital	10,362,639.09	10,998,085.23	11,512,046.14	9,678,646.54	11,138,088.09	11,630,710.64	11,694,598.39	14,333,365.81	15,676,888.81	
Bio-diversity net gain	-332,994.00	-237,161.00	-197,328.00	-296,398.00	-199,427.00	-185,425.00	-234,304.00	-184,685.00	-154,185.00	

Social

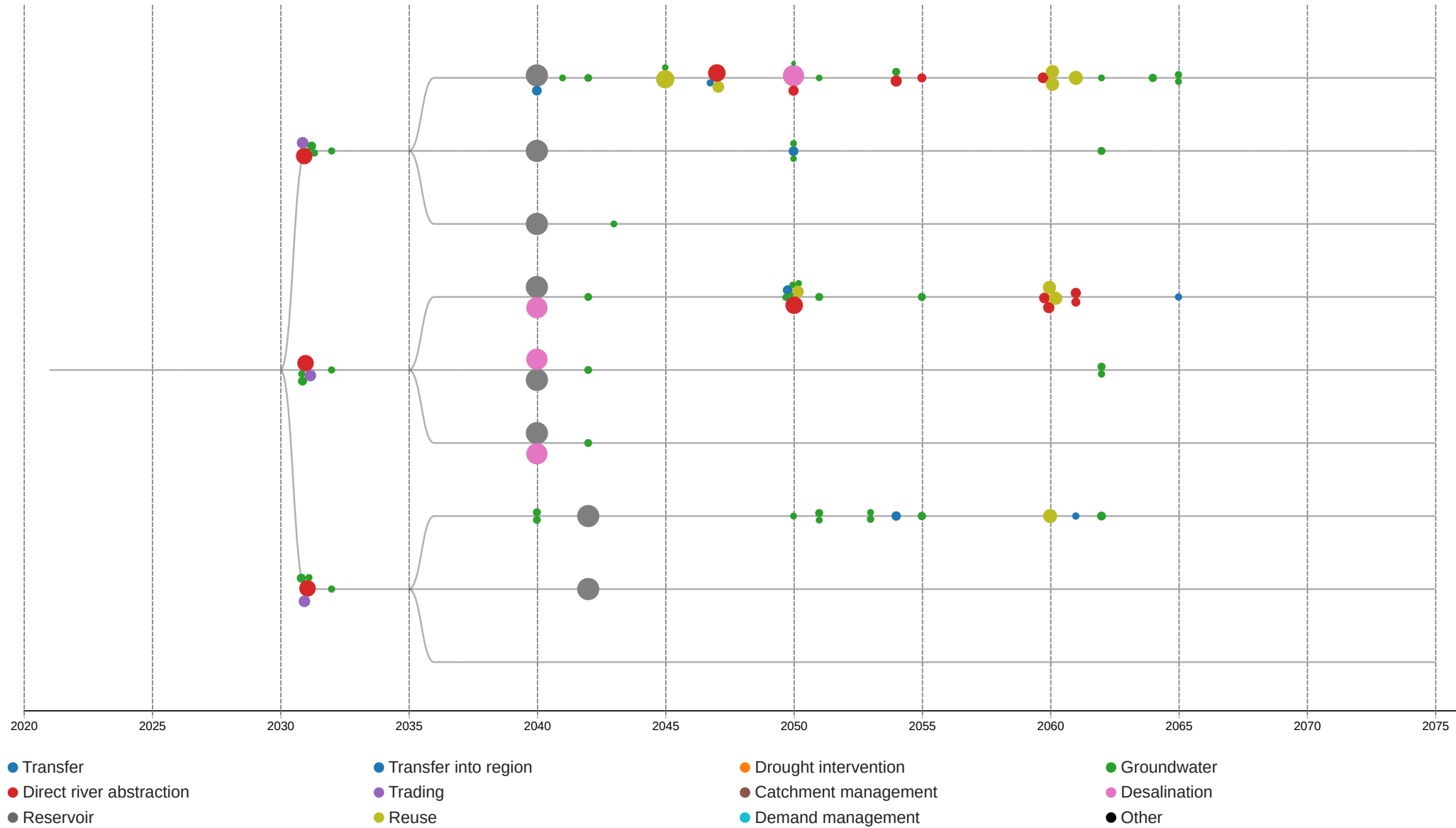
Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Customer preference	33,044.00	30,957.00	30,276.00	32,532.00	31,089.00	30,280.00	31,954.00	29,899.00	29,293.00	

Reliability

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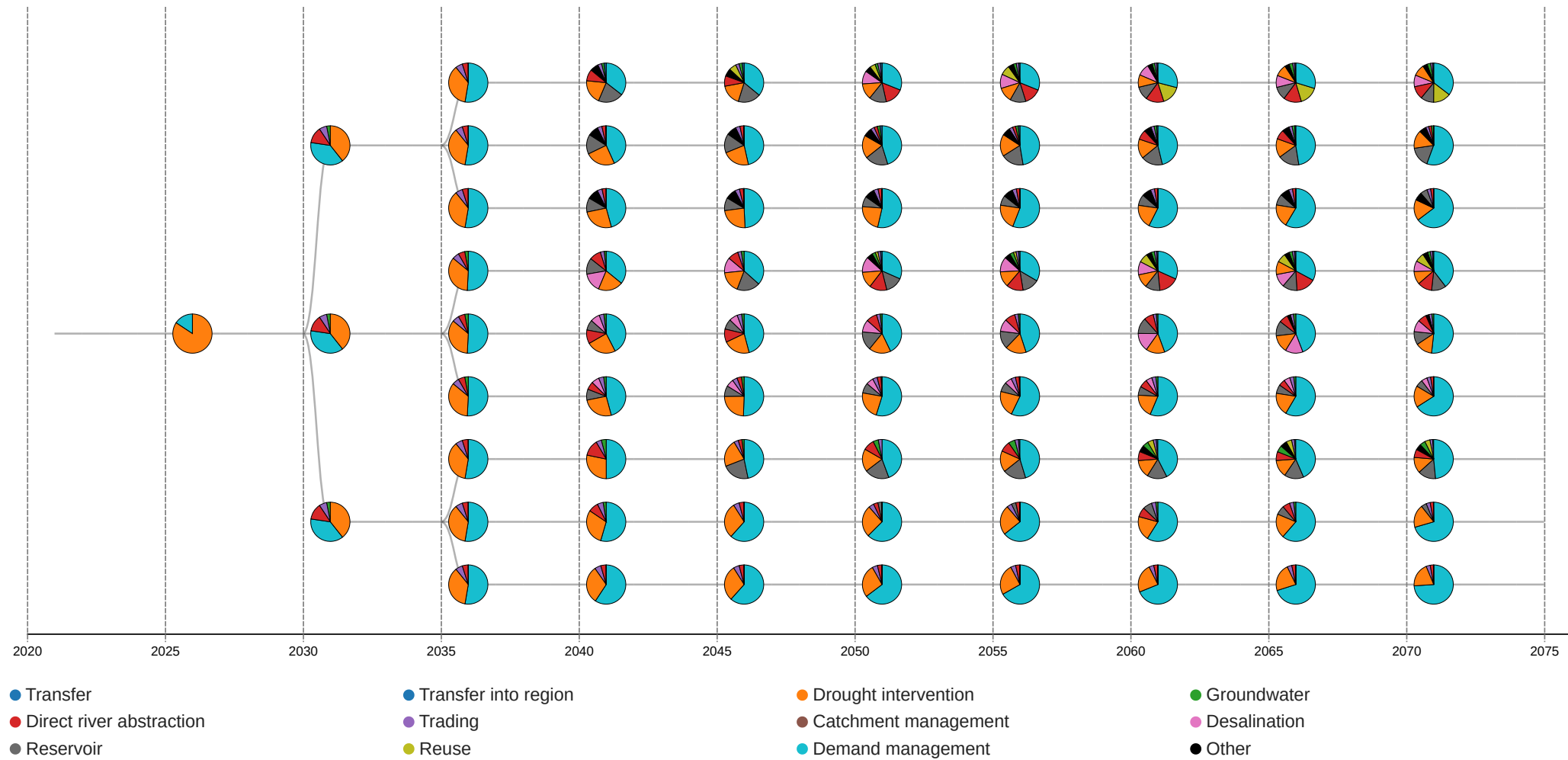
Adaptability										
Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Adaptability	18.31	19.72	21.91	18.03	17.53	19.22	19.93	21.43	24.93	
A3: Operational complexity and flexibility	8.88	9.12	10.03	8.68	8.88	9.71	9.26	9.76	11.55	
A4: WRZ connectivity	9.39	10.58	11.86	9.31	8.61	9.49	10.63	11.64	13.35	
A7: Customer relations support engagement with demand management	0.04	0.02	0.02	0.04	0.04	0.02	0.04	0.02	0.02	
Evolvability										
Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Evolvability	27.00	26.47	28.80	26.25	26.45	28.41	27.26	28.42	33.06	
E1: Scaleability and modularity of proposed changes	11.18	11.13	12.12	10.85	11.21	12.12	11.47	12.09	14.03	
E2: Intervention lead times	7.20	6.70	7.25	6.99	6.64	7.01	6.93	7.10	8.24	
E3: Reliance on external bodies to deliver changes	8.55	8.60	9.40	8.35	8.53	9.24	8.79	9.19	10.75	
E5: Collaborative land management	0.07	0.04	0.04	0.07	0.07	0.04	0.07	0.04	0.04	

Option Selection (Thames Water)

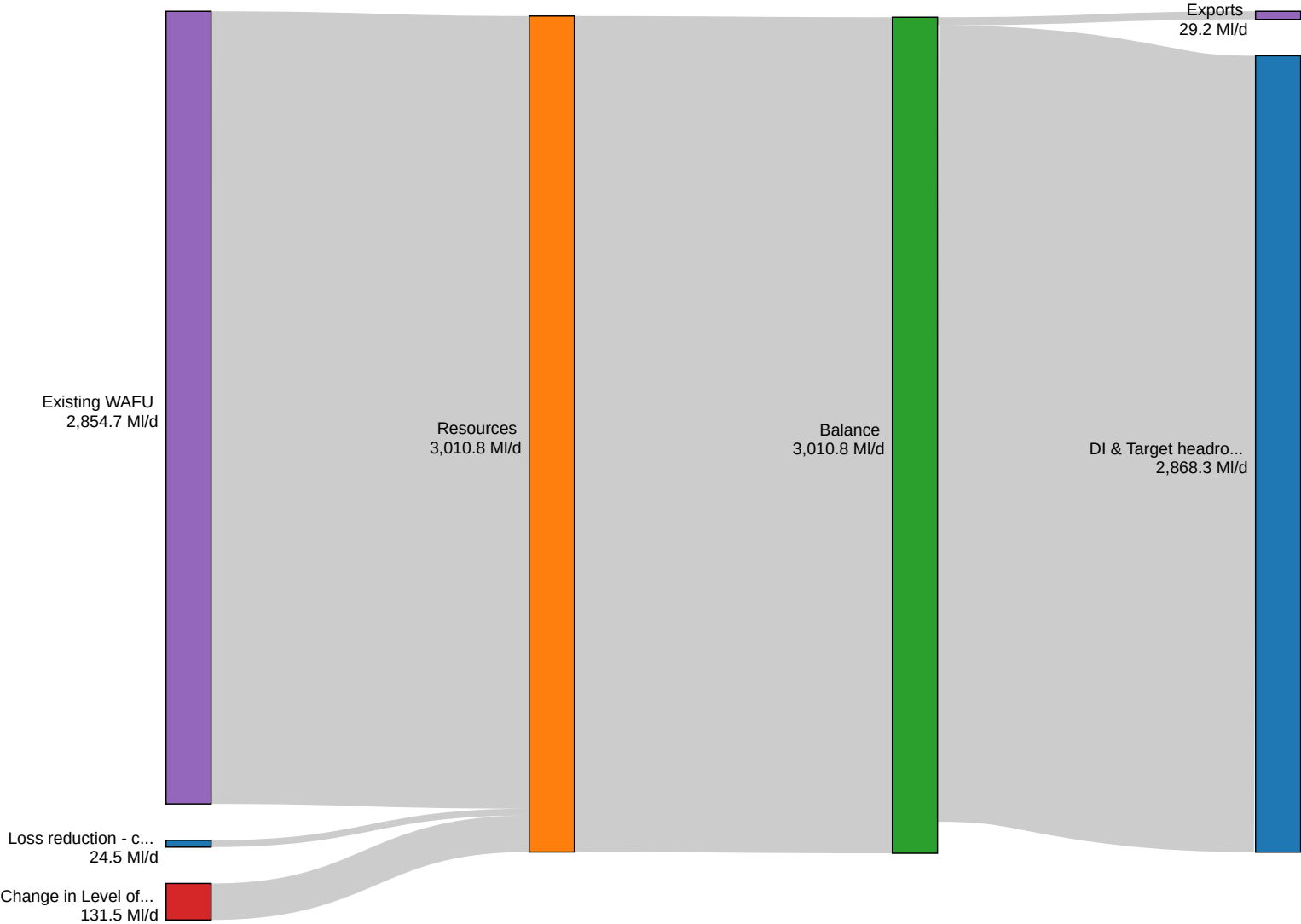


Utilisation (Thames Water)

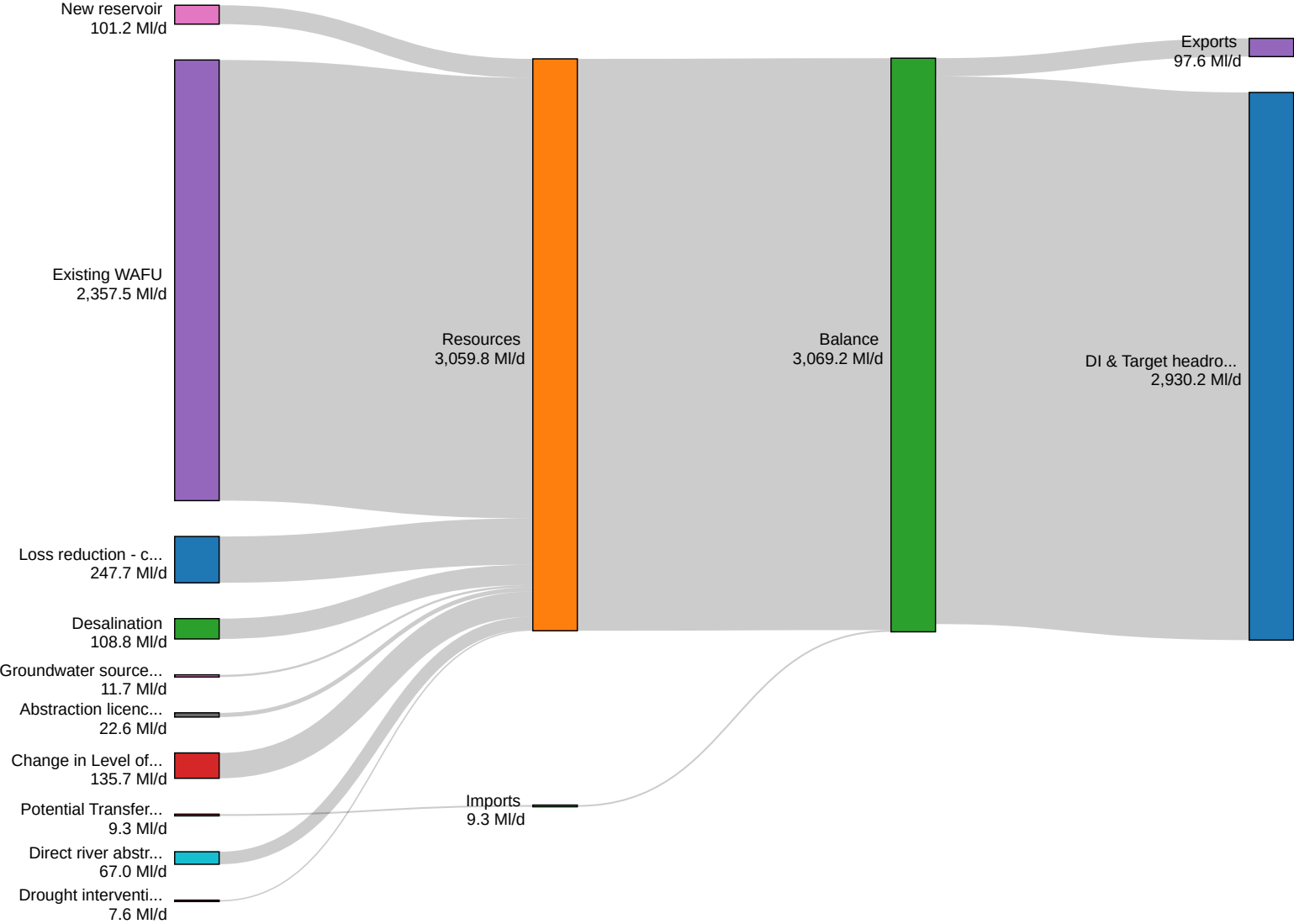
Pie charts show the breakdown of option utilisation by option category.



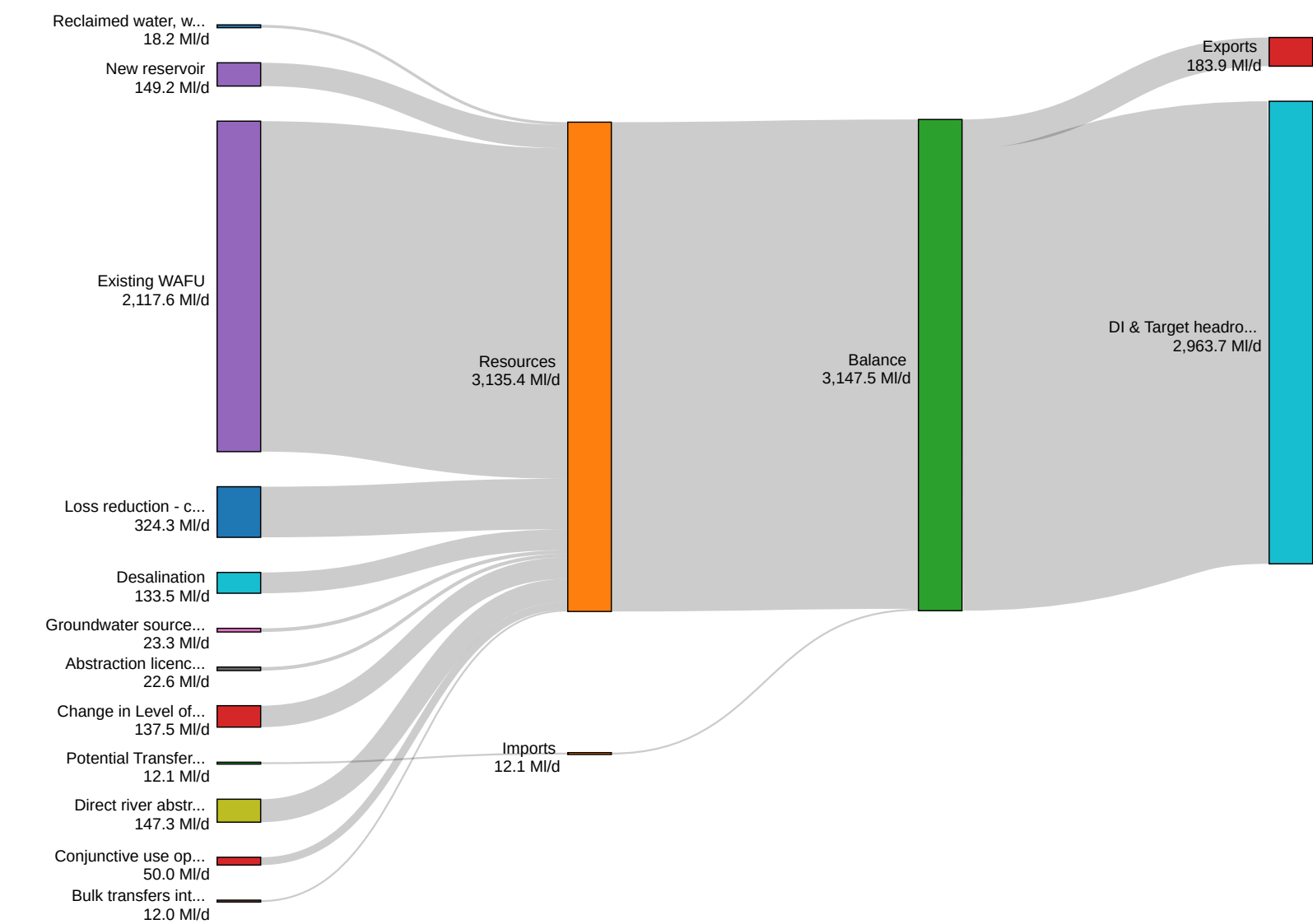
Situation 4 - 2026 (Thames Water)



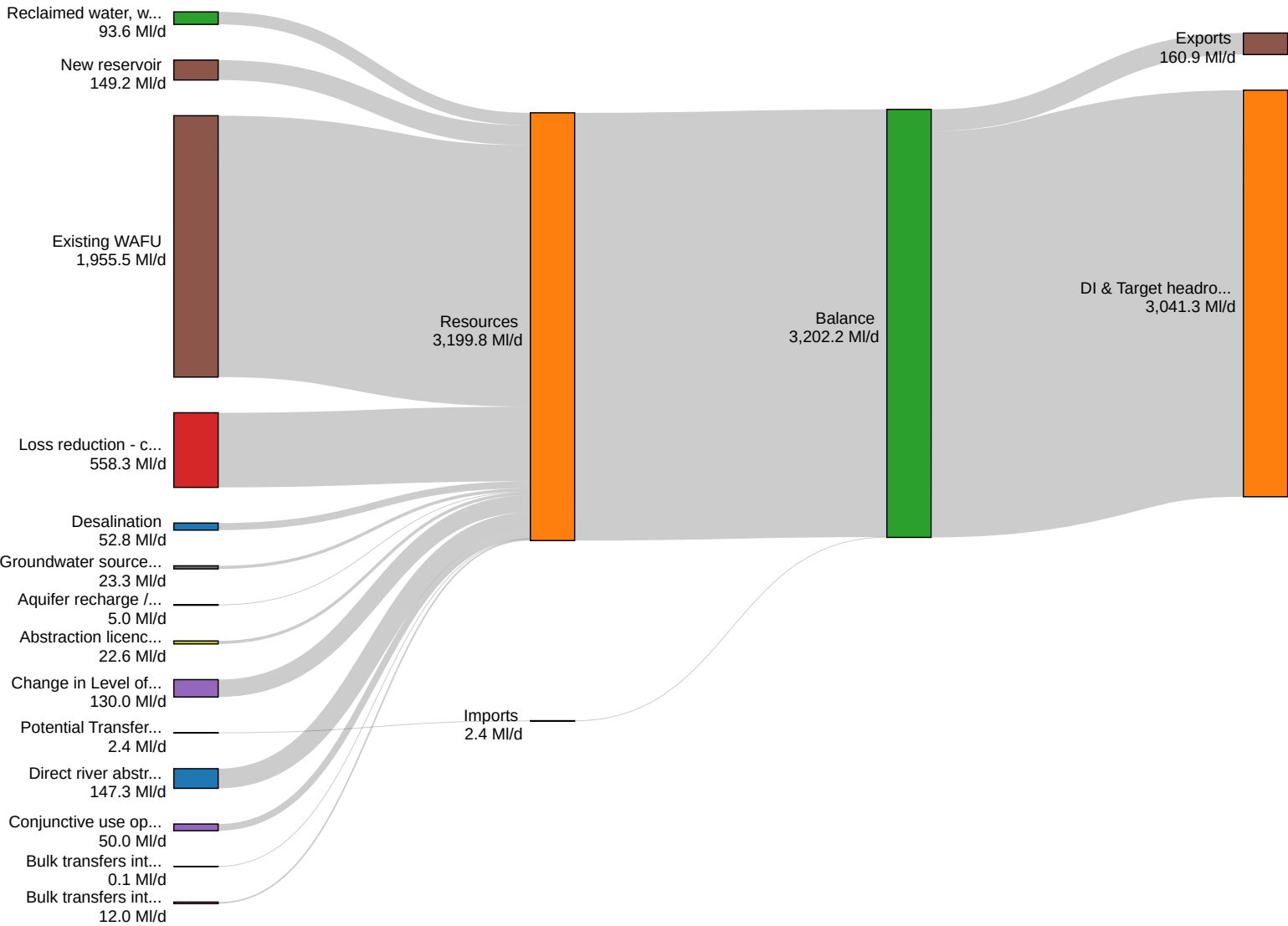
Situation 4 - 2040 (Thames Water)



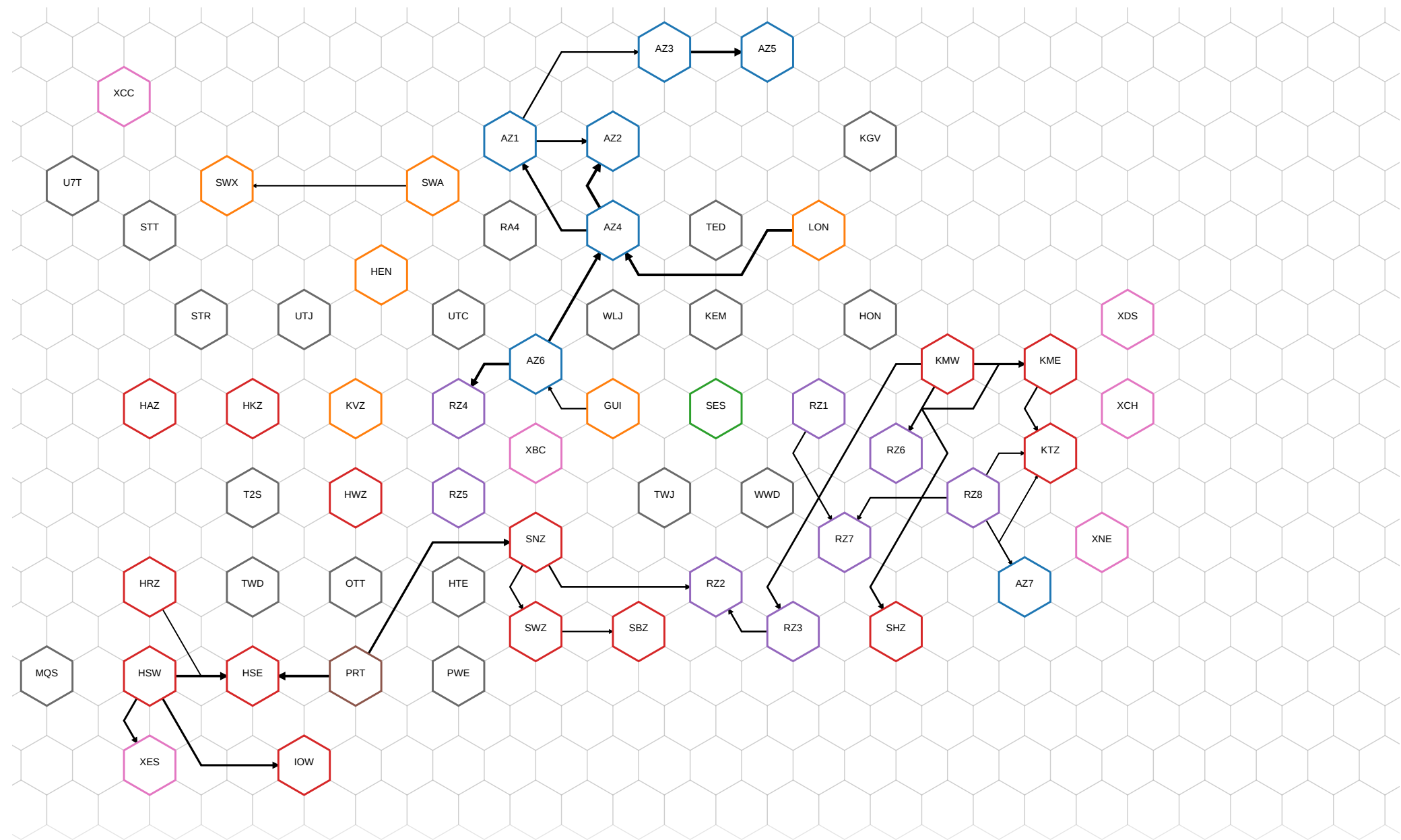
Situation 4 - 2050 (Thames Water)



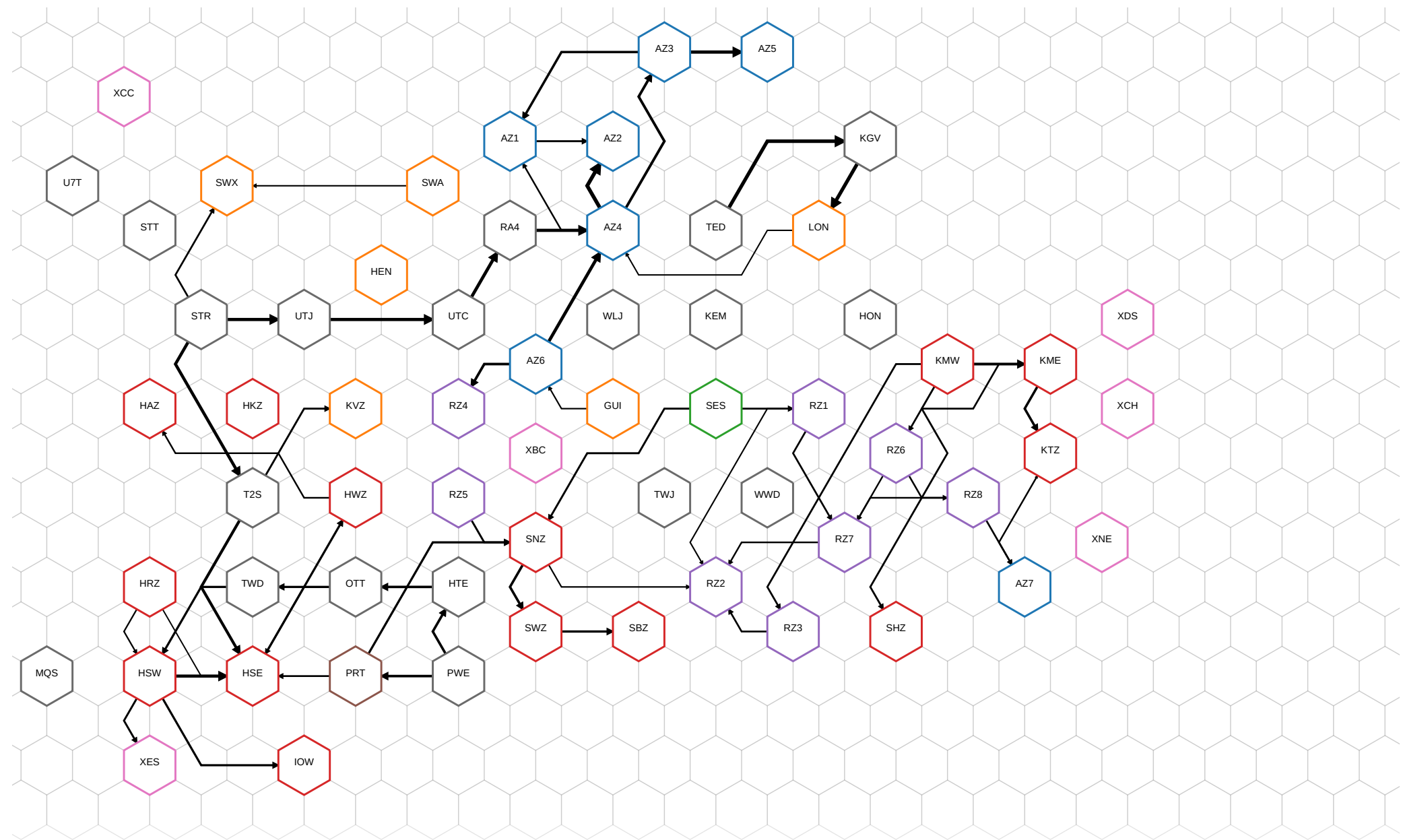
Situation 4 - 2075 (Thames Water)



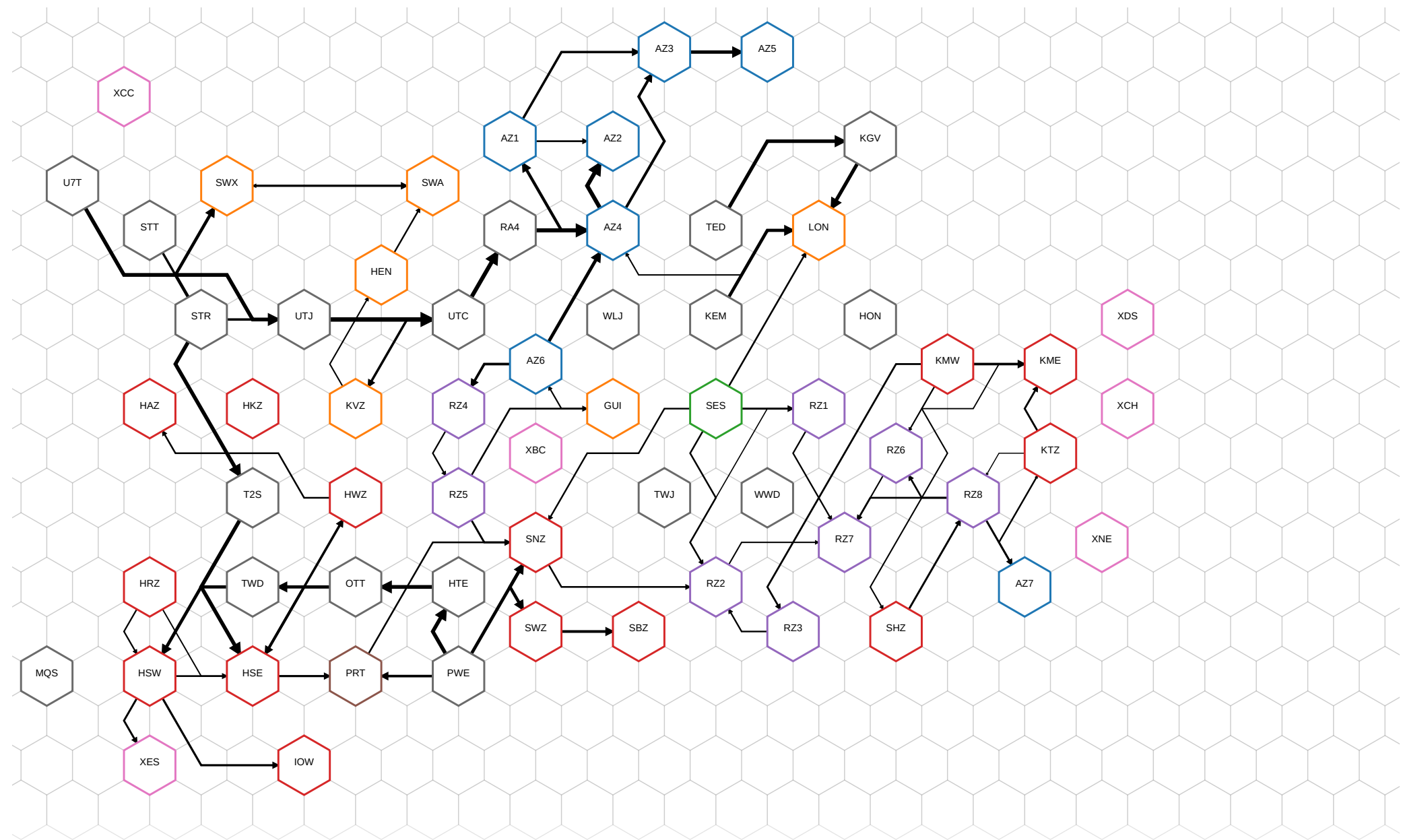
Situation 4 - 2026



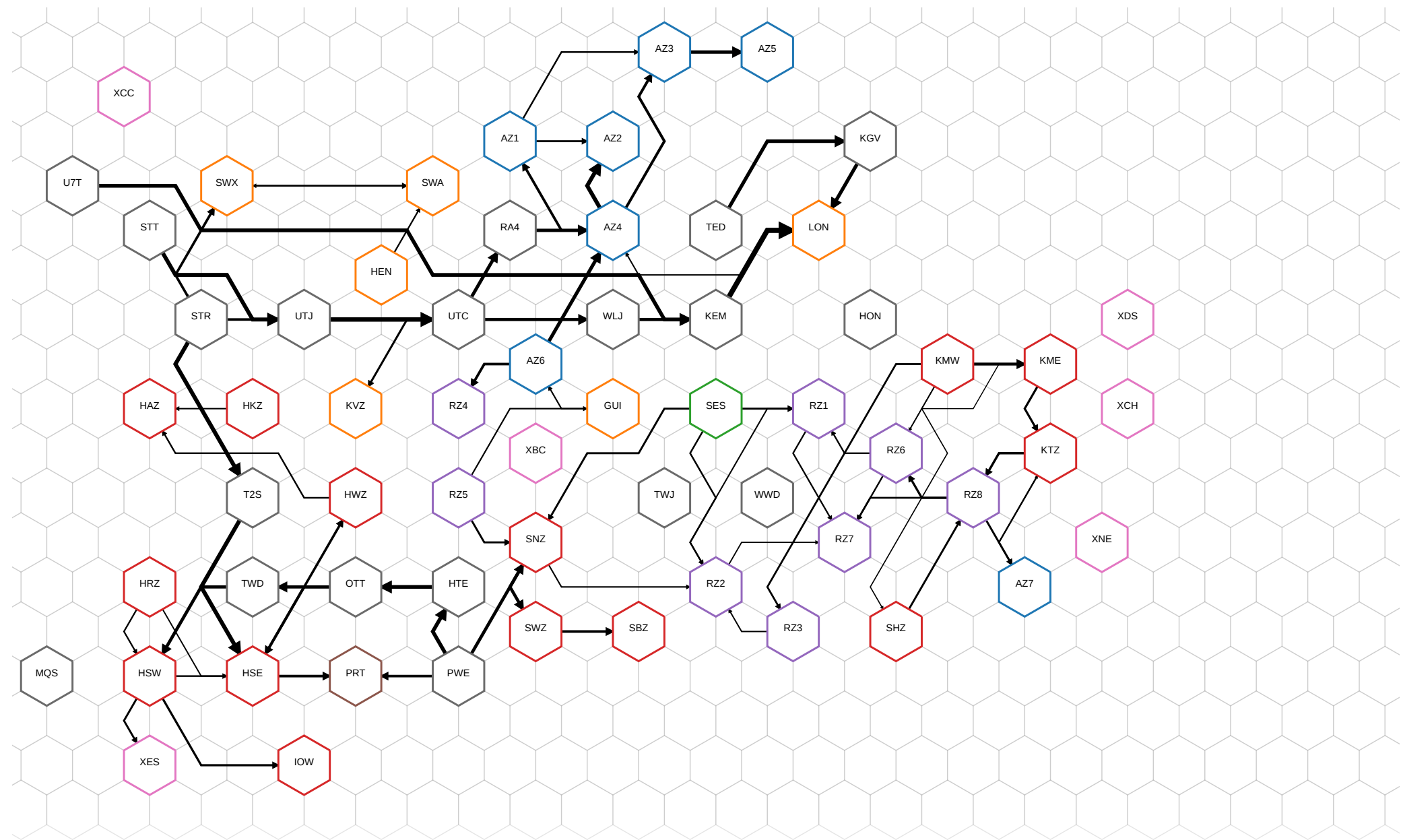
Situation 4 - 2040



Situation 4 - 2050



Situation 4 - 2075



IVM RUN DOSSIER

FORCE STT300 PIPELINE

IVM Summary: Thames Water

Metadata

General Settings

Name	st-hybrid-dy-w1-tree16.05-options-v37-gov-led-hybridb-force-stt300pipe-2075
Created at	22/08/2022, 09:49:30
Tree	tree16.05: Root and branch tree 16.05: Stage 1 - Begins Hplan and LOW LCED, Stage 2 - Branches on growth (OxCam1a, Hplan and ONS18c), Stage 3 - Branches on licenced capped environmental destination, climate change and further growth scenarios (Hmax and Hmin) 🔗
Setting name	options-v37-gov-led-hybridb-force-stt300pipe 🔗
Setting description	Emergency options in HSE, SBZ, and PRT. Include all STT options, but 300 Ml/d pipe pre-selected in 2033.
Optimised discount rate	STPR

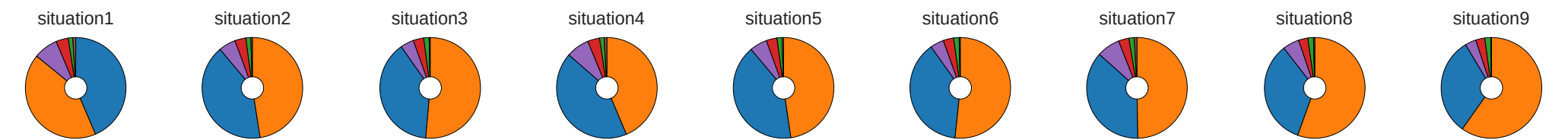
Metrics

Net present value (Cost)

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Cost w/ deficit (STPR)	16,466	13,661	12,434	15,641	13,603	12,375	13,662	11,486	10,506	(£m)
Cost w/o deficit (STPR)	16,466	13,661	12,434	15,641	13,603	12,375	13,662	11,486	10,506	(£m)
Cost w/ deficit (IGEQ)	26,435	21,134	18,911	24,810	21,040	18,812	21,597	17,538	15,735	(£m)
Cost w/o deficit (IGEQ)	26,435	21,134	18,911	24,810	21,040	18,812	21,597	17,538	15,735	(£m)
Cost w/ deficit (LTDR)	18,359	15,098	13,686	17,389	15,033	13,619	15,175	12,652	11,520	(£m)
Cost w/o deficit (LTDR)	18,359	15,098	13,686	17,389	15,033	13,619	15,175	12,652	11,520	(£m)

Cost breakdown (STPR)

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Capex	7,178	5,651	4,828	6,684	5,602	4,765	5,042	3,907	3,322	(£m)
Fixed opex	6,962	6,492	6,393	6,826	6,484	6,393	6,790	6,373	6,281	(£m)
Fixed operational carbon	243	223	219	236	223	221	236	210	206	(£m)
Embedded carbon	656	483	420	601	472	416	463	344	305	(£m)
Variable opex	1,275	745	532	1,159	755	535	1,014	605	369	(£m)
Variable carbon opex	152	68	42	134	67	44	116	47	23	(£m)



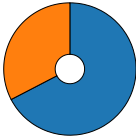
Emissions breakdown

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Capital emissions	4,162,521	2,985,173	2,559,015	3,773,289	2,917,769	2,536,223	2,913,793	2,088,212	1,821,004	(tonnes)
Operational emissions	2,116,353	1,445,013	1,291,185	1,958,663	1,441,352	1,313,348	1,845,791	1,231,979	1,081,833	(tonnes)

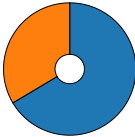
situation1



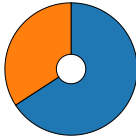
situation2



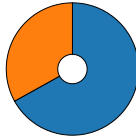
situation3



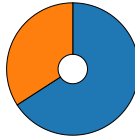
situation4



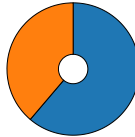
situation5



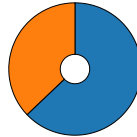
situation6



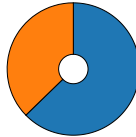
situation7



situation8



situation9



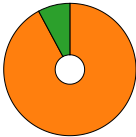
Electricity breakdown

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Generated (on site)	0	0	0	0	0	0	0	0	0	(GWh)
Grid	24,151	12,629	6,944	20,696	12,822	7,254	19,433	10,803	5,014	(GWh)
Renewable	2,207	1,073	545	1,873	1,158	586	1,214	772	133	(GWh)

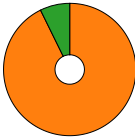
situation1



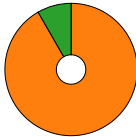
situation2



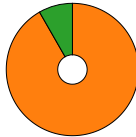
situation3



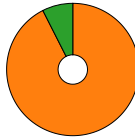
situation4



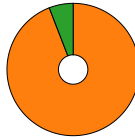
situation5



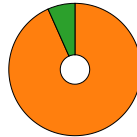
situation6



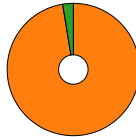
situation7



situation8



situation9



Environmental

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
SEA environmental benefit	87,276.00	80,222.00	78,548.00	85,251.00	80,082.00	78,496.00	82,867.00	76,102.00	74,332.00	
SEA environmental disbenefit	125,605.00	92,195.00	82,230.00	114,815.00	93,041.00	82,842.00	106,494.00	80,590.00	70,674.00	
Natural capital	7,501,052.60	7,949,717.65	8,527,336.29	7,473,971.57	8,414,908.79	8,839,252.30	6,721,035.33	10,430,577.81	11,754,614.75	
Bio-diversity net gain	-251,828.00	-145,652.00	-132,652.00	-252,253.00	-156,026.00	-117,218.00	-283,933.00	-205,999.00	-178,362.00	

Social

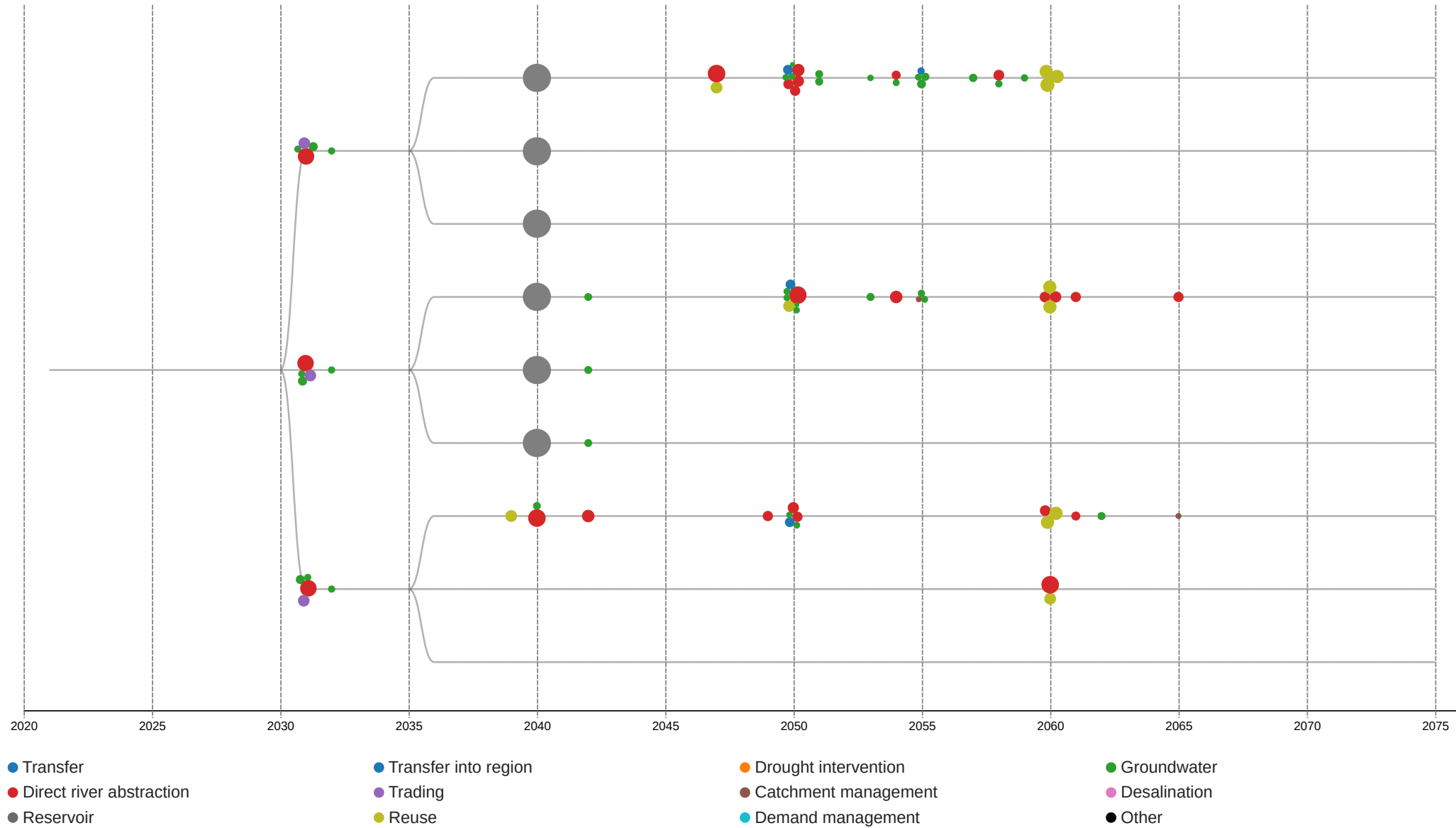
Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Customer preference	33,061.00	30,863.00	30,248.00	32,333.00	30,994.00	30,293.00	31,724.00	29,947.00	29,294.00	

Reliability

[illegible]

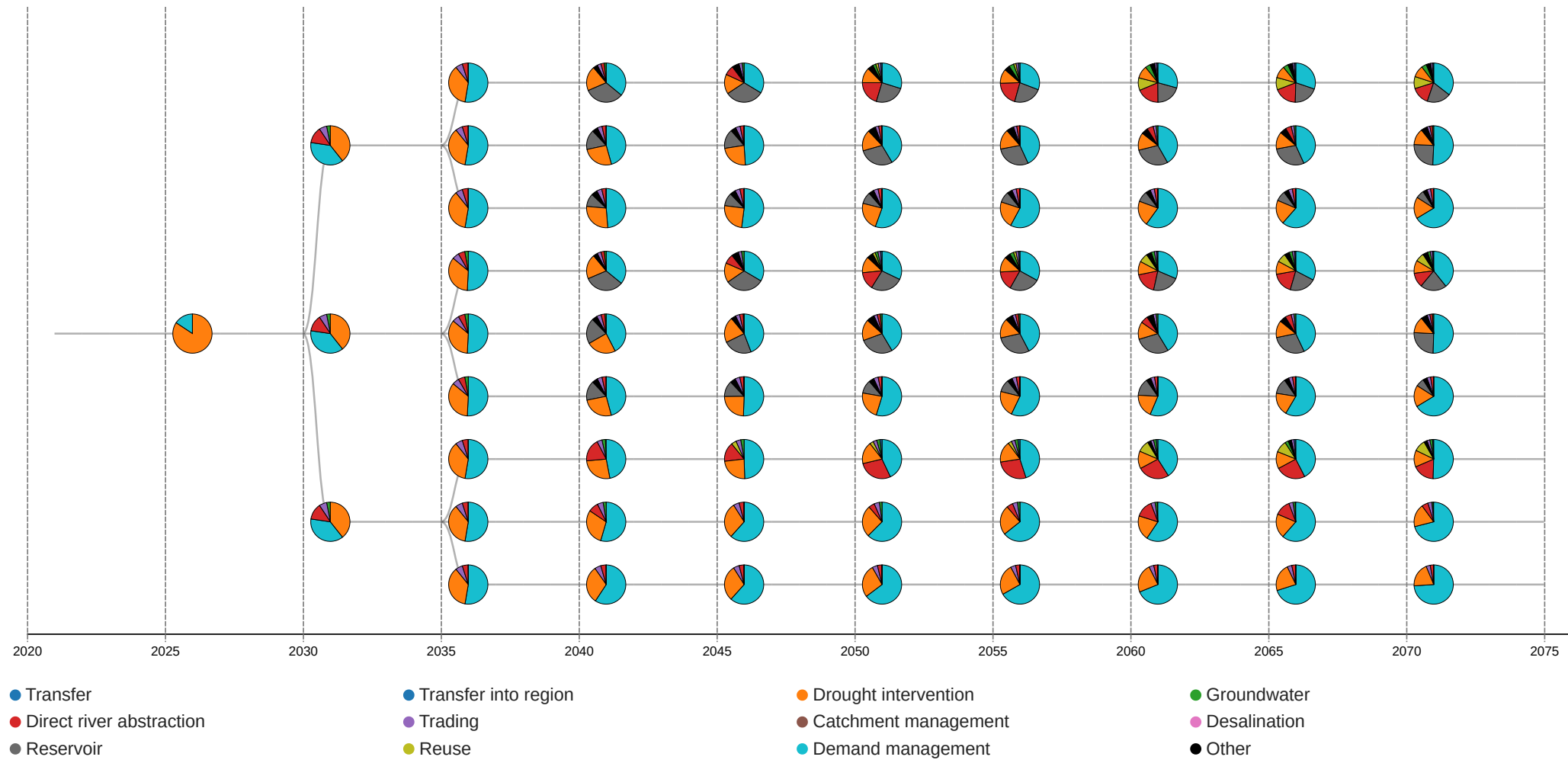
Adaptability										
Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Adaptability	18.75	20.92	22.63	19.00	20.41	22.24	19.67	20.68	23.91	
A3: Operational complexity and flexibility	9.27	9.88	10.69	9.32	9.70	10.61	8.97	8.91	10.33	
A4: WRZ connectivity	9.43	11.02	11.93	9.66	10.69	11.61	10.65	11.75	13.56	
A7: Customer relations support engagement with demand management	0.06	0.02	0.02	0.03	0.02	0.02	0.06	0.02	0.02	
Evolvability										
Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Evolvability	27.13	27.78	29.70	26.95	27.48	29.54	28.45	28.35	32.23	
E1: Scalability and modularity of proposed changes	10.89	11.40	12.23	10.88	11.26	12.16	11.61	11.87	13.56	
E2: Intervention lead times	7.46	7.22	7.67	7.33	7.19	7.64	7.95	7.62	8.52	
E3: Reliance on external bodies to deliver changes	8.68	9.12	9.77	8.69	8.99	9.70	8.81	8.82	10.11	
E5: Collaborative land management	0.10	0.04	0.04	0.05	0.04	0.04	0.08	0.04	0.04	

Option Selection (Thames Water)

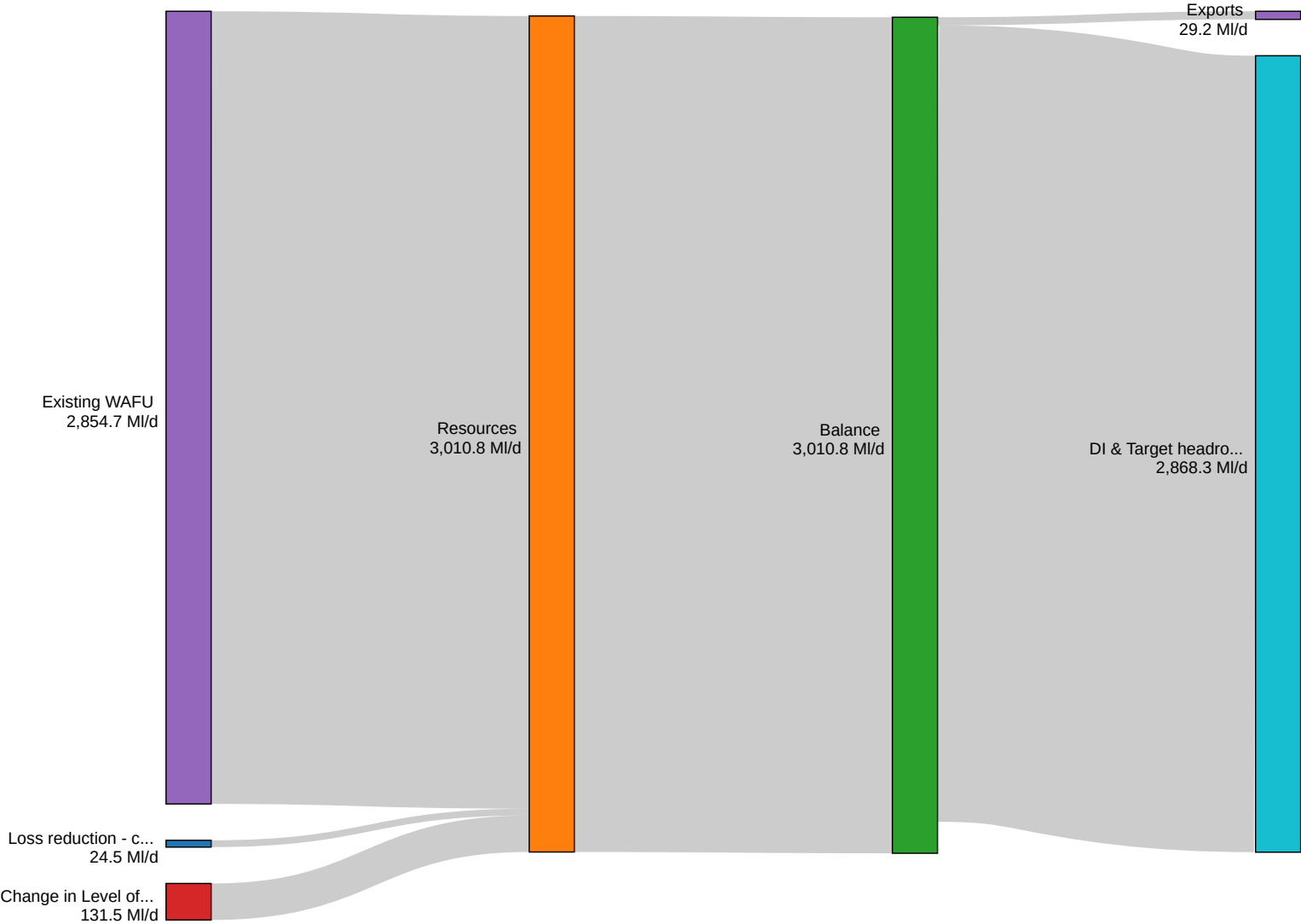


Utilisation (Thames Water)

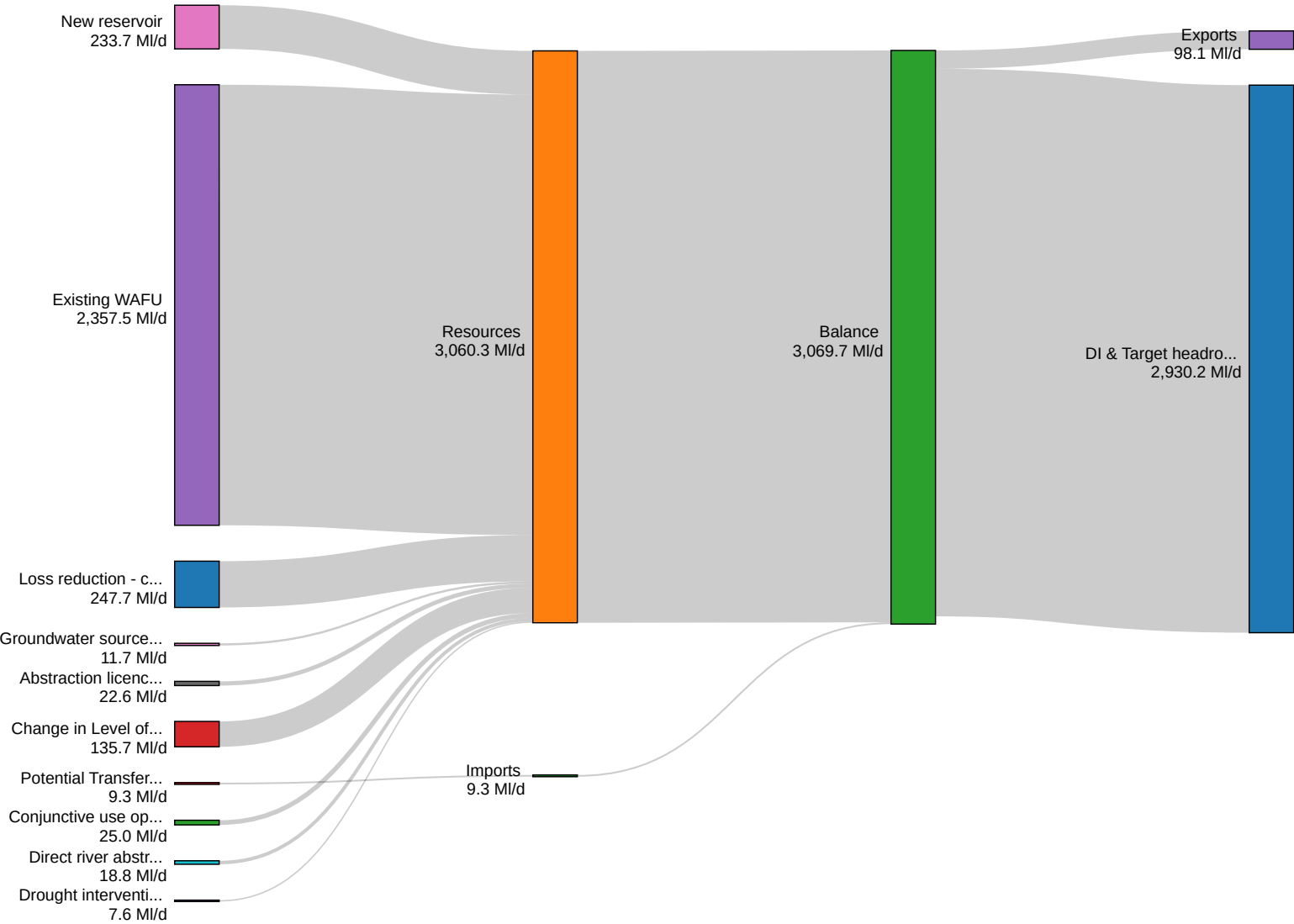
Pie charts show the breakdown of option utilisation by option category.



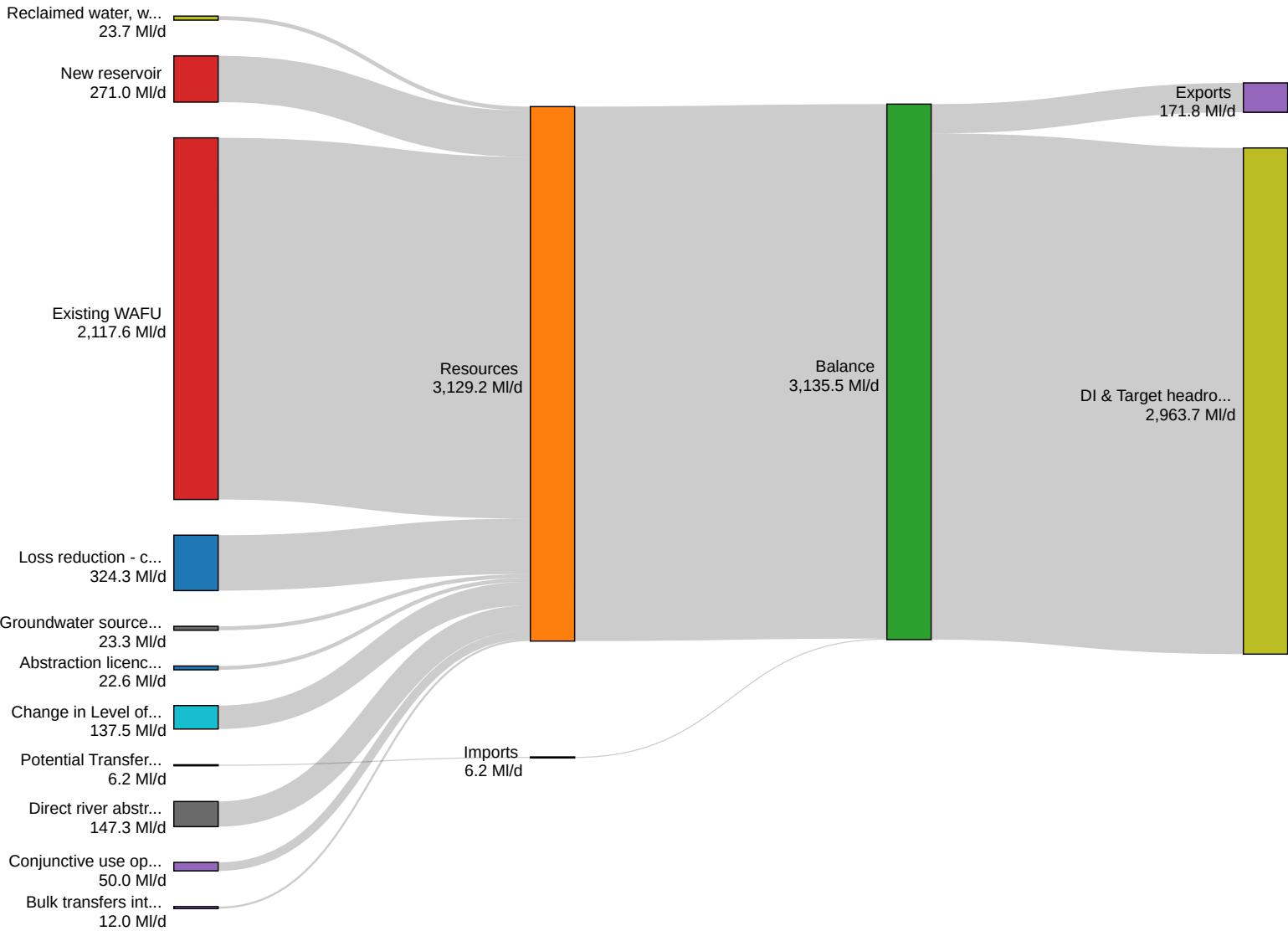
Situation 4 - 2026 (Thames Water)



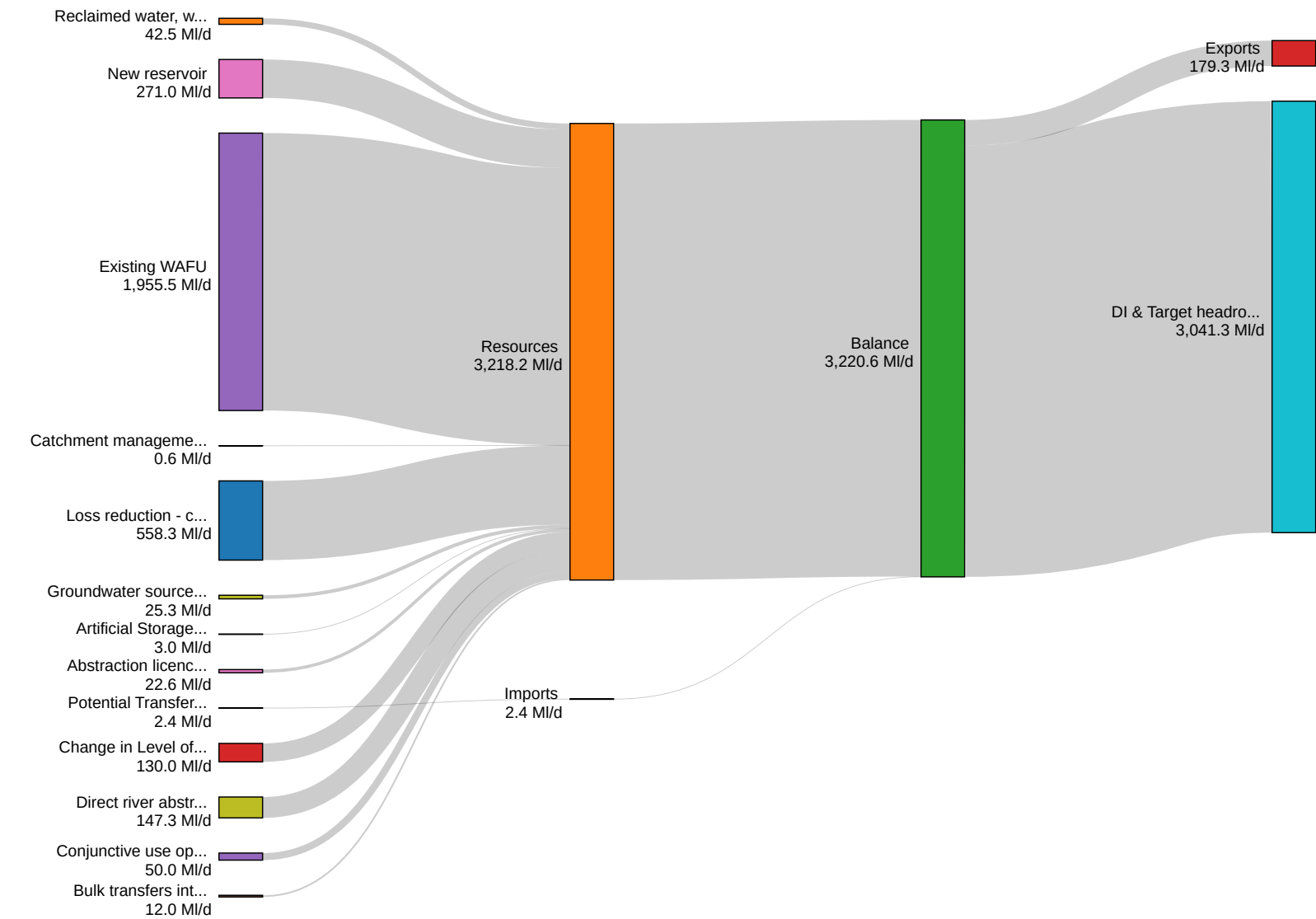
Situation 4 - 2040 (Thames Water)



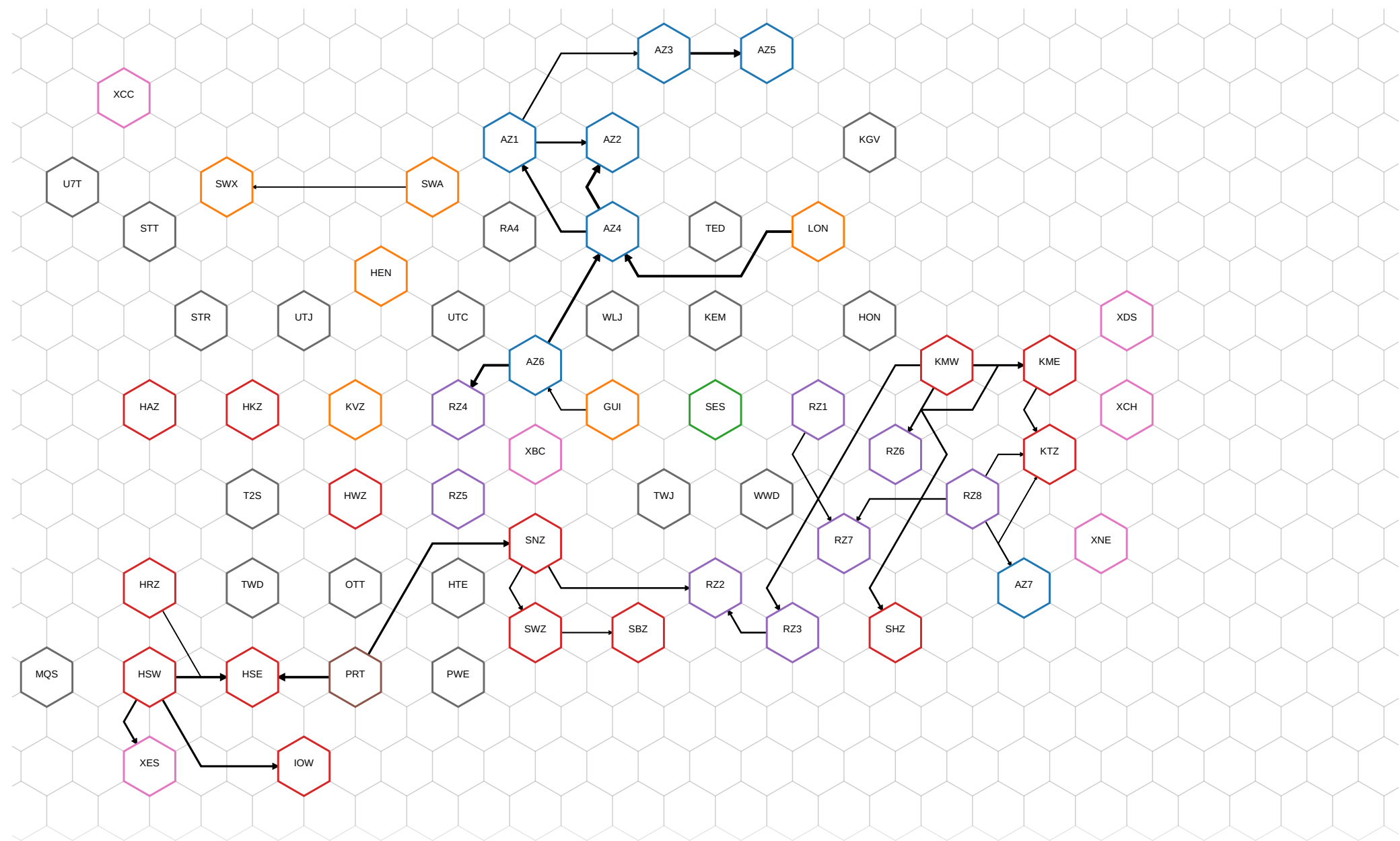
Situation 4 - 2050 (Thames Water)



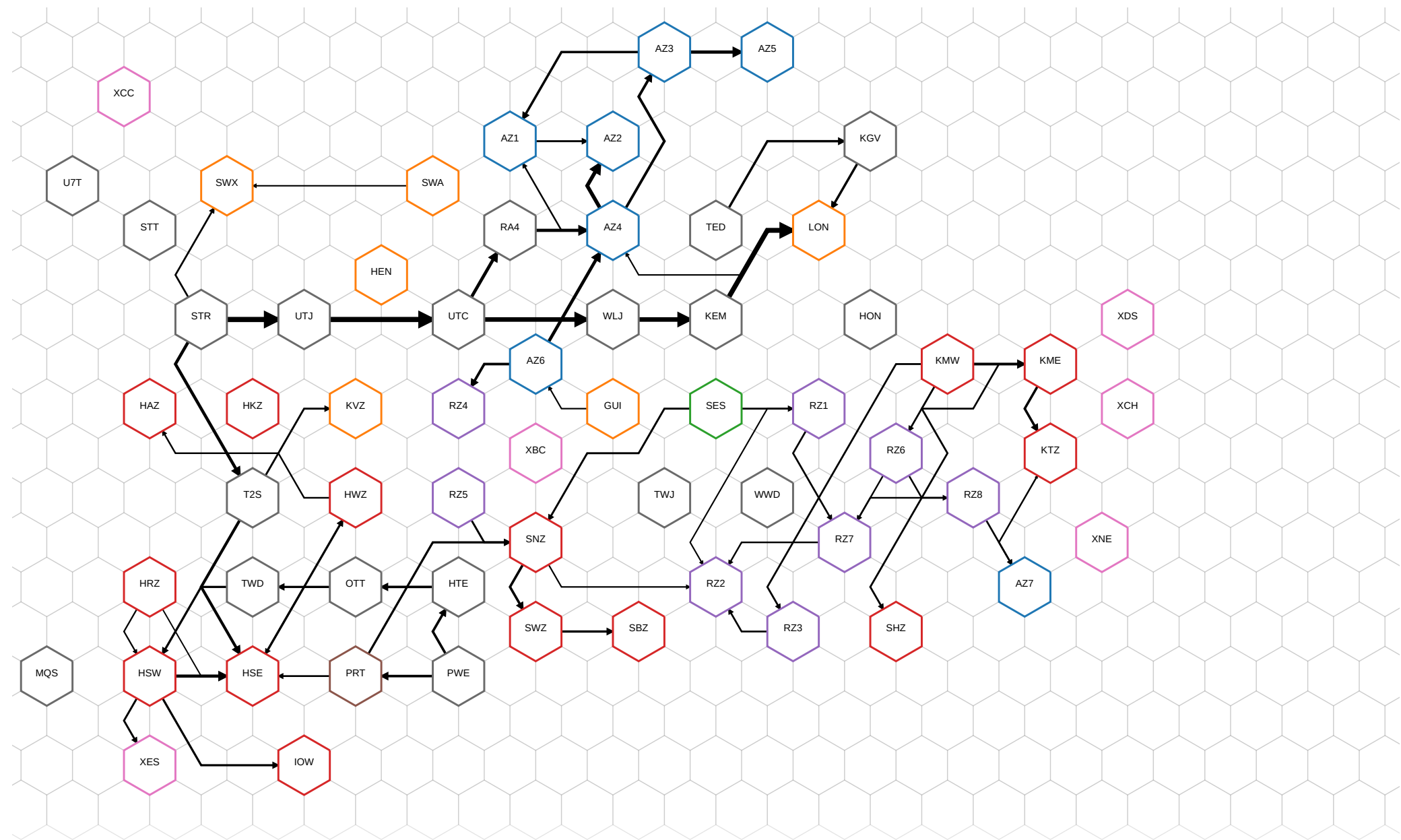
Situation 4 - 2075 (Thames Water)



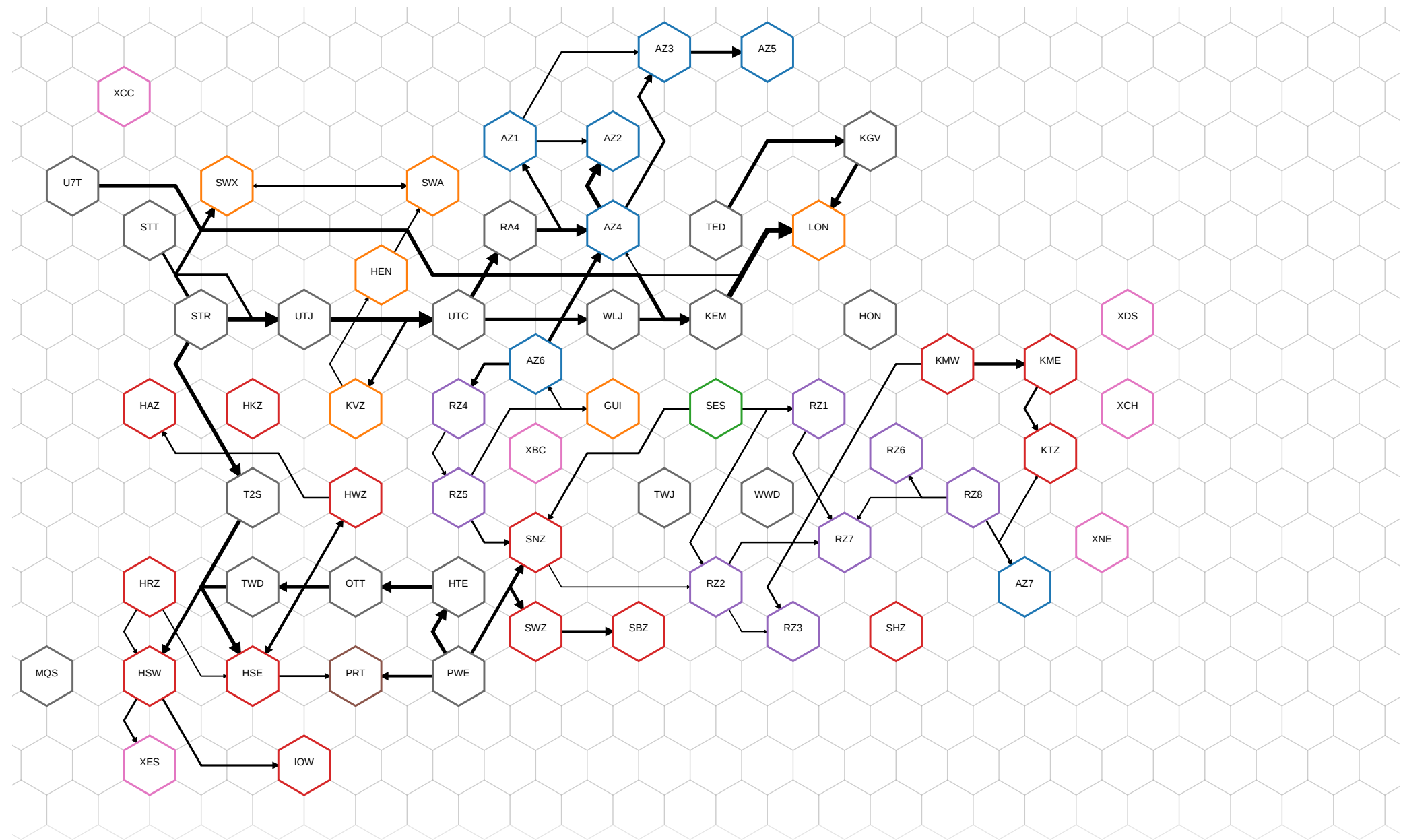
Situation 4 - 2026



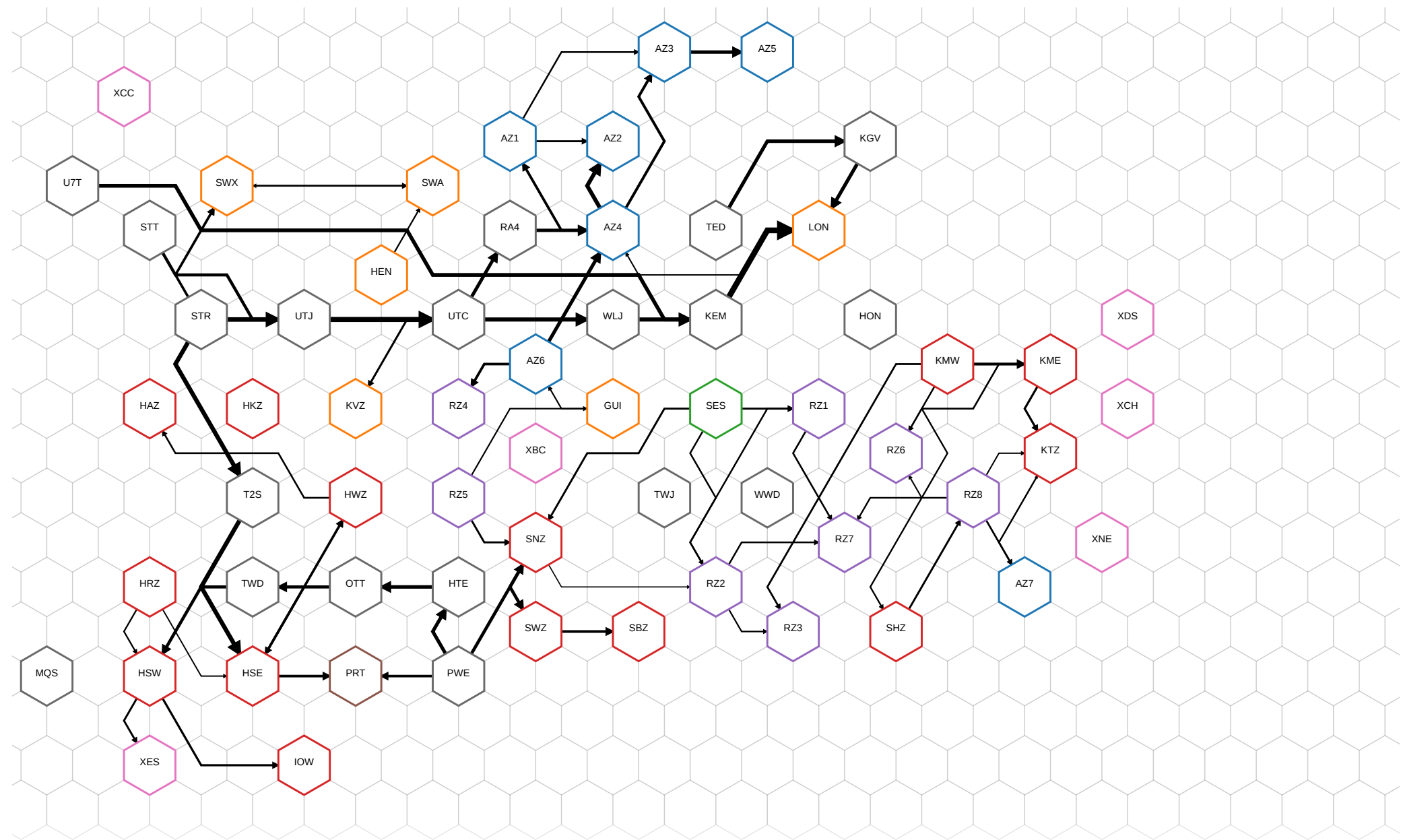
Situation 4 - 2040



Situation 4 - 2050



Situation 4 - 2075



IVM RUN DOSSIER

FORCE STT400 PIPELINE

IVM Summary: Thames Water

Metadata

General Settings

Name	st-hybrid-dy-w1-tree16.05-options-v37-gov-led-hybridb-force-stt400pipe-2075
Created at	22/08/2022, 09:49:32
Tree	tree16.05: Root and branch tree 16.05: Stage 1 - Begins Hplan and LOW LCED, Stage 2 - Branches on growth (OxCam1a, Hplan and ONS18c), Stage 3 - Branches on licenced capped environmental destination, climate change and further growth scenarios (Hmax and Hmin) 🔗
Setting name	options-v37-gov-led-hybridb-force-stt400pipe 🔗
Setting description	Emergency options in HSE, SBZ, and PRT. Include all STT options, but 400 Ml/d pipe pre-selected in 2033.
Optimised discount rate	STPR

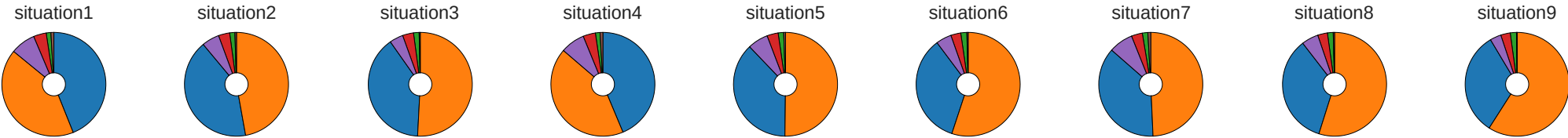
Metrics

Net present value (Cost)

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Cost w/ deficit (STPR)	16,506	13,754	12,593	15,927	13,037	11,599	13,801	11,622	10,649	(£m)
Cost w/o deficit (STPR)	16,506	13,754	12,593	15,927	13,037	11,599	13,801	11,622	10,649	(£m)
Cost w/ deficit (IGEQ)	26,461	21,264	19,171	25,377	20,251	17,624	21,783	17,754	15,968	(£m)
Cost w/o deficit (IGEQ)	26,461	21,264	19,171	25,377	20,251	17,624	21,783	17,754	15,968	(£m)
Cost w/ deficit (LTDR)	18,398	15,199	13,864	17,730	14,421	12,763	15,324	12,803	11,680	(£m)
Cost w/o deficit (LTDR)	18,398	15,199	13,864	17,730	14,421	12,763	15,324	12,803	11,680	(£m)

Cost breakdown (STPR)

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Capex	7,254	5,746	4,966	6,961	4,915	4,028	5,127	4,029	3,450	(£m)
Fixed opex	6,930	6,489	6,400	6,783	6,542	6,387	6,804	6,375	6,287	(£m)
Fixed operational carbon	242	223	220	233	225	220	238	210	206	(£m)
Embedded carbon	657	483	432	615	455	361	473	353	316	(£m)
Variable opex	1,274	746	532	1,198	827	557	1,035	606	367	(£m)
Variable carbon opex	150	67	43	138	73	45	123	47	23	(£m)



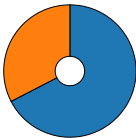
Emissions breakdown

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Capital emissions	4,165,380	2,986,106	2,638,075	3,884,518	2,803,654	2,181,436	2,972,325	2,146,036	1,895,716	(tonnes)
Operational emissions	2,096,101	1,442,982	1,305,936	1,926,331	1,497,328	1,316,466	1,902,933	1,232,768	1,081,752	(tonnes)

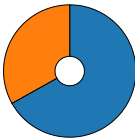
situation1



situation2



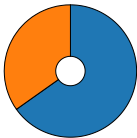
situation3



situation4



situation5



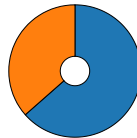
situation6



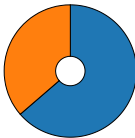
situation7



situation8



situation9



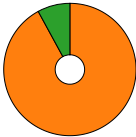
Electricity breakdown

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Generated (on site)	0	0	0	0	0	0	0	0	0	(GWh)
Grid	24,241	12,646	6,905	24,008	13,928	7,095	19,007	10,920	4,982	(GWh)
Renewable	2,069	1,091	572	1,859	1,485	600	1,229	771	133	(GWh)

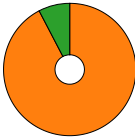
situation1



situation2



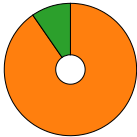
situation3



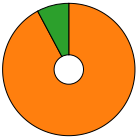
situation4



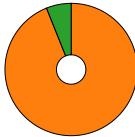
situation5



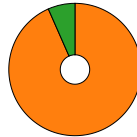
situation6



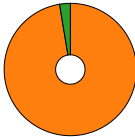
situation7



situation8



situation9



Environmental

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
SEA environmental benefit	87,085.00	80,011.00	78,336.00	85,011.00	79,888.00	77,110.00	82,044.00	75,824.00	74,044.00	
SEA environmental disbenefit	125,224.00	92,556.00	81,708.00	119,684.00	98,552.00	85,366.00	105,317.00	79,869.00	69,658.00	
Natural capital	7,173,459.72	8,407,520.68	8,527,317.49	7,340,153.98	6,691,863.73	7,418,831.76	6,782,549.09	10,287,776.78	11,754,875.07	
Bio-diversity net gain	-265,226.00	-158,277.00	-132,663.00	-260,667.00	-276,080.00	-230,985.00	-288,235.00	-211,223.00	-178,157.00	

Social

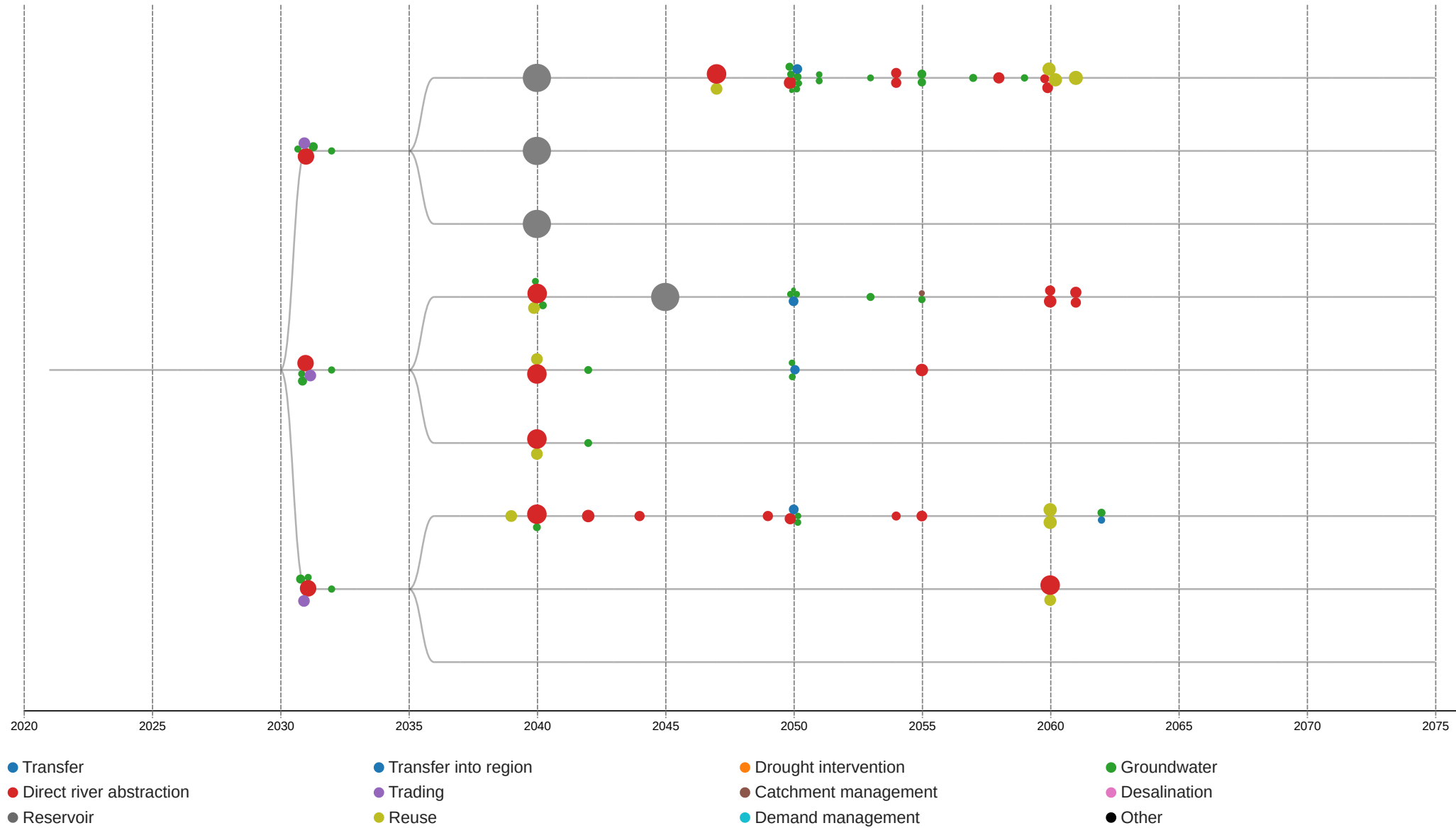
Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Customer preference	33,041.00	30,929.00	30,233.00	32,749.00	31,127.00	30,254.00	31,574.00	29,894.00	29,249.00	

Reliability

[illegible]

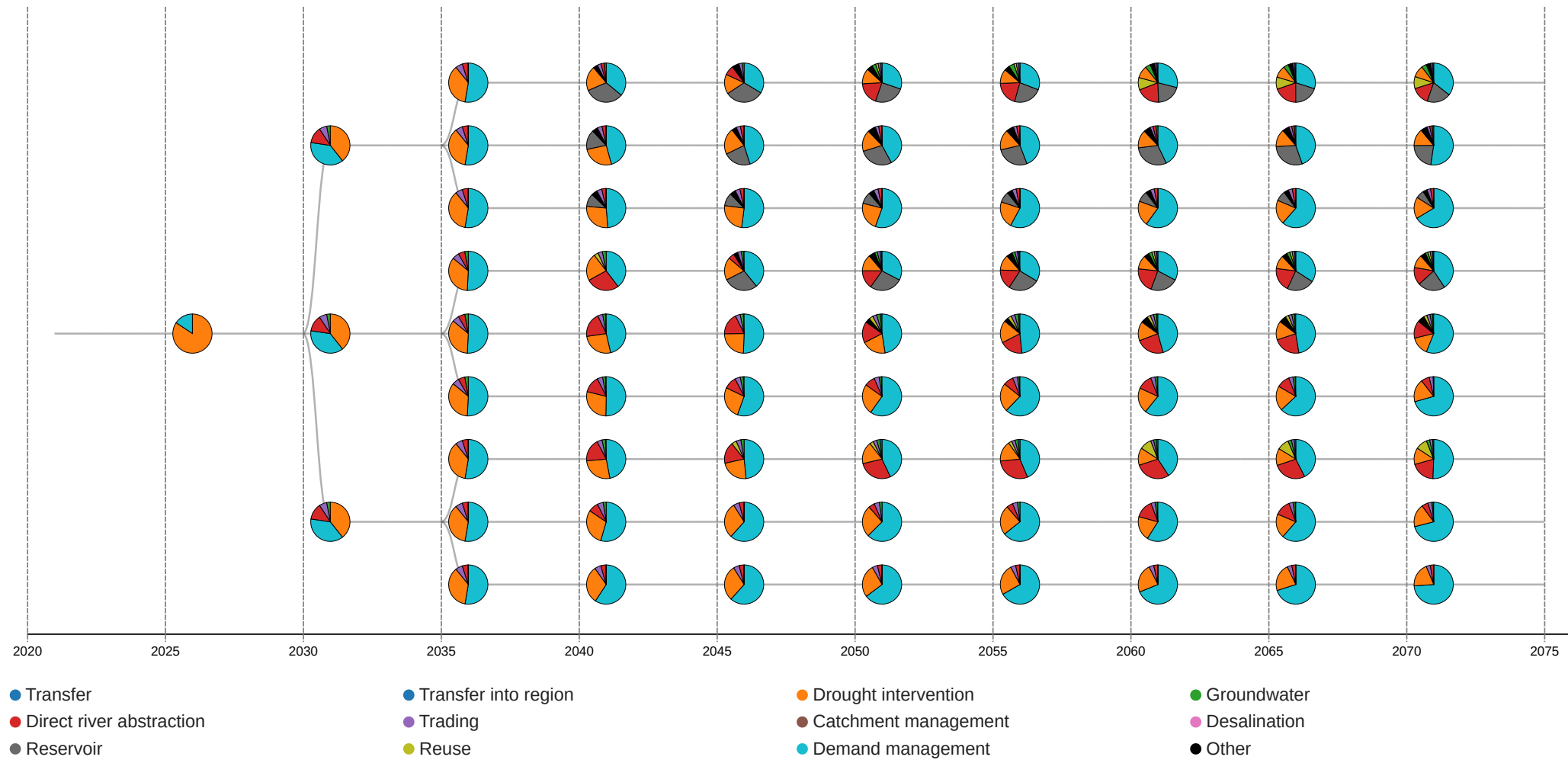
Adaptability										
Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Adaptability	18.73	20.55	22.65	18.73	19.36	20.96	19.96	20.69	23.89	
A3: Operational complexity and flexibility	9.27	9.76	10.70	9.27	8.94	9.67	9.18	8.96	10.34	
A4: WRZ connectivity	9.40	10.77	11.93	9.41	10.41	11.28	10.76	11.71	13.53	
A7: Customer relations support engagement with demand management	0.06	0.02	0.02	0.05	0.02	0.02	0.02	0.02	0.02	
Evolvability										
Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Evolvability	27.27	27.72	29.90	27.38	28.38	30.30	29.14	28.71	32.44	
E1: Scaleability and modularity of proposed changes	10.93	11.32	12.25	10.99	11.61	12.48	11.90	11.93	13.57	
E2: Intervention lead times	7.57	7.32	7.82	7.58	7.89	8.28	8.21	7.85	8.70	
E3: Reliance on external bodies to deliver changes	8.67	9.04	9.78	8.72	8.85	9.50	9.00	8.88	10.13	
E5: Collaborative land management	0.10	0.04	0.04	0.08	0.04	0.04	0.04	0.04	0.04	

Option Selection (Thames Water)

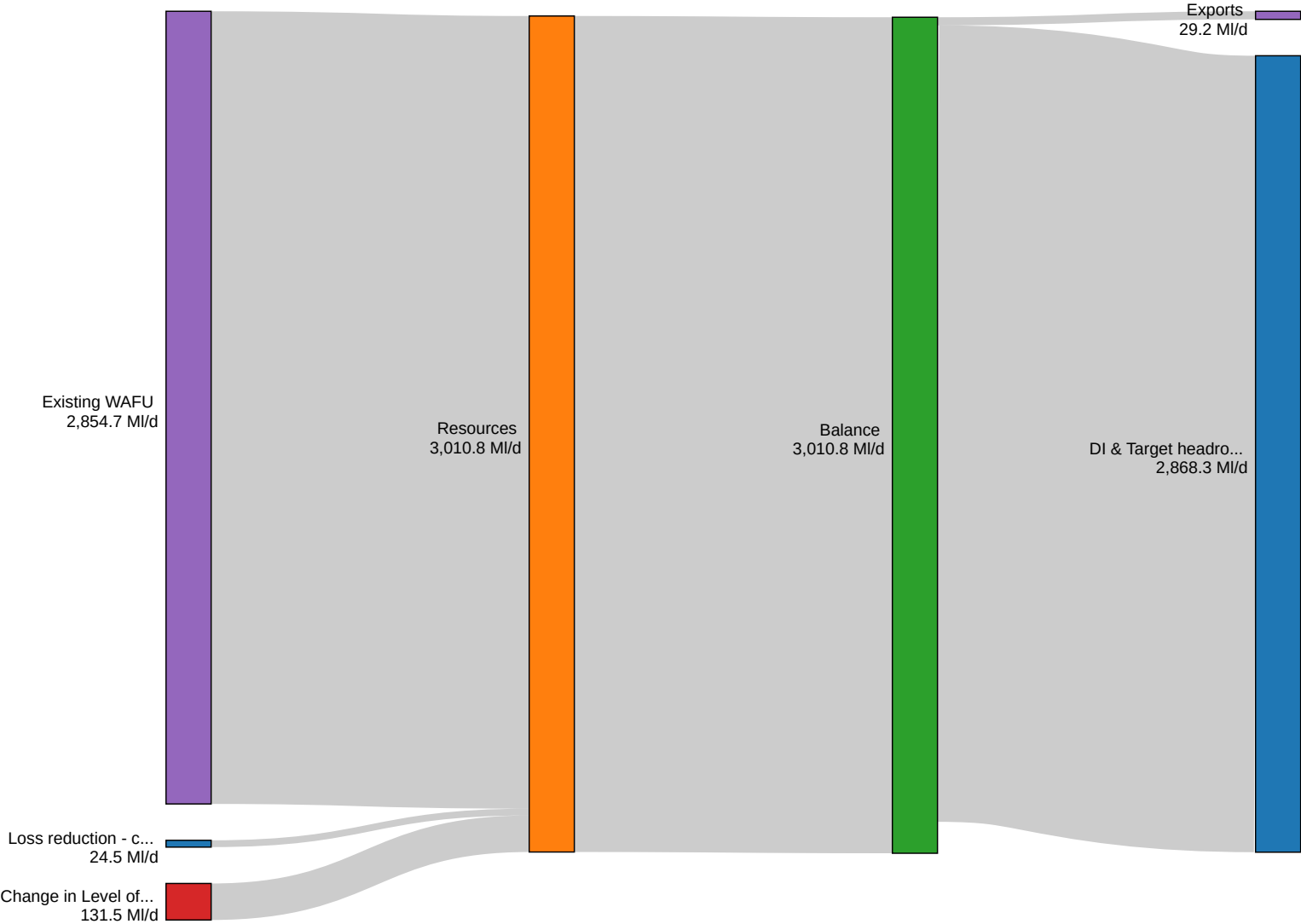


Utilisation (Thames Water)

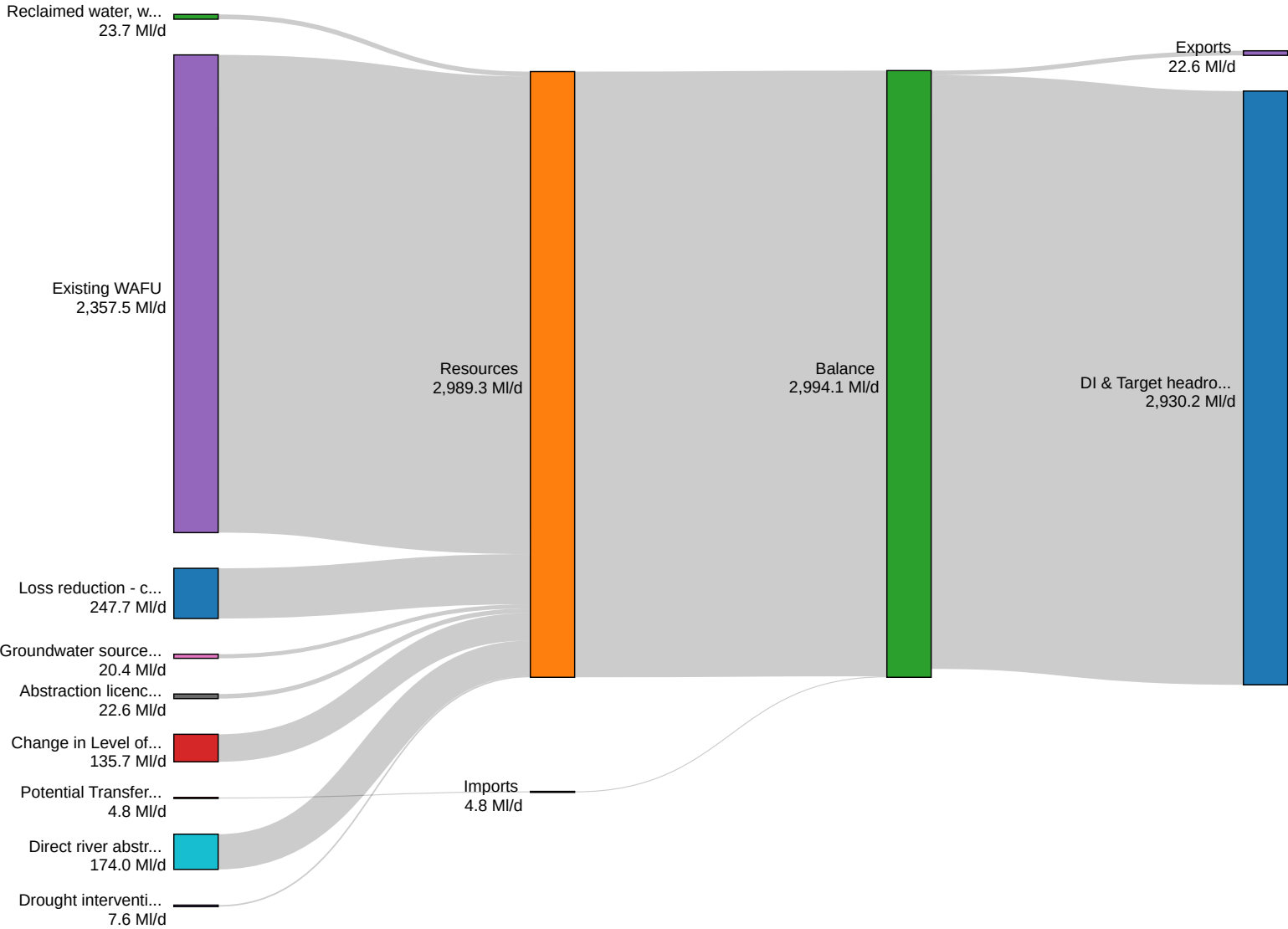
Pie charts show the breakdown of option utilisation by option category.



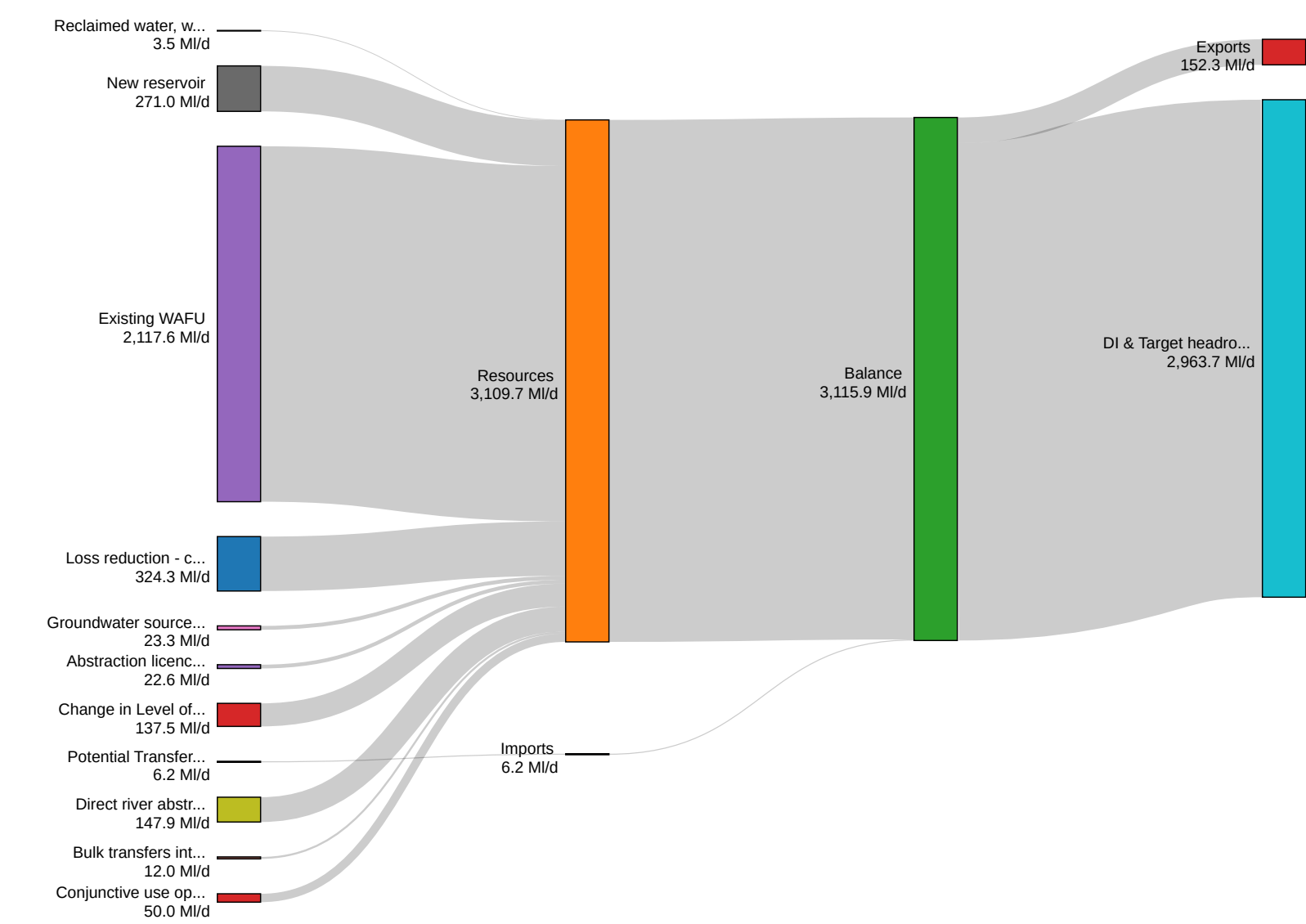
Situation 4 - 2026 (Thames Water)



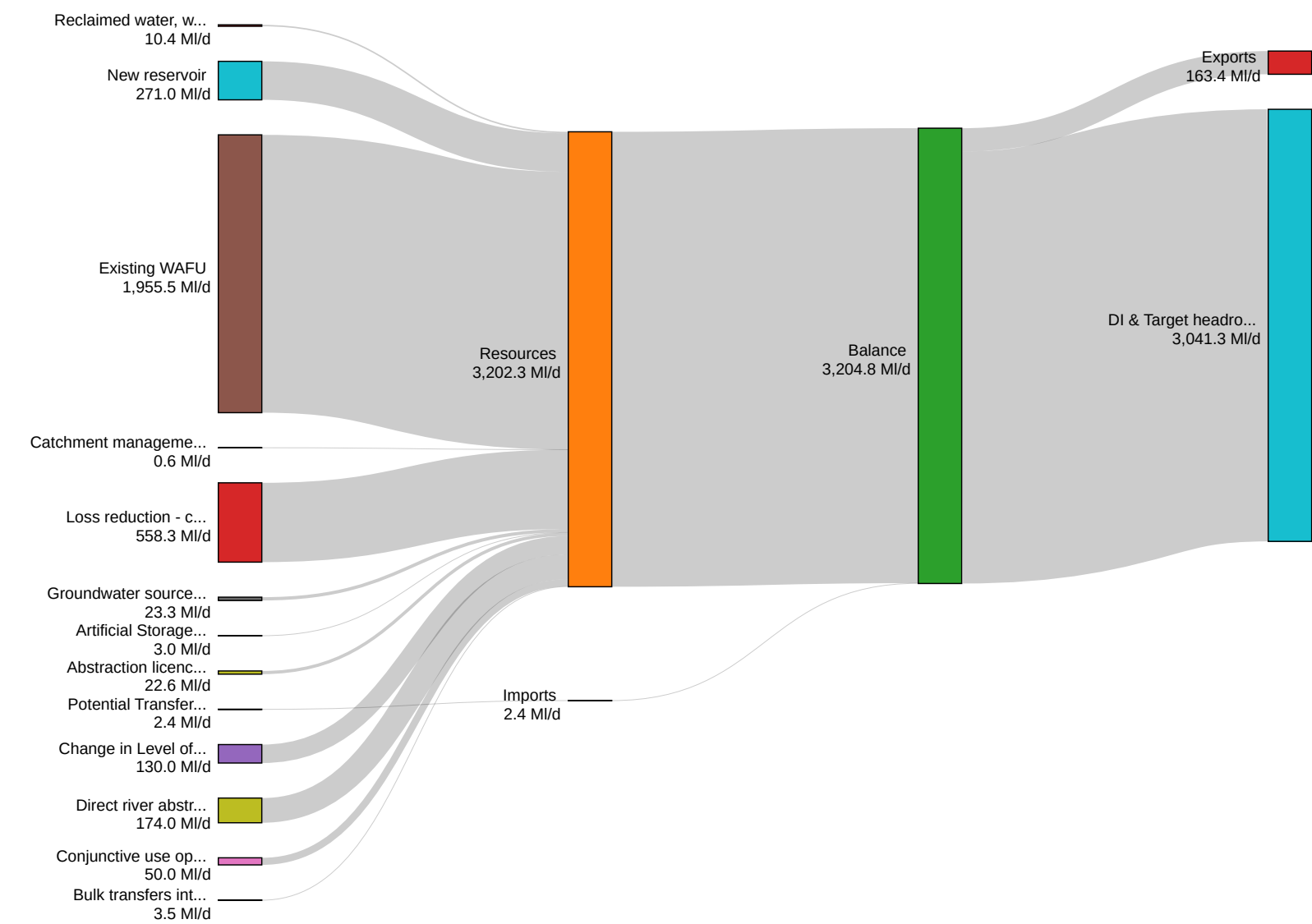
Situation 4 - 2040 (Thames Water)



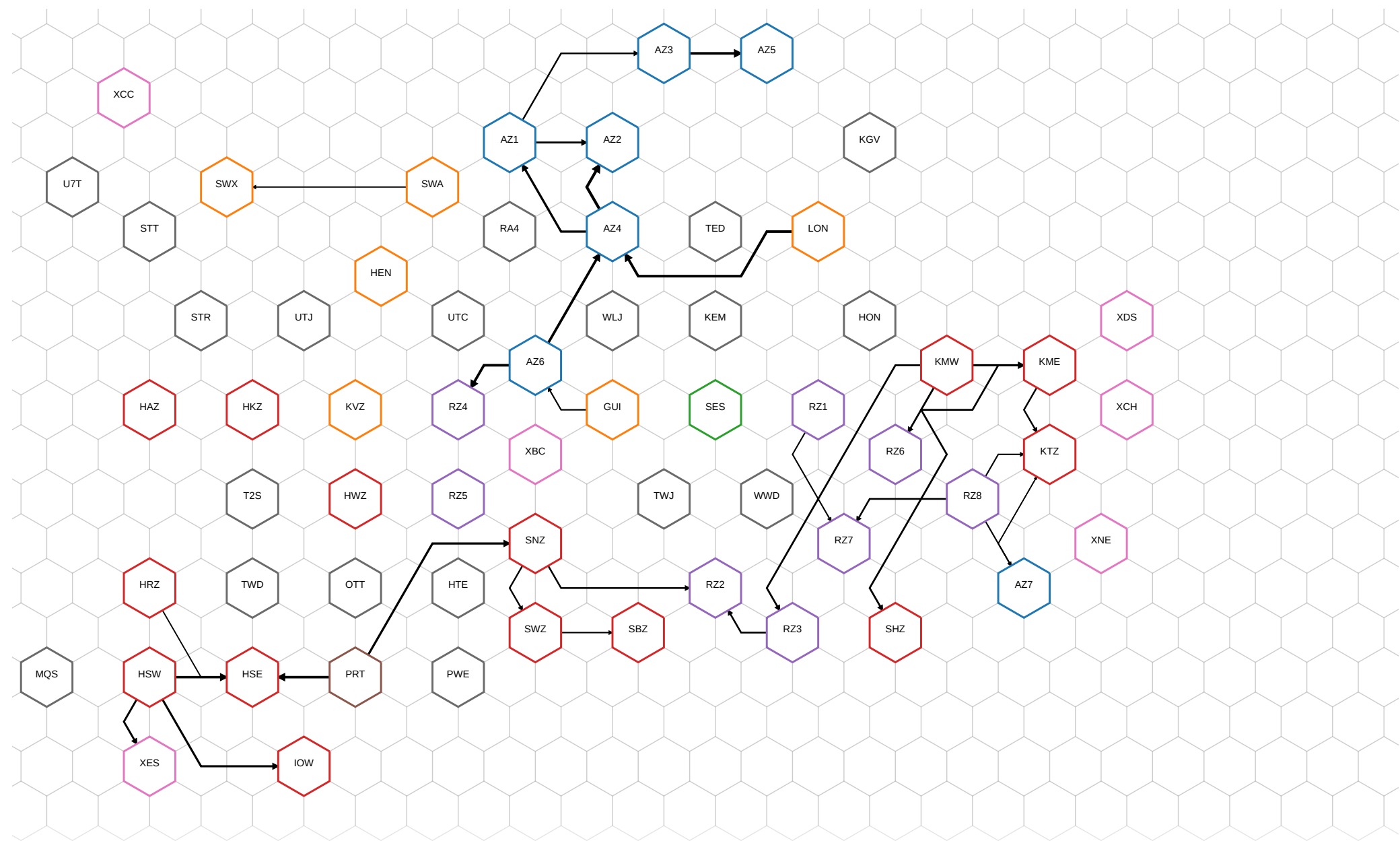
Situation 4 - 2050 (Thames Water)



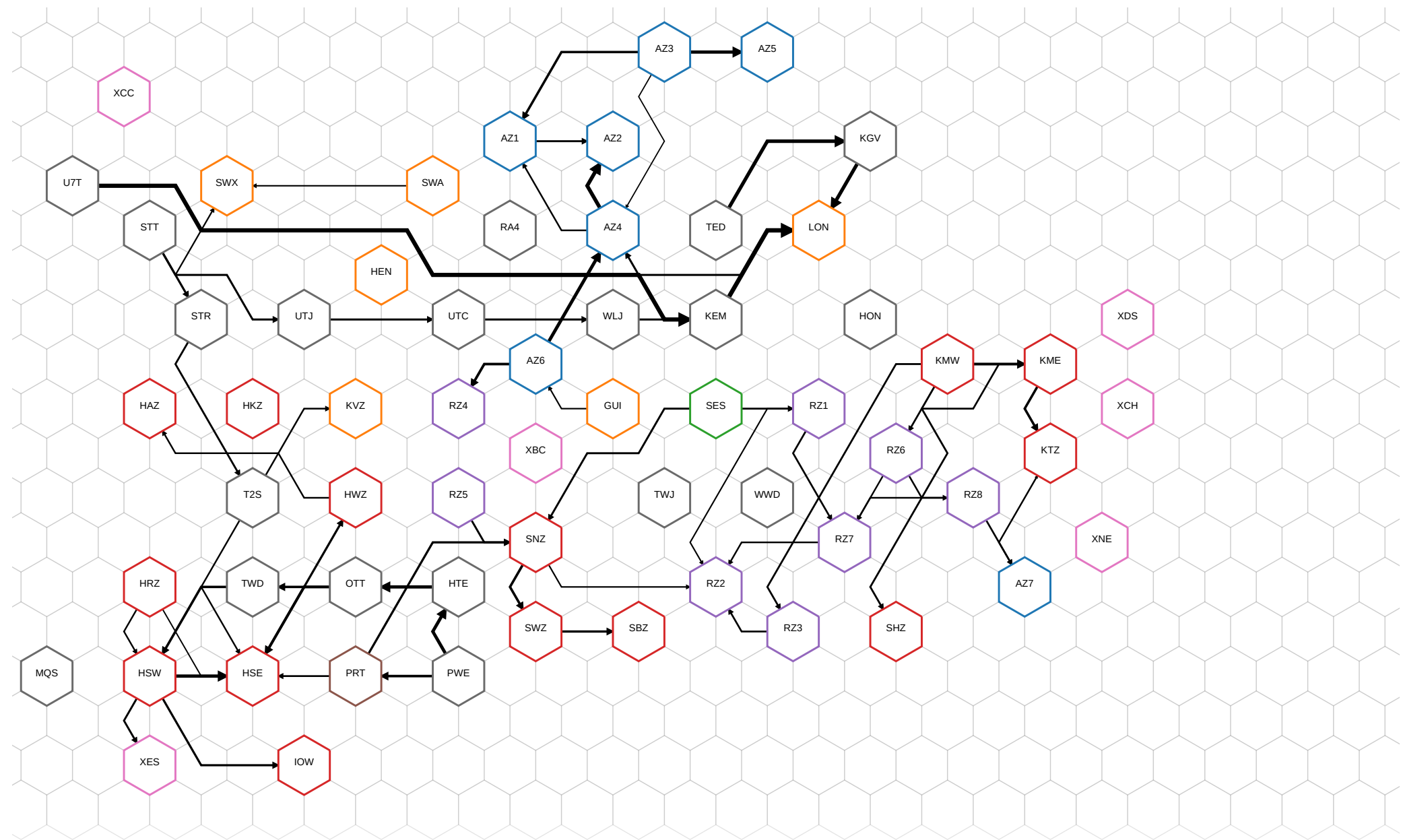
Situation 4 - 2075 (Thames Water)



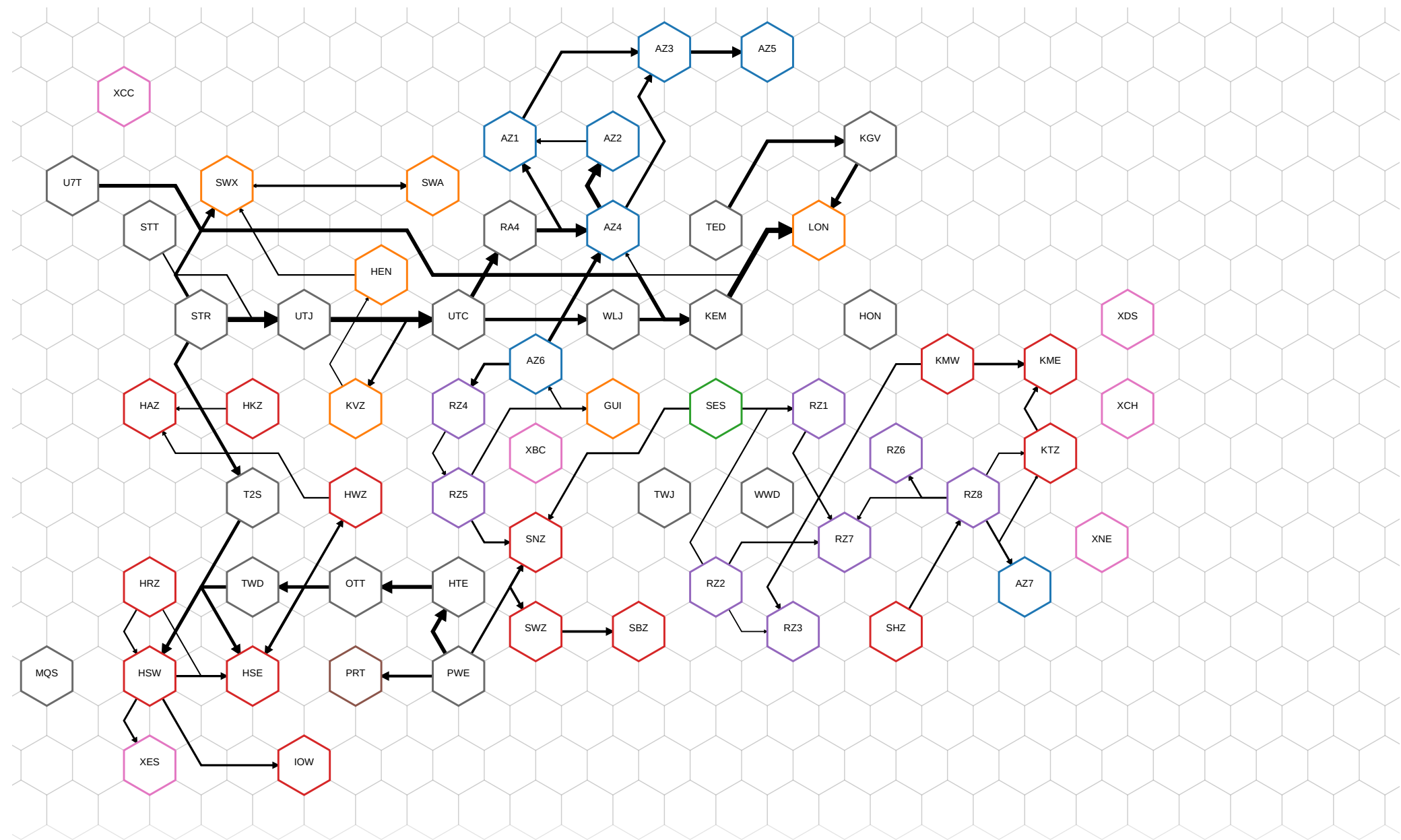
Situation 4 - 2026



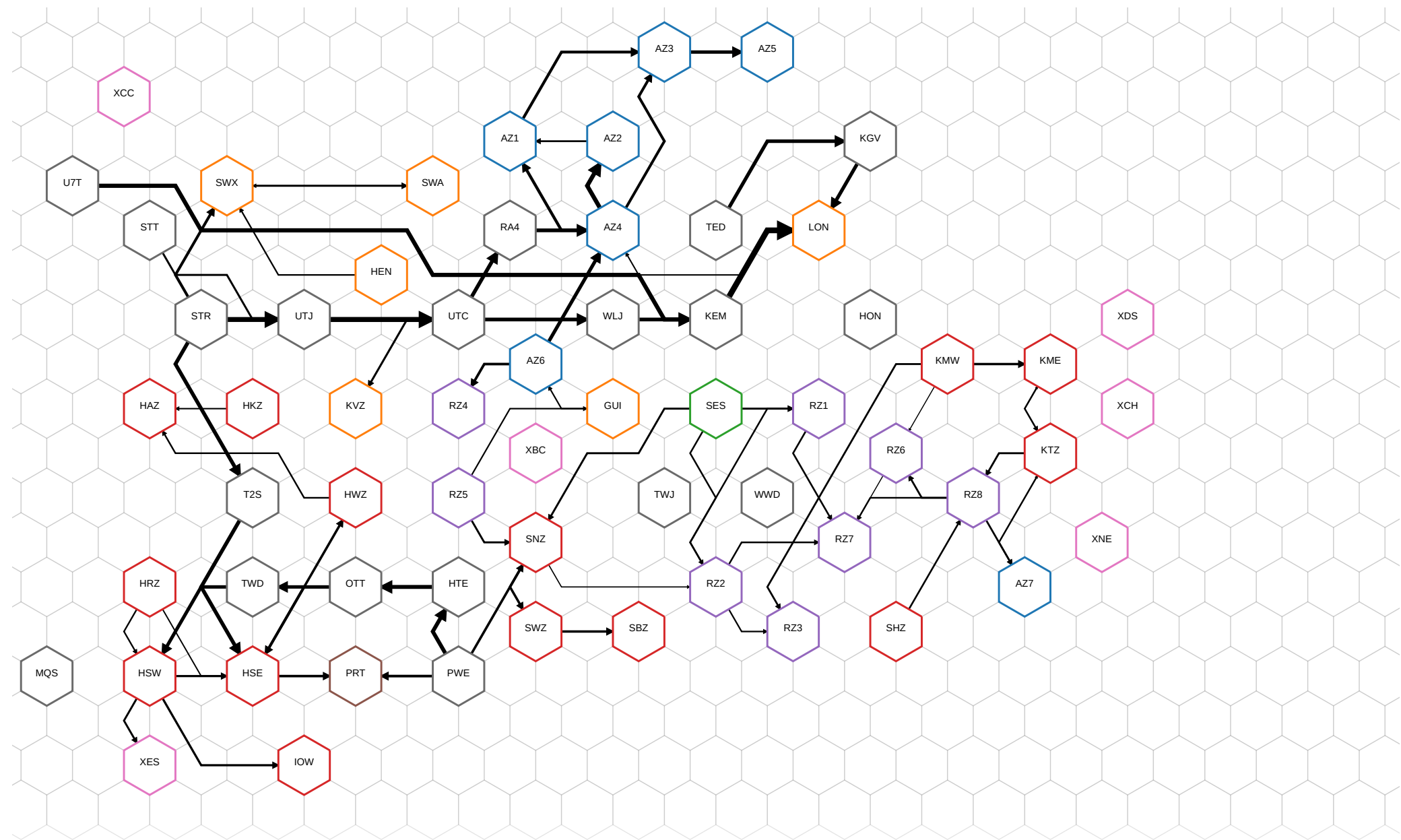
Situation 4 - 2040



Situation 4 - 2050



Situation 4 - 2075



IVM RUN DOSSIER

FORCE STT 500 PIPELINE

IVM Summary: Thames Water

Metadata

General Settings

Name	st-hybrid-dy-w1-tree16.05-options-v37-gov-led-hybridb-force-stt500pipe-2075
Created at	22/08/2022, 22:15:08
Tree	tree16.05: Root and branch tree 16.05: Stage 1 - Begins Hplan and LOW LCED, Stage 2 - Branches on growth (OxCam1a, Hplan and ONS18c), Stage 3 - Branches on licenced capped environmental destination, climate change and further growth scenarios (Hmax and Hmin) 🔗
Setting name	options-v37-gov-led-hybridb-force-stt500pipe 🔗
Setting description	Emergency options in HSE, SBZ, and PRT. Include all STT options, but 500 Ml/d pipe pre-selected in 2033.
Optimised discount rate	STPR

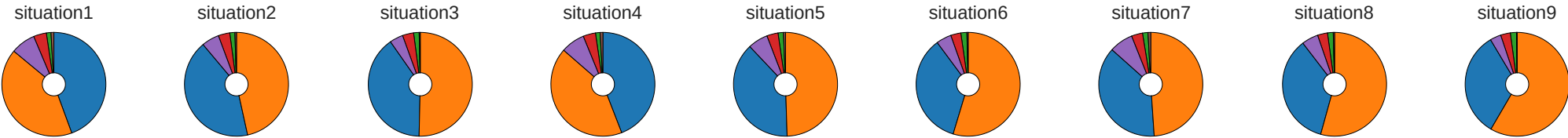
Metrics

Net present value (Cost)

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Cost w/ deficit (STPR)	16,616	14,001	12,743	16,039	13,202	11,709	13,898	11,778	10,796	(£m)
Cost w/o deficit (STPR)	16,616	14,001	12,743	16,039	13,202	11,709	13,898	11,778	10,796	(£m)
Cost w/ deficit (IGEQ)	26,628	21,708	19,420	25,552	20,564	17,802	21,948	18,015	16,209	(£m)
Cost w/o deficit (IGEQ)	26,628	21,708	19,420	25,552	20,564	17,802	21,948	18,015	16,209	(£m)
Cost w/ deficit (LTDR)	18,518	15,482	14,033	17,854	14,612	12,885	15,434	12,979	11,845	(£m)
Cost w/o deficit (LTDR)	18,518	15,482	14,033	17,854	14,612	12,885	15,434	12,979	11,845	(£m)

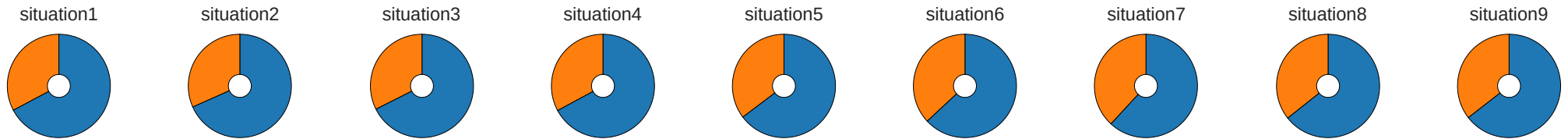
Cost breakdown (STPR)

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Capex	7,380	5,927	5,089	7,078	5,076	4,124	5,235	4,155	3,568	(£m)
Fixed opex	6,914	6,519	6,418	6,782	6,536	6,400	6,802	6,395	6,305	(£m)
Fixed operational carbon	240	223	220	233	224	220	238	211	206	(£m)
Embedded carbon	668	503	444	621	462	370	481	366	328	(£m)
Variable opex	1,268	761	530	1,190	819	550	1,024	604	367	(£m)
Variable carbon opex	146	68	42	136	83	45	118	46	22	(£m)



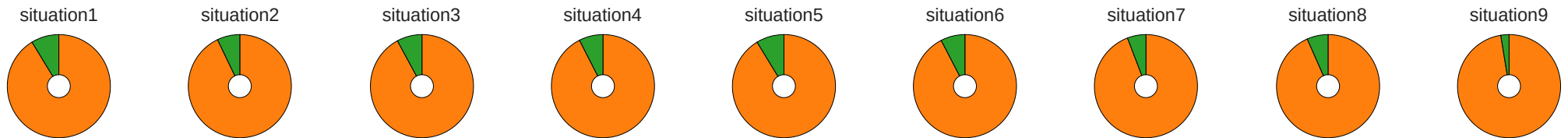
Emissions breakdown

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Capital emissions	4,237,558	3,118,778	2,717,551	3,921,905	2,862,177	2,248,688	3,031,031	2,232,998	1,971,624	(tonnes)
Operational emissions	2,064,539	1,445,087	1,302,940	1,920,848	1,560,050	1,315,408	1,865,721	1,237,916	1,084,224	(tonnes)



Electricity breakdown

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Generated (on site)	0	0	0	0	0	0	0	0	0	(GWh)
Grid	23,471	13,577	6,880	22,944	14,644	7,214	19,412	10,839	4,979	(GWh)
Renewable	2,241	1,041	589	1,866	1,400	595	1,201	768	132	(GWh)



Environmental

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
SEA environmental benefit	87,616.00	80,782.00	79,174.00	85,611.00	80,229.00	78,151.00	83,141.00	76,815.00	75,002.00	
SEA environmental disbenefit	125,295.00	91,816.00	81,552.00	119,211.00	98,353.00	86,156.00	105,705.00	80,796.00	70,312.00	
Natural capital	7,269,781.62	7,885,238.00	8,533,578.93	7,349,998.46	6,652,852.43	7,595,122.27	6,914,559.31	10,433,628.05	11,754,875.07	
Bio-diversity net gain	-265,046.00	-143,595.00	-132,152.00	-264,743.00	-268,045.00	-232,277.00	-283,551.00	-205,074.00	-178,157.00	

Social

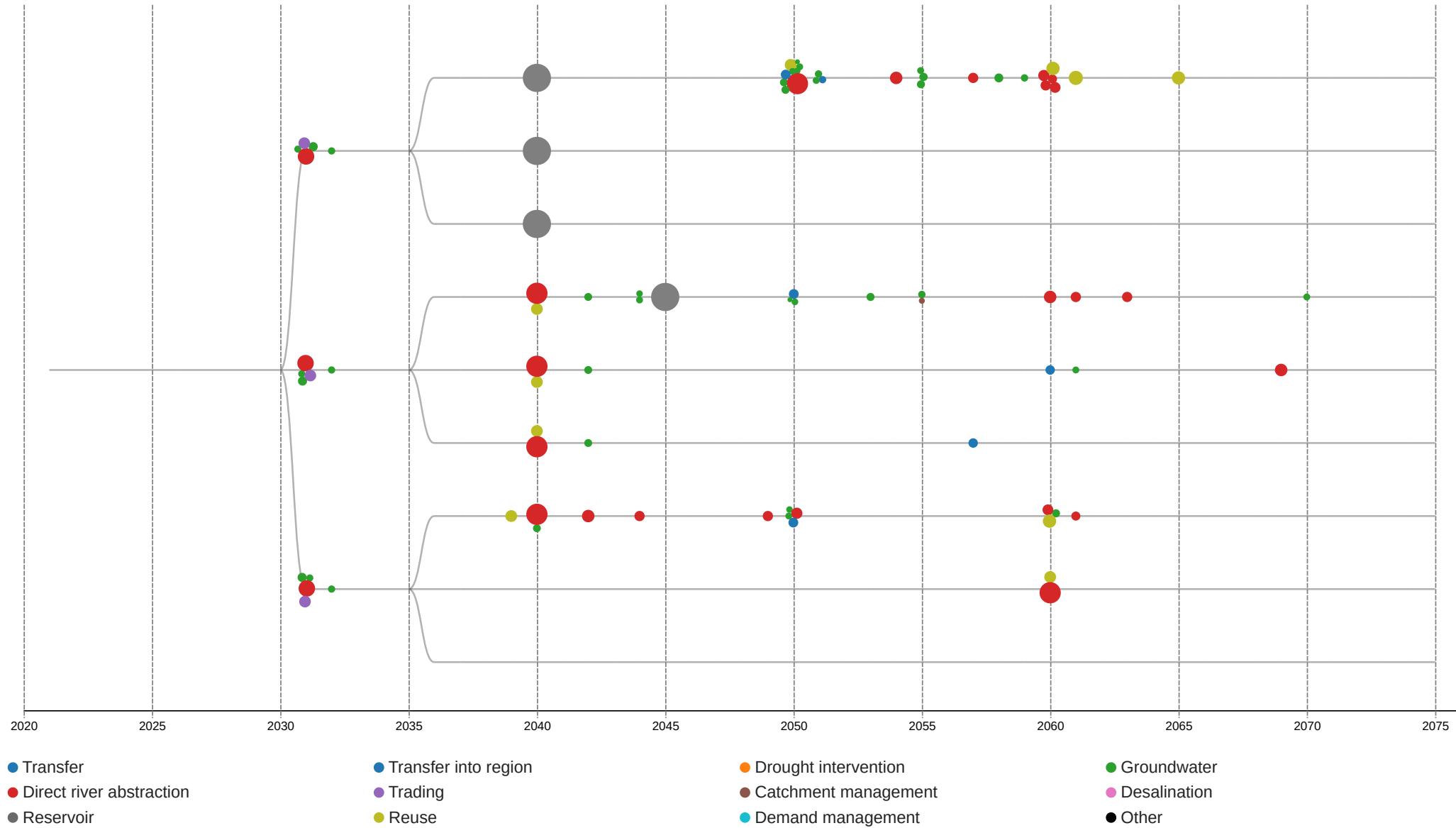
Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Customer preference	33,122.00	30,857.00	30,247.00	32,616.00	31,023.00	30,325.00	31,676.00	29,983.00	29,326.00	

Reliability

[illegible]

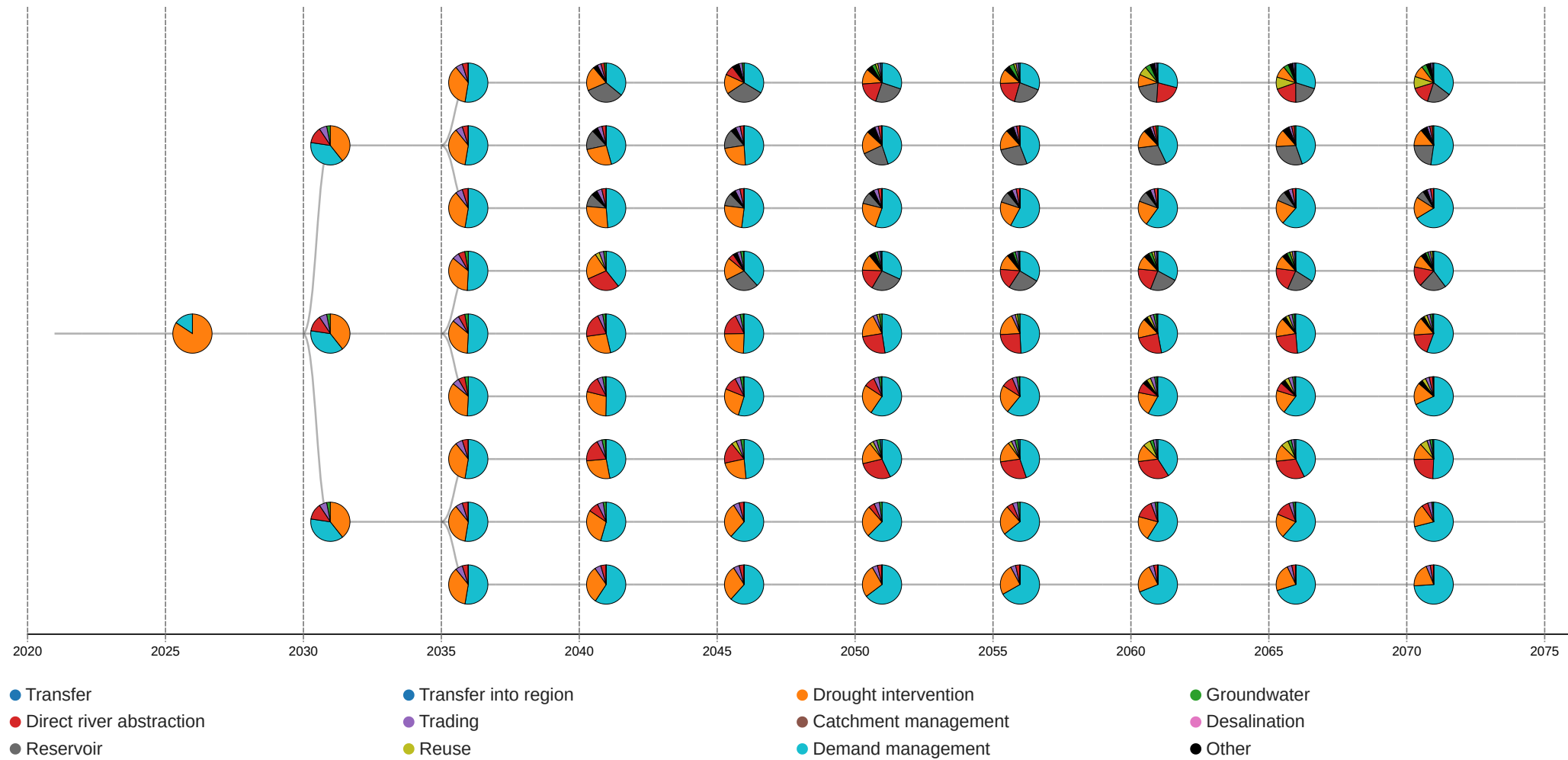
Adaptability										
Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Adaptability	18.76	20.87	22.65	18.84	19.32	21.08	19.75	20.74	23.90	
A3: Operational complexity and flexibility	9.29	9.82	10.71	9.33	9.00	9.71	9.13	9.02	10.36	
A4: WRZ connectivity	9.42	11.03	11.92	9.49	10.30	11.35	10.57	11.70	13.53	
A7: Customer relations support engagement with demand management	0.05	0.02	0.02	0.03	0.02	0.02	0.04	0.02	0.02	
Evolvability										
Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Evolvability	27.44	27.94	30.08	27.70	28.75	30.49	29.34	29.05	32.64	
E1: Scaleability and modularity of proposed changes	10.99	11.35	12.28	11.09	11.73	12.47	11.95	12.00	13.59	
E2: Intervention lead times	7.66	7.47	7.95	7.76	8.04	8.43	8.36	8.06	8.87	
E3: Reliance on external bodies to deliver changes	8.69	9.07	9.80	8.80	8.93	9.54	8.96	8.94	10.14	
E5: Collaborative land management	0.10	0.04	0.04	0.05	0.04	0.04	0.07	0.04	0.04	

Option Selection (Thames Water)

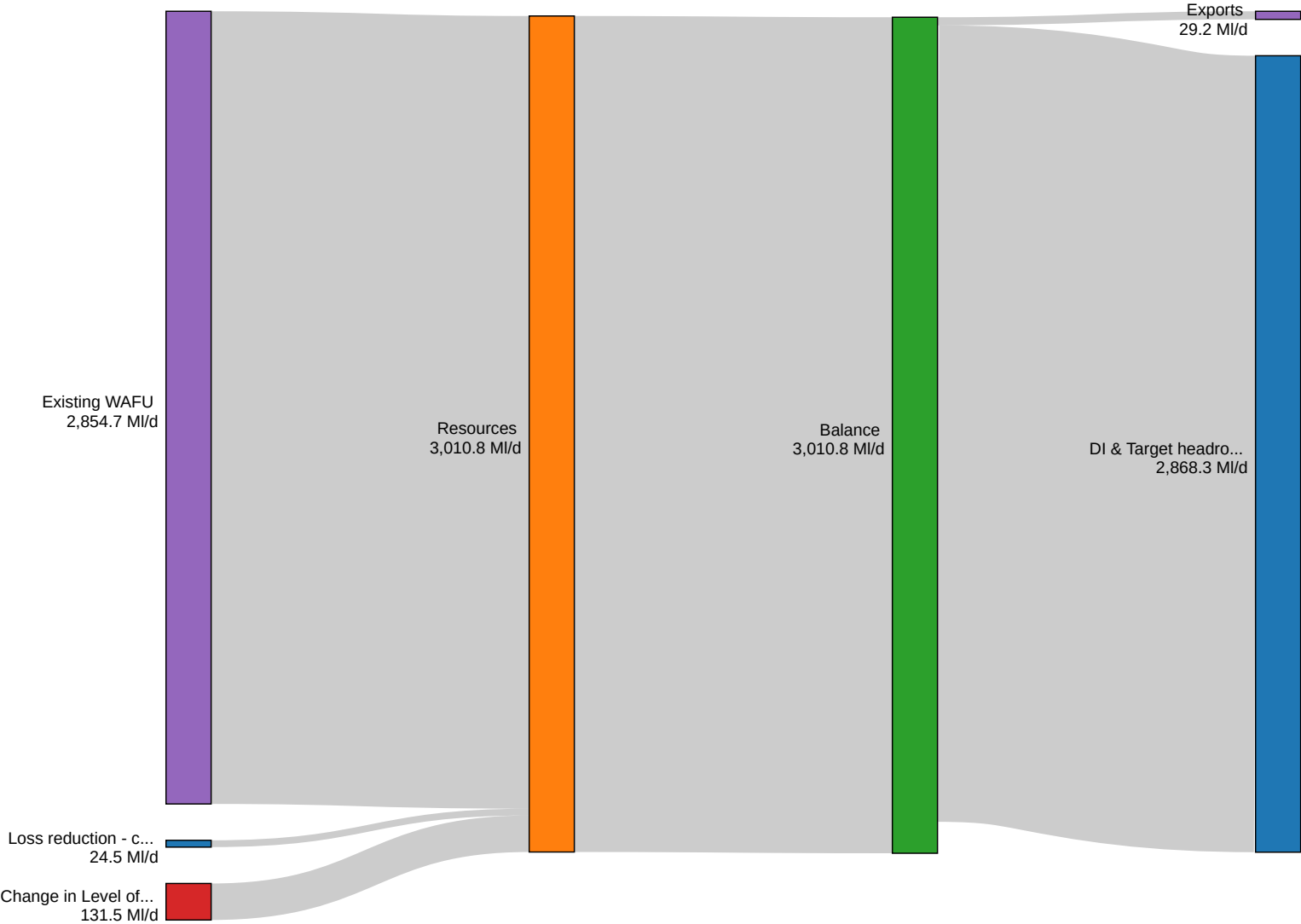


Utilisation (Thames Water)

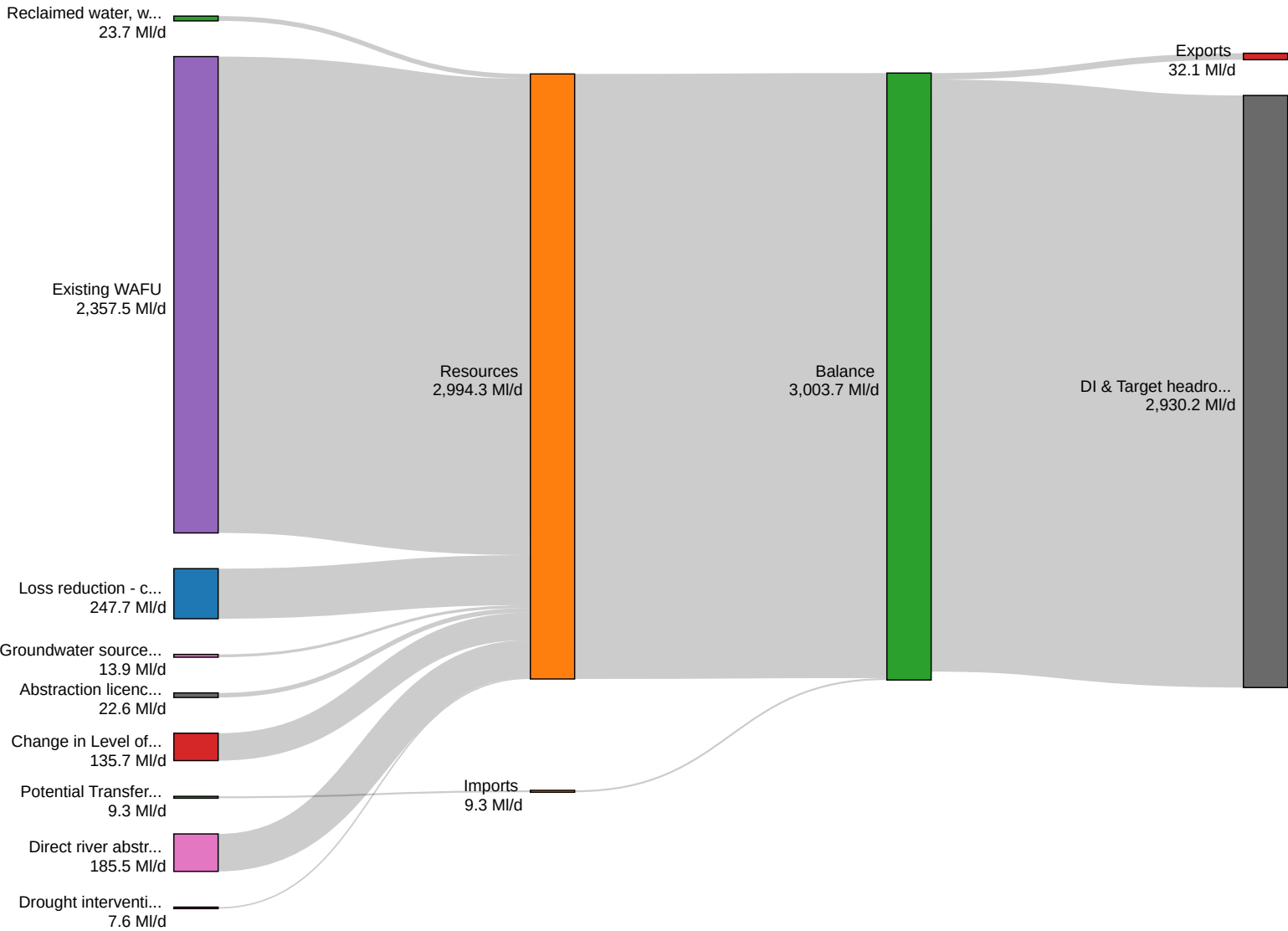
Pie charts show the breakdown of option utilisation by option category.



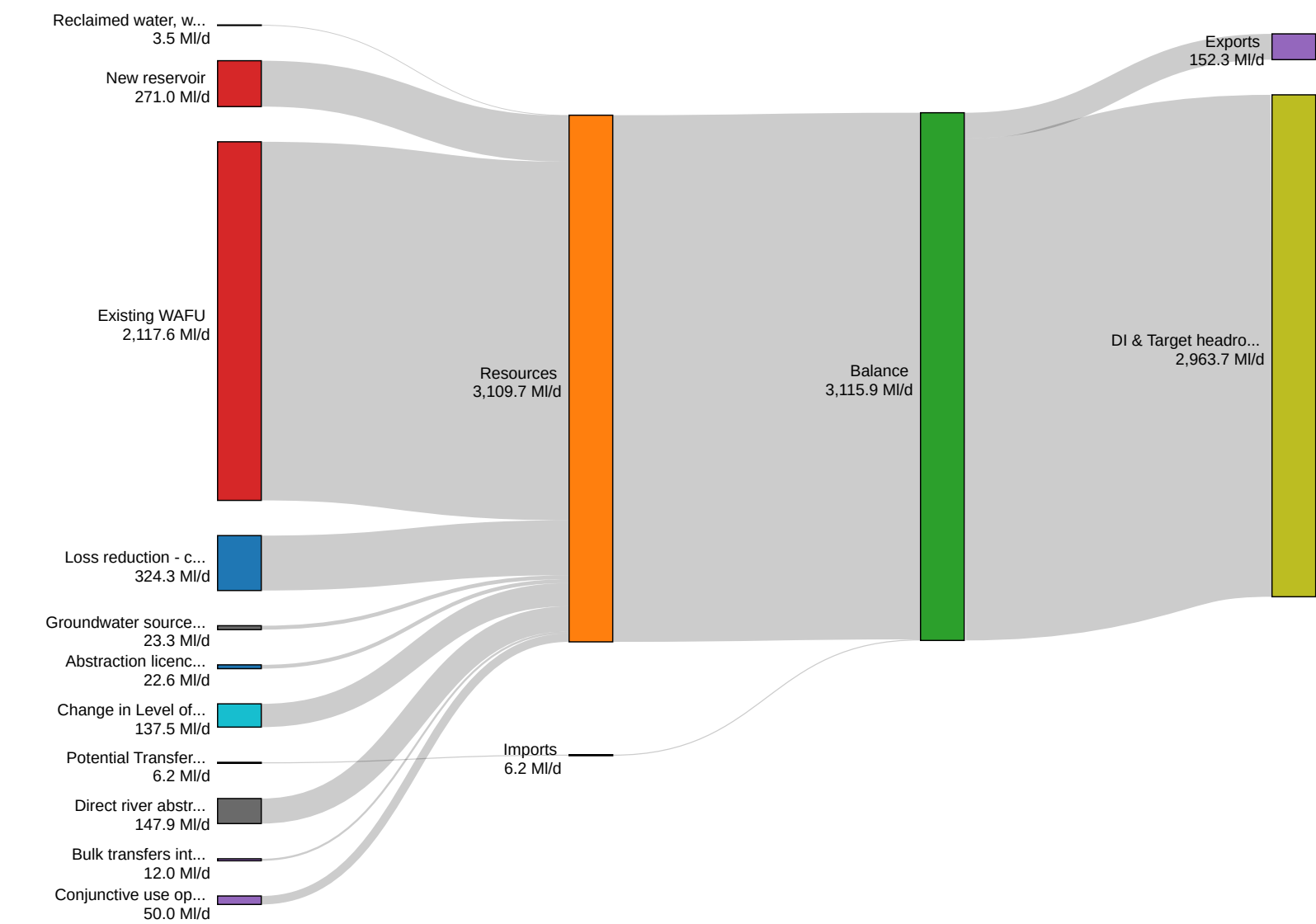
Situation 4 - 2026 (Thames Water)



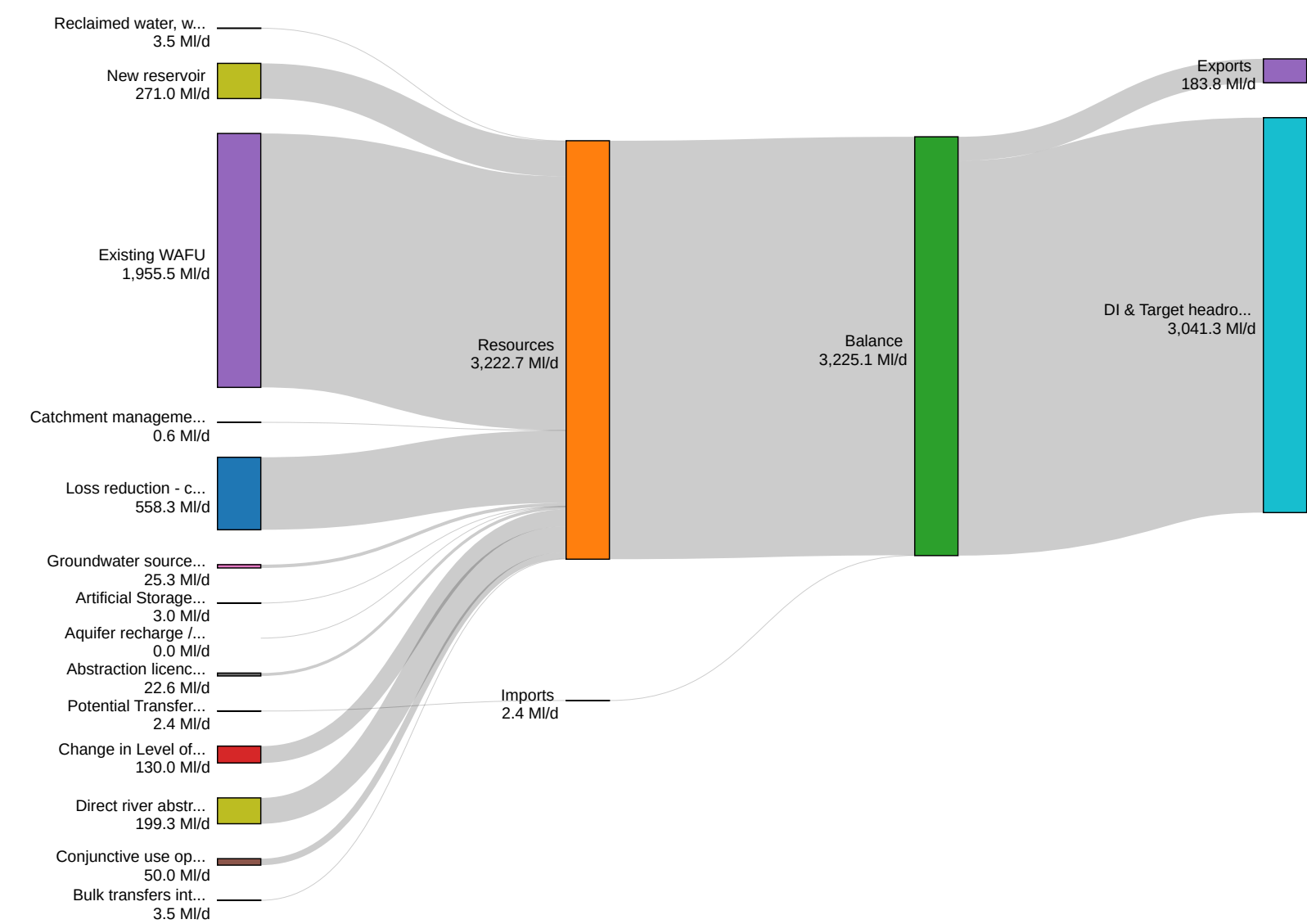
Situation 4 - 2040 (Thames Water)



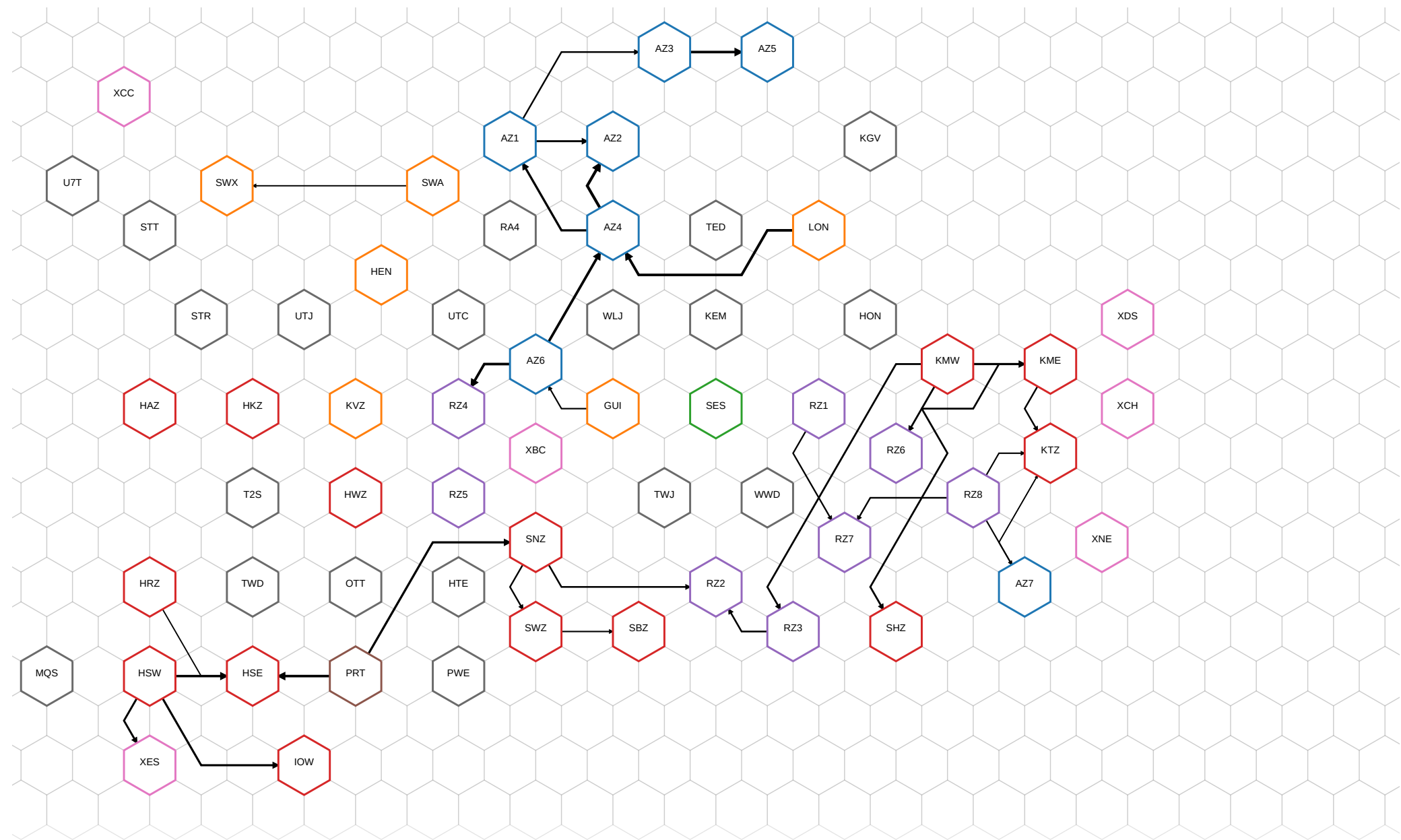
Situation 4 - 2050 (Thames Water)



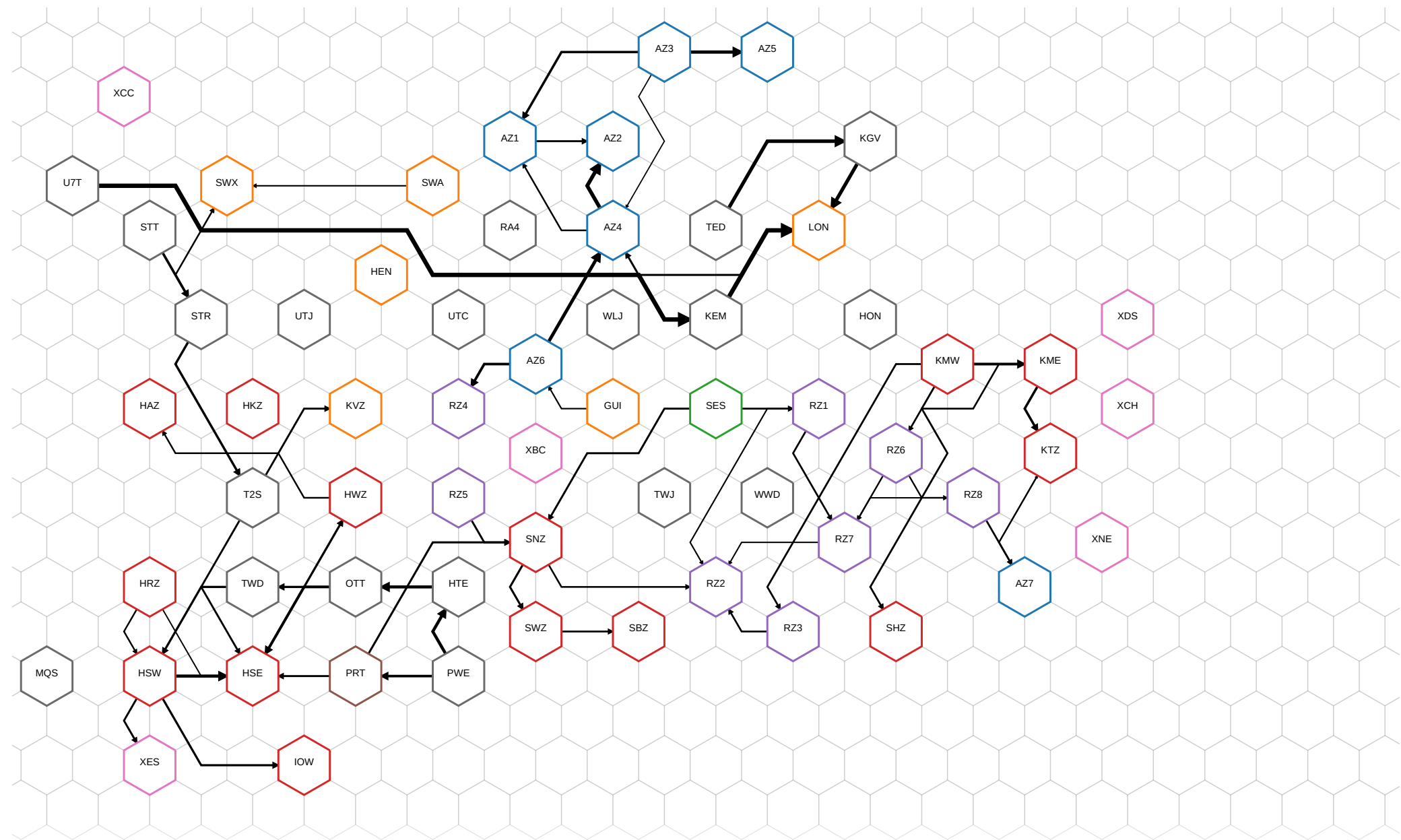
Situation 4 - 2075 (Thames Water)



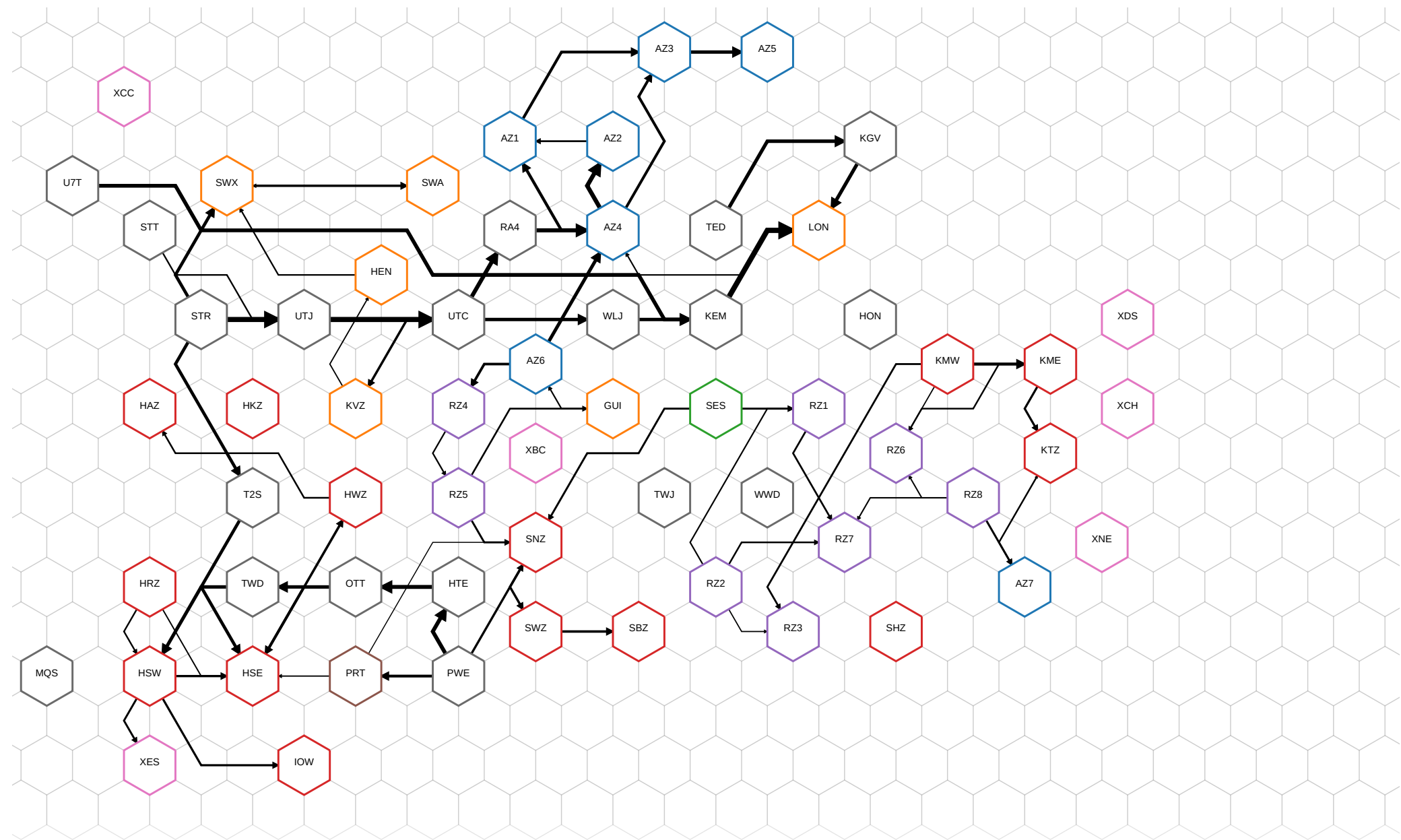
Situation 4 - 2026



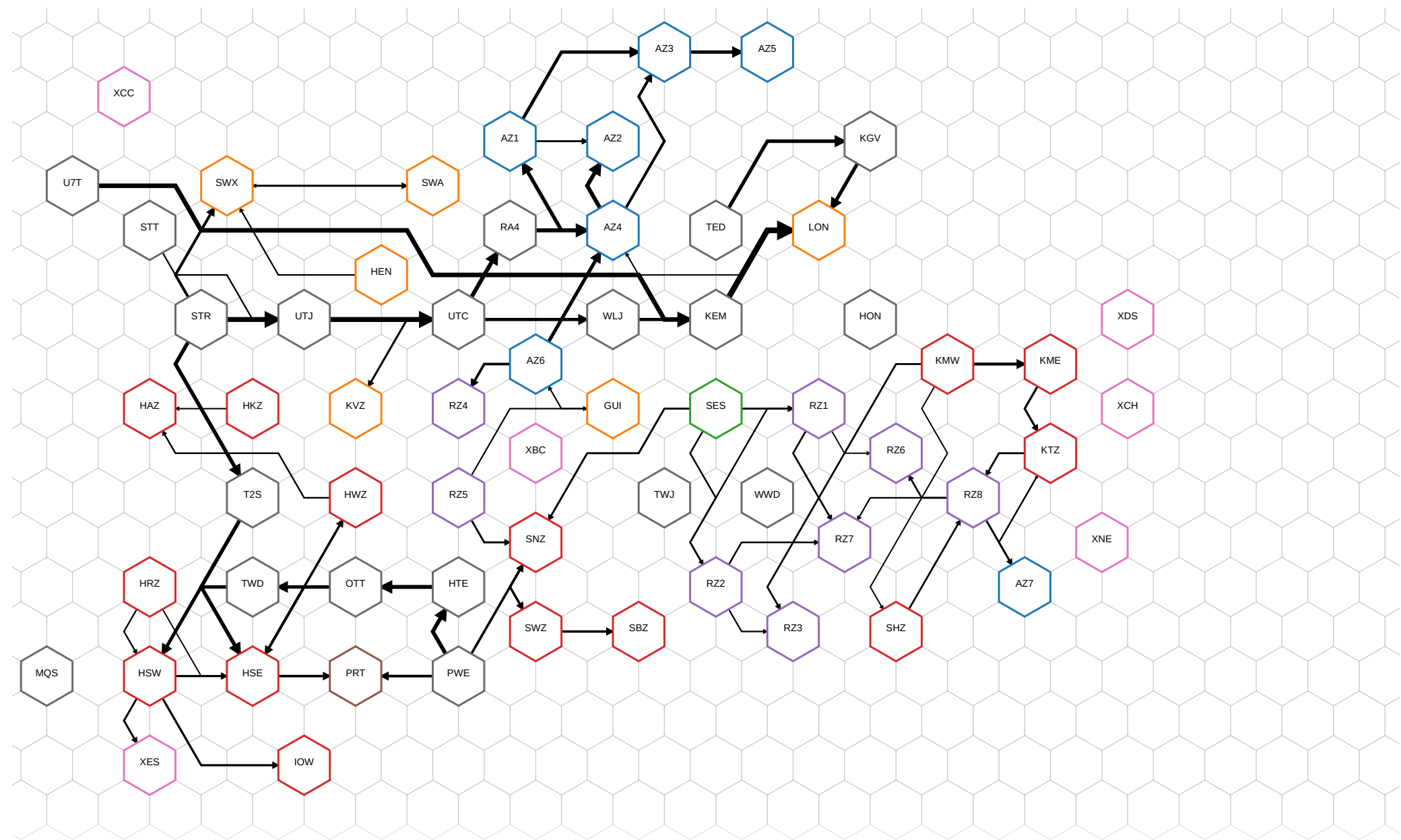
Situation 4 - 2040



Situation 4 - 2050



Situation 4 - 2075



IVM RUN DOSSIER

GATEWAY 50 MI/d

IVM Summary: Thames Water

[Home](#) / [jet-20220805-000002](#) / [st-hybrid-dy-w1-tree16.05-options-v37-gov-led-hybridb-adj-existing-beckton-do-01-2075](#)

Metadata

General Settings

Name	st-hybrid-dy-w1-tree16.05-options-v37-gov-led-hybridb-adj-existing-beckton-do-01-2075
Created at	10/11/2022, 14:43:54
Tree	tree16.05: Root and branch tree 16.05: Stage 1 - Begins Hplan and LOW LCED, Stage 2 - Branches on growth (OxCam1a, Hplan and ONS18c), Stage 3 - Branches on licenced capped environmental destination, climate change and further growth scenarios (Hmax and Hmin) 🔗
Setting name	options-v37-gov-led-hybridb-adj-existing-beckton-do-01 🔗
Setting description	Emergency options in HSE, SBZ, and PRT. Reduced LON DO by 20 MI/d to represent a permanent 50 MI/d write-down from Beckton.
Optimised discount rate	STPR

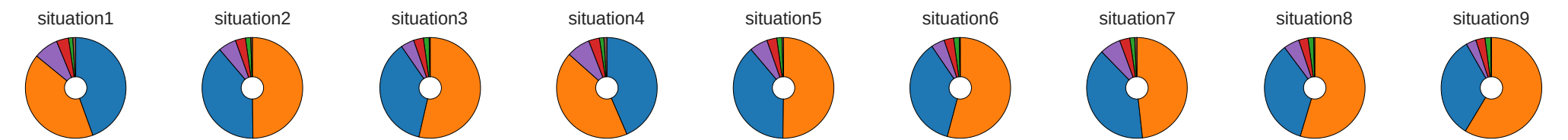
Metrics

Net present value (Cost)

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Cost w/ deficit (STPR)	16,414	13,115	12,008	15,519	13,004	11,879	13,626	11,797	10,862	(£m)
Cost w/o deficit (STPR)	16,414	13,115	12,008	15,519	13,004	11,879	13,626	11,797	10,862	(£m)
Cost w/ deficit (IGEQ)	26,377	20,233	18,202	24,692	20,053	17,988	21,396	18,031	16,320	(£m)
Cost w/o deficit (IGEQ)	26,377	20,233	18,202	24,692	20,053	17,988	21,396	18,031	16,320	(£m)
Cost w/ deficit (LTDR)	18,305	14,483	13,205	17,266	14,359	13,060	15,111	12,998	11,919	(£m)
Cost w/o deficit (LTDR)	18,305	14,483	13,205	17,266	14,359	13,060	15,111	12,998	11,919	(£m)

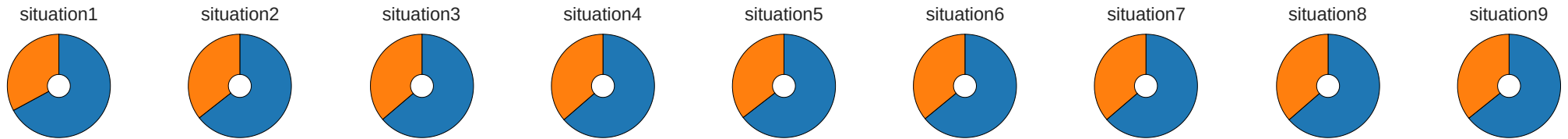
Cost breakdown (STPR)

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Capex	7,299	5,109	4,416	6,752	5,021	4,314	5,378	4,147	3,595	(£m)
Fixed opex	6,798	6,532	6,437	6,682	6,528	6,433	6,571	6,445	6,369	(£m)
Fixed operational carbon	230	224	221	225	220	217	219	212	207	(£m)
Embedded carbon	642	428	380	543	417	366	449	354	321	(£m)
Variable opex	1,294	753	513	1,169	753	513	912	594	349	(£m)
Variable carbon opex	150	68	41	148	65	37	97	45	20	(£m)



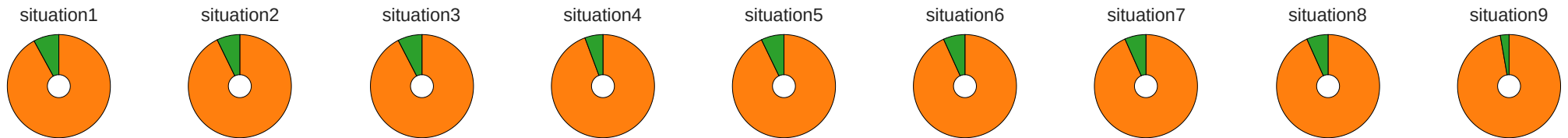
Emissions breakdown

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Capital emissions	4,095,424	2,621,259	2,288,836	3,427,221	2,551,839	2,205,396	2,810,595	2,149,957	1,931,027	(tonnes)
Operational emissions	2,004,304	1,448,429	1,298,752	1,956,682	1,401,849	1,236,957	1,599,308	1,228,423	1,073,732	(tonnes)



Electricity breakdown

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Generated (on site)	0	0	0	0	0	0	0	0	0	(GWh)
Grid	24,404	13,669	6,695	22,745	13,803	7,122	16,744	10,672	4,645	(GWh)
Renewable	2,116	1,066	551	1,372	1,067	519	1,197	770	131	(GWh)



Environmental

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
SEA environmental benefit	87,688.00	82,650.00	81,159.00	86,160.00	82,558.00	81,102.00	83,824.00	79,902.00	78,521.00	
SEA environmental disbenefit	125,703.00	96,469.00	86,438.00	121,991.00	96,565.00	87,341.00	104,294.00	83,673.00	73,833.00	
Natural capital	7,556,539.23	8,228,790.00	8,531,095.89	6,900,586.10	8,240,025.85	8,574,279.25	11,462,152.77	15,141,788.25	16,046,671.24	
Bio-diversity net gain	-253,862.00	-136,110.00	-133,139.00	-223,260.00	-131,748.00	-127,232.00	-202,641.00	-171,926.00	-144,488.00	

Social

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Customer preference	33,126.00	31,476.00	30,843.00	32,954.00	31,443.00	30,843.00	31,949.00	30,579.00	29,914.00	

Reliability

[illegible]

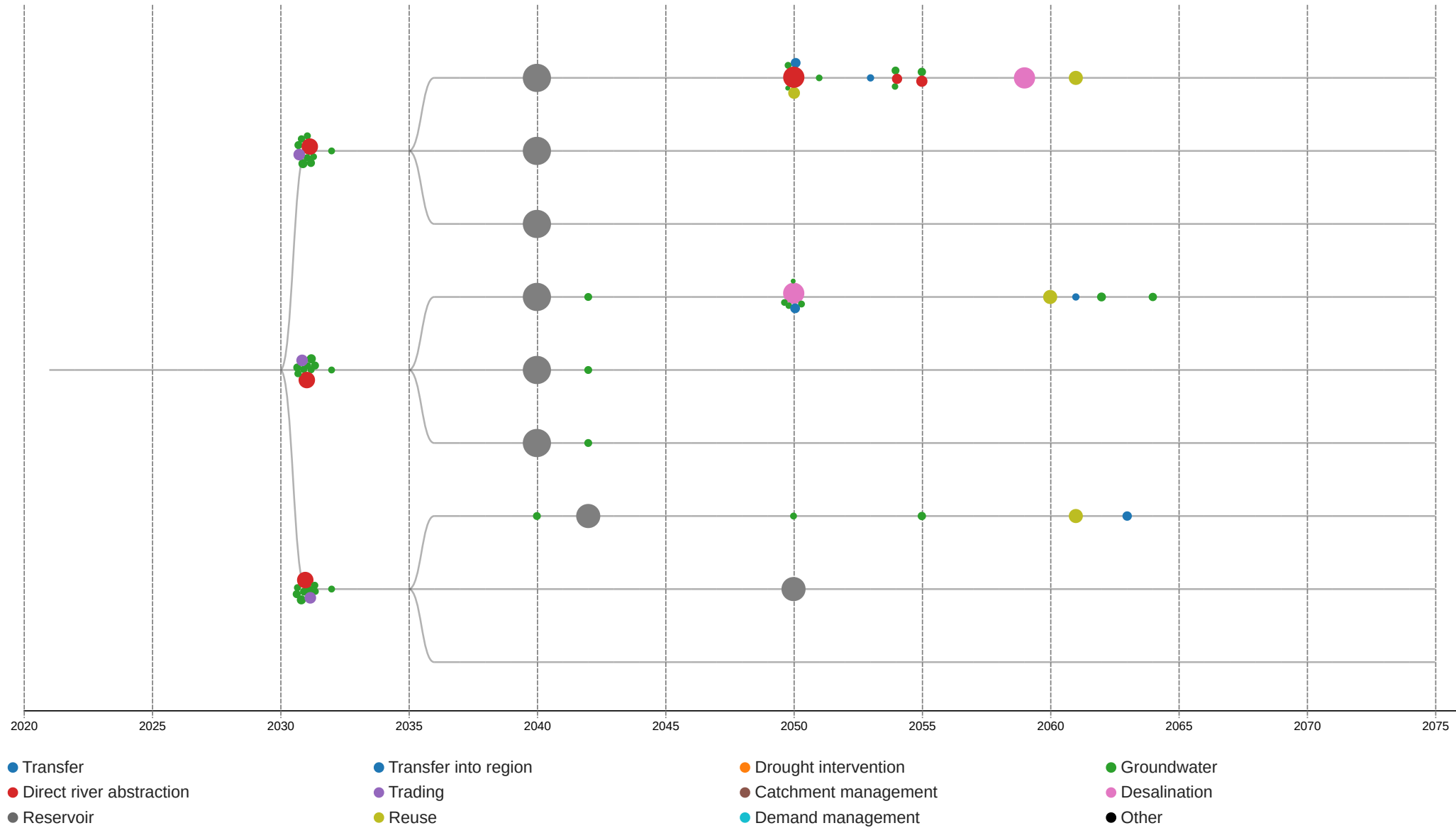
Adaptability

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Adaptability	18.57	20.51	22.83	18.52	20.13	22.23	19.99	21.64	25.26	
A3: Operational complexity and flexibility	9.21	9.94	10.96	8.99	9.71	10.70	9.41	9.98	11.84	
A4: WRZ connectivity	9.33	10.52	11.83	9.49	10.37	11.49	10.53	11.61	13.36	
A7: Customer relations support engagement with demand management	0.04	0.04	0.05	0.04	0.04	0.04	0.04	0.05	0.06	

Evolvability

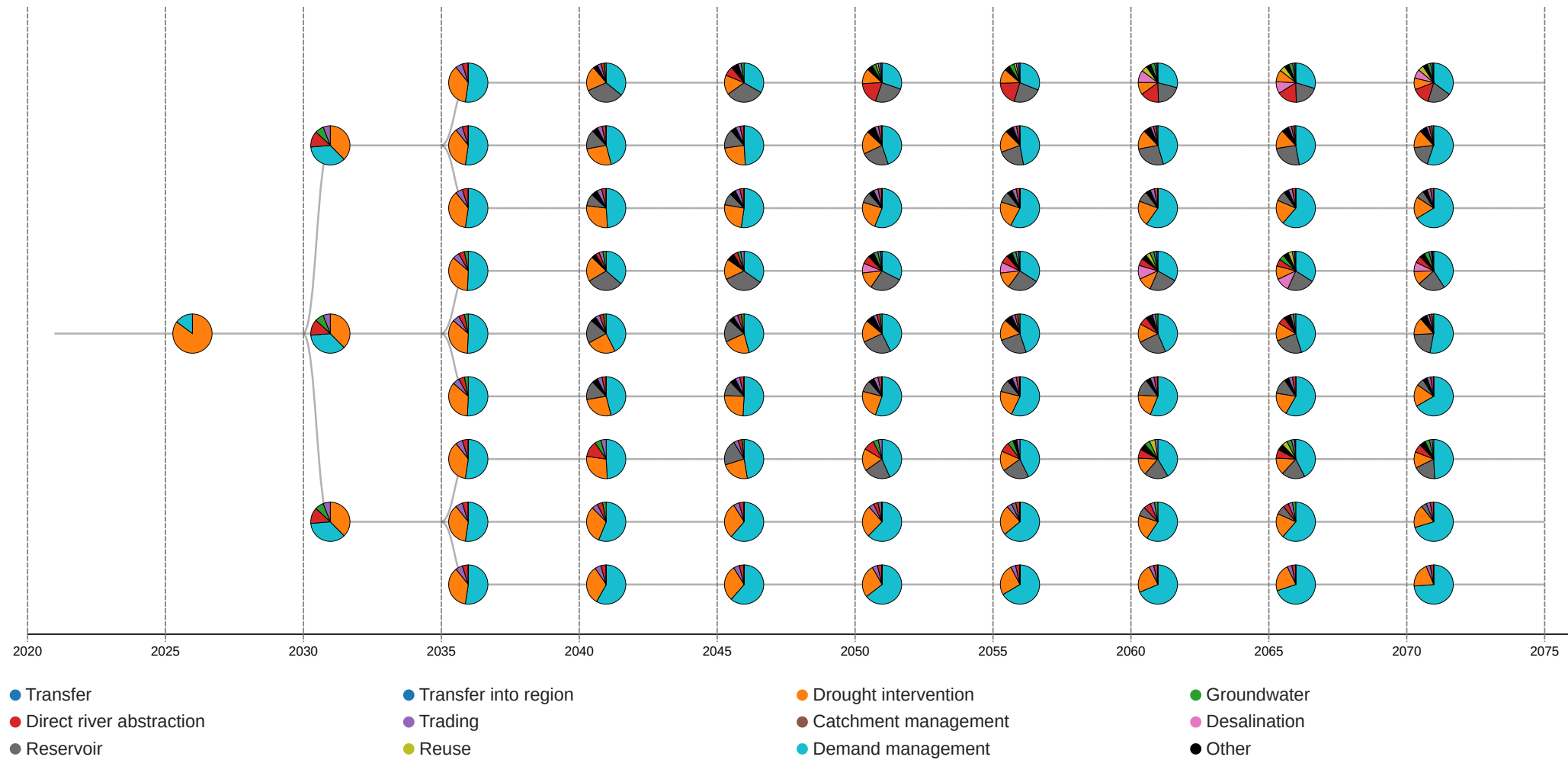
[illegible]

Option Selection (Thames Water)

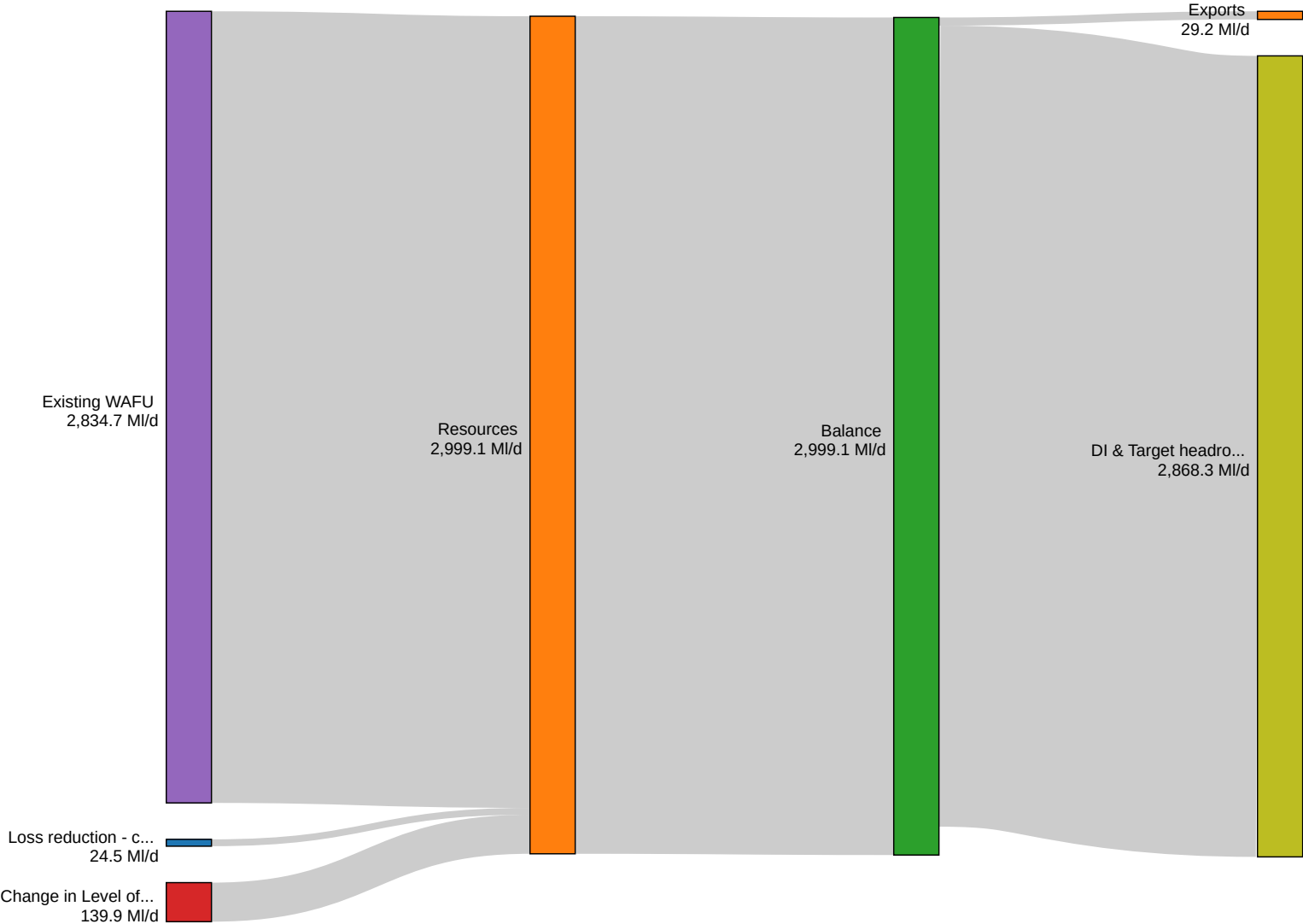


Utilisation (Thames Water)

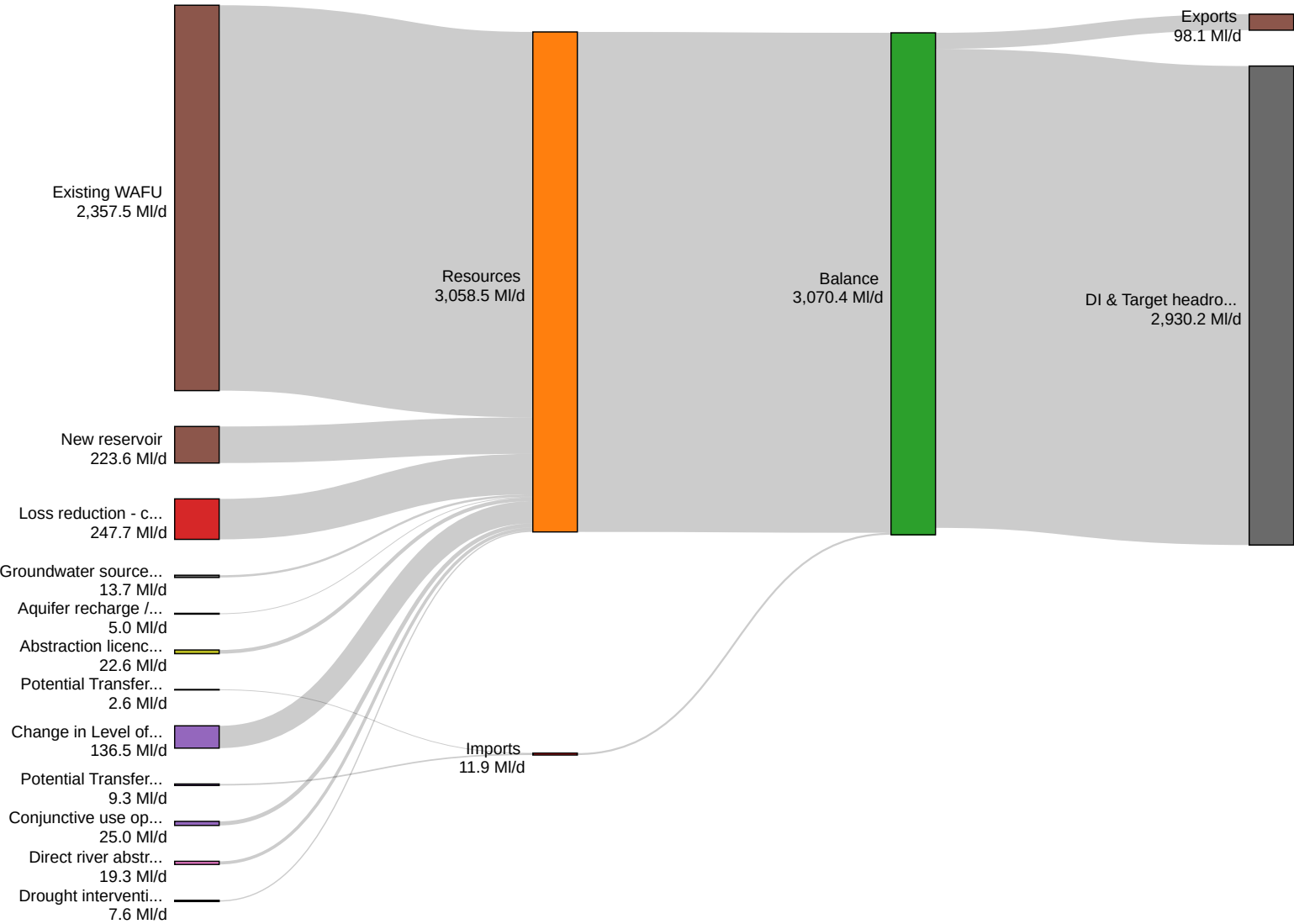
Pie charts show the breakdown of option utilisation by option category.



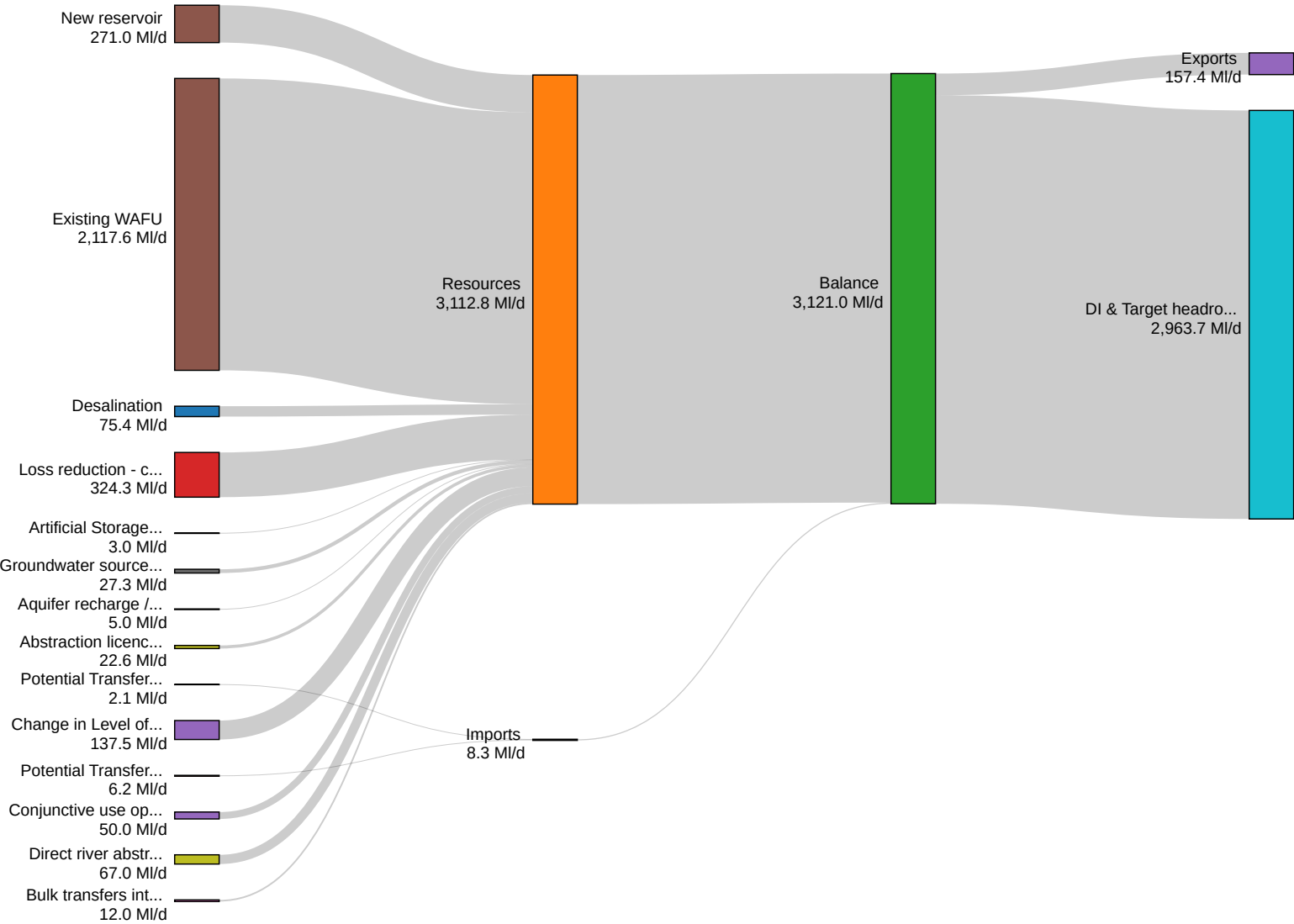
Situation 4 - 2026 (Thames Water)



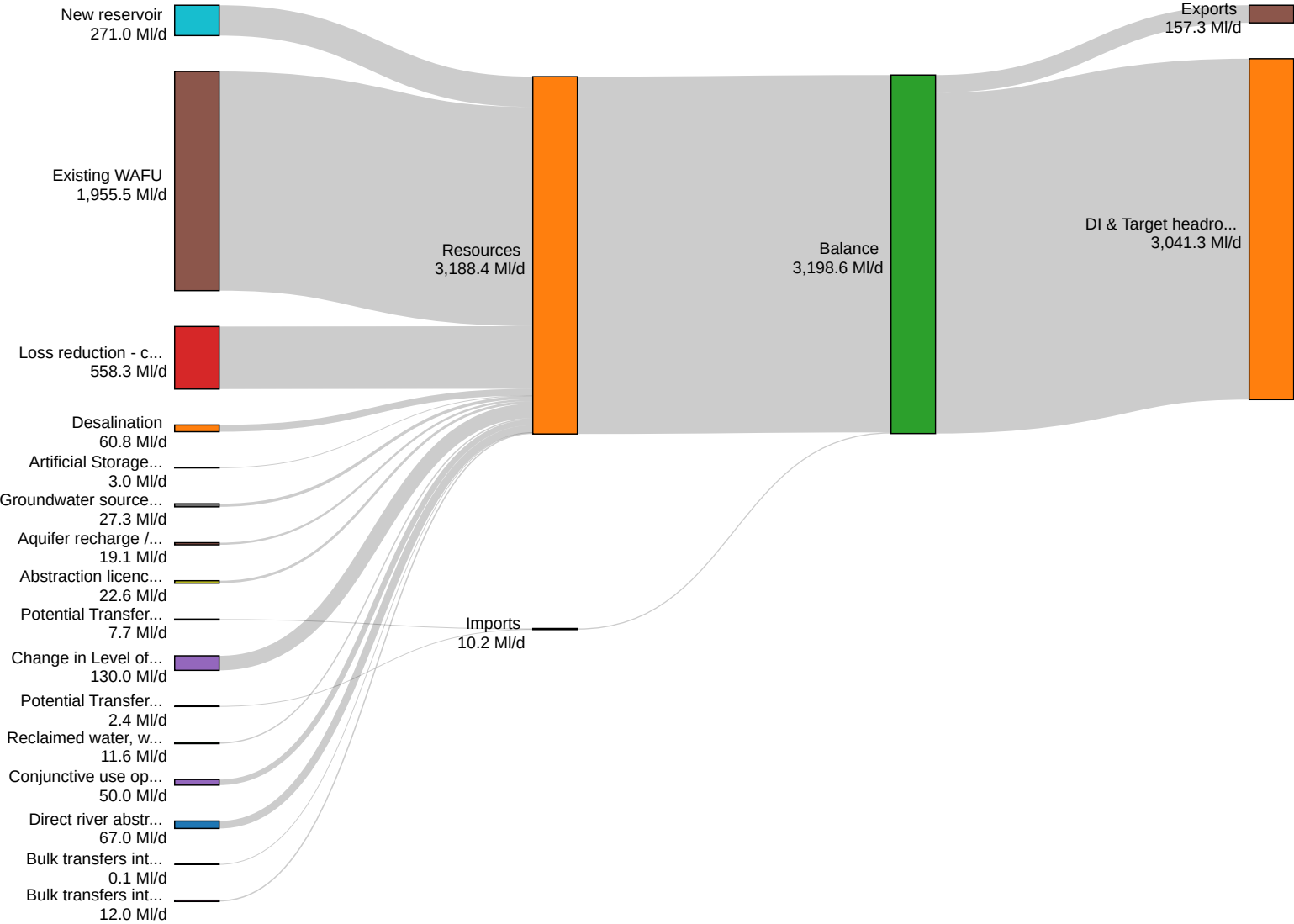
Situation 4 - 2040 (Thames Water)



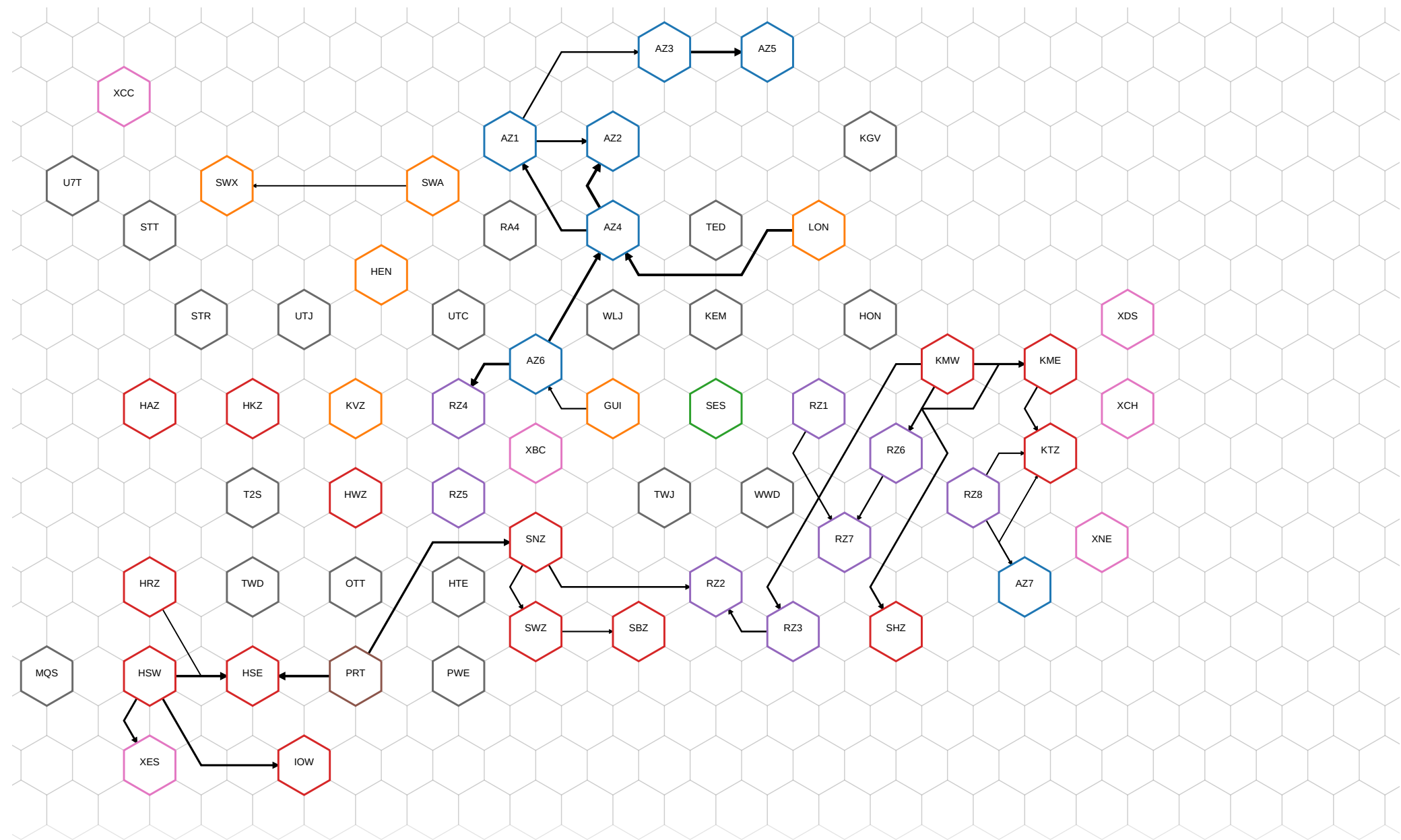
Situation 4 - 2050 (Thames Water)



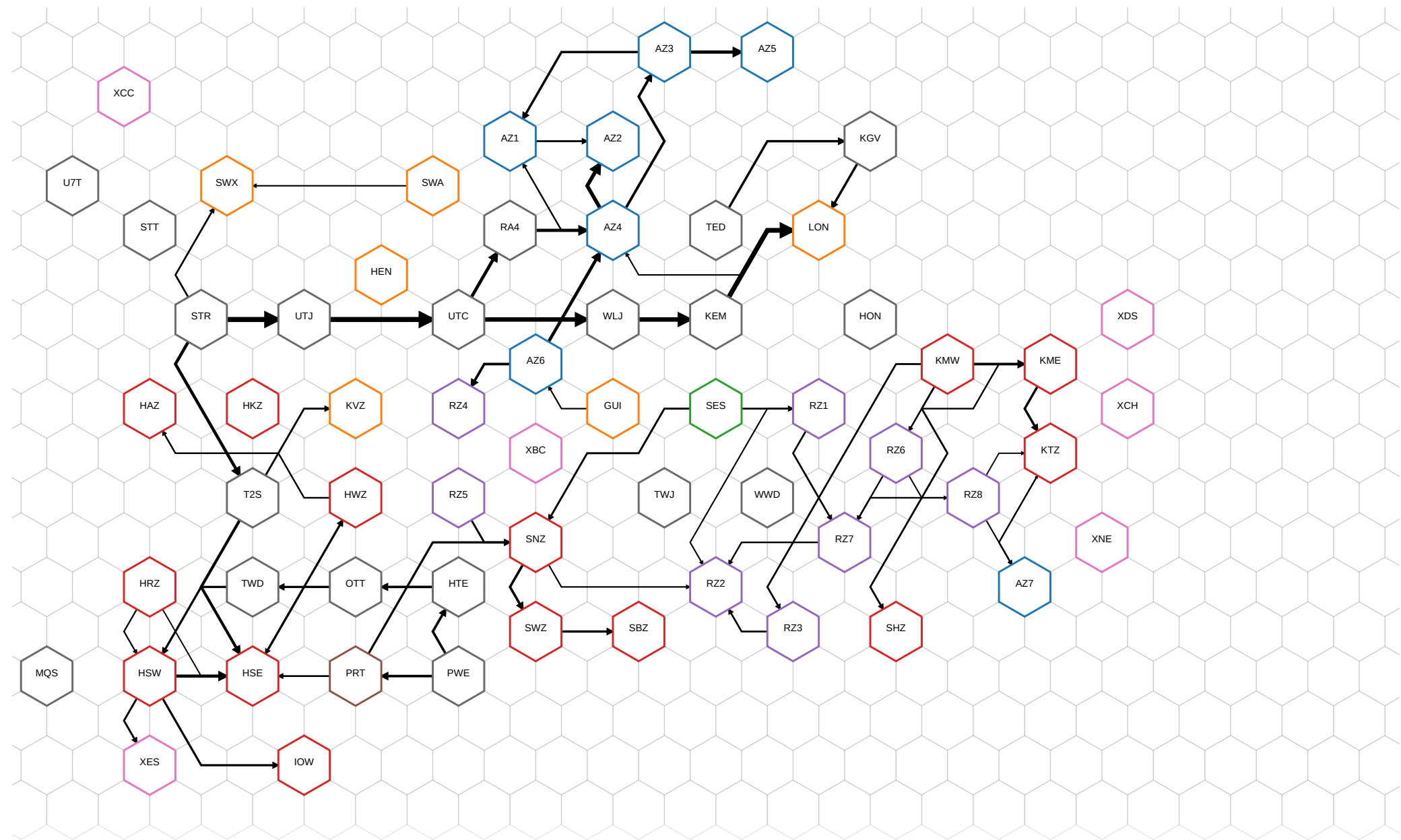
Situation 4 - 2075 (Thames Water)



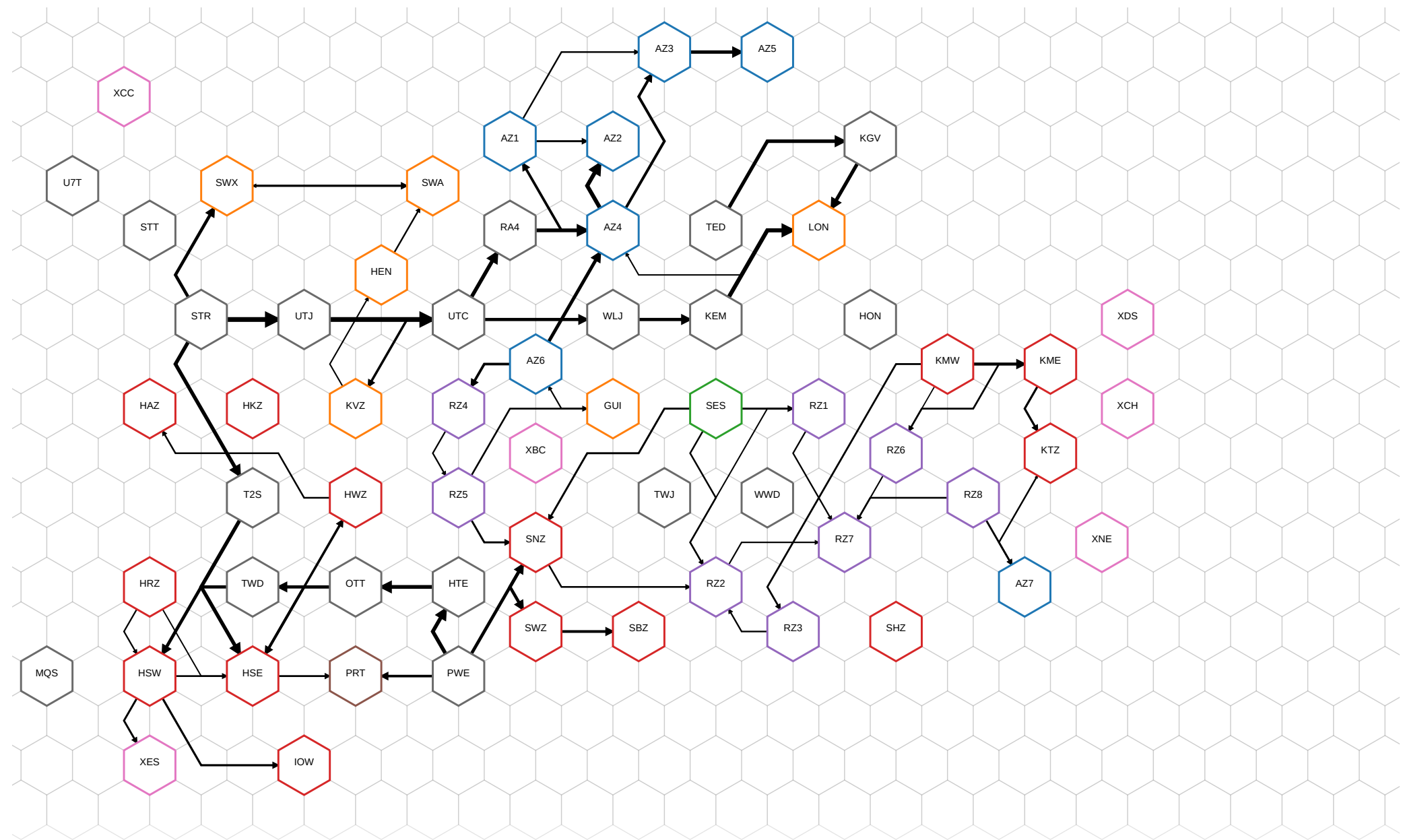
Situation 4 - 2026



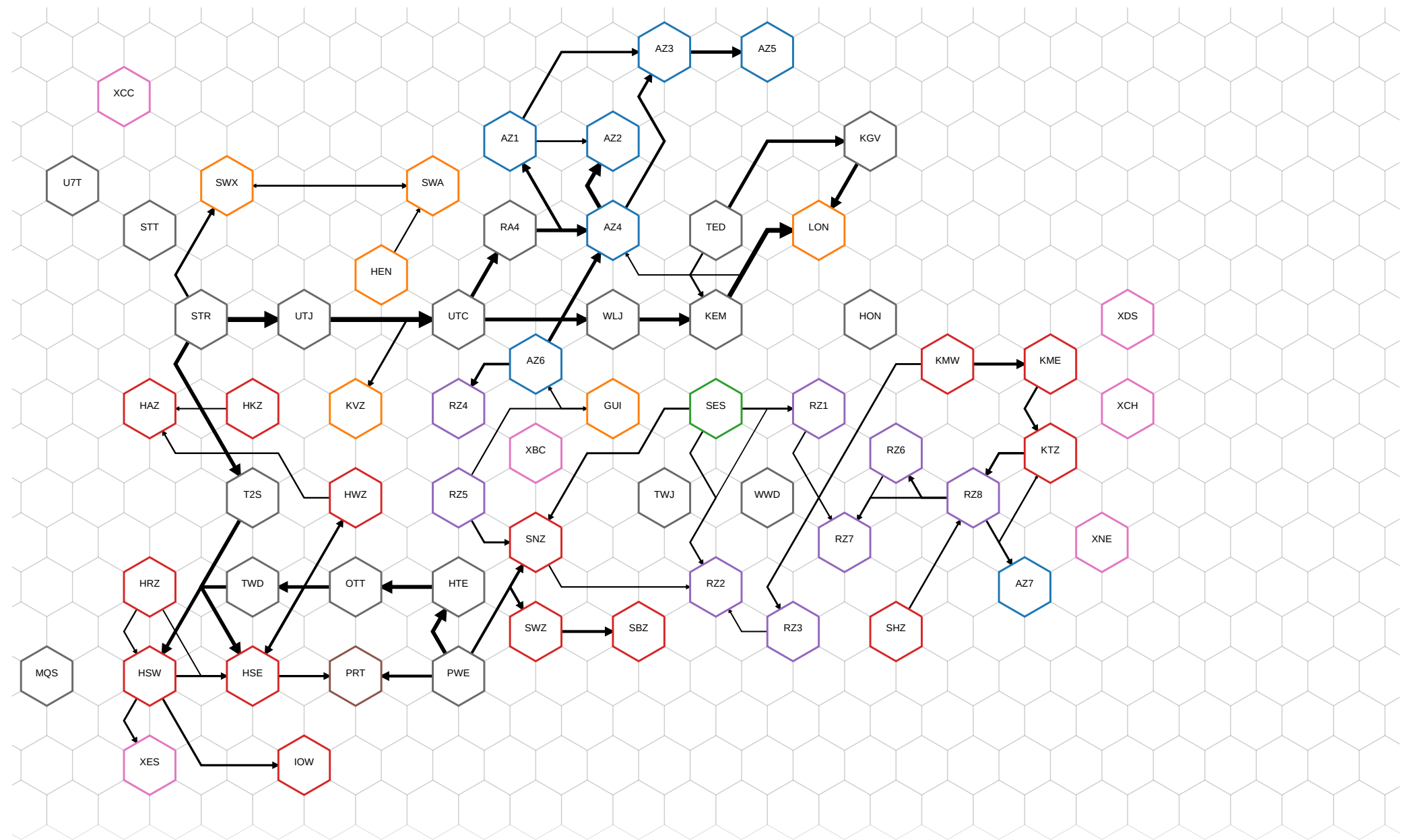
Situation 4 - 2040



Situation 4 - 2050



Situation 4 - 2075



IVM RUN DOSSIER

GATEWAY 50 MI/d

(only SESRO 100Mm³ available)

IVM Summary: Thames Water

Metadata

General Settings

Name	st-hybrid-dy-w1-tree16.05-options-v37-gov-led-hybridb-only-sesro100-excl-twul-rsr-adj-existing-beckton-do-01-2075
Created at	10/11/2022, 22:11:14
Tree	tree16.05: Root and branch tree 16.05: Stage 1 - Begins Hplan and LOW LCED, Stage 2 - Branches on growth (OxCam1a, Hplan and ONS18c), Stage 3 - Branches on licenced capped environmental destination, climate change and further growth scenarios (Hmax and Hmin) 🔗
Setting name	options-v37-gov-led-hybridb-only-sesro100-excl-twul-rsr-adj-existing-beckton-do-01 🔗
Setting description	Emergency options in HSE, SBZ, and PRT. Only SESRO 100 Mm3 available. Excludes TWUL reservoirs. Reduced LON DO by 20 MI/d to represent a permanent 50 MI/d write-down from Beckton.
Optimised discount rate	STPR

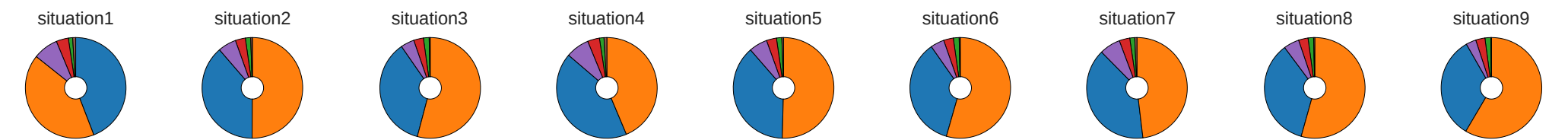
Metrics

Net present value (Cost)

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Cost w/ deficit (STPR)	16,531	12,976	11,826	15,588	12,876	11,750	13,606	11,805	10,837	(£m)
Cost w/o deficit (STPR)	16,531	12,976	11,826	15,588	12,876	11,750	13,606	11,805	10,837	(£m)
Cost w/ deficit (IGEQ)	26,613	20,045	17,914	24,891	19,866	17,801	21,372	18,053	16,272	(£m)
Cost w/o deficit (IGEQ)	26,613	20,045	17,914	24,891	19,866	17,801	21,372	18,053	16,272	(£m)
Cost w/ deficit (LTDR)	18,445	14,334	13,003	17,358	14,219	12,920	15,089	13,009	11,890	(£m)
Cost w/o deficit (LTDR)	18,445	14,334	13,003	17,358	14,219	12,920	15,089	13,009	11,890	(£m)

Cost breakdown (STPR)

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Capex	7,297	5,006	4,285	6,637	4,916	4,209	5,373	4,184	3,600	(£m)
Fixed opex	6,870	6,498	6,400	6,806	6,492	6,398	6,544	6,416	6,339	(£m)
Fixed operational carbon	232	223	218	229	223	220	217	211	206	(£m)
Embedded carbon	648	420	370	598	417	366	463	361	323	(£m)
Variable opex	1,326	759	513	1,174	758	515	911	590	349	(£m)
Variable carbon opex	159	70	39	143	70	41	96	44	20	(£m)



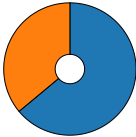
Emissions breakdown

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Capital emissions	4,139,137	2,573,656	2,229,221	3,793,916	2,558,849	2,209,148	2,905,999	2,197,733	1,939,004	(tonnes)
Operational emissions	2,071,282	1,450,940	1,261,912	1,968,945	1,458,604	1,292,947	1,585,572	1,217,733	1,067,067	(tonnes)

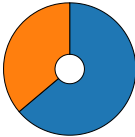
situation1



situation2



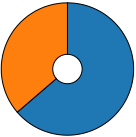
situation3



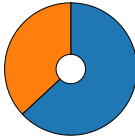
situation4



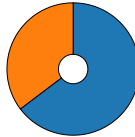
situation5



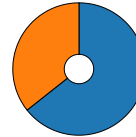
situation6



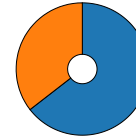
situation7



situation8



situation9



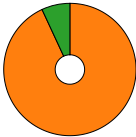
Electricity breakdown

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Generated (on site)	0	0	0	0	0	0	0	0	0	(GWh)
Grid	25,669	14,205	6,891	22,148	13,760	7,039	16,753	10,741	4,649	(GWh)
Renewable	2,020	1,056	460	1,826	1,091	603	1,453	771	133	(GWh)

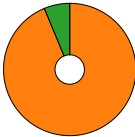
situation1



situation2



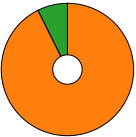
situation3



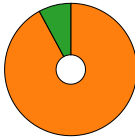
situation4



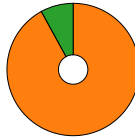
situation5



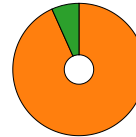
situation6



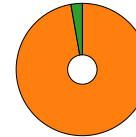
situation7



situation8



situation9



Environmental

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
SEA environmental benefit	87,163.00	81,633.00	80,236.00	85,726.00	81,575.00	80,102.00	82,710.00	78,805.00	77,471.00	
SEA environmental disbenefit	126,176.00	97,682.00	86,544.00	118,923.00	97,016.00	86,913.00	105,614.00	83,313.00	73,883.00	
Natural capital	10,788,929.11	11,417,557.18	11,952,127.77	10,869,656.72	11,609,749.04	12,175,908.97	12,147,832.01	14,846,726.26	16,046,671.24	
Bio-diversity net gain	-313,299.00	-218,129.00	-184,539.00	-308,962.00	-196,220.00	-173,090.00	-215,471.00	-166,080.00	-144,488.00	

Social

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Customer preference	33,263.00	31,444.00	30,822.00	32,842.00	31,470.00	30,874.00	32,053.00	30,502.00	29,890.00	

Reliability

[illegible]

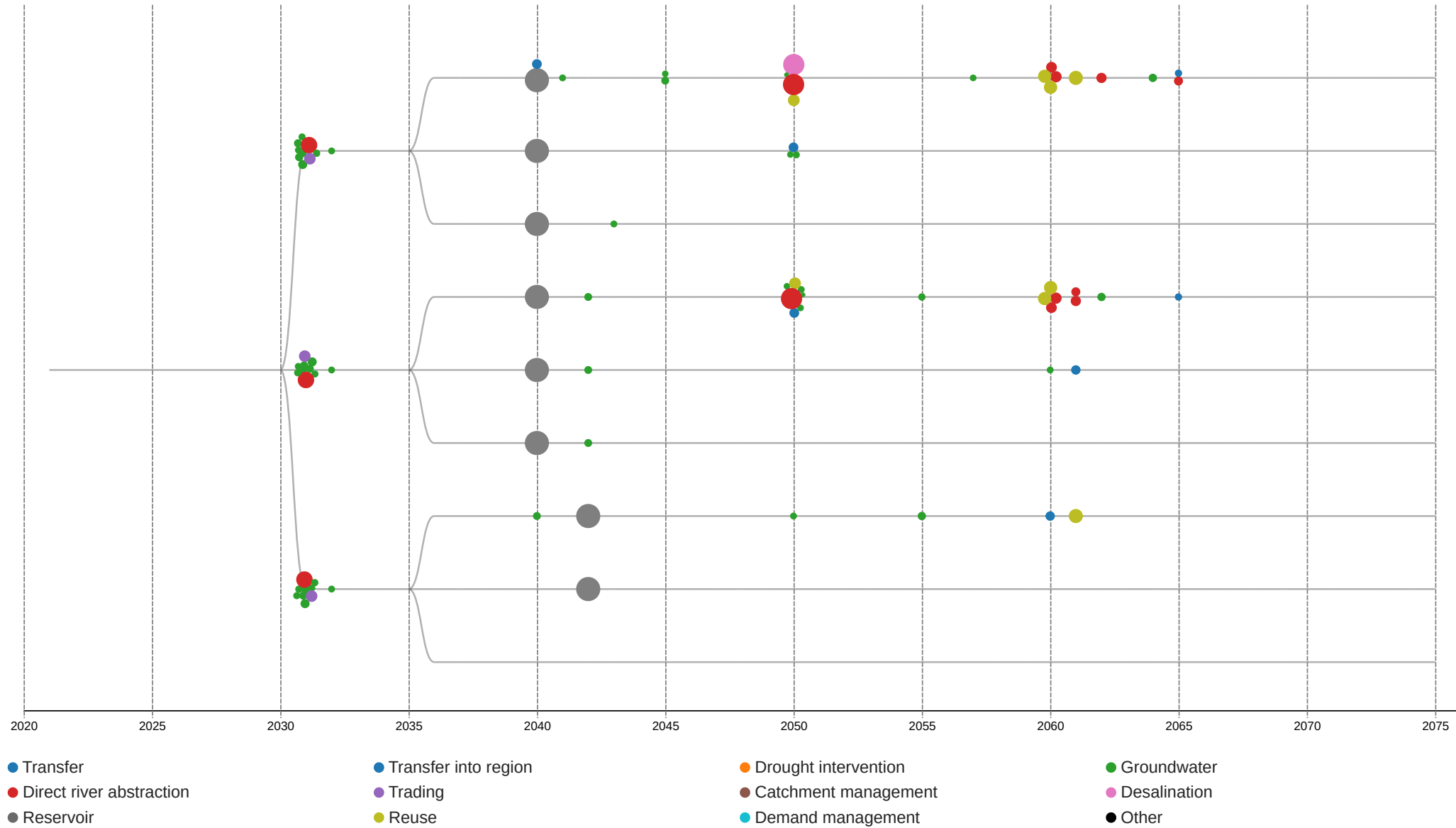
Adaptability

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Adaptability	18.37	20.07	22.35	18.70	19.95	22.02	20.03	21.66	25.35	
A3: Operational complexity and flexibility	8.94	9.51	10.47	9.14	9.45	10.39	9.39	10.03	11.83	
A4: WRZ connectivity	9.37	10.51	11.83	9.52	10.45	11.58	10.60	11.59	13.46	
A7: Customer relations support engagement with demand management	0.05	0.04	0.05	0.04	0.04	0.04	0.04	0.05	0.06	

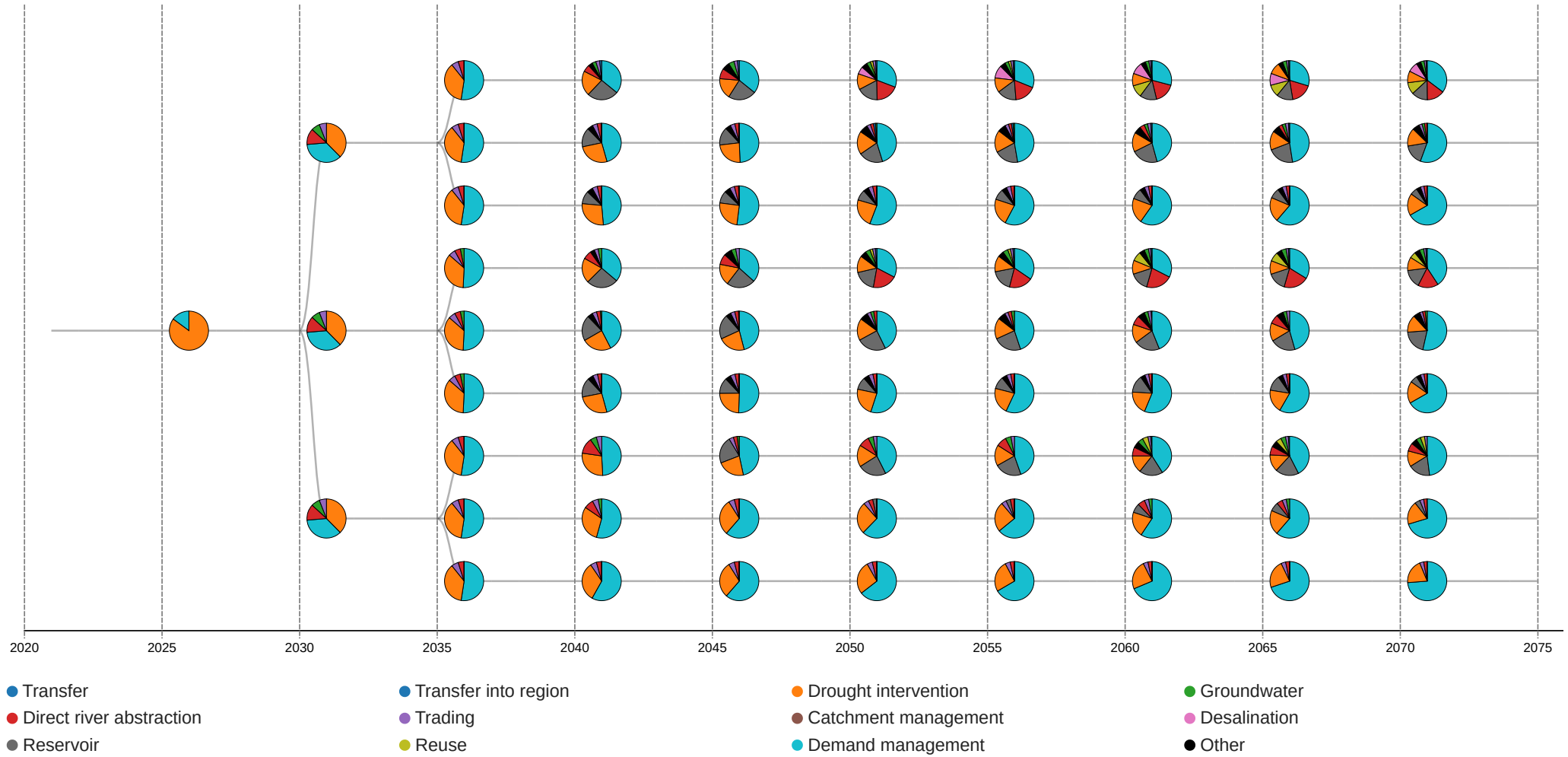
Evolvability

[illegible]

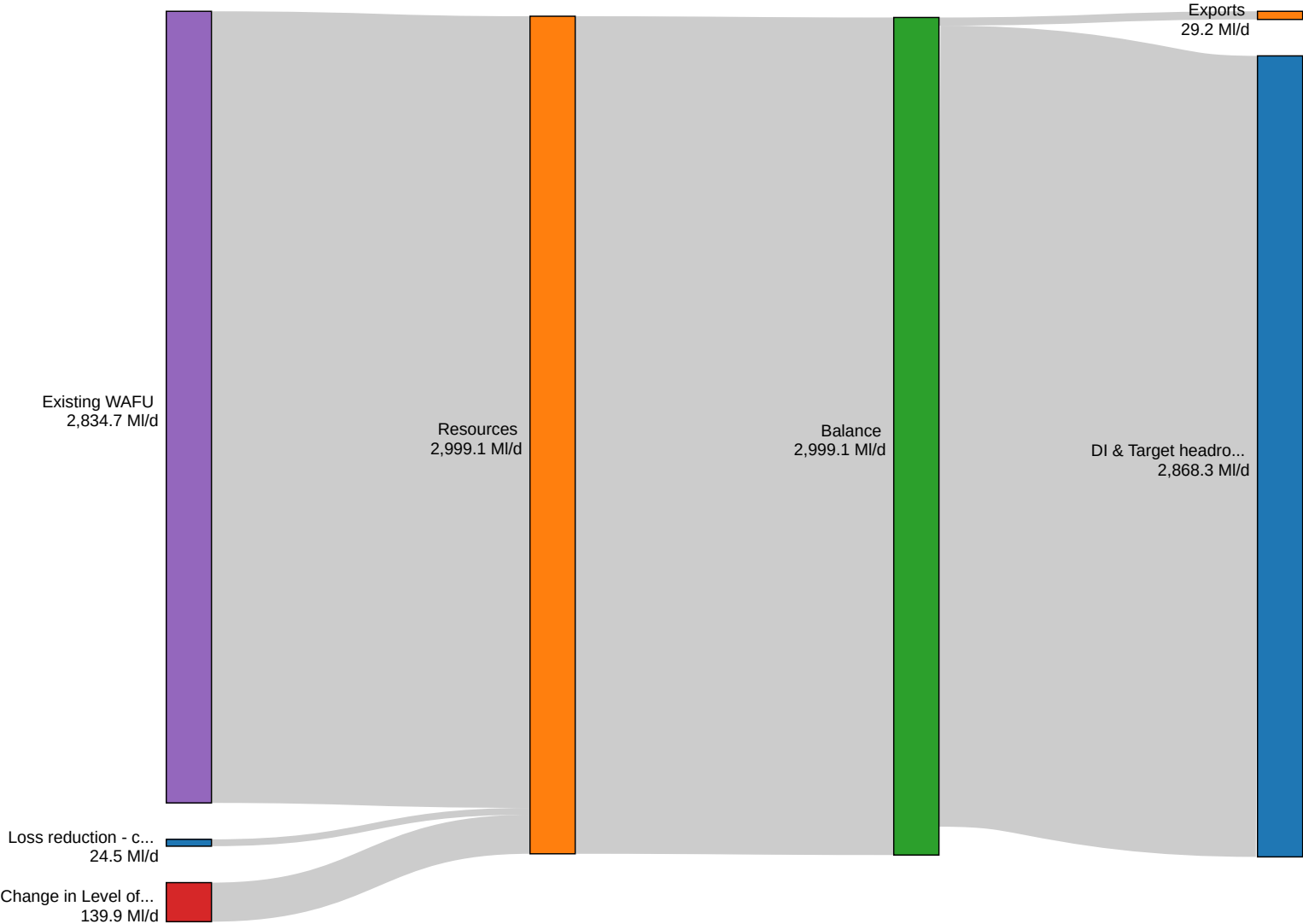
Option Selection (Thames Water)



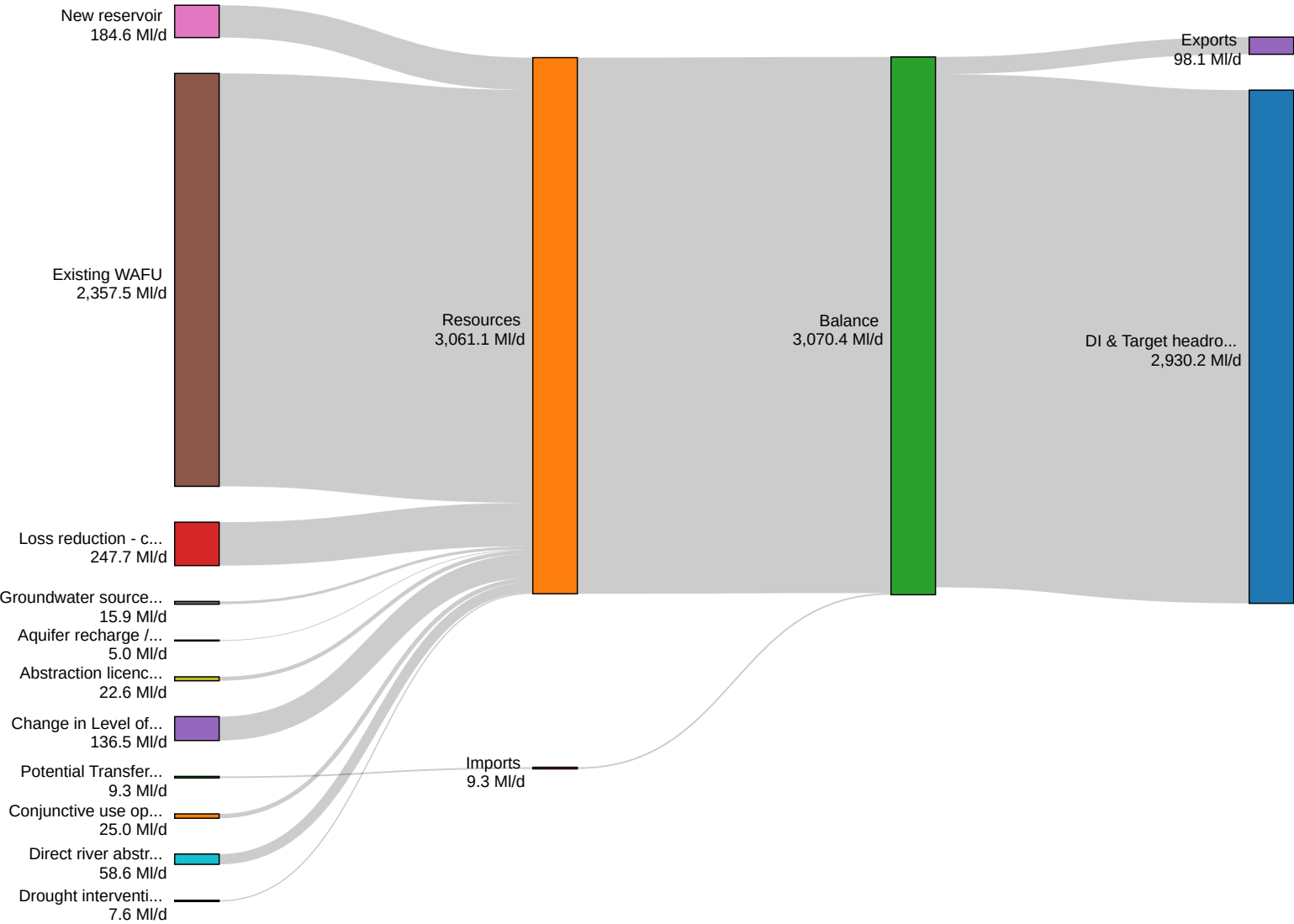
Pie charts show the breakdown of option utilisation by option category.



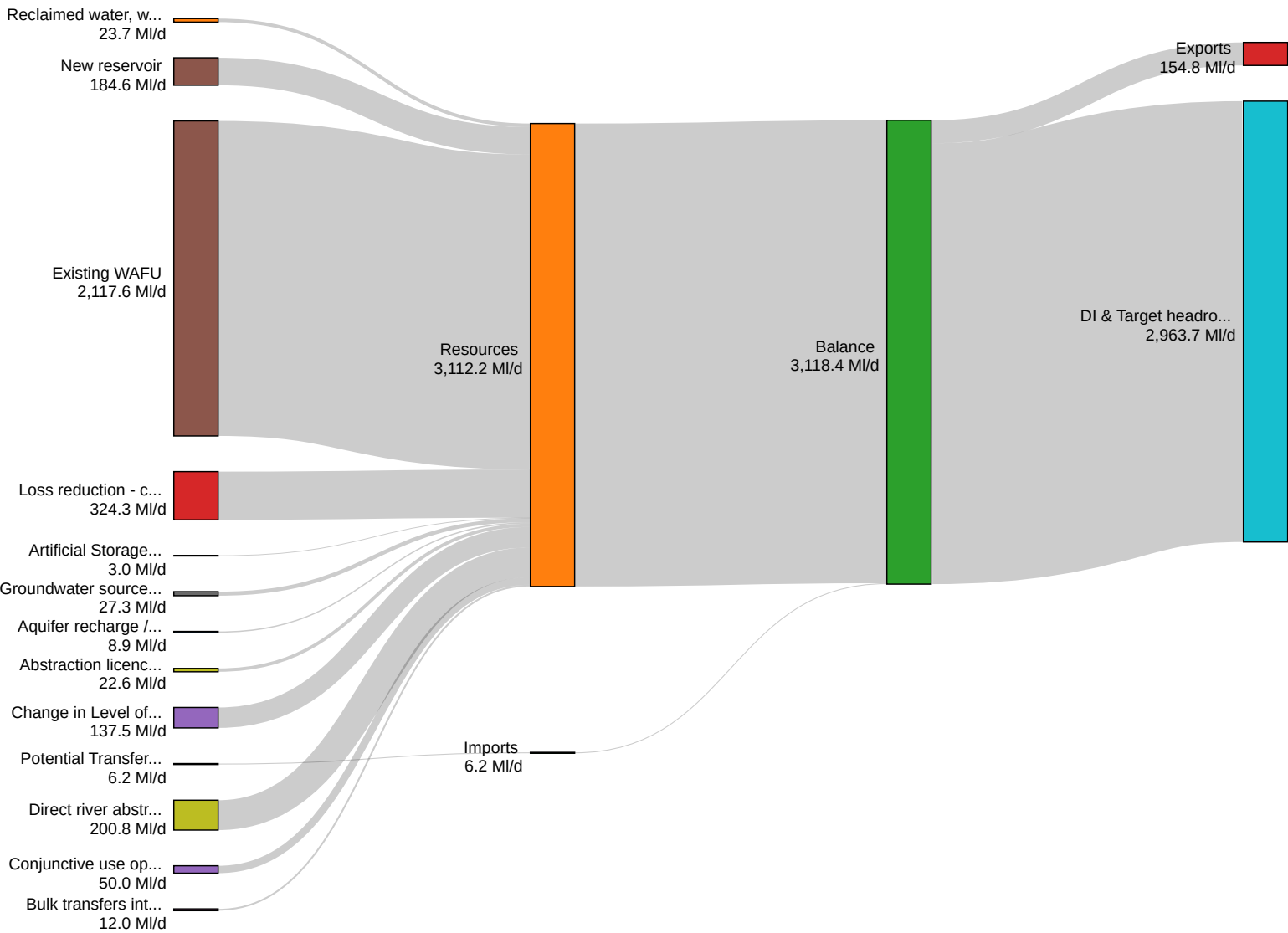
Situation 4 - 2026 (Thames Water)



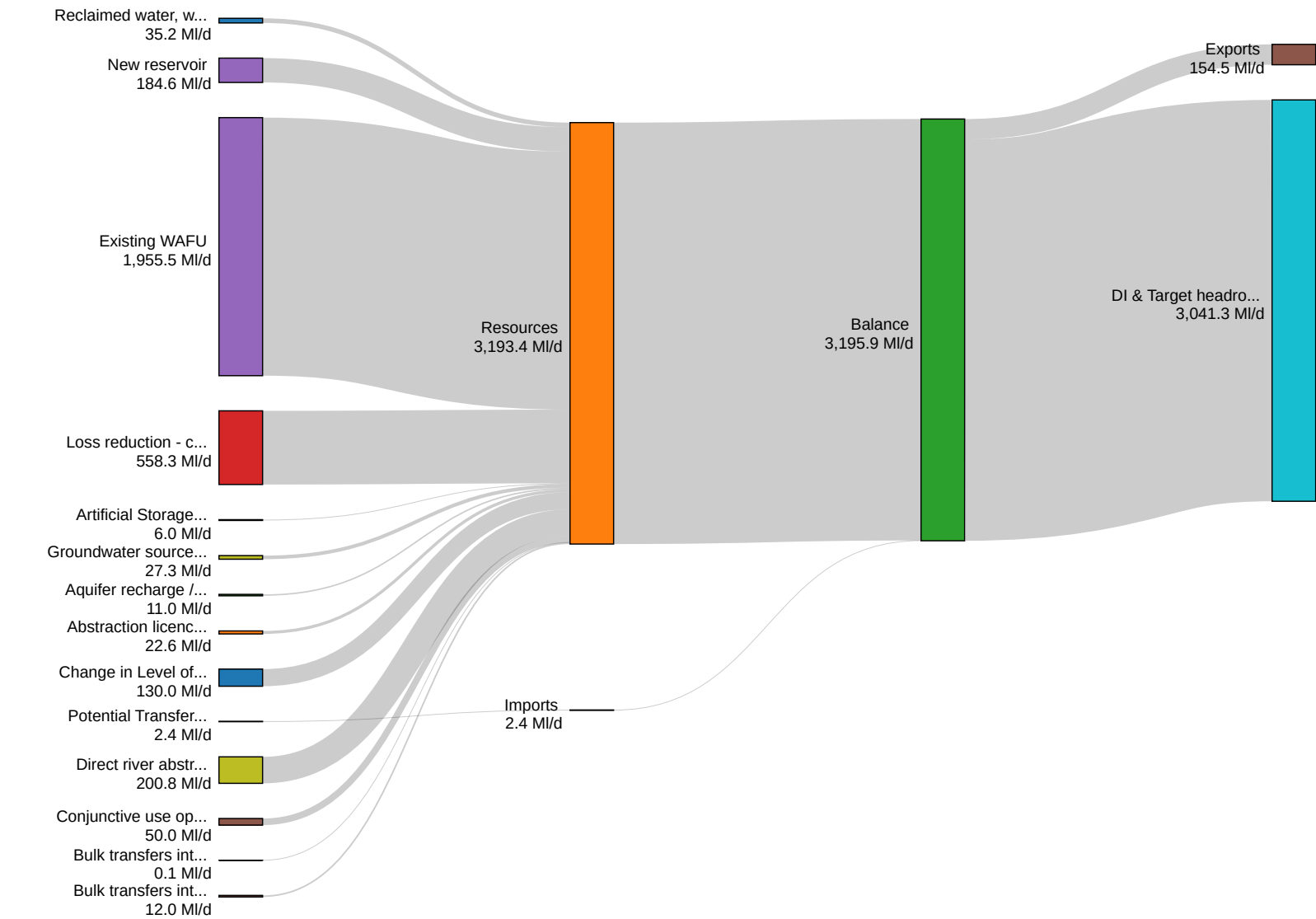
Situation 4 - 2040 (Thames Water)



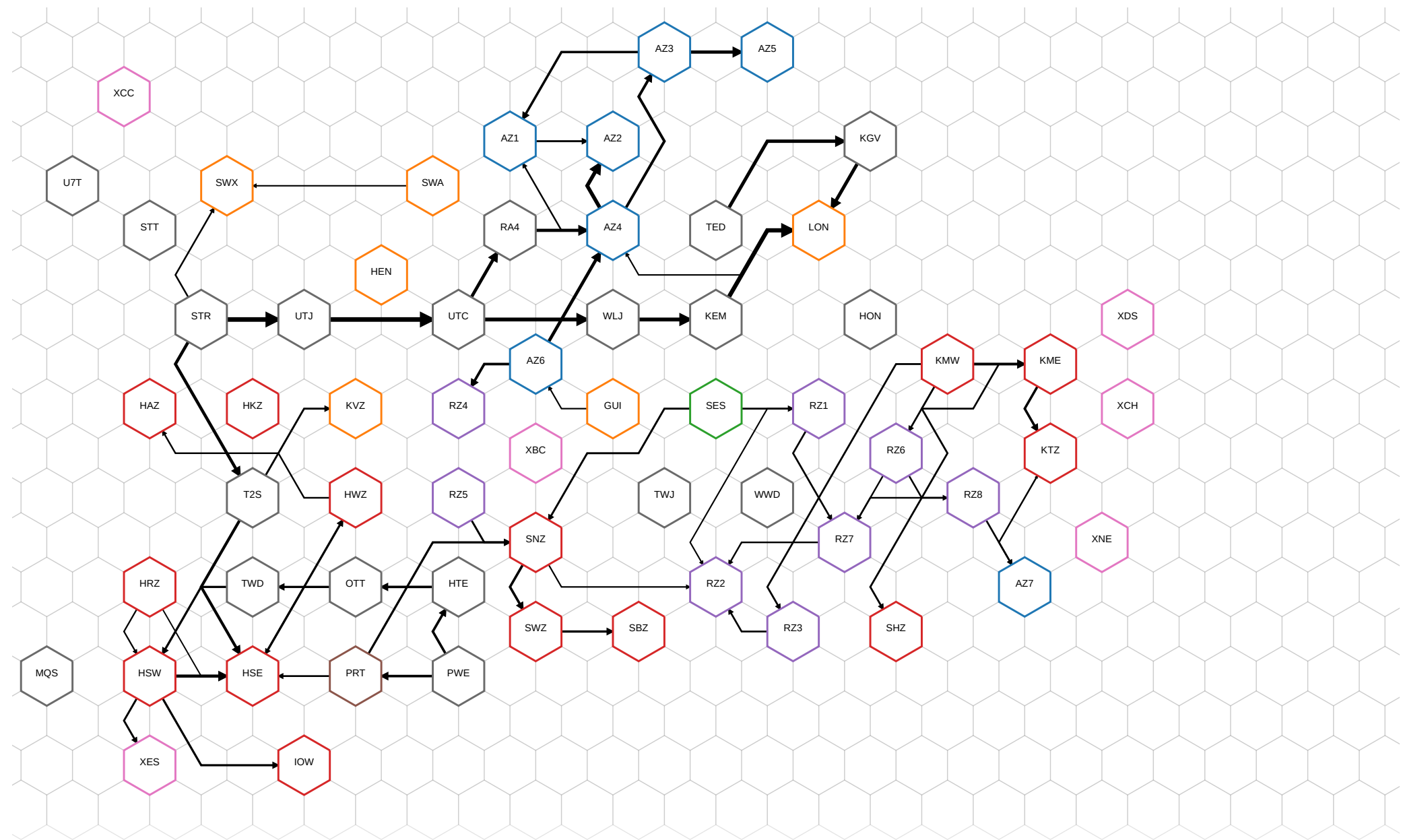
Situation 4 - 2050 (Thames Water)



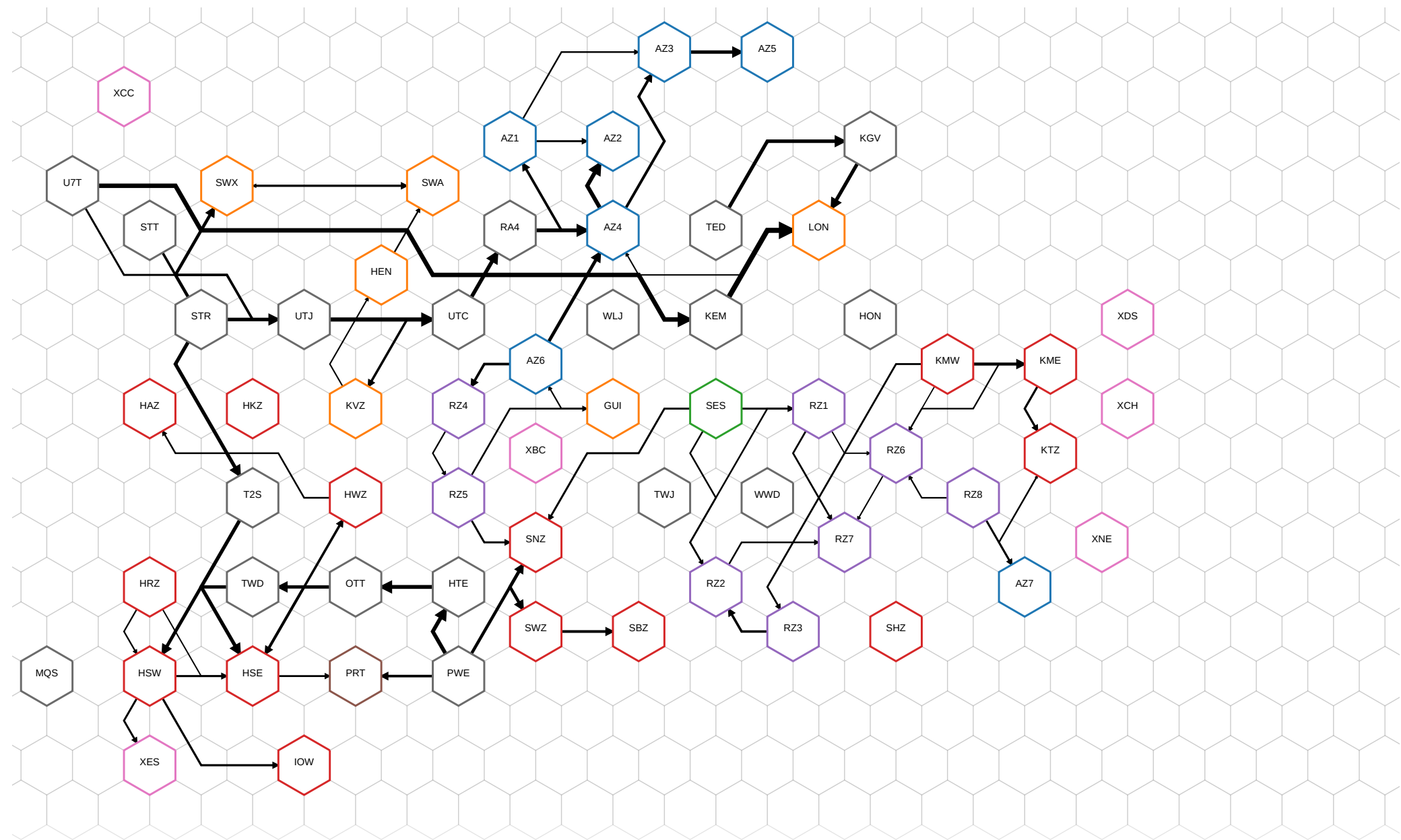
Situation 4 - 2075 (Thames Water)



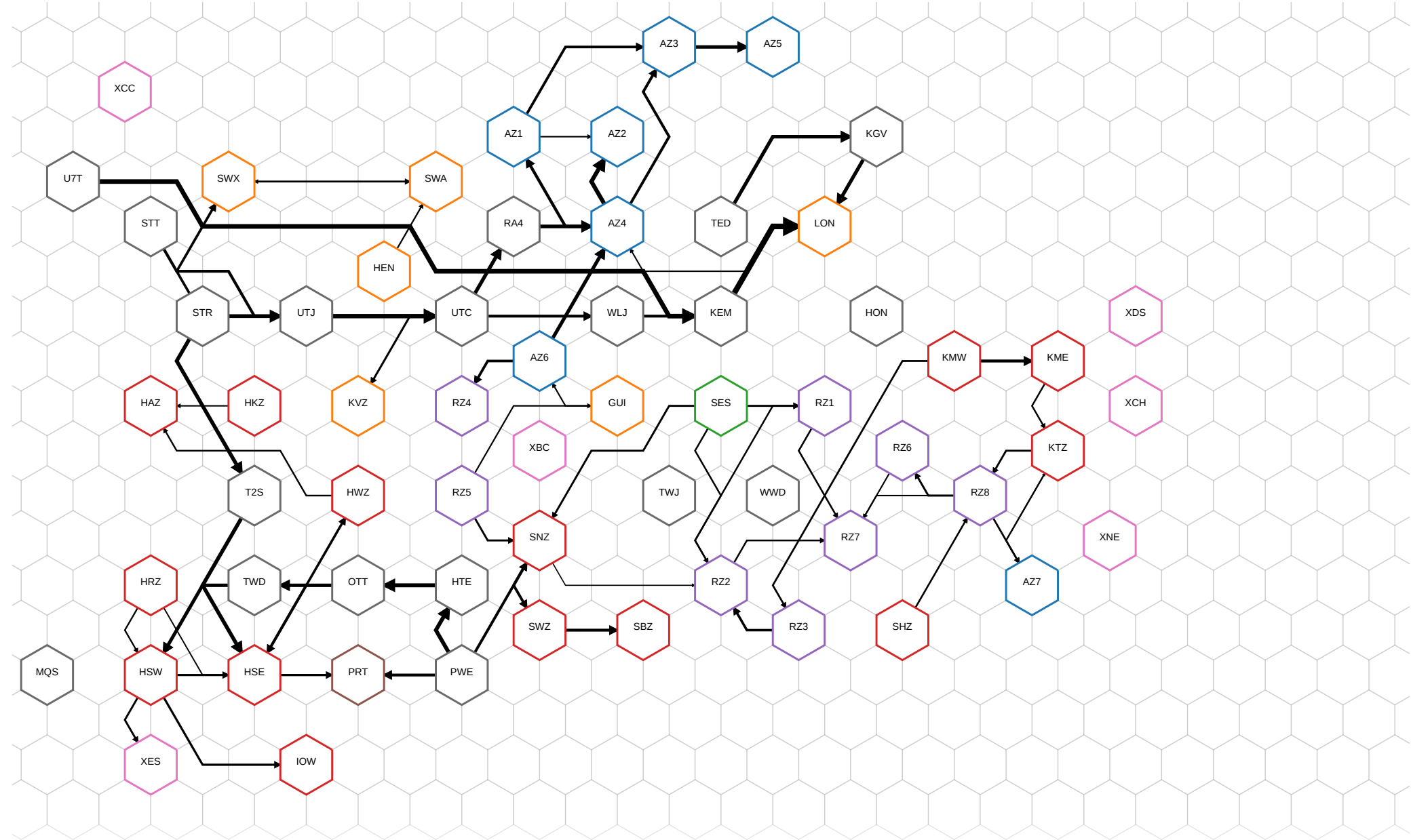
Situation 4 - 2040



Situation 4 - 2050



Situation 4 - 2075



IVM RUN DOSSIER

1:500 DROUGHT RESILIENCE IN 2035

IVM Summary: Thames Water

Metadata

General Settings

Name	st-hybrid2035-dy-w1-tree16.05-options-v37-gov-led-hybridb-drpo-v4-2075
Created at	12/09/2022, 23:47:53
Tree	tree16.05: Root and branch tree 16.05: Stage 1 - Begins Hplan and LOW LCED, Stage 2 - Branches on growth (OxCam1a, Hplan and ONS18c), Stage 3 - Branches on licenced capped environmental destination, climate change and further growth scenarios (Hmax and Hmin) 🔗
Setting name	options-v37-gov-led-hybridb-drpo-v4 🔗
Setting description	Emergency options in HSE, SBZ, and PRT. Use v4 of drought permits and orders (end in 2037).
Optimised discount rate	STPR

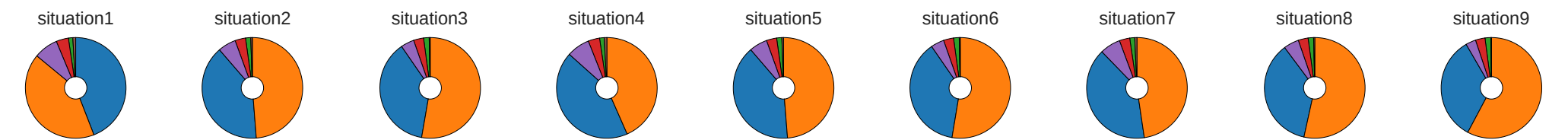
Metrics

Net present value (Cost)

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Cost w/ deficit (STPR)	16,382	13,346	12,126	15,620	13,396	12,202	13,664	11,982	10,932	(£m)
Cost w/o deficit (STPR)	16,382	13,346	12,126	15,620	13,396	12,202	13,664	11,982	10,932	(£m)
Cost w/ deficit (IGEQ)	26,298	20,616	18,346	24,784	20,652	18,477	21,390	18,272	16,346	(£m)
Cost w/o deficit (IGEQ)	26,298	20,616	18,346	24,784	20,652	18,477	21,390	18,272	16,346	(£m)
Cost w/ deficit (LTDR)	18,264	14,742	13,329	17,367	14,791	13,415	15,141	13,195	11,983	(£m)
Cost w/o deficit (LTDR)	18,264	14,742	13,329	17,367	14,791	13,415	15,141	13,195	11,983	(£m)

Cost breakdown (STPR)

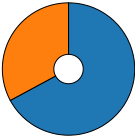
Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Capex	7,225	5,325	4,566	6,751	5,351	4,606	5,477	4,354	3,700	(£m)
Fixed opex	6,859	6,507	6,394	6,778	6,530	6,421	6,511	6,405	6,317	(£m)
Fixed operational carbon	233	223	218	233	224	222	219	211	206	(£m)
Embedded carbon	648	454	390	576	443	394	458	381	337	(£m)
Variable opex	1,268	768	518	1,150	775	519	901	586	353	(£m)
Variable carbon opex	149	69	39	133	73	40	96	45	20	(£m)



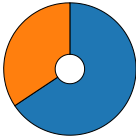
Emissions breakdown

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Capital emissions	4,123,792	2,772,250	2,335,728	3,636,733	2,696,584	2,362,316	2,845,656	2,305,725	1,998,490	(tonnes)
Operational emissions	2,018,803	1,450,390	1,263,072	1,910,657	1,481,980	1,301,266	1,609,908	1,221,300	1,065,572	(tonnes)

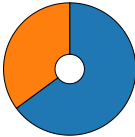
situation1



situation2



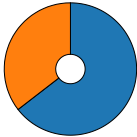
situation3



situation4



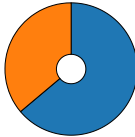
situation5



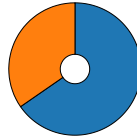
situation6



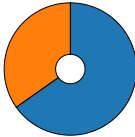
situation7



situation8



situation9



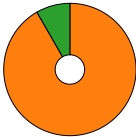
Electricity breakdown

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Generated (on site)	0	0	0	0	0	0	0	0	0	(GWh)
Grid	23,851	13,652	6,802	21,201	14,361	6,637	16,594	11,174	4,535	(GWh)
Renewable	2,322	1,237	467	1,505	1,079	622	1,224	794	122	(GWh)

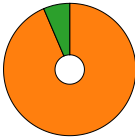
situation1



situation2



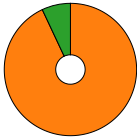
situation3



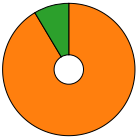
situation4



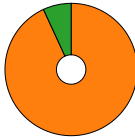
situation5



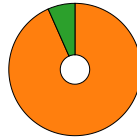
situation6



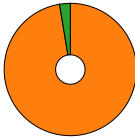
situation7



situation8



situation9



Environmental

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
SEA environmental benefit	86,799.00	80,865.00	78,937.00	86,646.00	81,890.00	80,430.00	81,905.00	78,042.00	76,384.00	
SEA environmental disbenefit	128,089.00	98,886.00	85,443.00	121,544.00	98,426.00	88,895.00	106,460.00	83,879.00	72,066.00	
Natural capital	8,144,825.31	8,732,373.53	12,030,433.28	7,042,286.13	9,028,701.73	12,035,963.75	11,940,180.69	15,142,817.03	18,226,855.12	
Bio-diversity net gain	-268,238.00	-158,424.00	-130,496.00	-240,516.00	-132,760.00	-130,596.00	-212,071.00	-165,929.00	-149,789.00	

Social

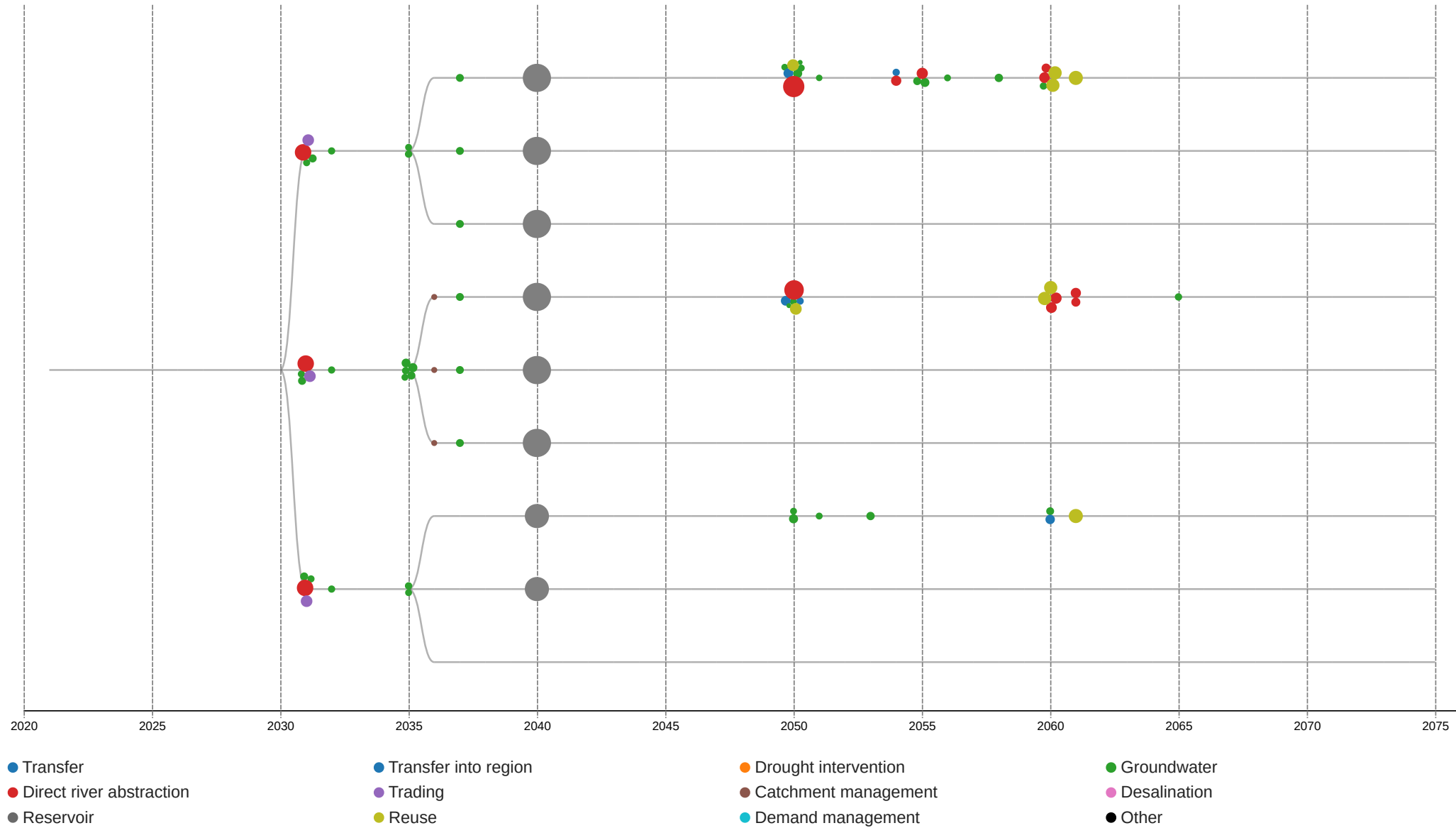
Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Customer preference	33,323.00	31,245.00	30,513.00	33,171.00	31,711.00	31,148.00	31,801.00	30,326.00	29,710.00	

Reliability

[illegible]

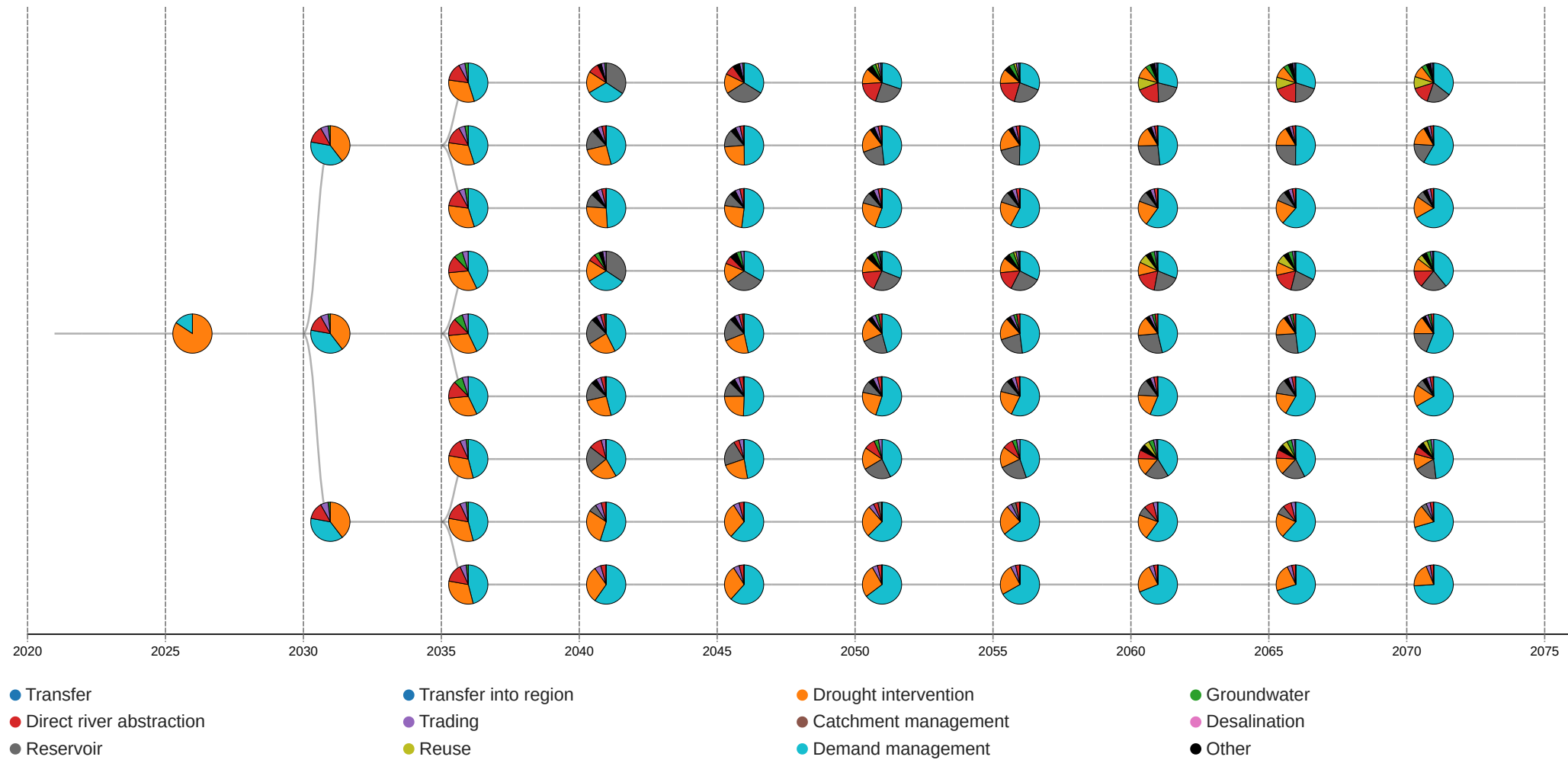
Adaptability										
Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Adaptability	18.97	20.77	22.95	19.53	20.69	22.89	20.35	22.03	25.80	
A3: Operational complexity and flexibility	9.30	9.94	10.92	9.45	9.95	10.95	9.36	9.99	11.63	
A4: WRZ connectivity	9.61	10.81	12.01	10.03	10.68	11.88	10.98	12.03	14.15	
A7: Customer relations support engagement with demand management	0.05	0.02	0.02	0.05	0.06	0.06	0.02	0.02	0.02	
Evolvability										
Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Evolvability	27.20	27.77	30.11	27.10	27.82	30.26	27.31	29.22	33.69	
E1: Scaleability and modularity of proposed changes	10.92	11.55	12.52	10.93	11.54	12.56	11.52	12.43	14.32	
E2: Intervention lead times	7.43	6.97	7.54	7.31	6.99	7.57	6.90	7.36	8.50	
E3: Reliance on external bodies to deliver changes	8.75	9.22	10.02	8.79	9.21	10.06	8.85	9.38	10.83	
E5: Collaborative land management	0.10	0.04	0.04	0.08	0.08	0.08	0.04	0.04	0.04	

Option Selection (Thames Water)

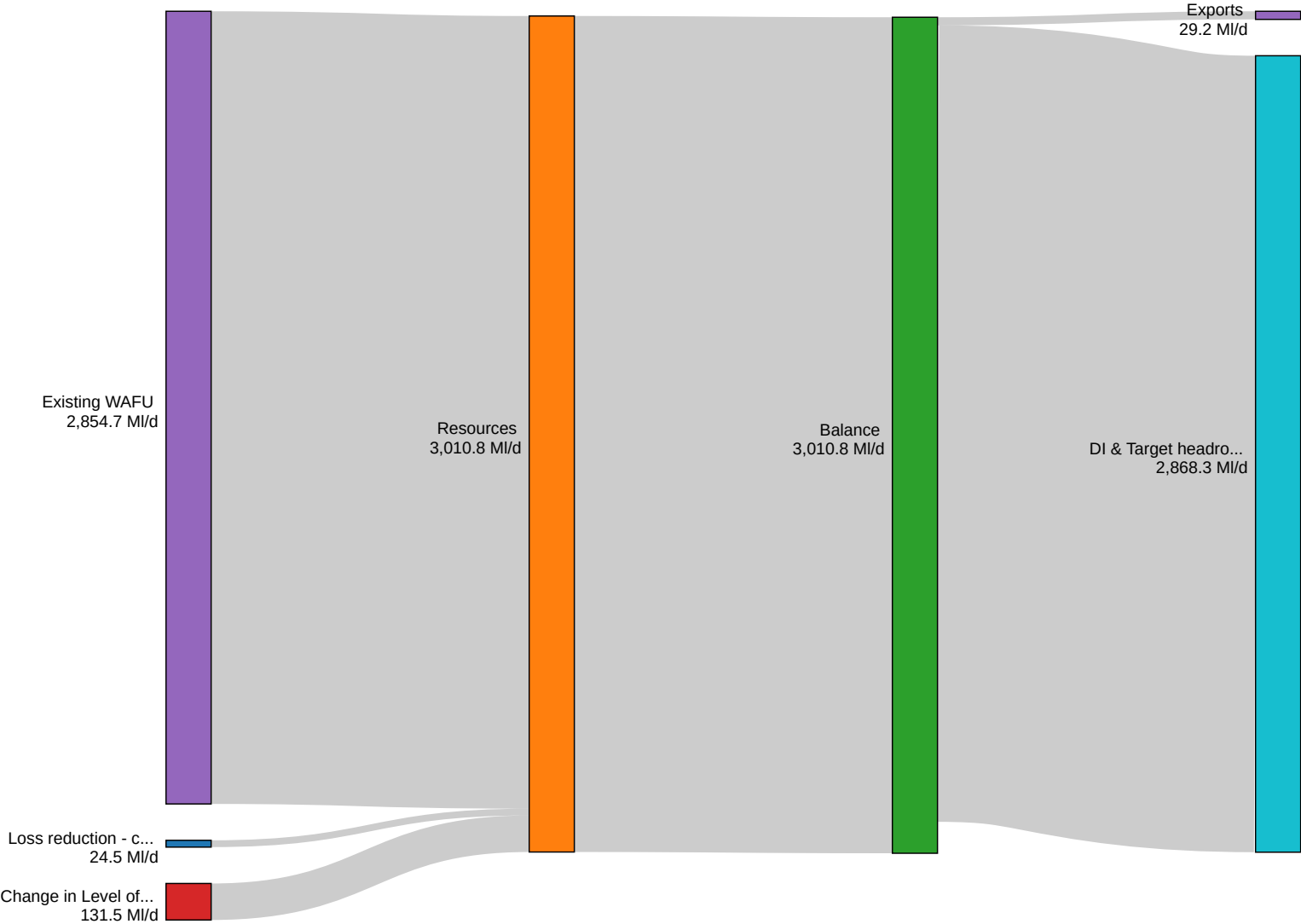


Utilisation (Thames Water)

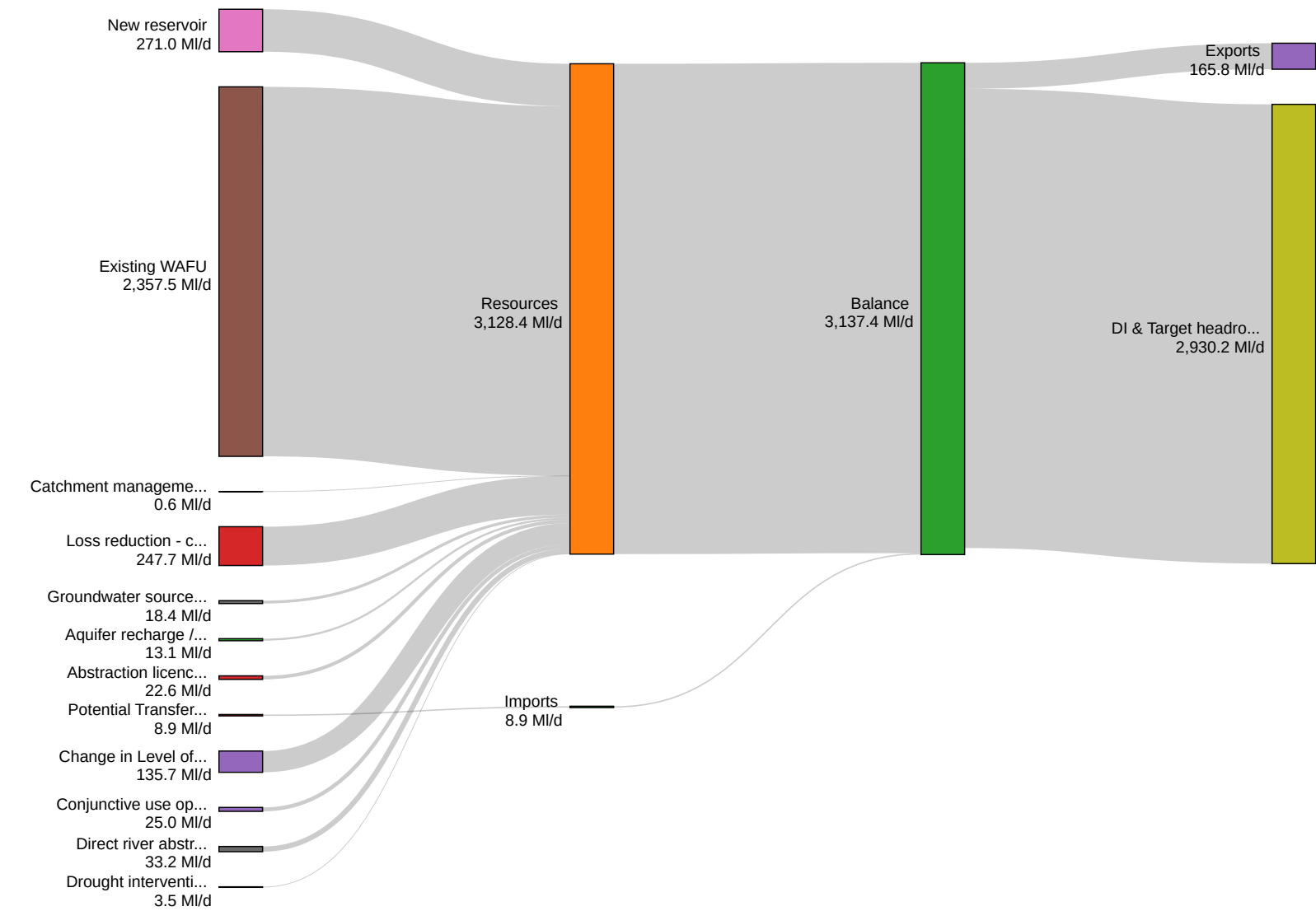
Pie charts show the breakdown of option utilisation by option category.



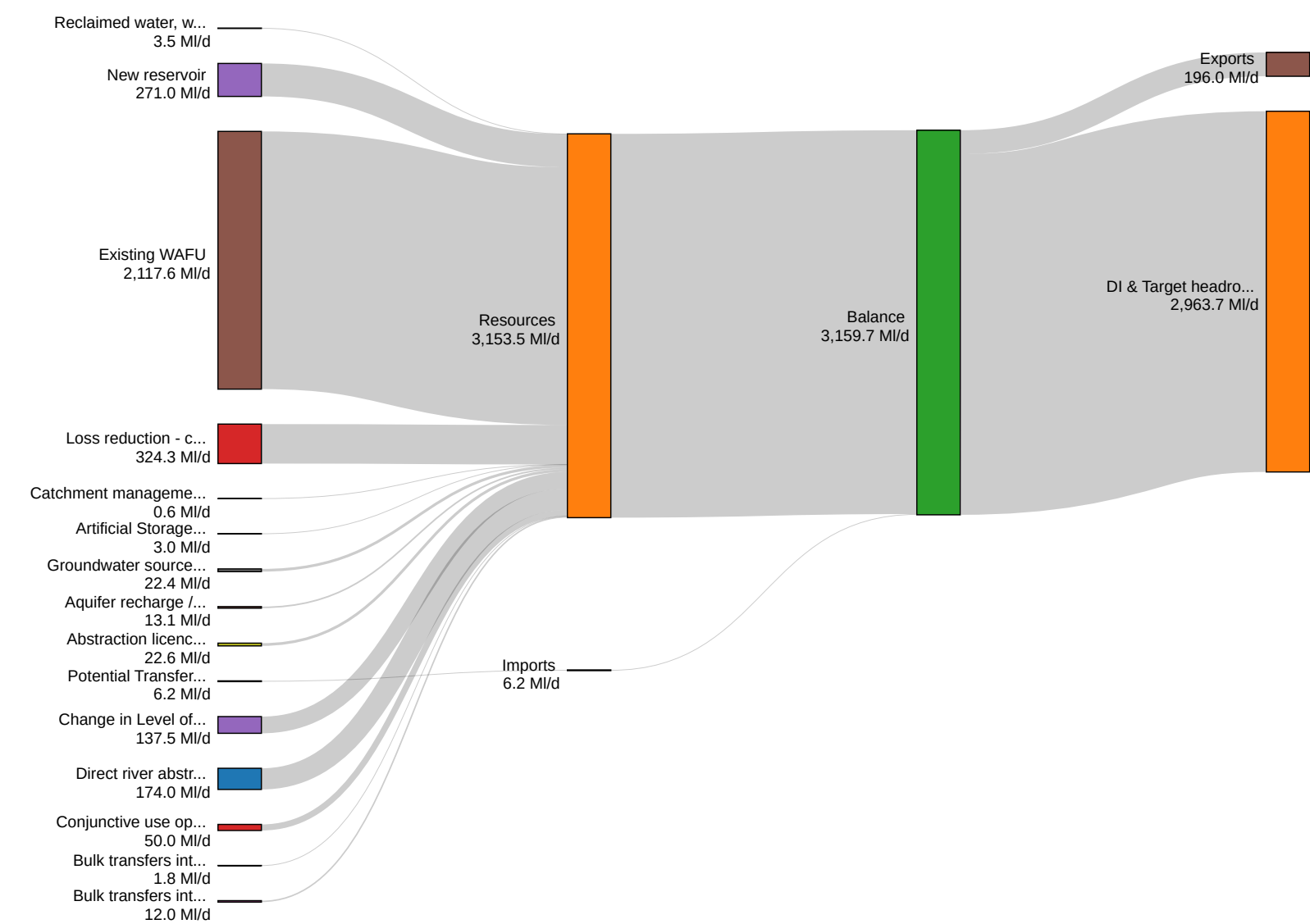
Situation 4 - 2026 (Thames Water)



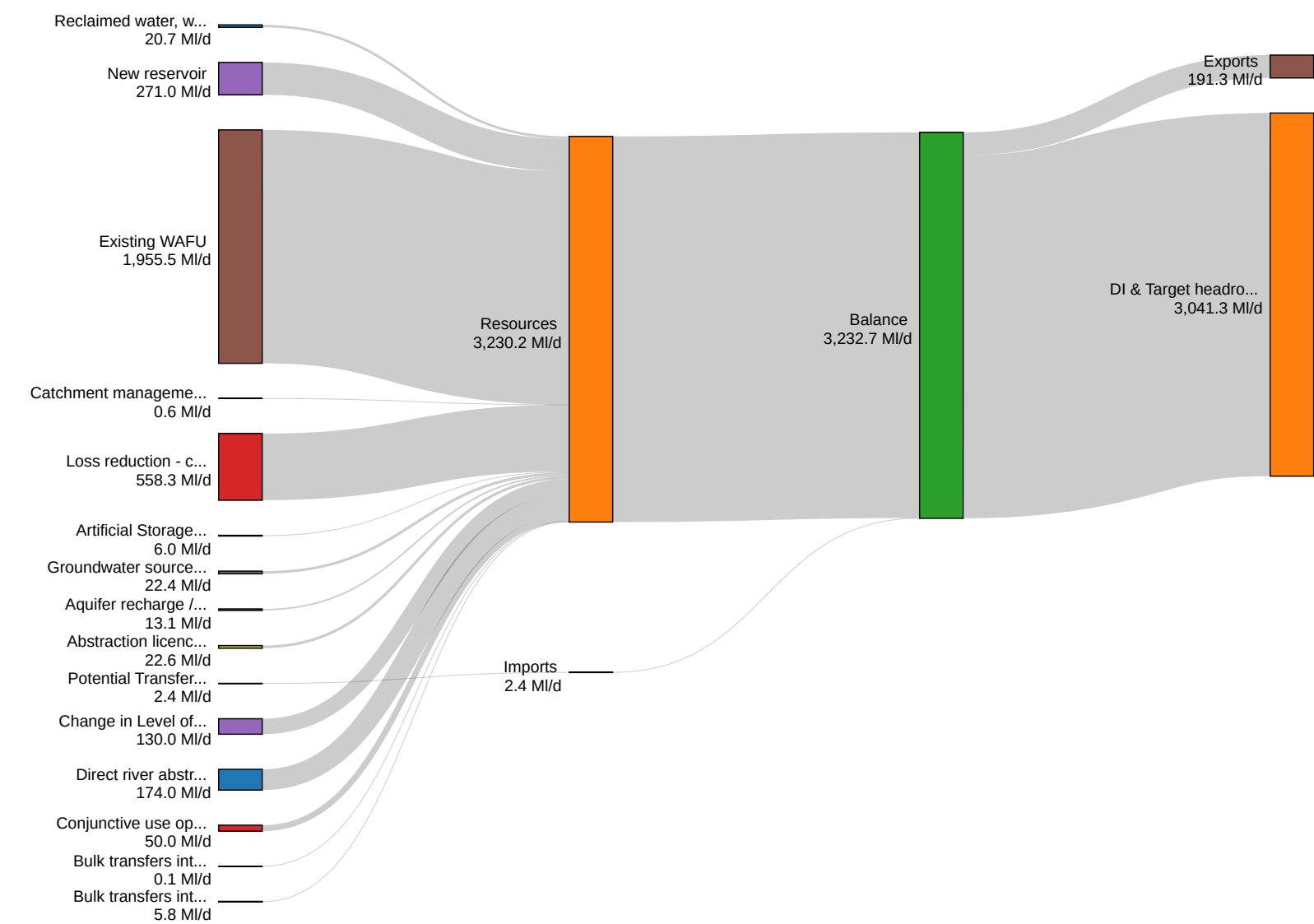
Situation 4 - 2040 (Thames Water)



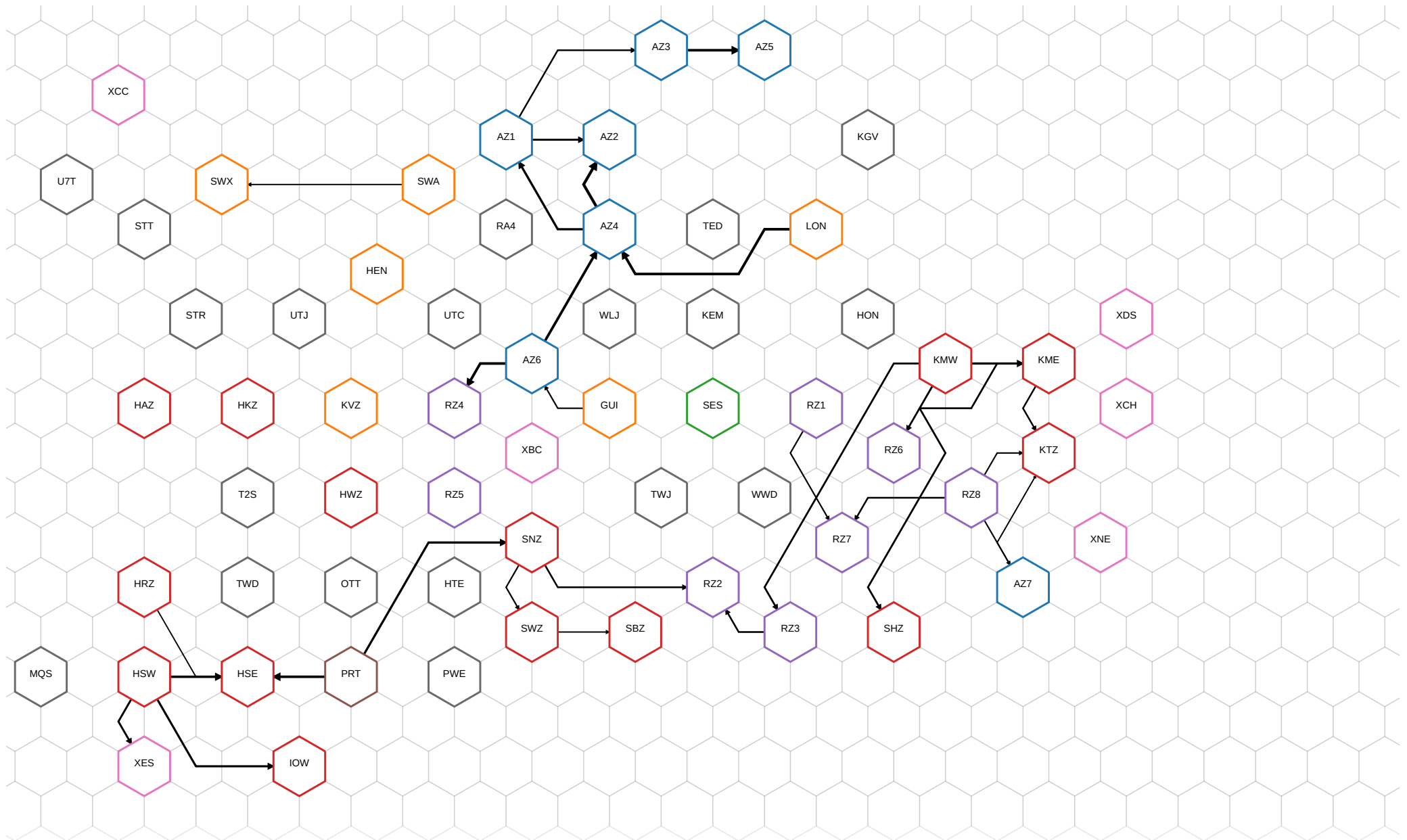
Situation 4 - 2050 (Thames Water)



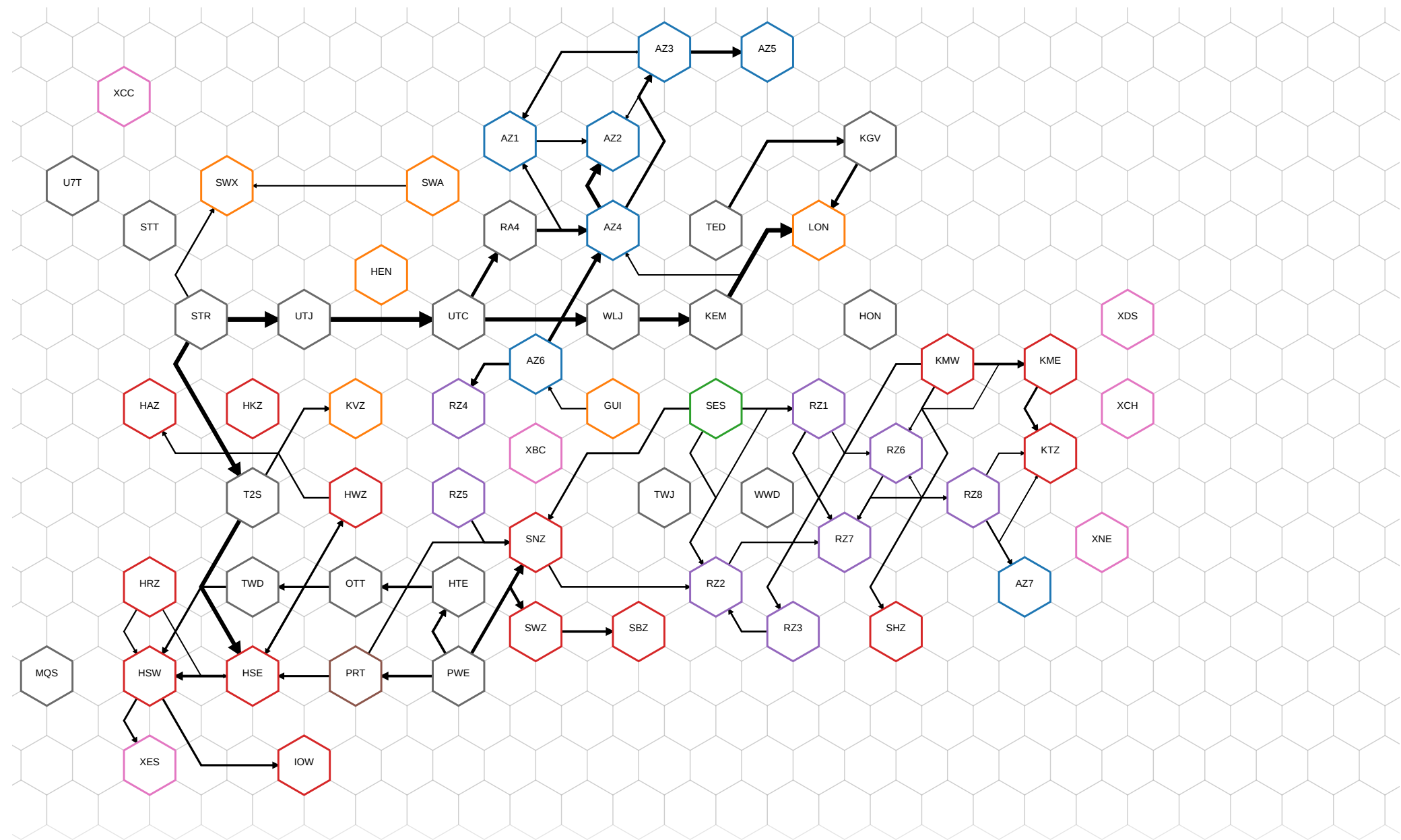
Situation 4 - 2075 (Thames Water)



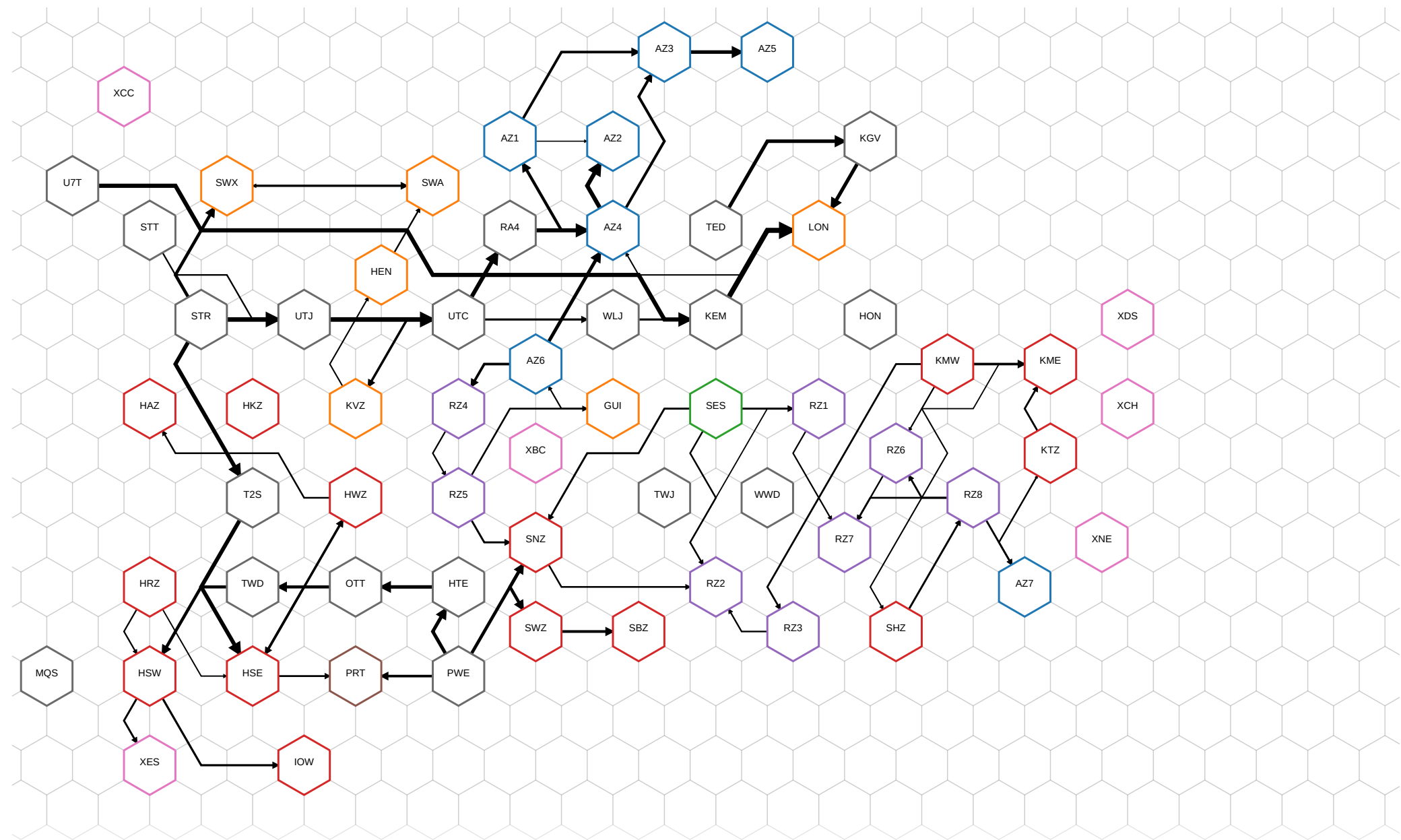
Situation 4 - 2026



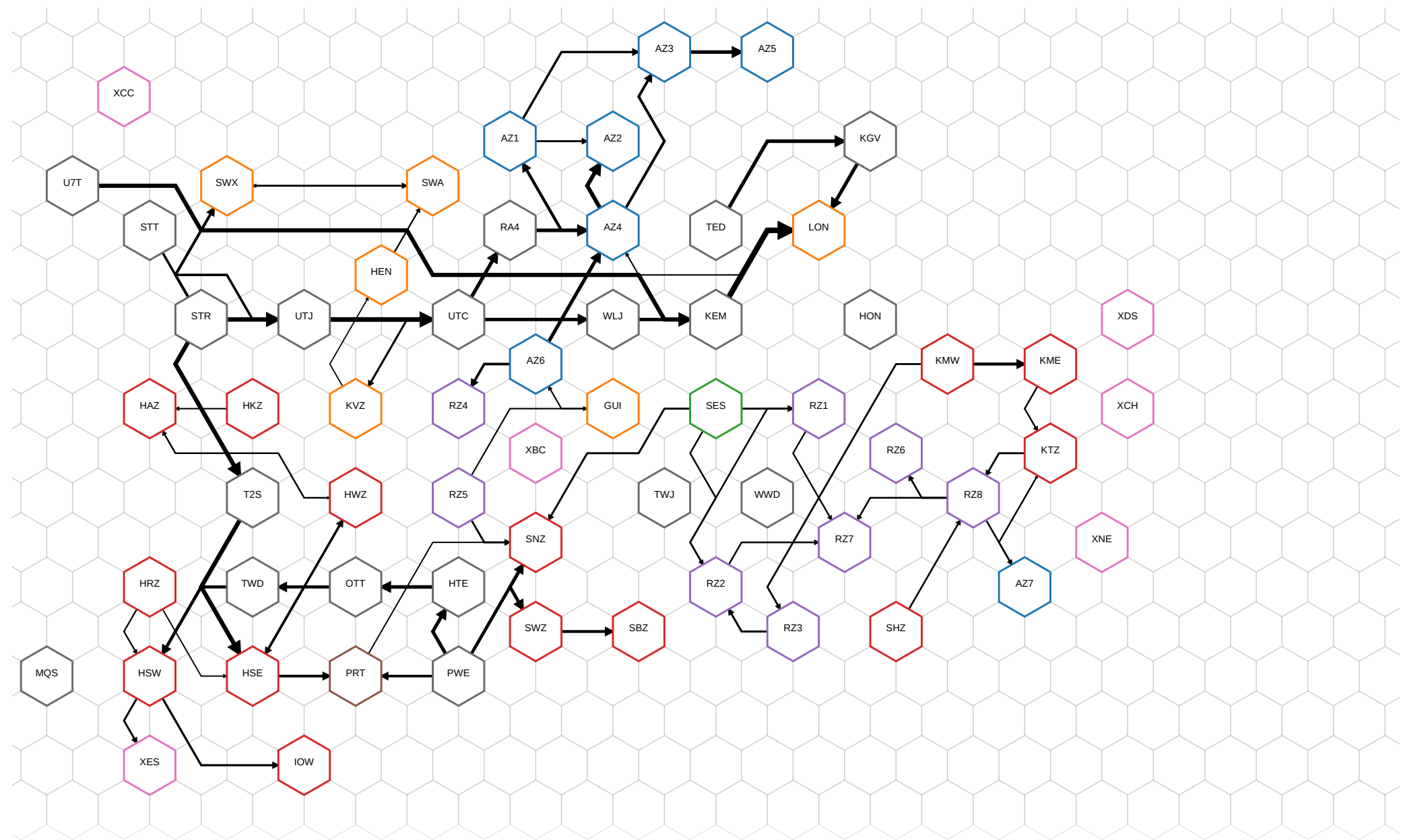
Situation 4 - 2040



Situation 4 - 2050



Situation 4 - 2075



IVM RUN DOSSIER

1:500 DROUGHT RESILIENCE IN 2045

IVM Summary: Thames Water

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Metadata

General Settings

Name	st-hybrid2045-dy-w1-tree16.05-options-v37-gov-led-hybridb-drpo-v3-2075
Created at	12/09/2022, 23:48:01
Tree	tree16.05: Root and branch tree 16.05: Stage 1 - Begins Hplan and LOW LCED, Stage 2 - Branches on growth (OxCam1a, Hplan and ONS18c), Stage 3 - Branches on licenced capped environmental destination, climate change and further growth scenarios (Hmax and Hmin) ↗
Setting name	options-v37-gov-led-hybridb-drpo-v3 ↗
Setting description	Emergency options in HSE, SBZ, and PRT. Use v3 of drought permits and orders (end in 2047).
Optimised discount rate	STPR

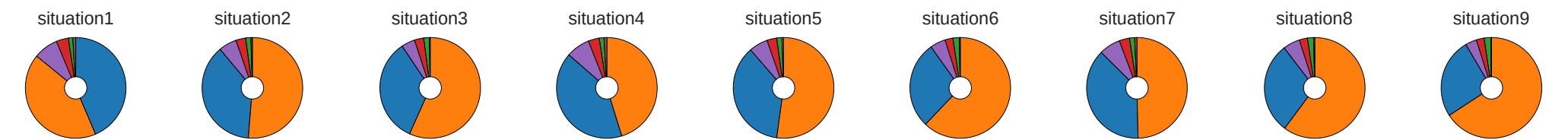
Metrics

Net present value (Cost)

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Cost w/ deficit (STPR)	15,995	12,541	11,187	14,960	12,378	10,133	13,055	10,526	9,486	(£m)
Cost w/o deficit (STPR)	15,995	12,541	11,187	14,960	12,378	10,133	13,055	10,526	9,486	(£m)
Cost w/ deficit (IGEQ)	25,823	19,351	16,870	23,993	19,332	15,245	20,629	16,028	14,081	(£m)
Cost w/o deficit (IGEQ)	25,823	19,351	16,870	23,993	19,332	15,245	20,629	16,028	14,081	(£m)
Cost w/ deficit (LTDR)	17,858	13,850	12,287	16,677	13,708	11,121	14,499	11,584	10,378	(£m)
Cost w/o deficit (LTDR)	17,858	13,850	12,287	16,677	13,708	11,121	14,499	11,584	10,378	(£m)

Cost breakdown (STPR)

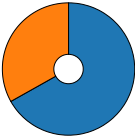
Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Capex	6,967	4,720	3,792	6,165	4,511	2,841	4,937	3,101	2,440	(£m)
Fixed opex	6,769	6,431	6,344	6,759	6,459	6,293	6,480	6,333	6,242	(£m)
Fixed operational carbon	230	215	207	229	214	209	218	210	206	(£m)
Embedded carbon	627	396	333	530	387	260	433	279	236	(£m)
Variable opex	1,255	721	484	1,137	744	499	891	565	342	(£m)
Variable carbon opex	146	58	27	139	63	30	95	38	20	(£m)



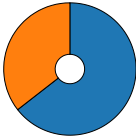
Emissions breakdown

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Capital emissions	4,034,528	2,427,838	1,990,050	3,402,288	2,408,801	1,523,958	2,746,749	1,664,631	1,369,403	(tonnes)
Operational emissions	1,999,558	1,337,434	1,109,962	1,921,003	1,359,081	1,148,854	1,594,612	1,180,973	1,069,073	(tonnes)

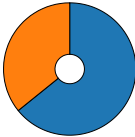
situation1



situation2



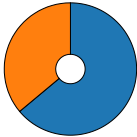
situation3



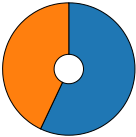
situation4



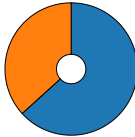
situation5



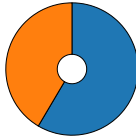
situation6



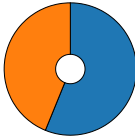
situation7



situation8



situation9



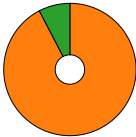
Electricity breakdown

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Generated (on site)	0	0	0	0	0	0	0	0	0	(GWh)
Grid	24,010	12,499	6,494	21,494	13,740	6,393	16,004	10,136	4,603	(GWh)
Renewable	2,020	1,035	437	1,467	1,068	563	1,194	722	115	(GWh)

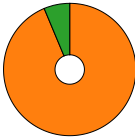
situation1



situation2



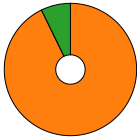
situation3



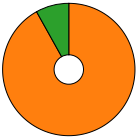
situation4



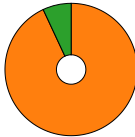
situation5



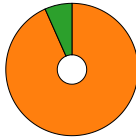
situation6



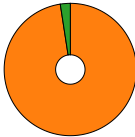
situation7



situation8



situation9



Environmental

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
SEA environmental benefit	85,806.00	79,318.00	77,852.00	85,294.00	79,865.00	75,645.00	82,027.00	76,473.00	74,092.00	
SEA environmental disbenefit	118,915.00	82,034.00	75,011.00	116,252.00	94,652.00	77,715.00	102,757.00	79,651.00	66,496.00	
Natural capital	7,588,319.64	8,538,049.84	8,909,713.12	6,638,085.73	10,344,139.27	7,805,513.12	10,947,802.85	8,762,276.83	13,760,220.81	
Bio-diversity net gain	-233,561.00	-135,284.00	-101,589.00	-233,651.00	-217,675.00	-189,615.00	-216,194.00	-190,356.00	-182,824.00	

Social

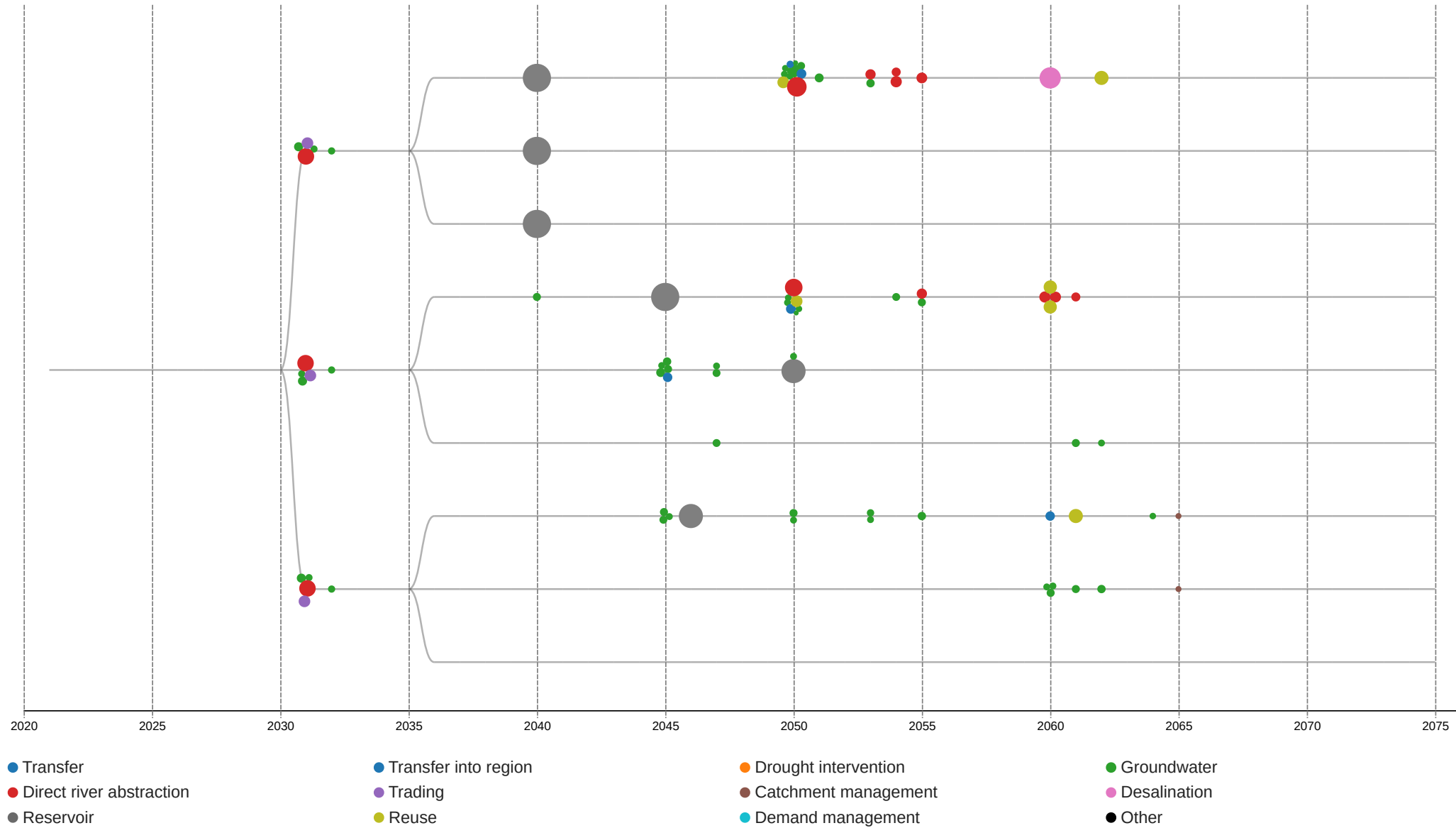
Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Customer preference	32,508.00	30,194.00	29,763.00	32,493.00	30,786.00	29,790.00	31,576.00	29,941.00	29,100.00	

Reliability

[illegible]

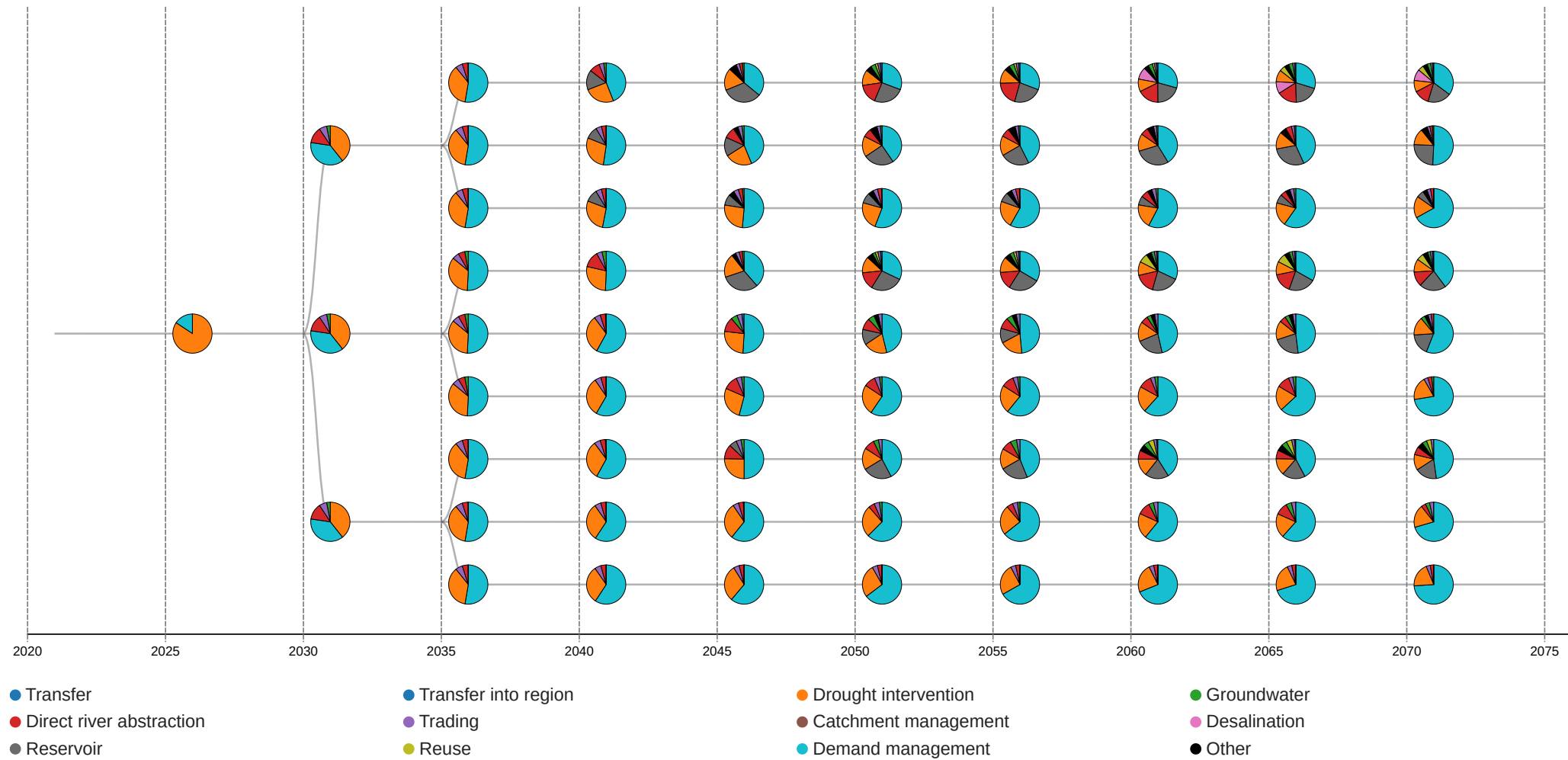
Adaptability										
Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Adaptability	18.27	19.82	19.79	18.56	18.88	17.87	19.68	18.42	21.15	
A3: Operational complexity and flexibility	9.04	9.46	10.12	9.16	8.95	8.73	9.26	8.89	10.20	
A4: WRZ connectivity	9.20	10.34	9.65	9.36	9.91	9.12	10.36	9.46	10.93	
A7: Customer relations support engagement with demand management	0.04	0.02	0.02	0.04	0.02	0.02	0.06	0.07	0.02	
Evolvability										
Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Evolvability	26.53	26.58	28.06	26.63	26.66	26.99	27.35	27.62	31.58	
E1: Scaleability and modularity of proposed changes	10.76	11.01	11.68	10.81	11.31	11.50	11.54	11.78	13.50	
E2: Intervention lead times	7.20	6.78	7.14	7.19	6.80	6.89	6.94	6.99	8.02	
E3: Reliance on external bodies to deliver changes	8.50	8.75	9.21	8.56	8.51	8.56	8.79	8.76	10.02	
E5: Collaborative land management	0.07	0.04	0.04	0.07	0.04	0.04	0.08	0.08	0.04	

Option Selection (Thames Water)

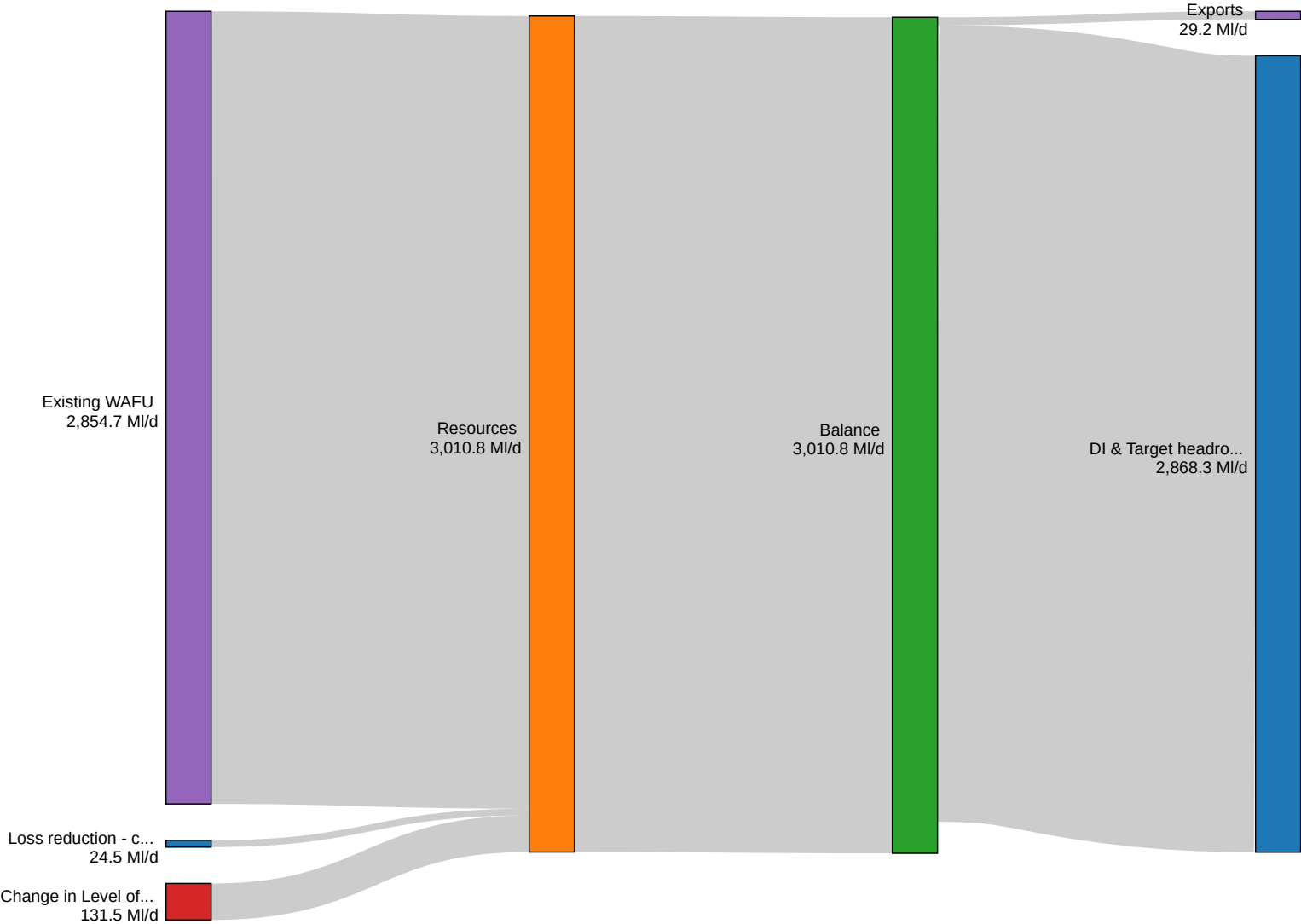


Utilisation (Thames Water)

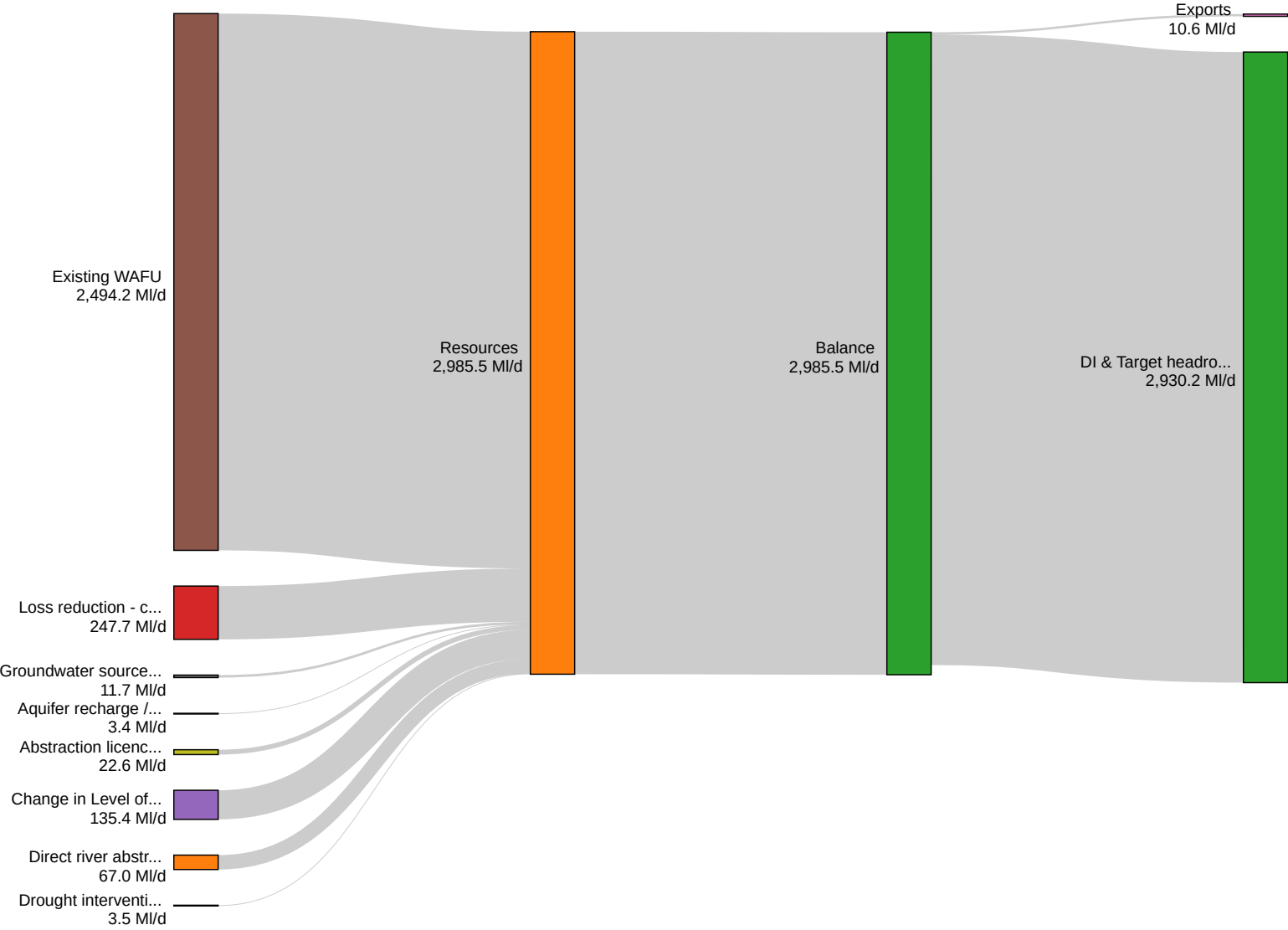
Pie charts show the breakdown of option utilisation by option category.



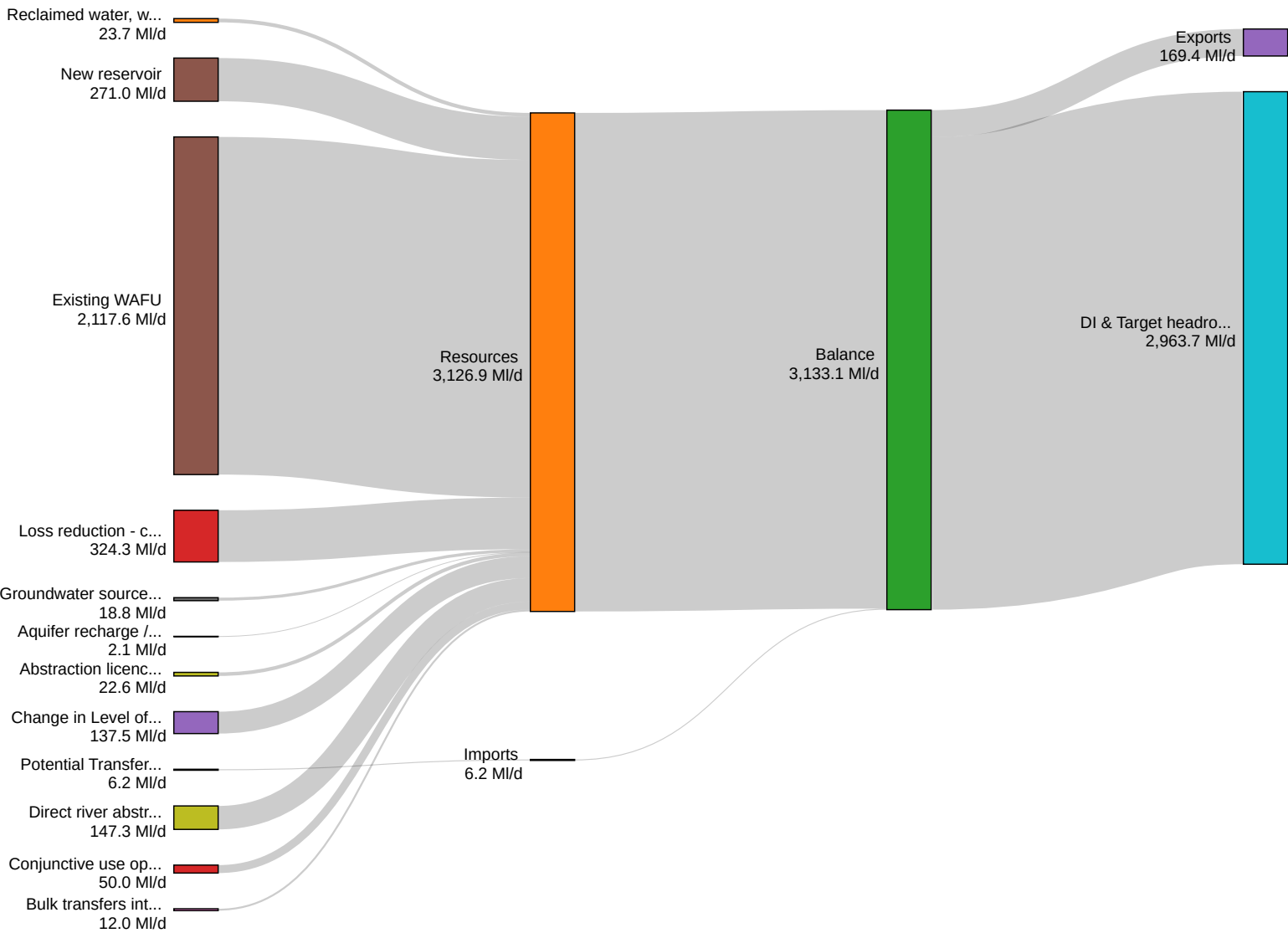
Situation 4 - 2026 (Thames Water)



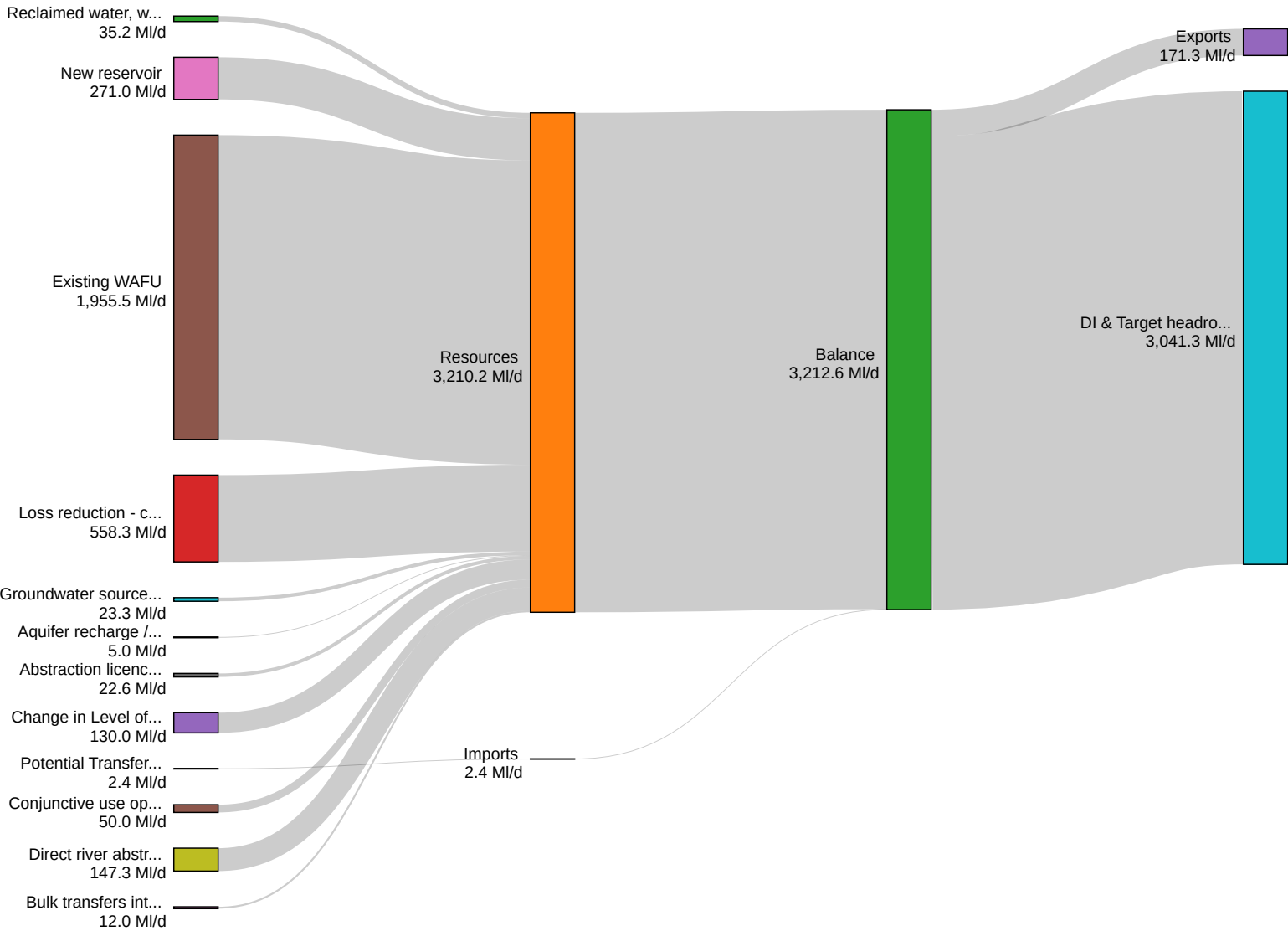
Situation 4 - 2040 (Thames Water)



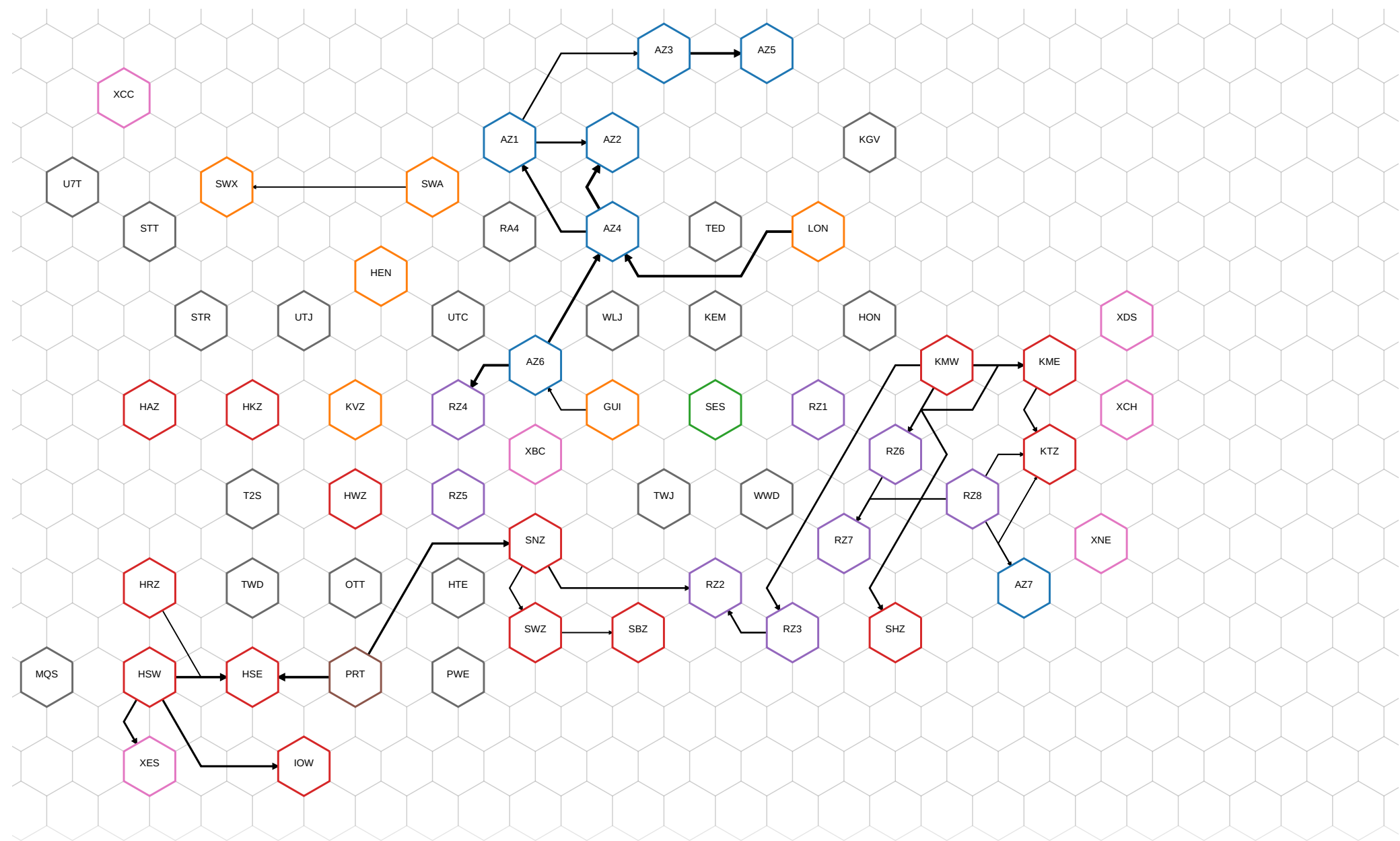
Situation 4 - 2050 (Thames Water)



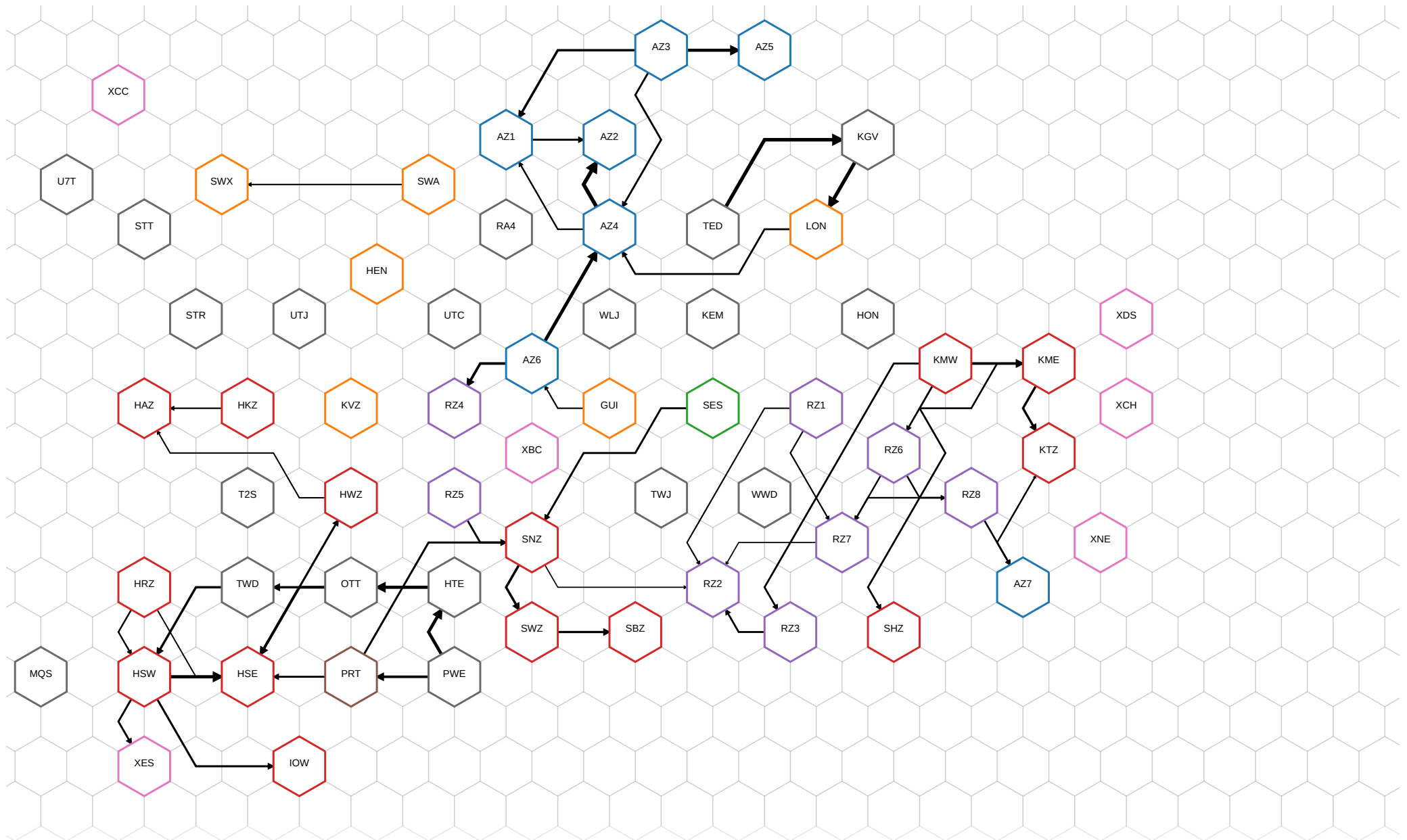
Situation 4 - 2075 (Thames Water)



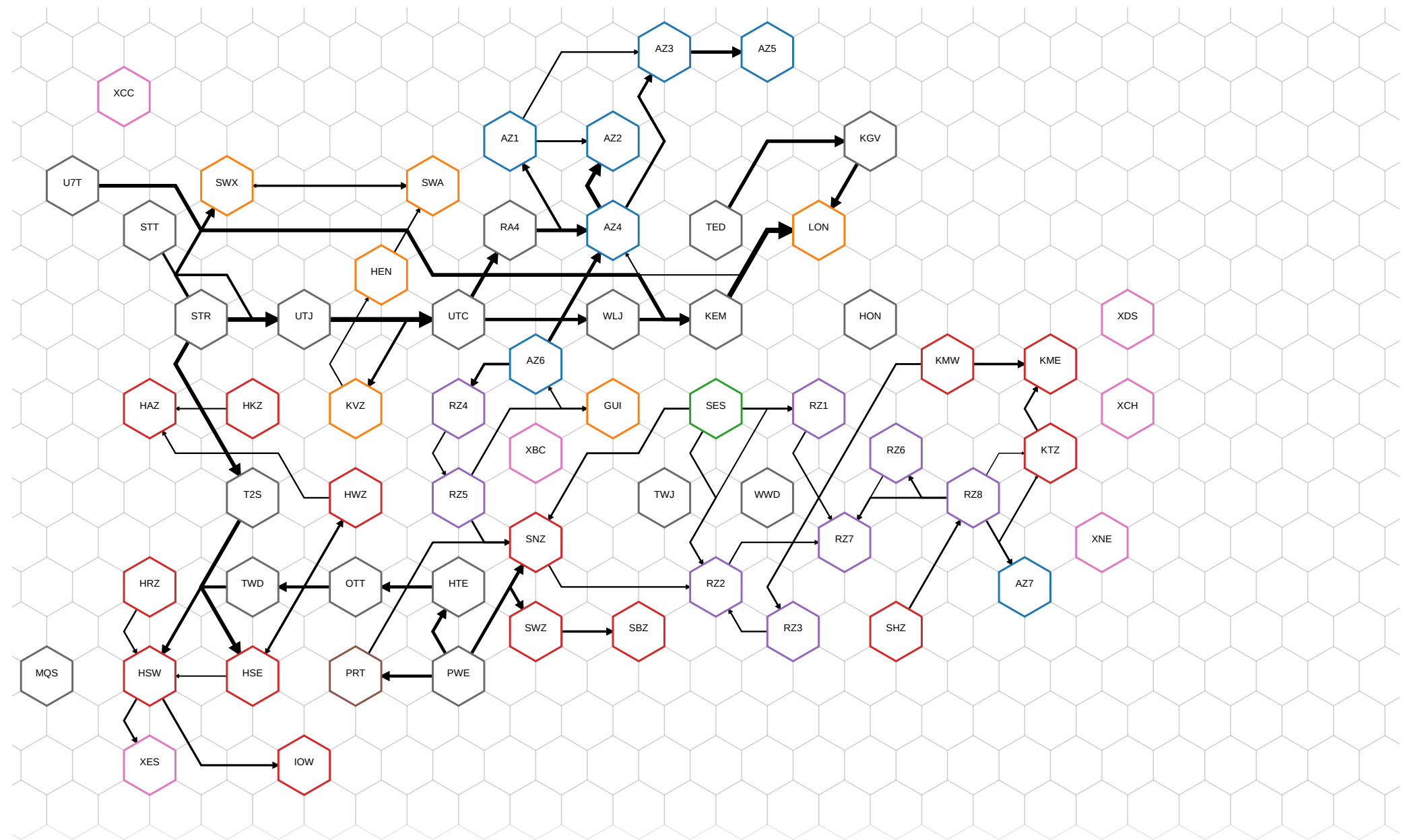
Situation 4 - 2026



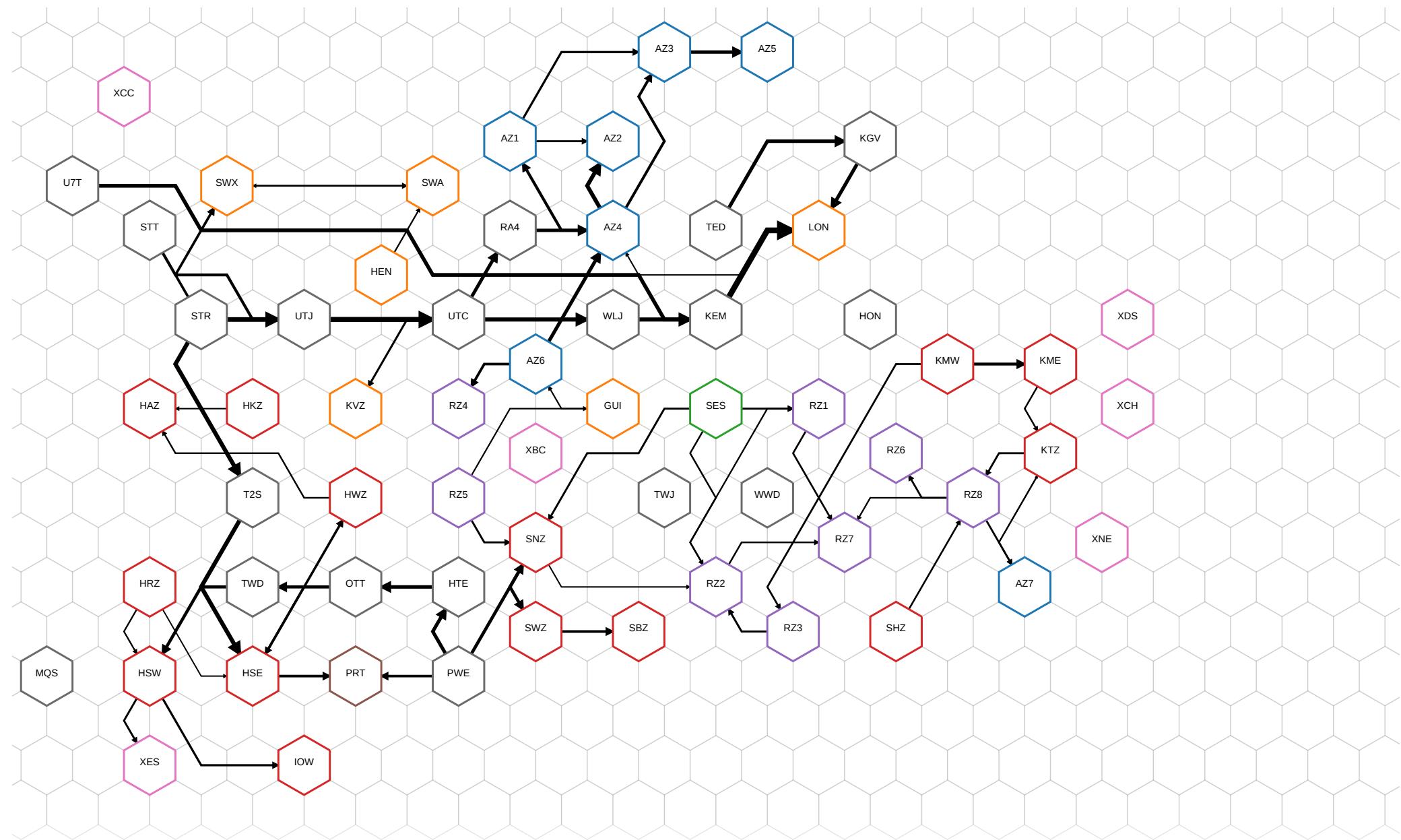
Situation 4 - 2040



Situation 4 - 2050



Situation 4 - 2075



IVM RUN DOSSIER

1:500 DROUGHT RESILIENCE IN 2050

IVM Summary: Thames Water

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Metadata

General Settings

Name	st-hybrid2050-dy-w1-tree16.05-options-v37-gov-led-hybridb-drpo-v2-2075
Created at	12/09/2022, 23:48:08
Tree	tree16.05: Root and branch tree 16.05: Stage 1 - Begins Hplan and LOW LCED, Stage 2 - Branches on growth (OxCam1a, Hplan and ONS18c), Stage 3 - Branches on licenced capped environmental destination, climate change and further growth scenarios (Hmax and Hmin) ↗
Setting name	options-v37-gov-led-hybridb-drpo-v2 ↗
Setting description	Emergency options in HSE, SBZ, and PRT. Use v2 of drought permits and orders (end in 2052).
Optimised discount rate	STPR

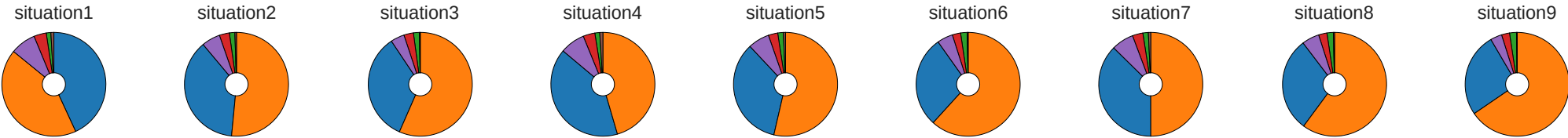
Metrics

Net present value (Cost)

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Cost w/ deficit (STPR)	15,847	12,521	11,237	14,833	12,024	10,222	12,970	10,545	9,559	(£m)
Cost w/o deficit (STPR)	15,847	12,521	11,237	14,833	12,024	10,222	12,970	10,545	9,559	(£m)
Cost w/ deficit (IGEQ)	25,597	19,347	16,952	23,804	18,739	15,379	20,470	16,037	14,191	(£m)
Cost w/o deficit (IGEQ)	25,597	19,347	16,952	23,804	18,739	15,379	20,470	16,037	14,191	(£m)
Cost w/ deficit (LTDR)	17,693	13,831	12,343	16,537	13,308	11,219	14,400	11,602	10,458	(£m)
Cost w/o deficit (LTDR)	17,693	13,831	12,343	16,537	13,308	11,219	14,400	11,602	10,458	(£m)

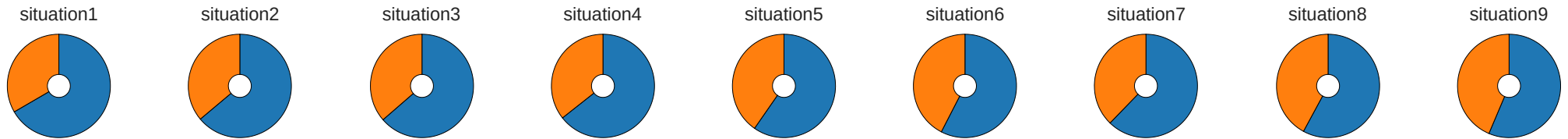
Cost breakdown (STPR)

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Capex	6,833	4,683	3,830	6,028	4,140	2,910	4,851	3,116	2,497	(£m)
Fixed opex	6,778	6,450	6,356	6,746	6,446	6,310	6,483	6,338	6,256	(£m)
Fixed operational carbon	228	214	210	226	212	209	221	210	206	(£m)
Embedded carbon	614	392	334	544	352	265	424	275	239	(£m)
Variable opex	1,247	720	479	1,144	797	498	894	567	341	(£m)
Variable carbon opex	146	62	29	144	78	29	97	39	20	(£m)



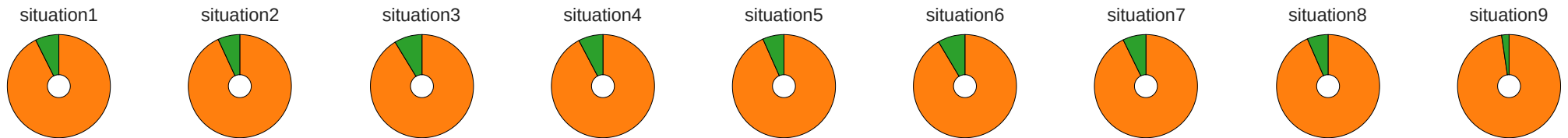
Emissions breakdown

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Capital emissions	3,962,497	2,405,136	1,994,505	3,495,581	2,160,593	1,548,573	2,674,442	1,628,468	1,383,511	(tonnes)
Operational emissions	1,983,901	1,358,408	1,139,085	1,933,691	1,460,003	1,140,837	1,620,474	1,183,184	1,069,779	(tonnes)



Electricity breakdown

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Generated (on site)	0	0	0	0	0	0	0	0	0	(GWh)
Grid	23,893	13,519	6,218	20,748	14,477	6,339	16,065	10,149	4,634	(GWh)
Renewable	1,910	1,002	594	1,736	1,037	593	1,259	713	110	(GWh)



Environmental

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
SEA environmental benefit	86,378.00	79,907.00	78,127.00	84,780.00	78,589.00	75,795.00	81,000.00	76,077.00	73,955.00	
SEA environmental disbenefit	120,422.00	87,684.00	76,066.00	112,196.00	91,362.00	75,989.00	97,078.00	79,104.00	66,294.00	
Natural capital	7,632,836.25	8,095,880.24	8,881,480.11	7,456,631.15	6,971,556.03	7,806,082.67	7,805,083.80	9,489,768.85	13,760,435.72	
Bio-diversity net gain	-233,373.00	-132,226.00	-102,762.00	-246,735.00	-246,858.00	-188,774.00	-163,589.00	-193,297.00	-181,519.00	

Social

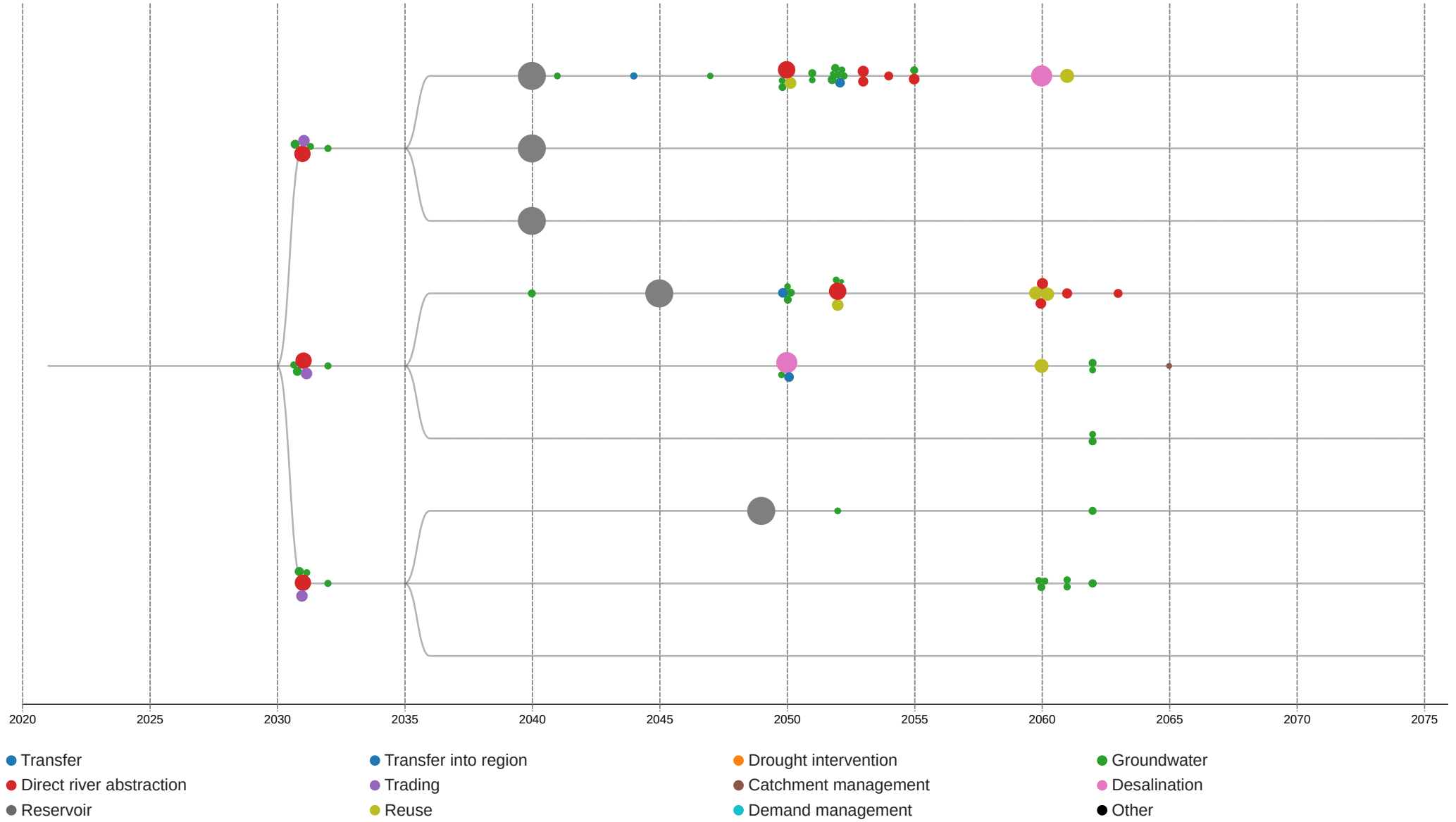
Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Customer preference	32,735.00	30,443.00	29,746.00	32,256.00	30,635.00	29,622.00	31,012.00	29,865.00	29,055.00	

Reliability

[illegible]

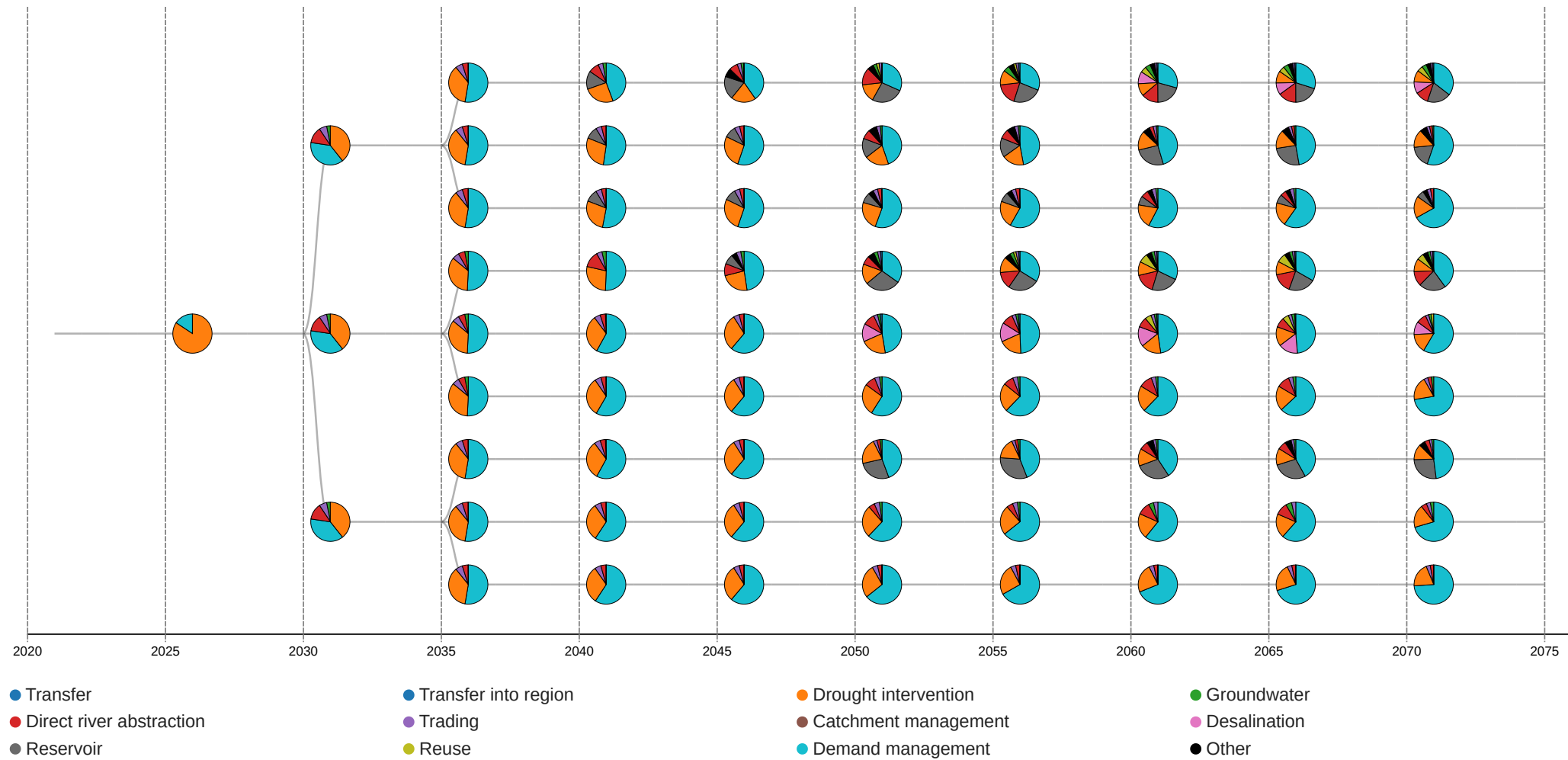
Adaptability										
Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Adaptability	18.21	19.61	19.99	18.43	16.58	18.05	19.79	18.56	21.43	
A3: Operational complexity and flexibility	9.14	9.56	10.33	9.21	8.25	8.92	9.62	9.03	10.48	
A4: WRZ connectivity	9.02	10.04	9.63	9.18	8.26	9.11	10.15	9.48	10.93	
A7: Customer relations support engagement with demand management	0.06	0.02	0.02	0.04	0.06	0.02	0.02	0.05	0.02	
Evolvability										
Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Evolvability	26.41	26.46	28.21	26.38	25.91	27.19	27.09	27.67	31.76	
E1: Scaleability and modularity of proposed changes	10.68	10.90	11.70	10.70	11.02	11.55	11.24	11.77	13.52	
E2: Intervention lead times	7.06	6.79	7.13	7.07	6.62	6.91	6.88	6.98	8.02	
E3: Reliance on external bodies to deliver changes	8.57	8.73	9.34	8.54	8.20	8.69	8.93	8.86	10.18	
E5: Collaborative land management	0.10	0.04	0.04	0.07	0.08	0.04	0.04	0.07	0.04	

Option Selection (Thames Water)

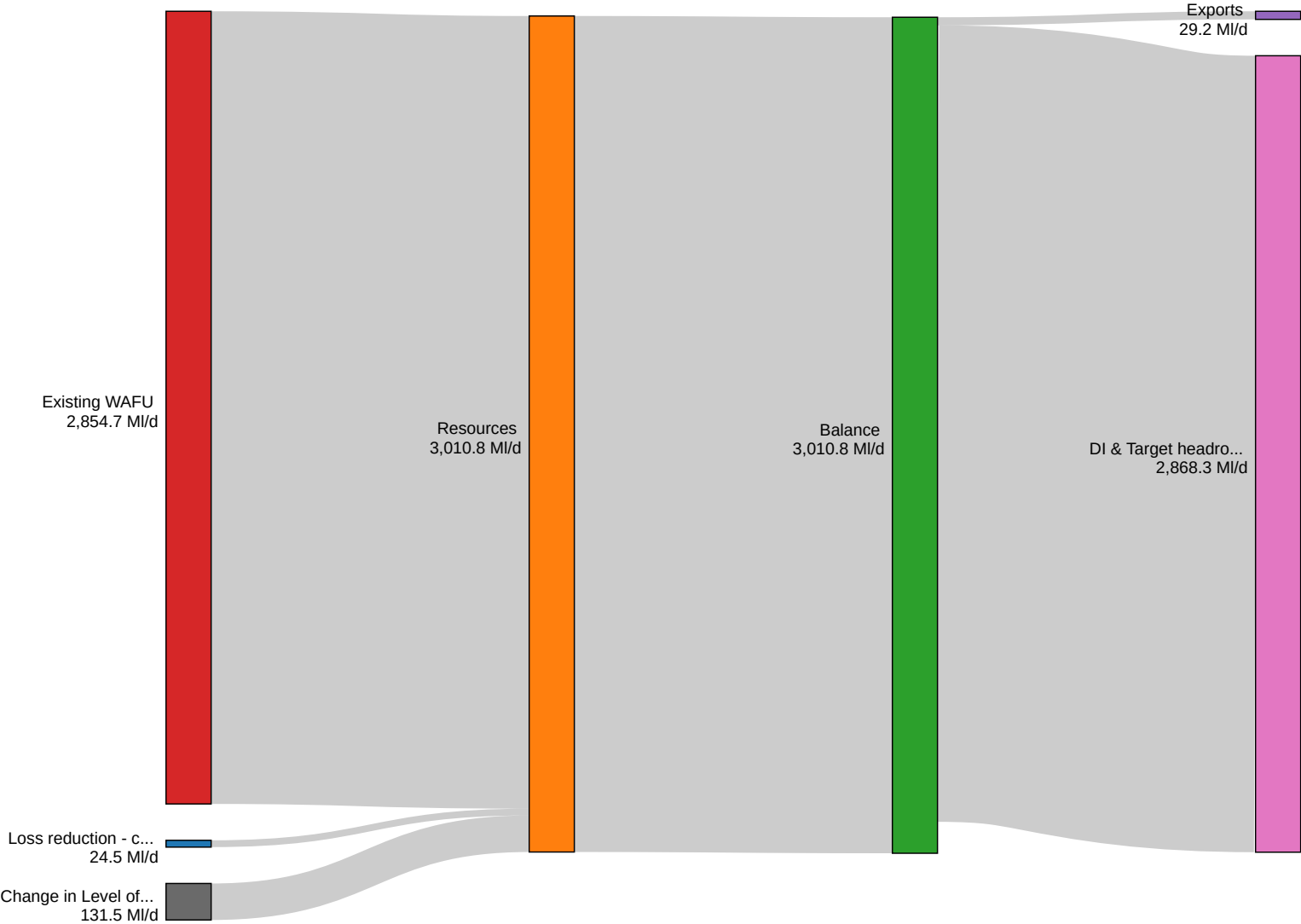


Utilisation (Thames Water)

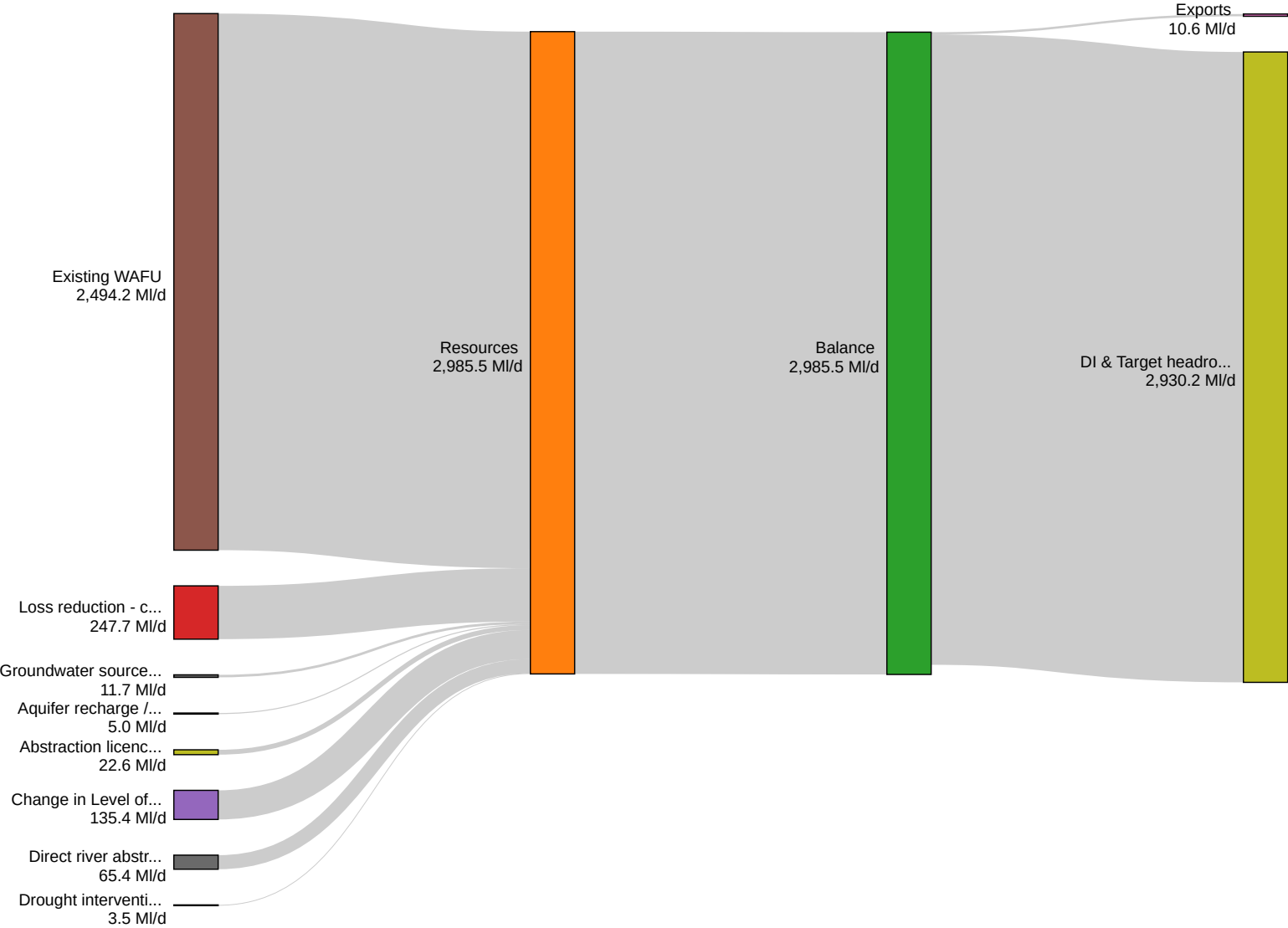
Pie charts show the breakdown of option utilisation by option category.



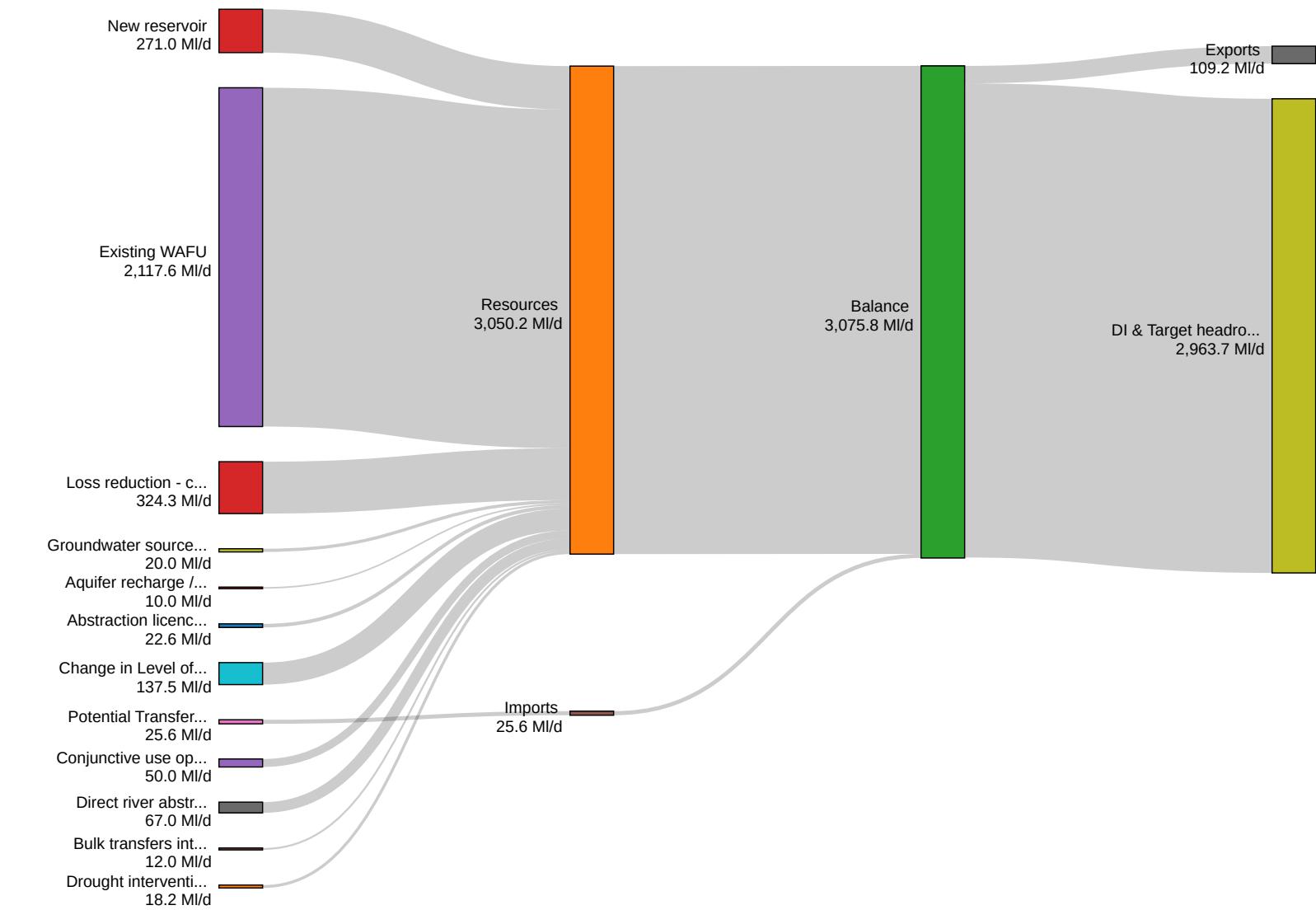
Situation 4 - 2026 (Thames Water)



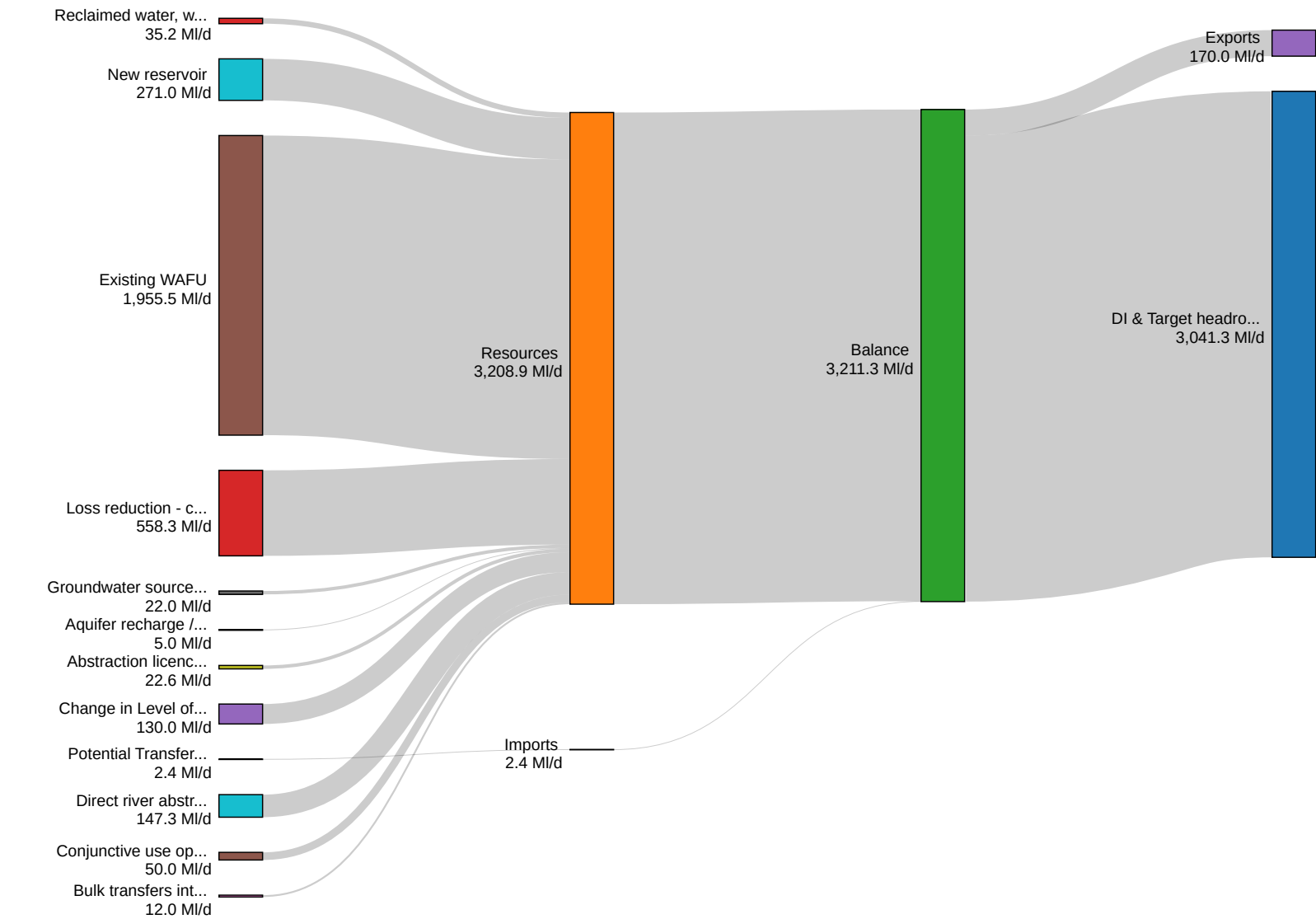
Situation 4 - 2040 (Thames Water)



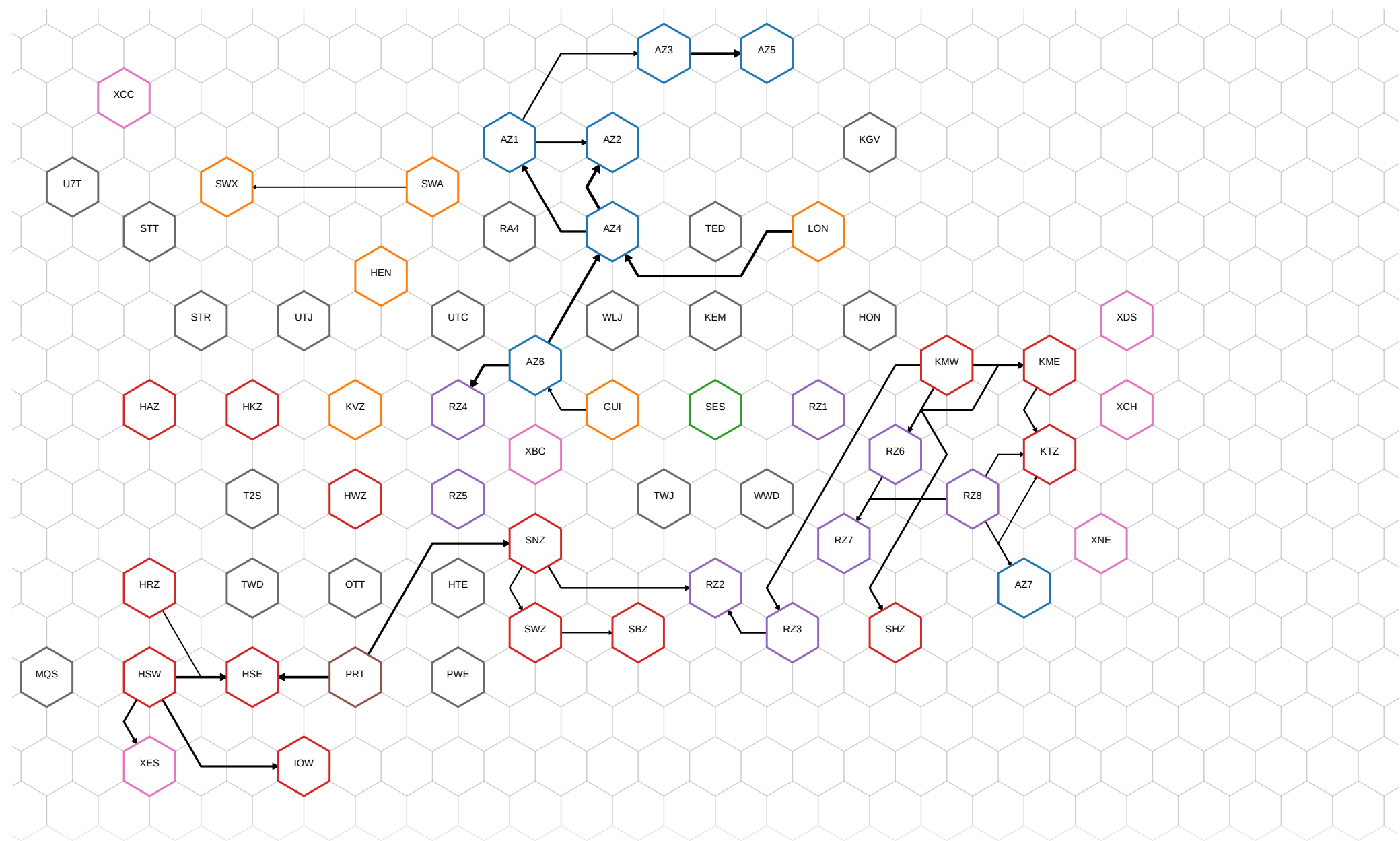
Situation 4 - 2050 (Thames Water)



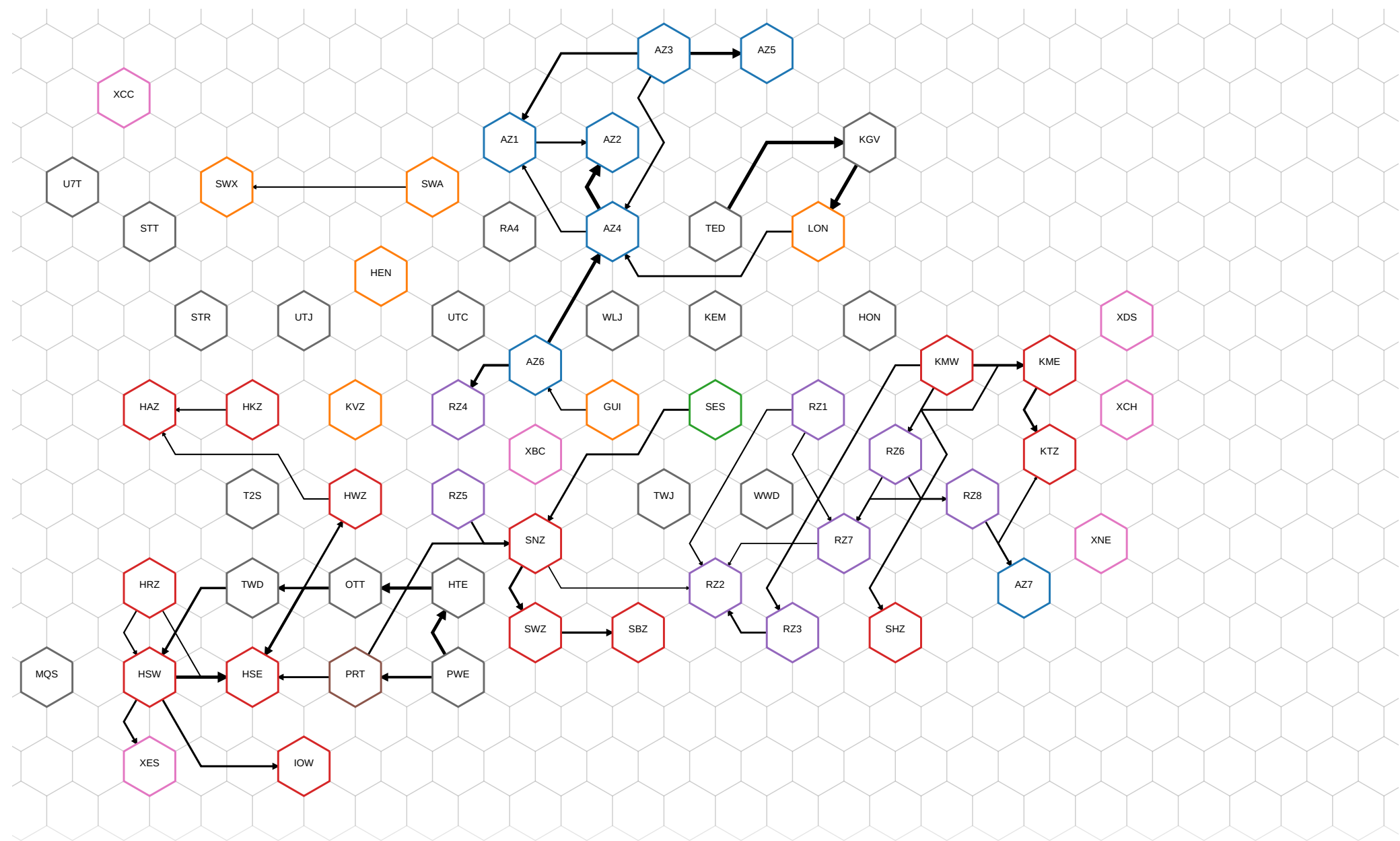
Situation 4 - 2075 (Thames Water)



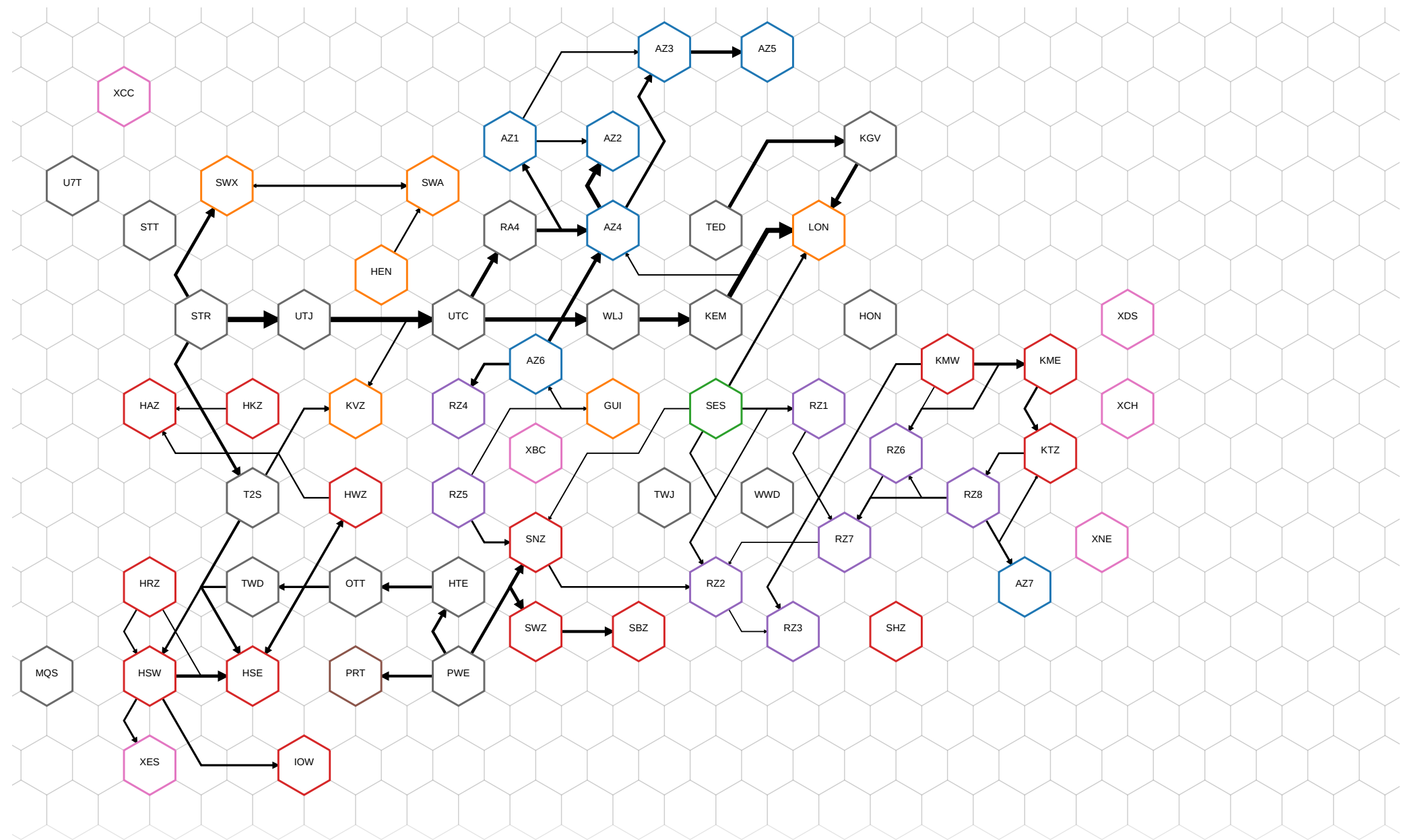
Situation 4 - 2026



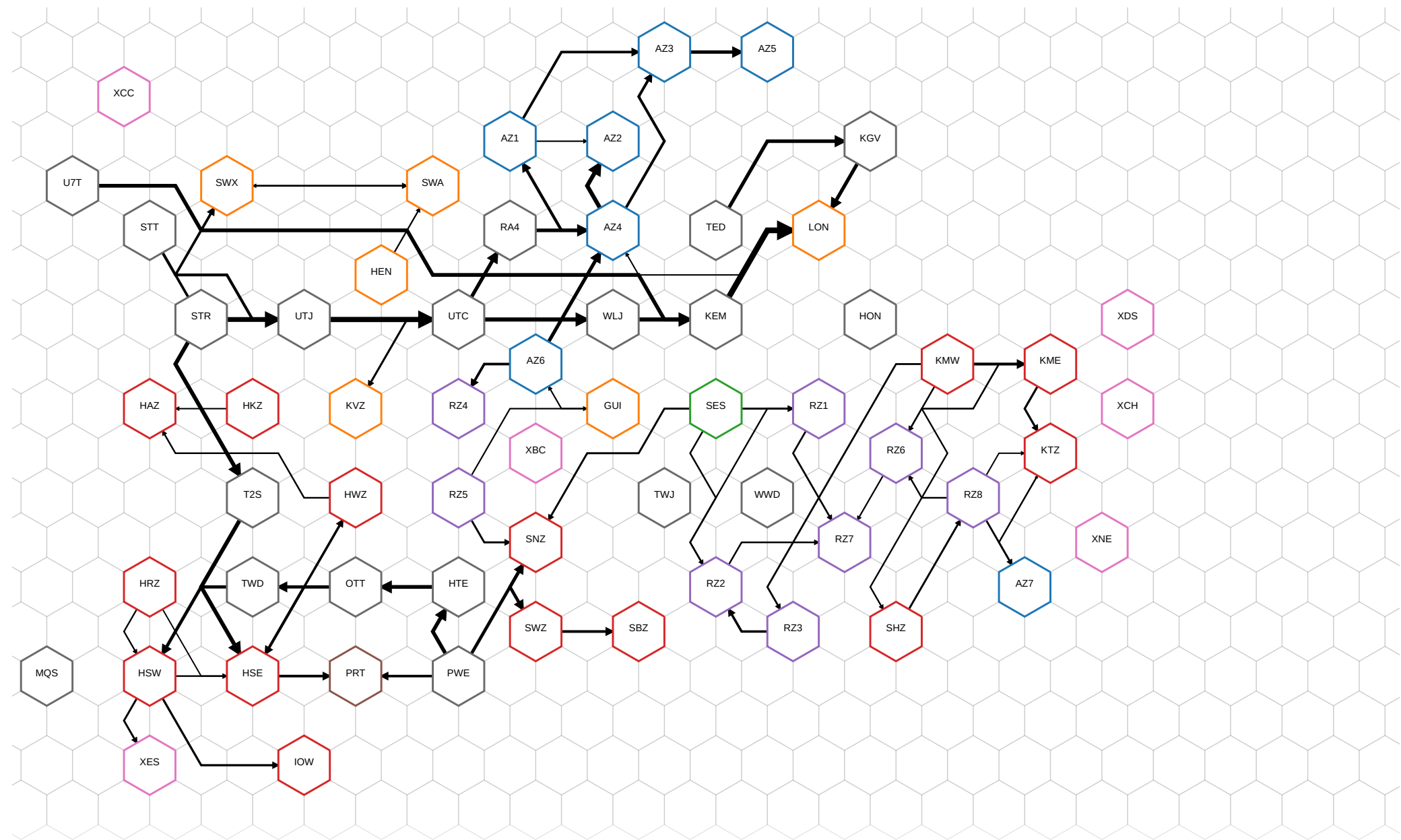
Situation 4 - 2040



Situation 4 - 2050



Situation 4 - 2075



IVM RUN DOSSIER

1:200 DROUGHT RESILIENCE IN 2034

IVM Summary: Thames Water

[Home](#) / [jet-20220805-000002](#) / [st-hybrid-dy-w1-tree16.05-options-v37-gov-led-hybridb-lon-1in200-2034-2075](#)

Metadata

General Settings

Name	st-hybrid-dy-w1-tree16.05-options-v37-gov-led-hybridb-lon-1in200-2034-2075
Created at	03/09/2022, 20:06:12
Tree	tree16.05: Root and branch tree 16.05: Stage 1 - Begins Hplan and LOW LCED, Stage 2 - Branches on growth (OxCam1a, Hplan and ONS18c), Stage 3 - Branches on licenced capped environmental destination, climate change and further growth scenarios (Hmax and Hmin) 🔗
Setting name	options-v37-gov-led-hybridb-lon-1in200-2034 🔗
Setting description	Emergency options in HSE, SBZ, and PRT. London resilience change delayed to 2034.
Optimised discount rate	STPR

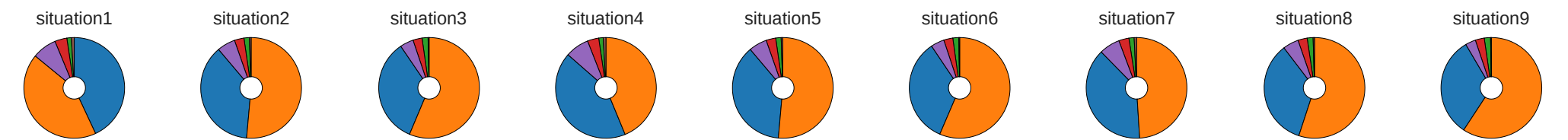
Metrics

Net present value (Cost)

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Cost w/ deficit (STPR)	15,942	12,553	11,251	15,156	12,582	11,256	13,178	11,522	10,574	(£m)
Cost w/o deficit (STPR)	15,942	12,553	11,251	15,156	12,582	11,256	13,178	11,522	10,574	(£m)
Cost w/ deficit (IGEIQ)	25,796	19,462	17,074	24,222	19,518	17,070	20,719	17,646	15,910	(£m)
Cost w/o deficit (IGEIQ)	25,796	19,462	17,074	24,222	19,518	17,070	20,719	17,646	15,910	(£m)
Cost w/ deficit (LTDR)	17,809	13,880	12,377	16,882	13,913	12,380	14,618	12,702	11,608	(£m)
Cost w/o deficit (LTDR)	17,809	13,880	12,377	16,882	13,913	12,380	14,618	12,702	11,608	(£m)

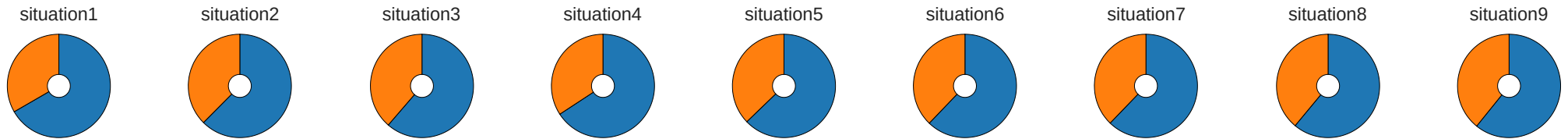
Cost breakdown (STPR)

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Capex	6,863	4,694	3,843	6,465	4,707	3,843	5,092	3,985	3,415	(£m)
Fixed opex	6,836	6,457	6,339	6,635	6,469	6,353	6,458	6,342	6,264	(£m)
Fixed operational carbon	231	220	217	221	220	214	222	219	214	(£m)
Embedded carbon	621	386	329	552	390	328	431	342	305	(£m)
Variable opex	1,245	729	487	1,153	730	485	875	582	349	(£m)
Variable carbon opex	146	67	36	130	66	33	100	51	27	(£m)



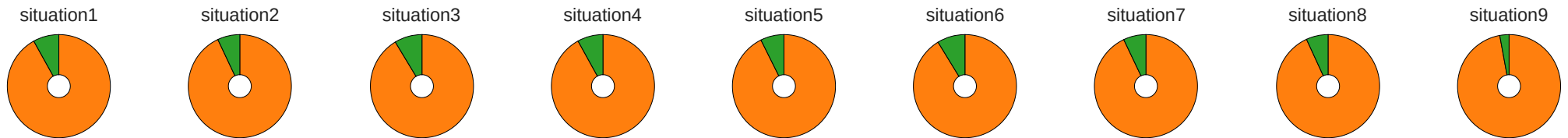
Emissions breakdown

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Capital emissions	3,996,162	2,367,575	1,977,765	3,498,201	2,408,275	1,972,792	2,709,714	2,089,759	1,834,122	(tonnes)
Operational emissions	1,997,369	1,422,635	1,245,951	1,818,650	1,425,637	1,200,025	1,644,836	1,333,881	1,181,204	(tonnes)



Electricity breakdown

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Generated (on site)	0	0	0	0	0	0	0	0	0	(GWh)
Grid	24,235	14,021	6,334	21,366	13,754	6,433	15,856	10,581	4,543	(GWh)
Renewable	2,131	1,057	600	1,867	1,093	616	1,207	780	136	(GWh)



Environmental

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
SEA environmental benefit	86,906.00	79,963.00	78,373.00	84,665.00	80,807.00	79,210.00	81,759.00	77,701.00	76,403.00	
SEA environmental disbenefit	127,881.00	95,978.00	83,217.00	119,260.00	97,112.00	85,403.00	104,334.00	80,633.00	71,532.00	
Natural capital	7,200,542.14	7,990,274.47	8,583,417.69	7,599,740.87	8,180,095.32	8,857,124.98	7,916,381.63	11,569,311.69	12,849,065.89	
Bio-diversity net gain	-275,776.00	-171,640.00	-134,479.00	-246,110.00	-145,843.00	-117,388.00	-189,784.00	-119,815.00	-98,370.00	

Social

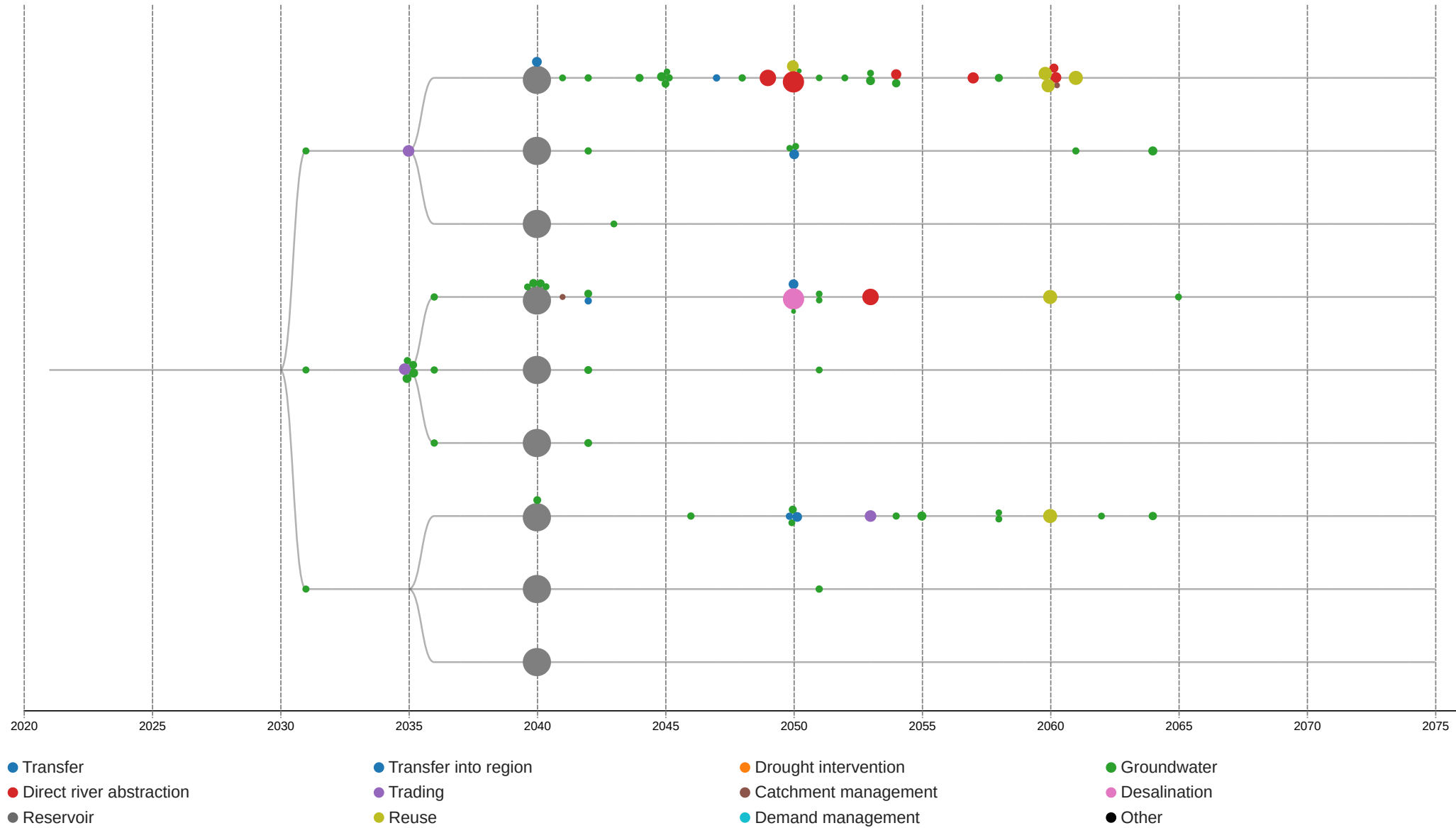
Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Customer preference	33,127.00	30,712.00	29,986.00	32,716.00	31,094.00	30,417.00	31,351.00	29,649.00	29,089.00	

Reliability

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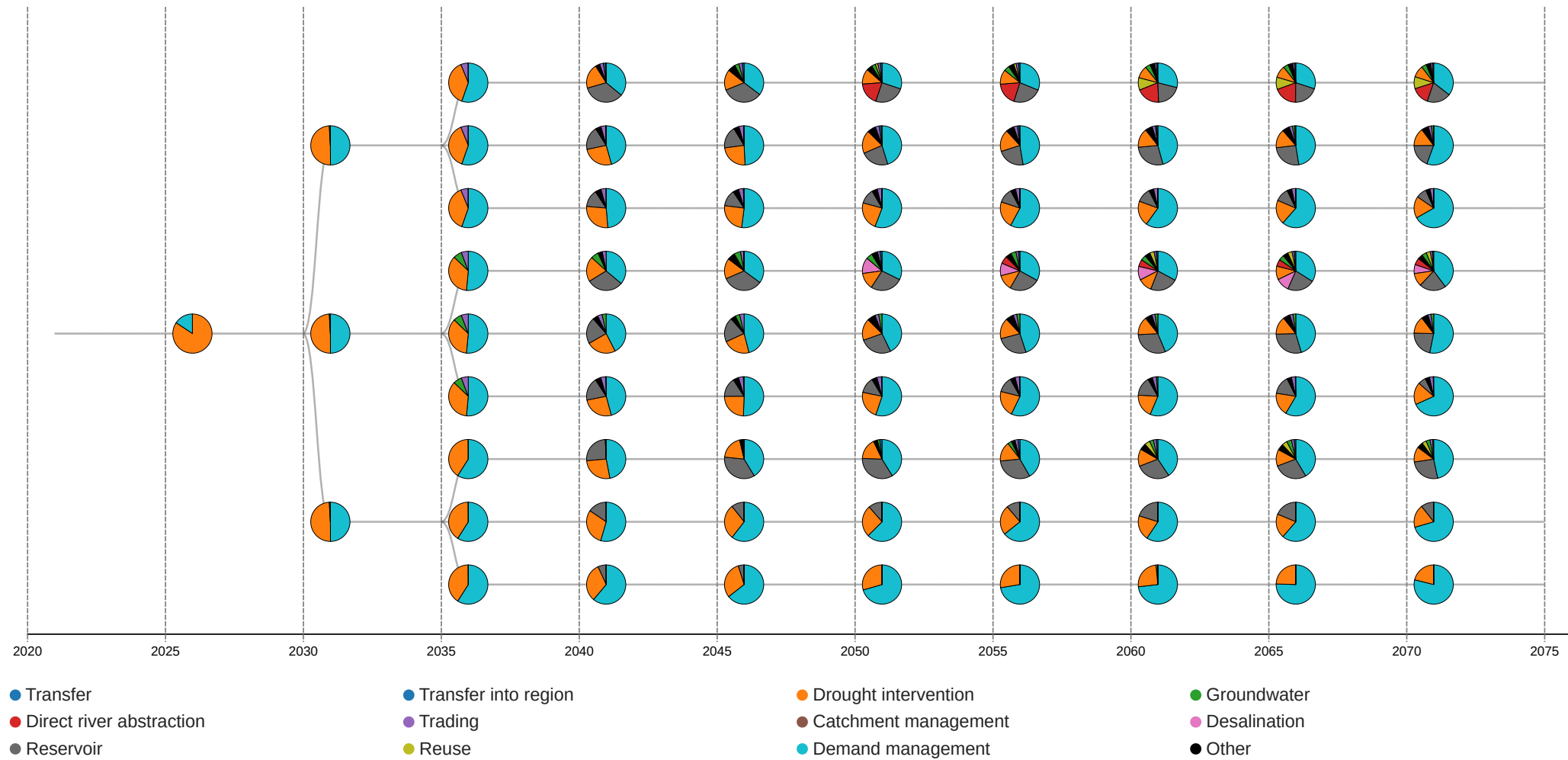
Adaptability										
Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Adaptability	18.75	19.92	22.12	18.65	19.91	21.79	20.55	22.14	26.11	
A3: Operational complexity and flexibility	9.29	9.61	10.52	8.95	9.66	10.33	9.85	10.73	12.70	
A4: WRZ connectivity	9.40	10.29	11.58	9.65	10.21	11.41	10.68	11.39	13.39	
A7: Customer relations support engagement with demand management	0.07	0.02	0.02	0.05	0.04	0.05	0.02	0.02	0.02	
Evolvability										
Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Evolvability	27.32	26.95	28.92	25.88	27.07	28.55	27.56	29.74	34.61	
E1: Scaleability and modularity of proposed changes	10.99	11.21	12.12	10.79	11.25	11.93	11.48	12.51	14.52	
E2: Intervention lead times	7.50	6.83	7.16	6.55	6.83	7.13	6.95	7.36	8.55	
E3: Reliance on external bodies to deliver changes	8.71	8.87	9.60	8.47	8.91	9.41	9.09	9.83	11.50	
E5: Collaborative land management	0.11	0.04	0.04	0.08	0.07	0.07	0.04	0.04	0.04	

Option Selection (Thames Water)

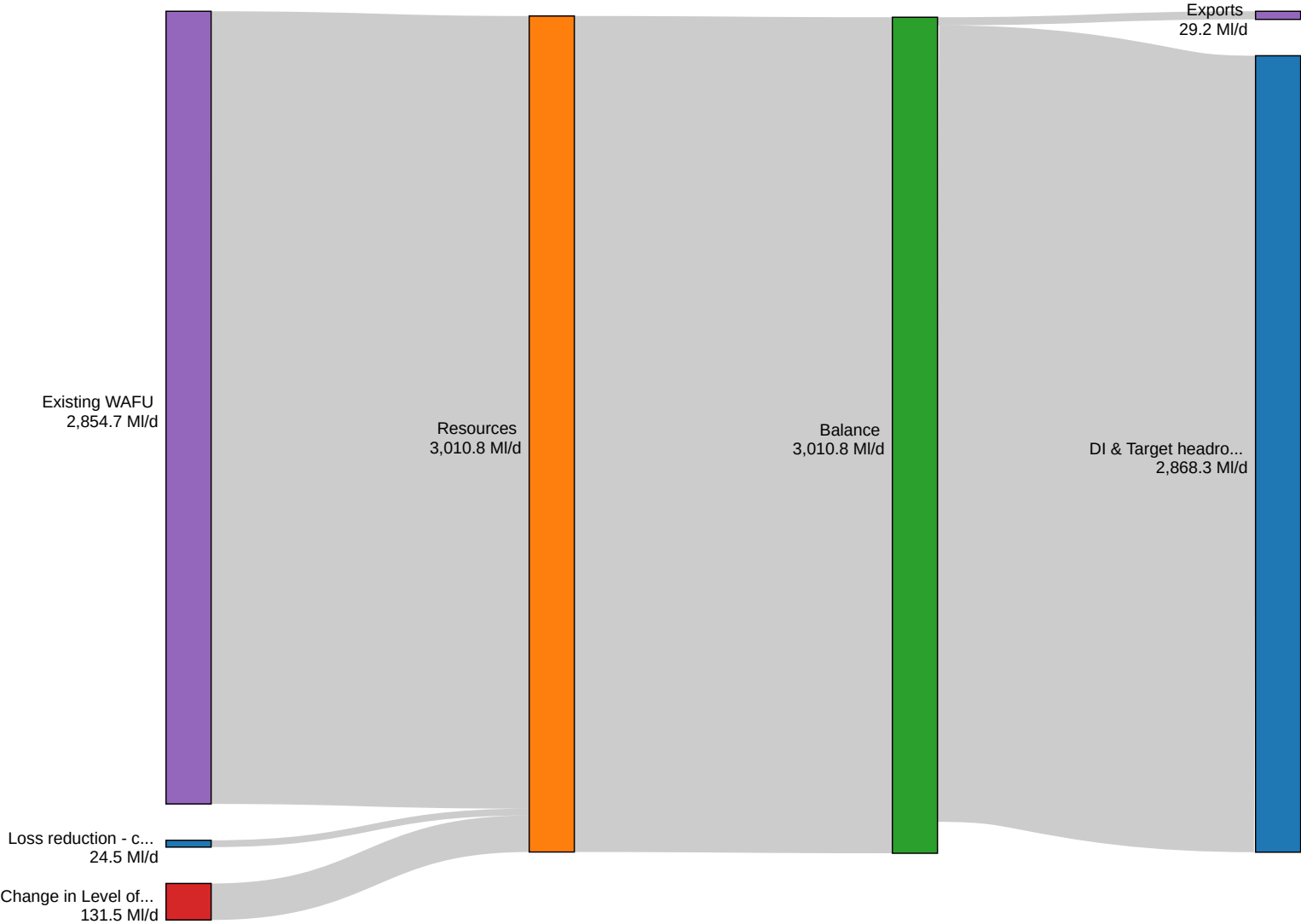


Utilisation (Thames Water)

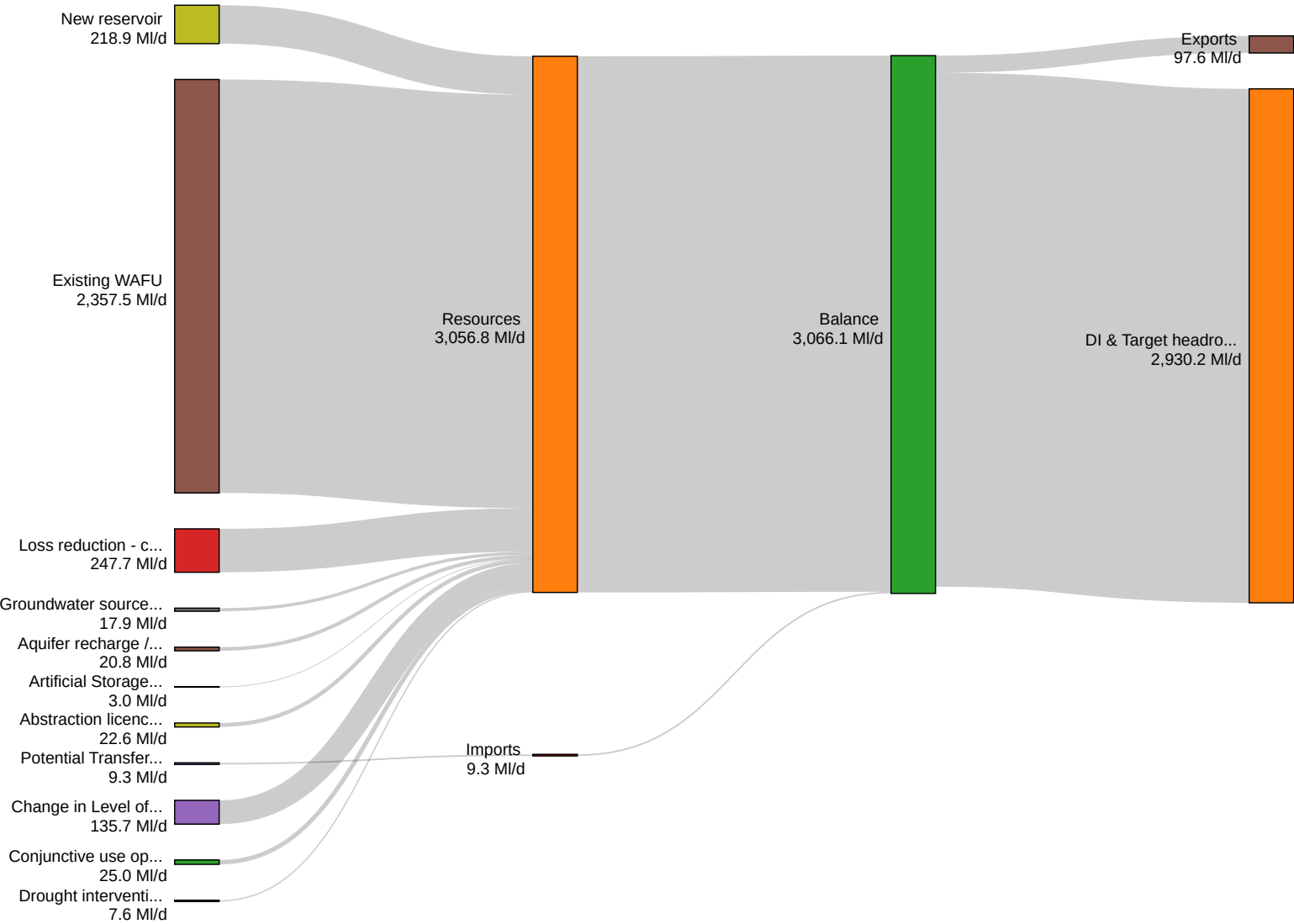
Pie charts show the breakdown of option utilisation by option category.



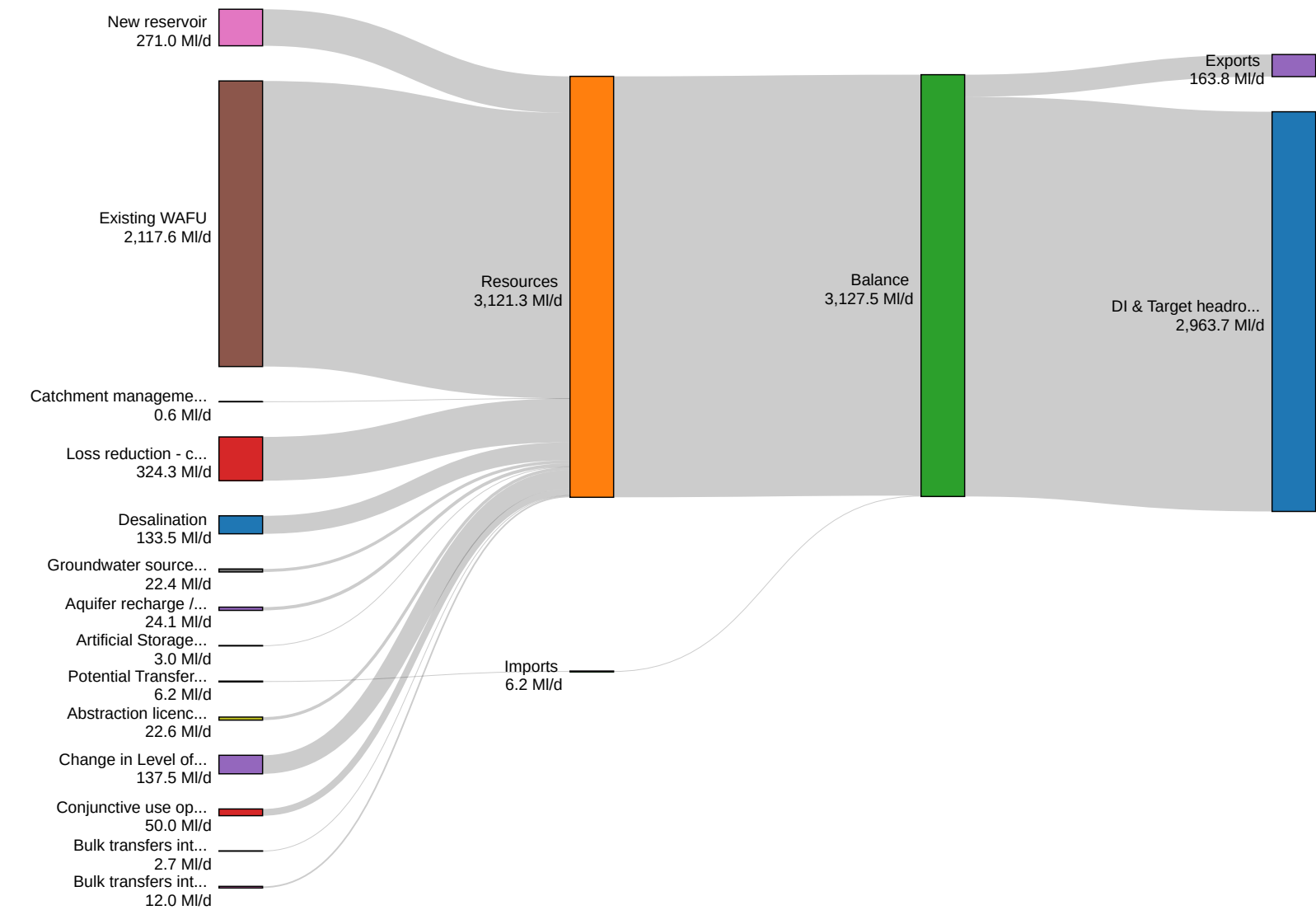
Situation 4 - 2026 (Thames Water)



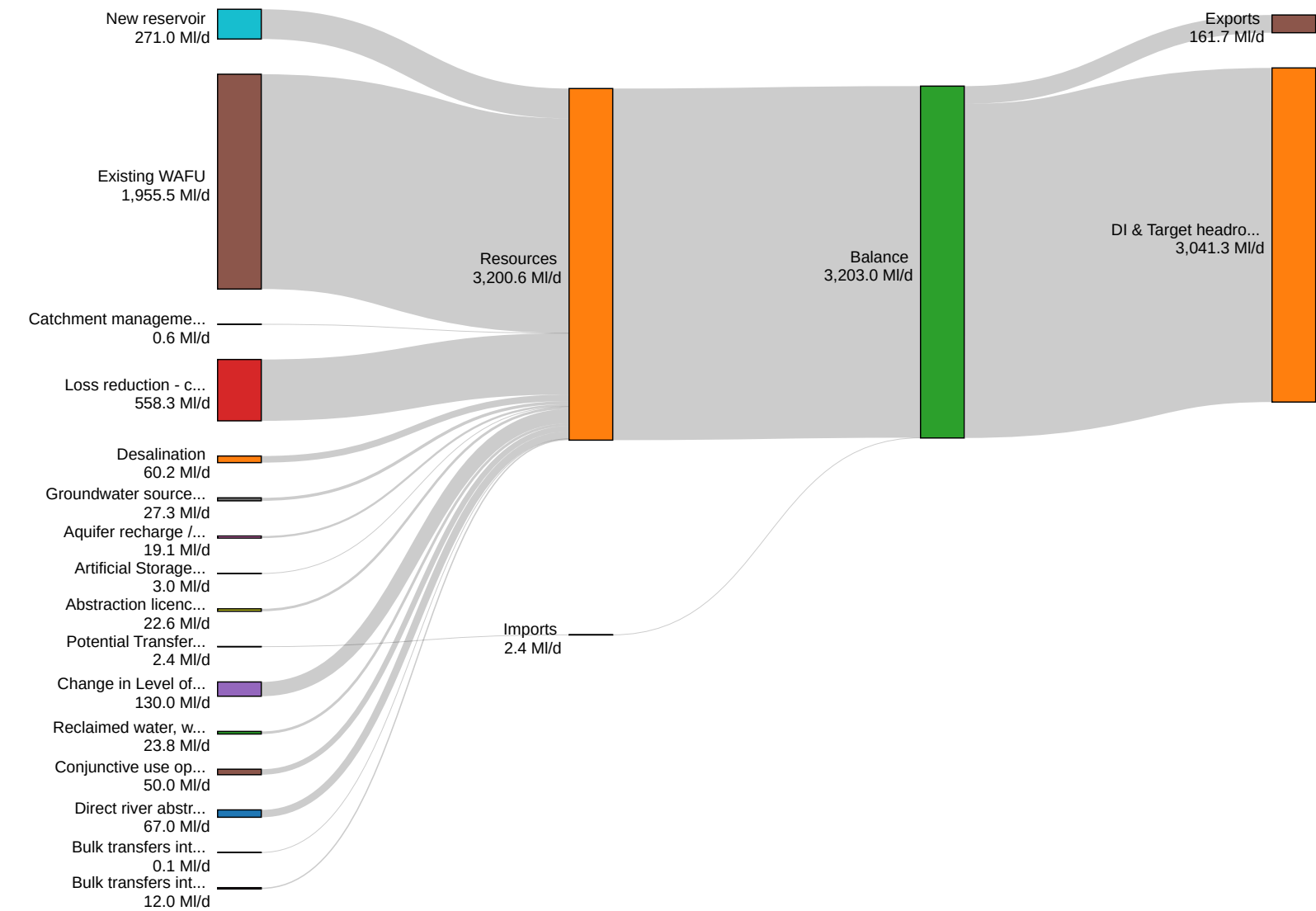
Situation 4 - 2040 (Thames Water)



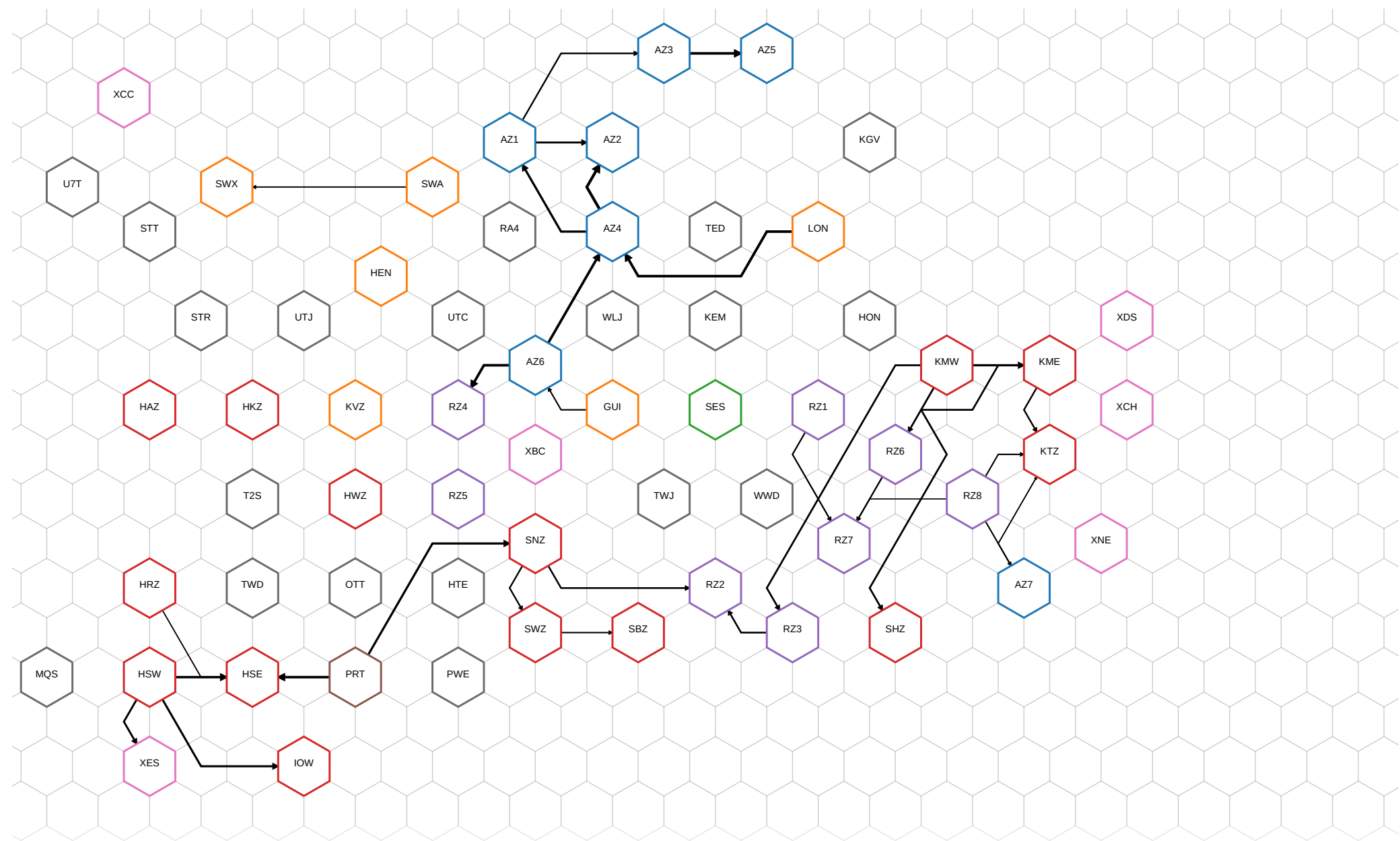
Situation 4 - 2050 (Thames Water)



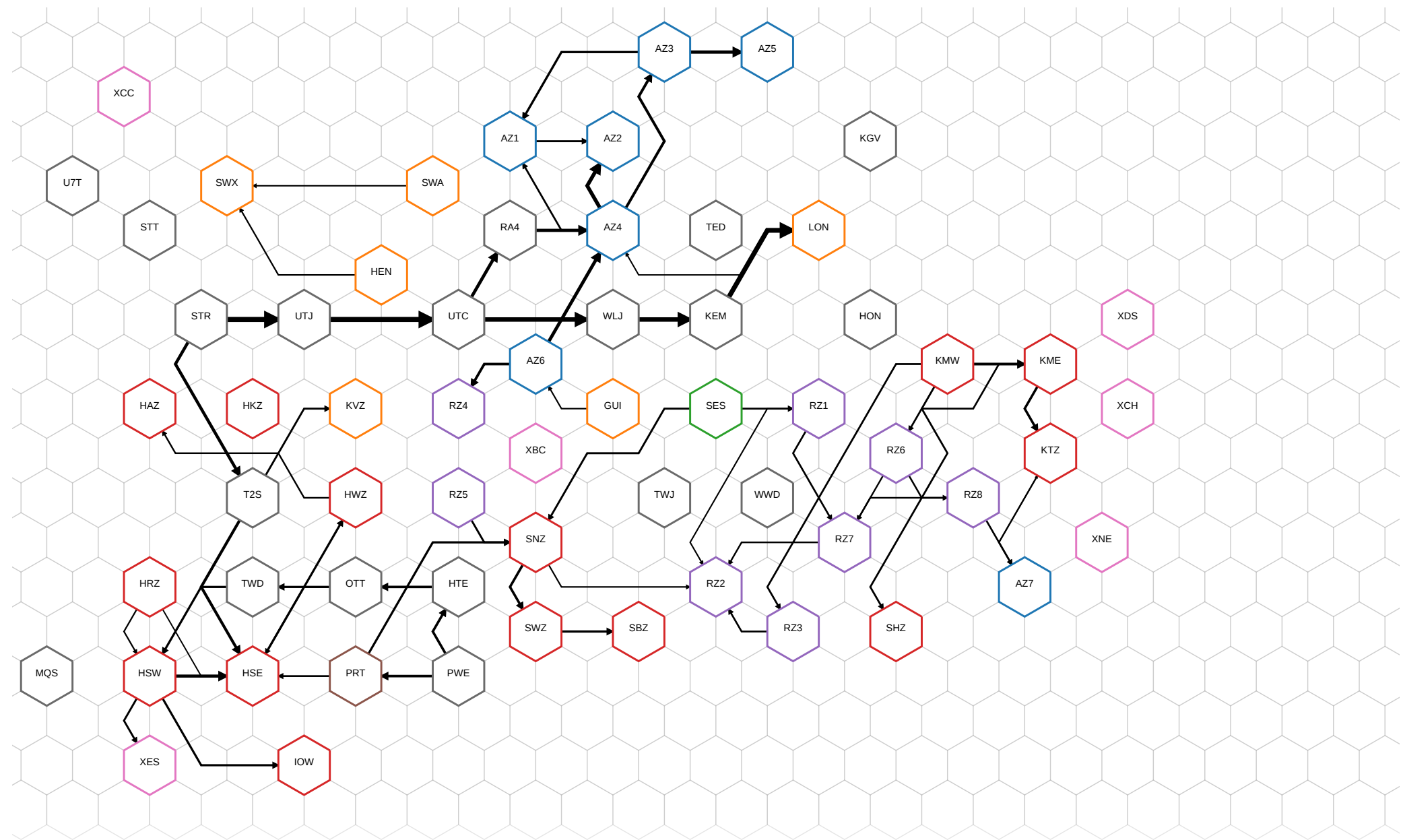
Situation 4 - 2075 (Thames Water)



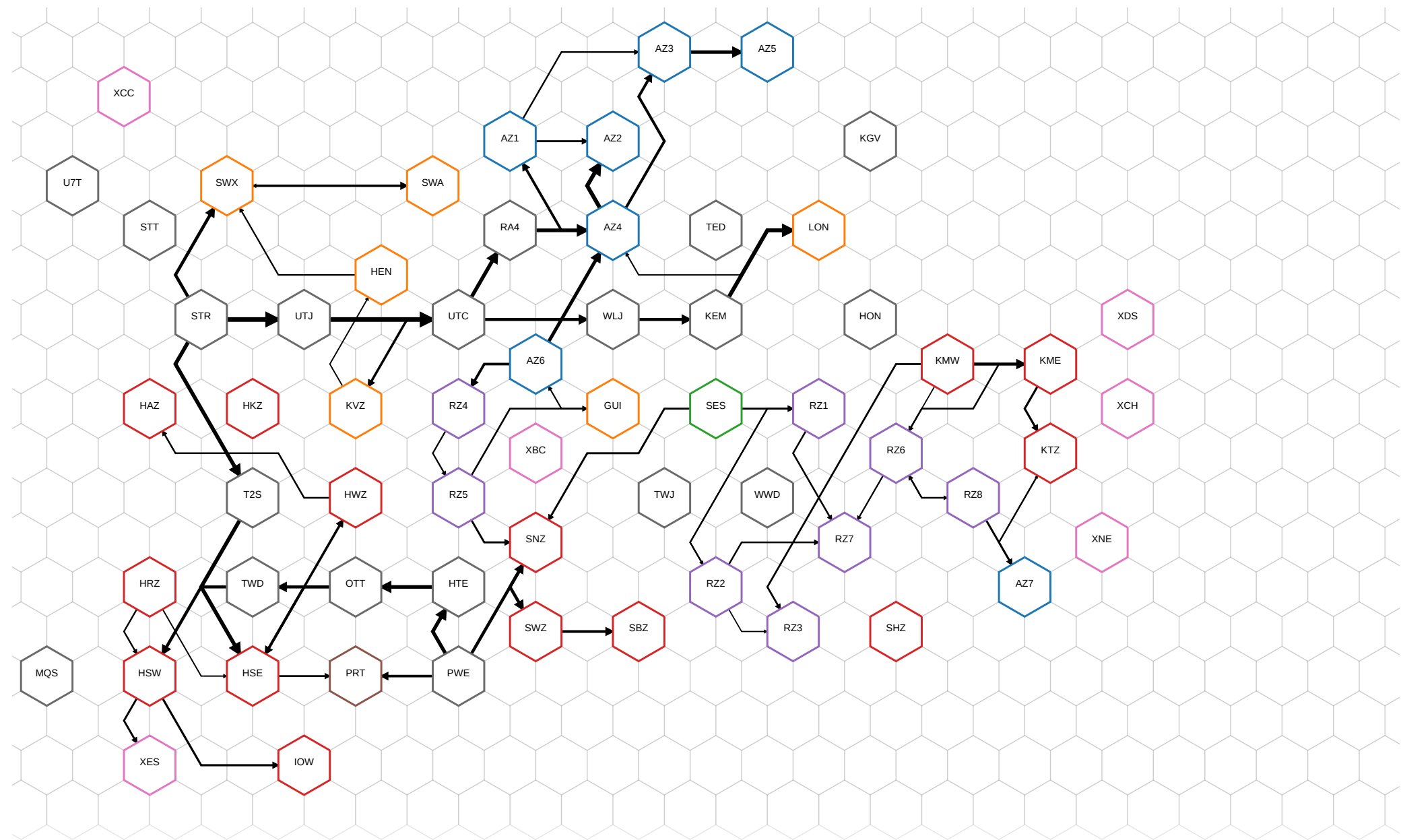
Situation 4 - 2026



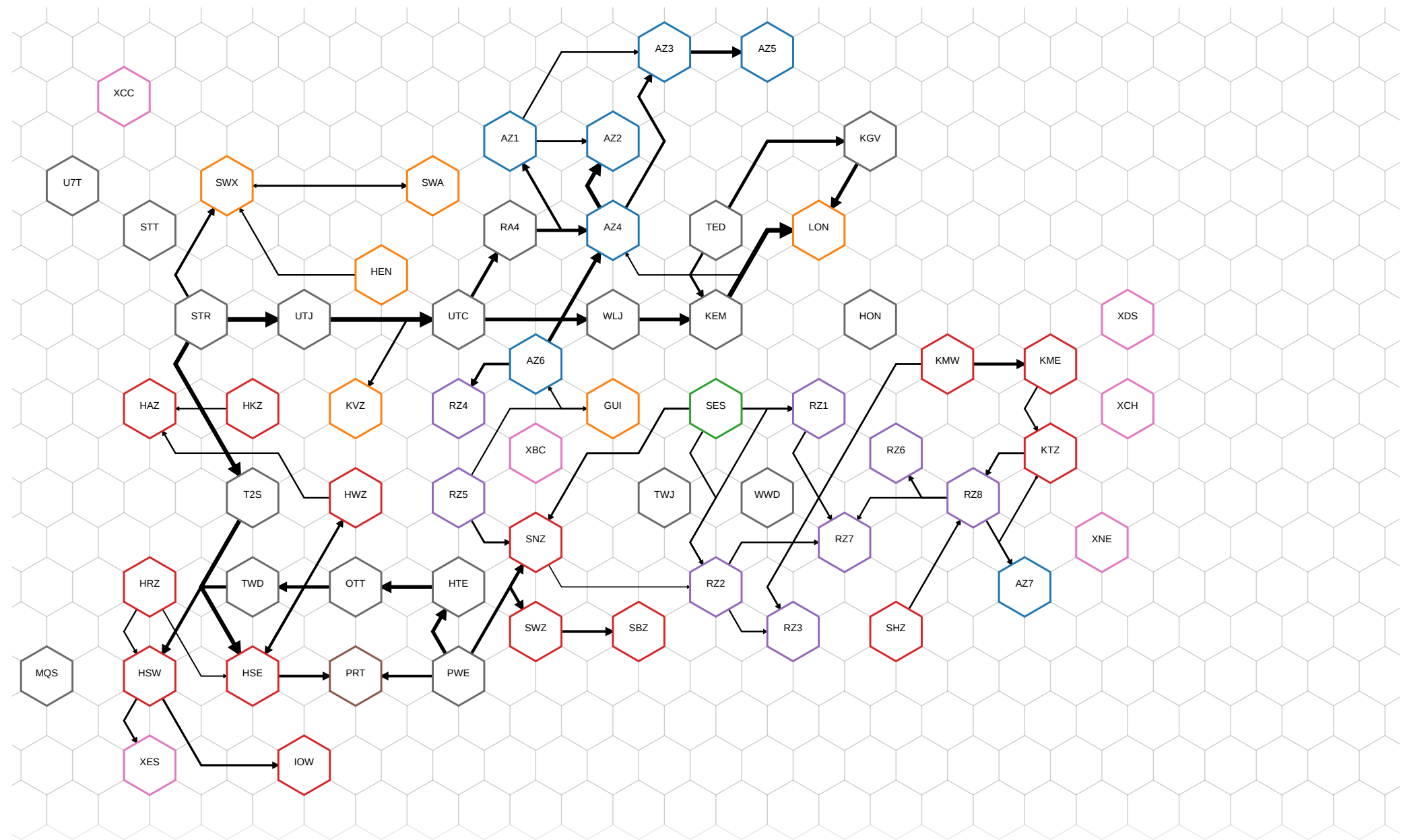
Situation 4 - 2040



Situation 4 - 2050



Situation 4 - 2075



IVM RUN DOSSIER

NO GOVERNMENT-LED

IVM Summary: Thames Water

! This run contained total deficits of 5.1 MI/d in the "**hybrida-dyaa-hplan-fthr**" planning scenario.

Metadata

General Settings

Name	st-hybrid-dy-w1-tree16.05-options-v37-excl-gov-led-2075
Created at	09/09/2022, 09:44:42
Tree	tree16.05: Root and branch tree 16.05: Stage 1 - Begins Hplan and LOW LCED, Stage 2 - Branches on growth (OxCam1a, Hplan and ONS18c), Stage 3 - Branches on licenced capped environmental destination, climate change and further growth scenarios (Hmax and Hmin) ↗
Setting name	options-v37-excl-gov-led ↗
Setting description	Emergency options in HSE, SBZ, and PRT.
Optimised discount rate	STPR

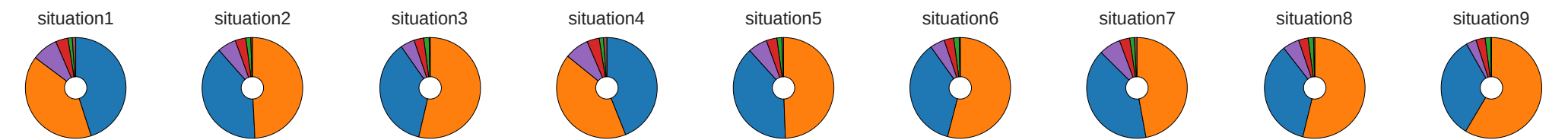
Metrics

Net present value (Cost)

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Cost w/ deficit (STPR)	293,861	197,908	196,566	292,915	197,860	196,449	198,617	196,558	195,406	(£m)
Cost w/o deficit (STPR)	17,695	13,805	12,462	16,806	13,757	12,346	14,513	12,454	11,302	(£m)
Cost w/ deficit (IGEIQ)	305,100	205,623	203,133	303,317	205,581	202,950	207,226	203,342	201,176	(£m)
Cost w/o deficit (IGEIQ)	28,934	21,520	19,030	27,208	21,478	18,847	23,123	19,239	17,073	(£m)
Cost w/ deficit (LTDR)	295,979	199,384	197,831	294,883	199,336	197,702	200,252	197,859	196,521	(£m)
Cost w/o deficit (LTDR)	19,814	15,281	13,728	18,774	15,233	13,599	16,148	13,756	12,418	(£m)

Cost breakdown (STPR)

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Capex	7,970	5,420	4,565	7,386	5,346	4,451	5,849	4,440	3,756	(£m)
Fixed opex	7,111	6,792	6,685	7,035	6,799	6,673	6,836	6,703	6,617	(£m)
Fixed operational carbon	248	224	221	234	225	222	224	218	210	(£m)
Embedded carbon	703	471	388	663	472	379	481	382	335	(£m)
Variable opex	1,467	828	561	1,305	842	578	1,007	660	363	(£m)
Variable carbon opex	195	70	41	183	73	42	118	51	21	(£m)



Emissions breakdown

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Capital emissions	4,553,823	2,885,802	2,326,143	4,249,299	2,899,297	2,274,120	3,027,577	2,330,622	1,996,134	(tonnes)
Operational emissions	2,477,098	1,471,358	1,298,966	2,304,549	1,503,760	1,308,599	1,775,698	1,322,195	1,100,202	(tonnes)

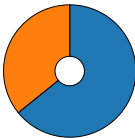
situation1



situation2



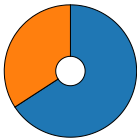
situation3



situation4



situation5



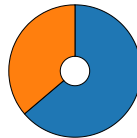
situation6



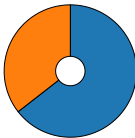
situation7



situation8



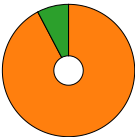
situation9



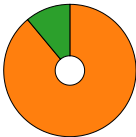
Electricity breakdown

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Generated (on site)	0	0	0	0	0	0	0	0	0	(GWh)
Grid	28,349	13,329	6,995	25,133	13,832	7,021	18,581	11,043	4,977	(GWh)
Renewable	2,364	1,653	874	2,076	1,658	741	1,451	1,000	220	(GWh)

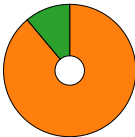
situation1



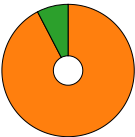
situation2



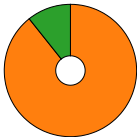
situation3



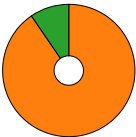
situation4



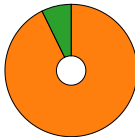
situation5



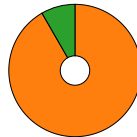
situation6



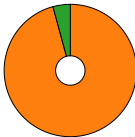
situation7



situation8



situation9



Environmental

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
SEA environmental benefit	92,022.00	85,854.00	84,513.00	91,101.00	86,305.00	84,521.00	87,788.00	83,537.00	81,742.00	
SEA environmental disbenefit	132,160.00	97,466.00	89,174.00	127,956.00	98,448.00	88,324.00	112,190.00	86,978.00	76,006.00	
Natural capital	6,581,450.35	8,236,531.91	8,753,057.15	7,369,418.38	7,999,636.54	7,757,512.37	7,234,128.84	9,558,624.12	12,214,059.18	
Bio-diversity net gain	-270,246.00	-161,709.00	-122,125.00	-256,678.00	-171,251.00	-120,100.00	-228,057.00	-171,100.00	-149,665.00	

Social

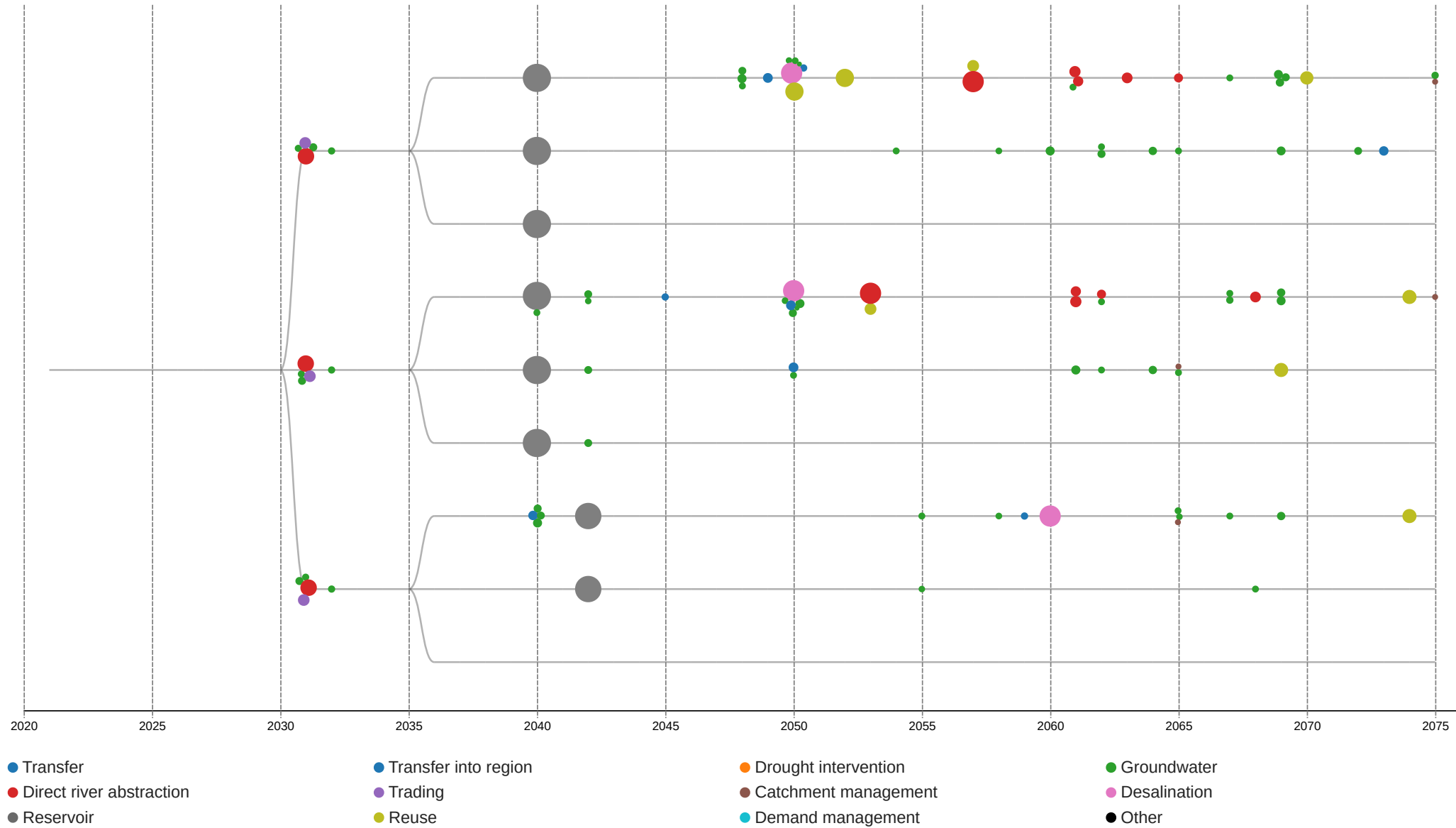
Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Customer preference	31,450.00	29,361.00	28,796.00	31,203.00	29,519.00	28,780.00	30,213.00	28,499.00	27,817.00	

Reliability

[illegible]

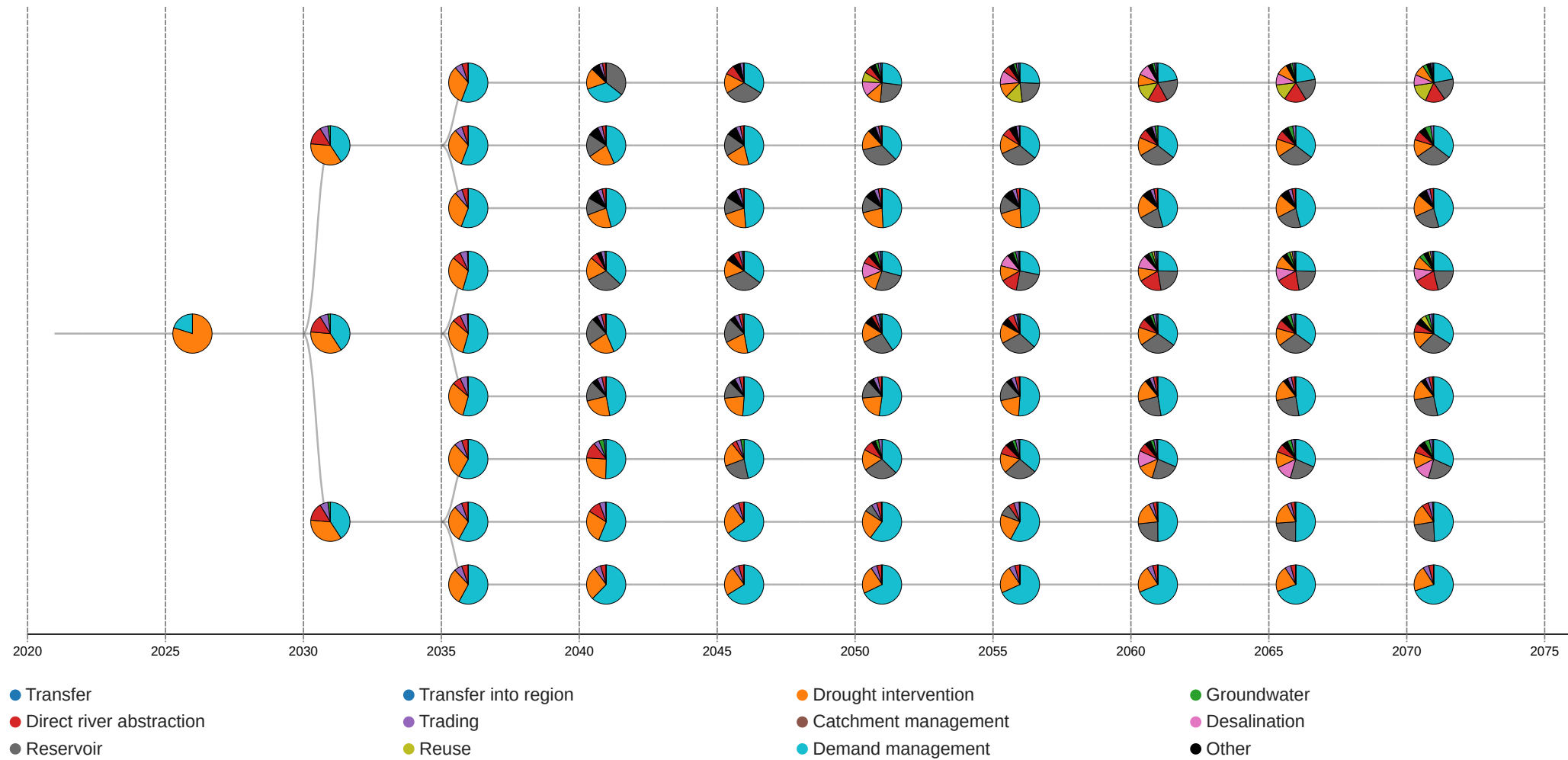
Adaptability										
Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Adaptability	18.90	21.12	22.61	19.21	20.76	22.34	20.35	22.18	25.55	
A3: Operational complexity and flexibility	9.25	10.02	10.56	9.38	9.86	10.51	9.52	10.38	11.91	
A4: WRZ connectivity	9.58	11.04	11.98	9.75	10.82	11.76	10.76	11.73	13.57	
A7: Customer relations support engagement with demand management	0.07	0.06	0.07	0.07	0.08	0.07	0.08	0.07	0.08	
Evolvability										
Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Evolvability	26.16	26.66	27.86	26.30	26.24	27.38	26.22	27.85	31.53	
E1: Scaleability and modularity of proposed changes	10.75	11.09	11.57	10.70	10.91	11.45	10.96	11.73	13.25	
E2: Intervention lead times	6.65	6.29	6.61	6.71	6.21	6.33	6.24	6.48	7.37	
E3: Reliance on external bodies to deliver changes	8.67	9.18	9.59	8.79	9.01	9.50	8.92	9.54	10.82	
E5: Collaborative land management	0.11	0.10	0.10	0.11	0.11	0.10	0.11	0.10	0.10	

Option Selection (Thames Water)

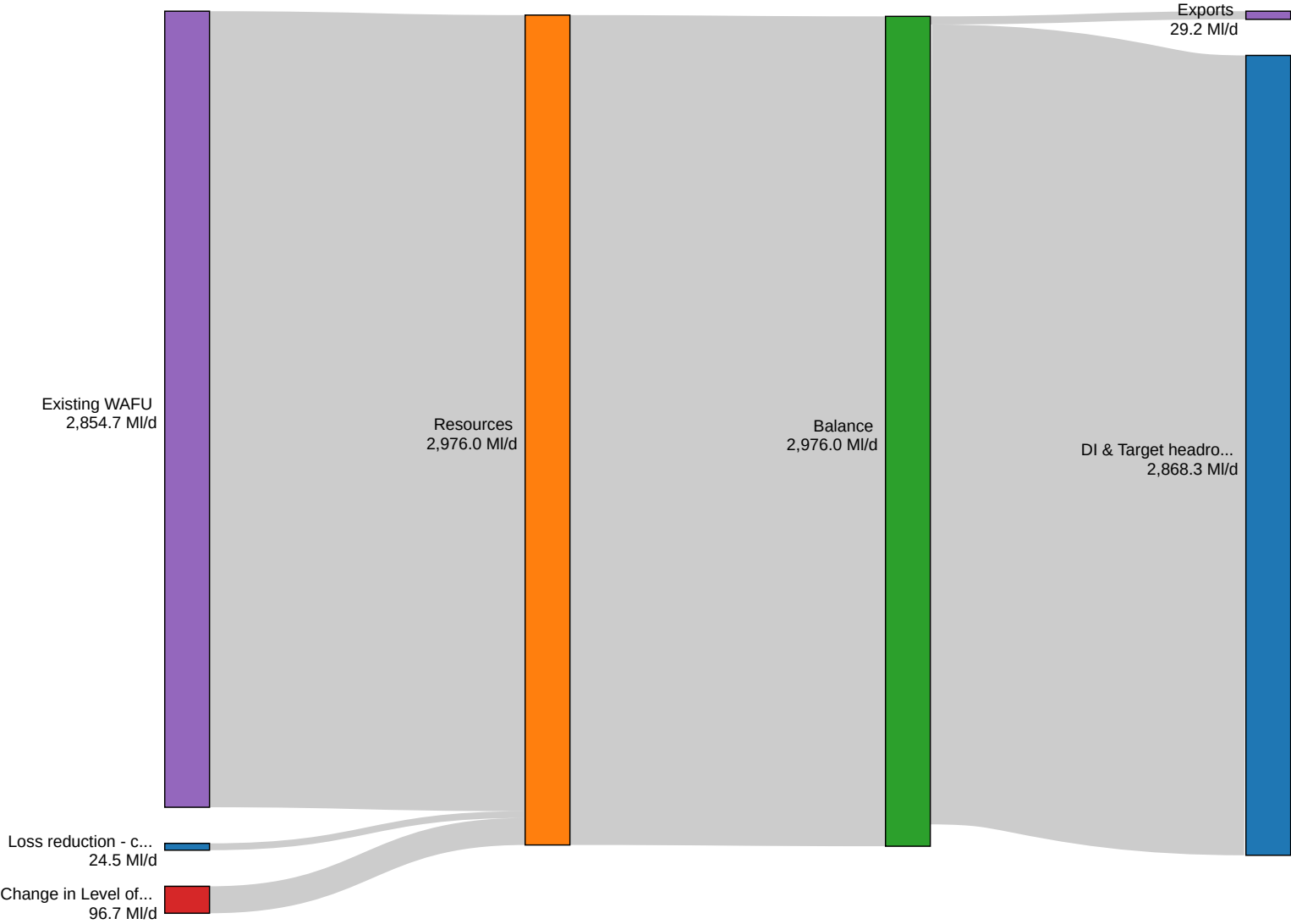


Utilisation (Thames Water)

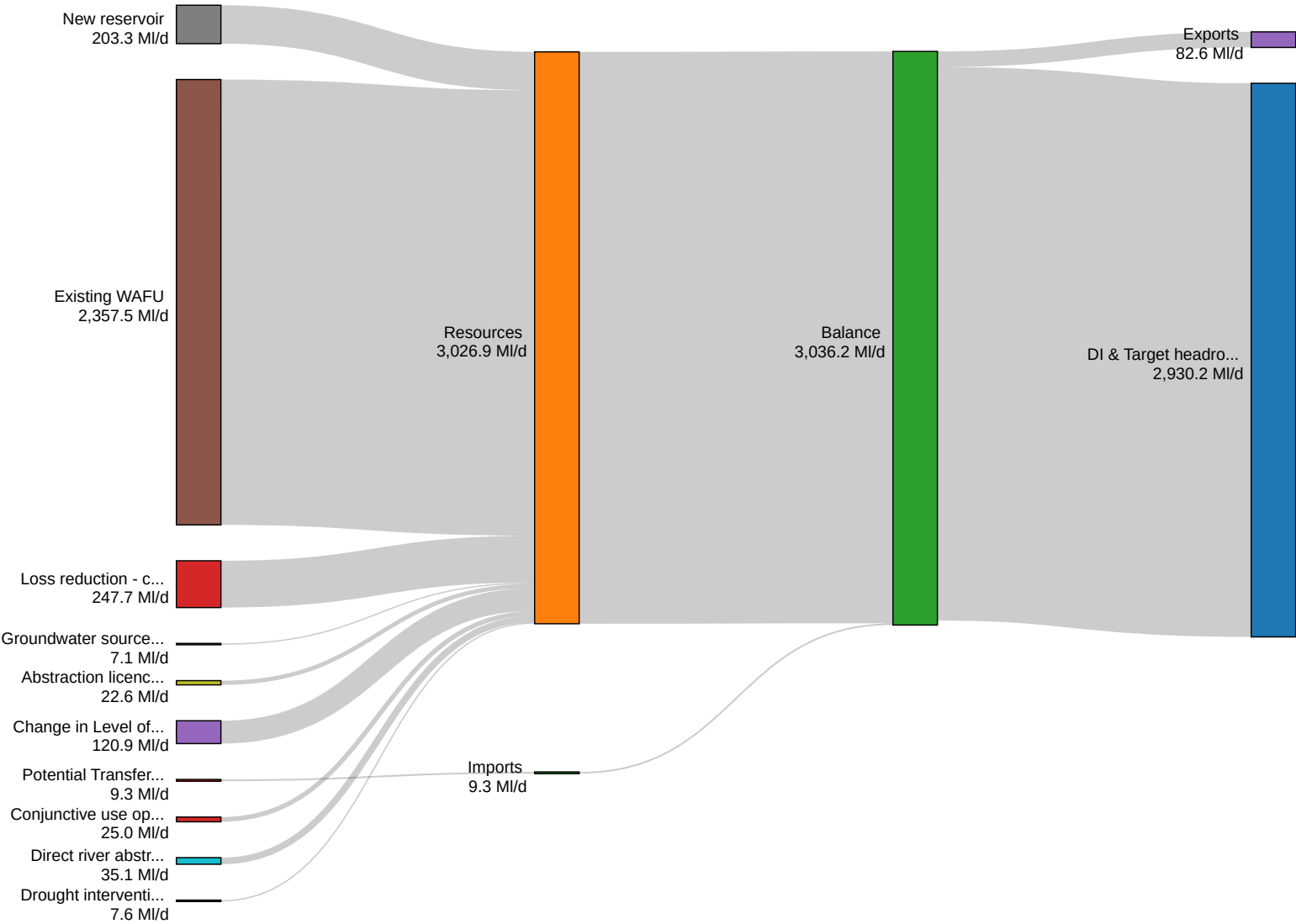
Pie charts show the breakdown of option utilisation by option category.



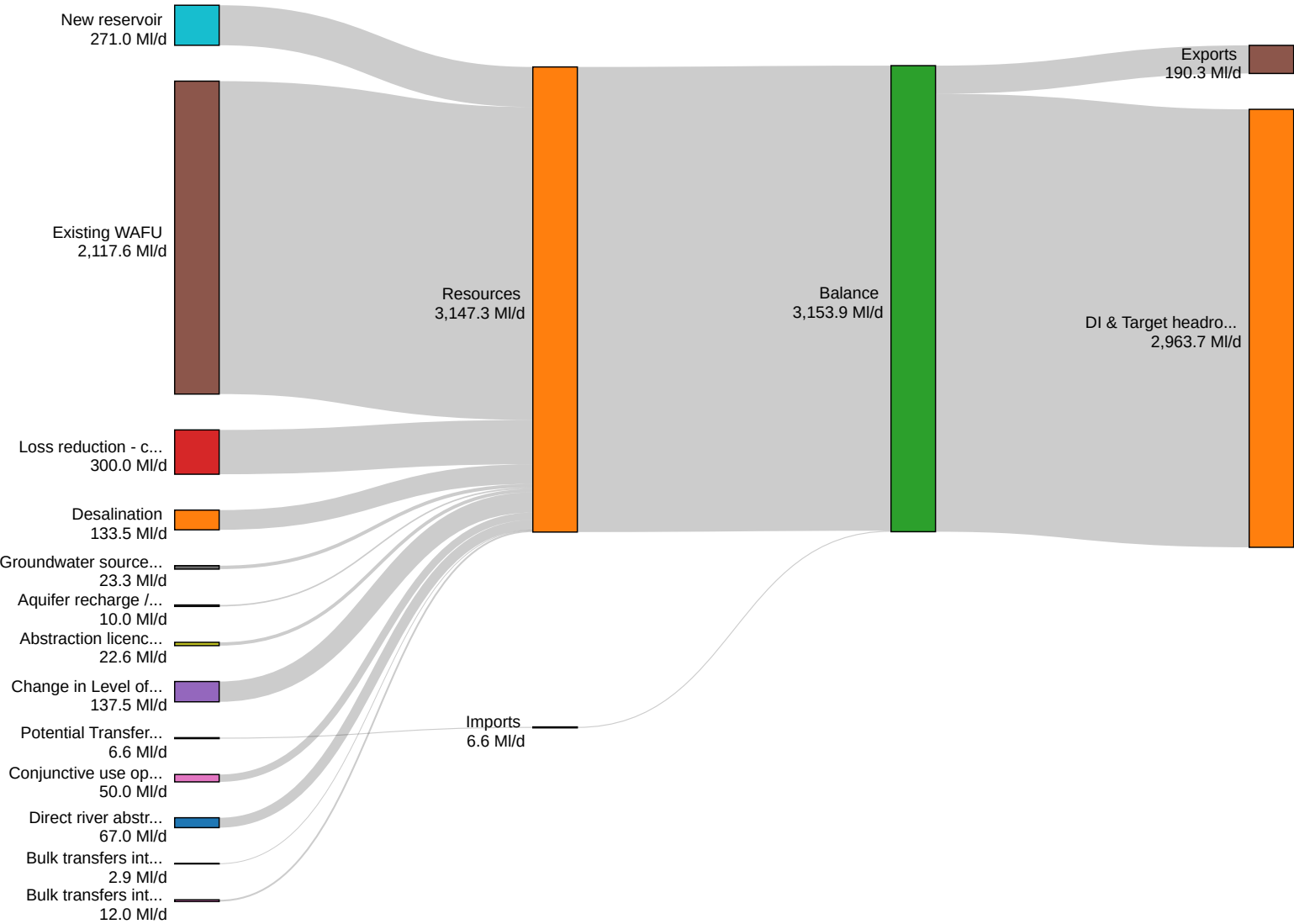
Situation 4 - 2026 (Thames Water)



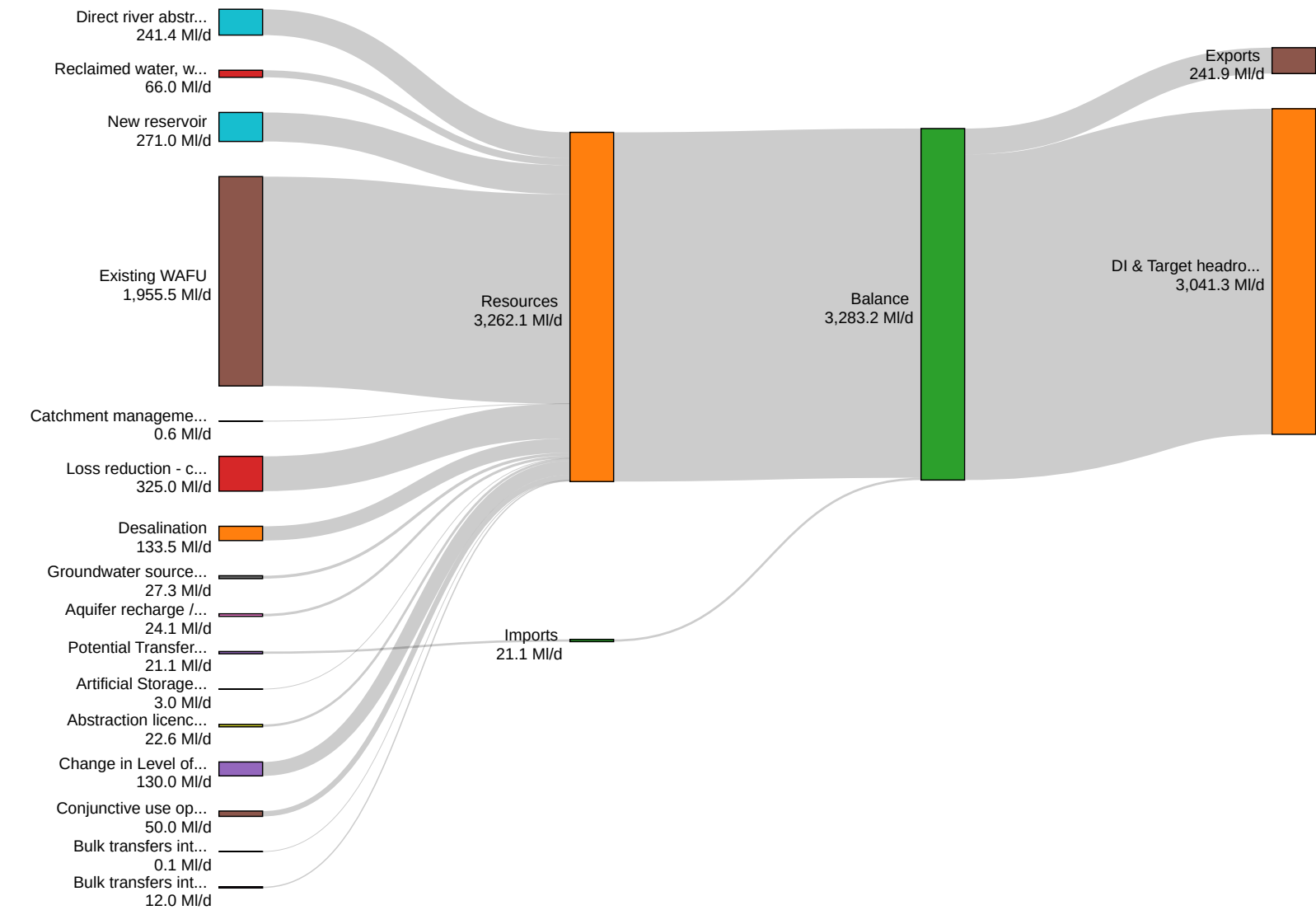
Situation 4 - 2040 (Thames Water)



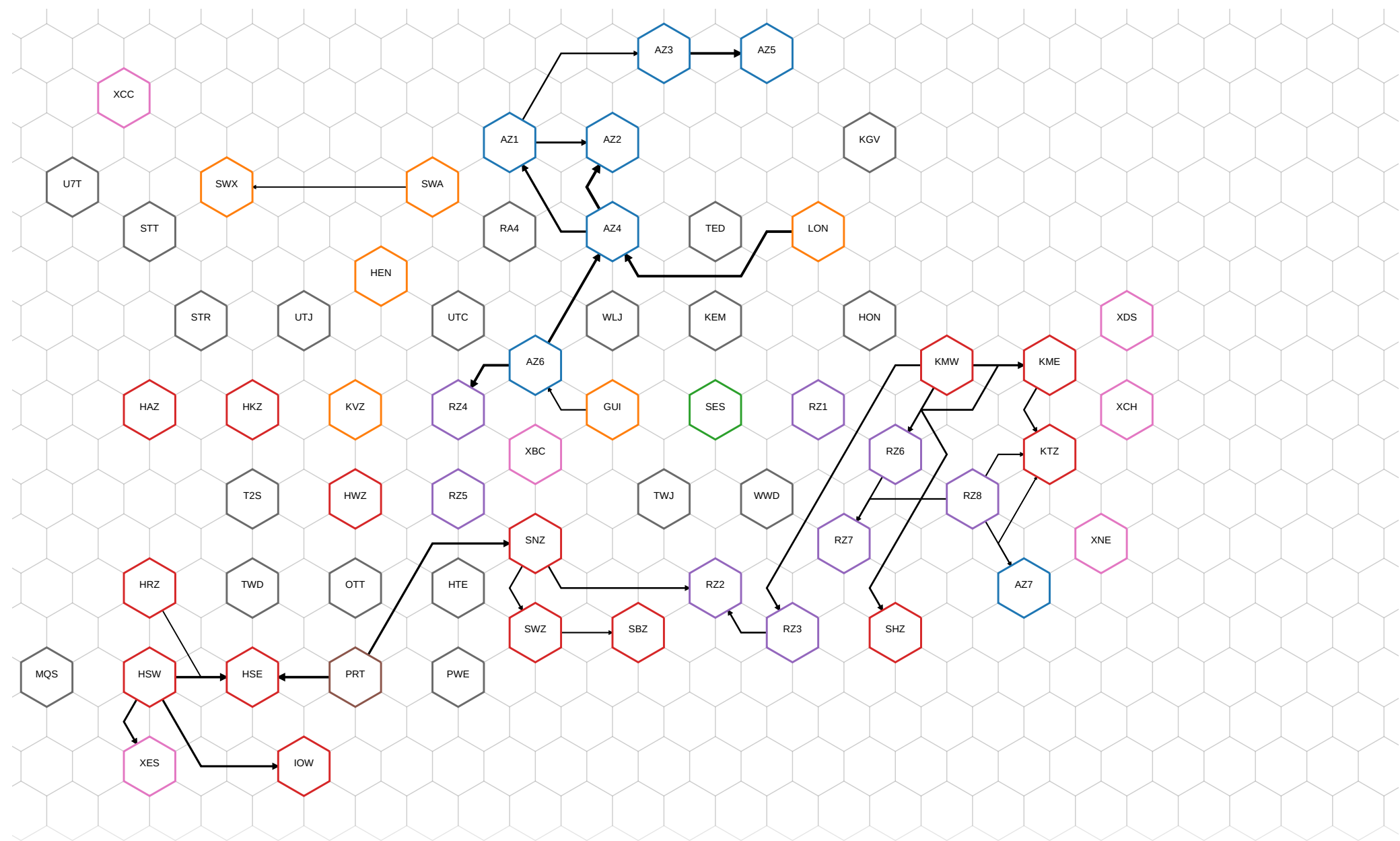
Situation 4 - 2050 (Thames Water)



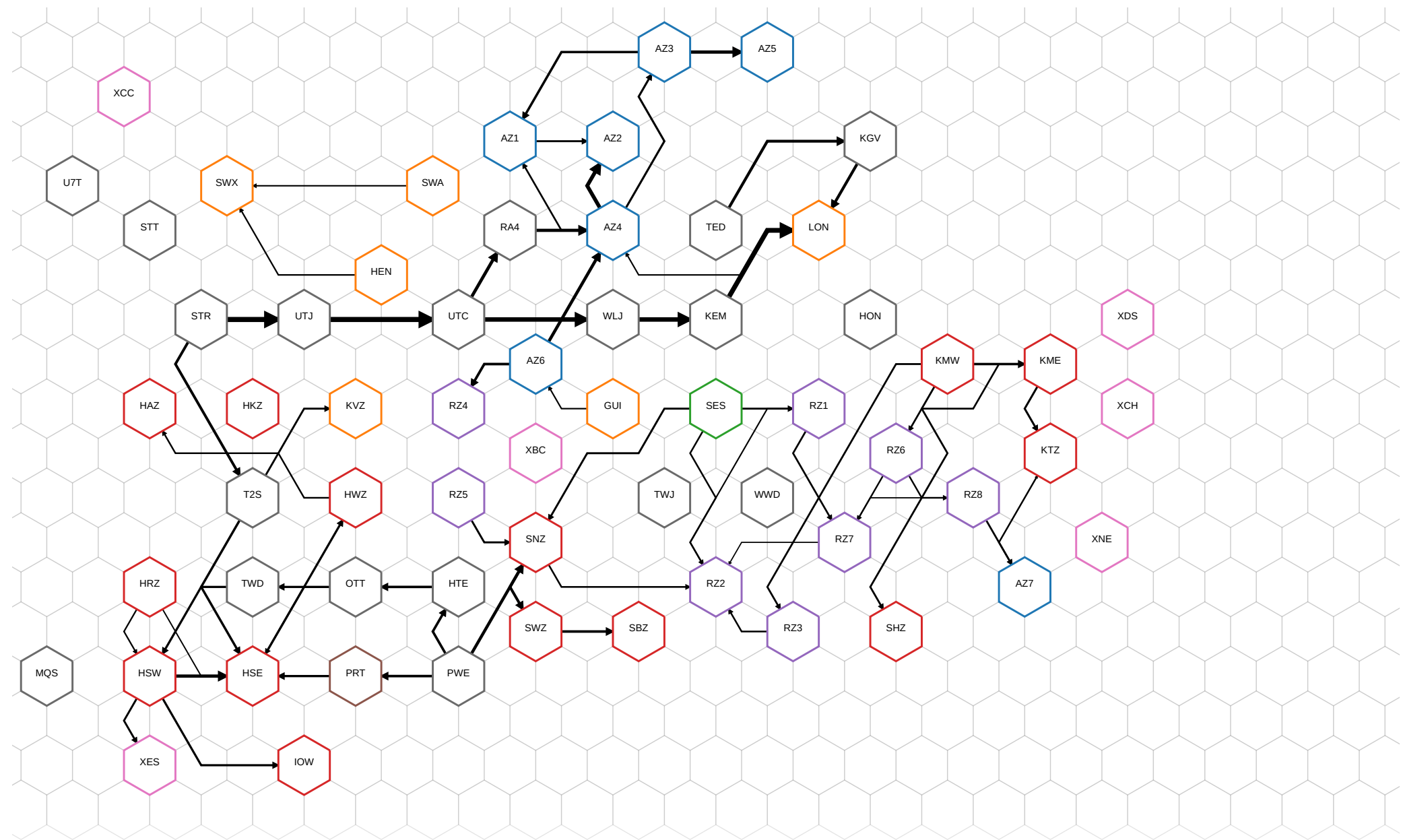
Situation 4 - 2075 (Thames Water)



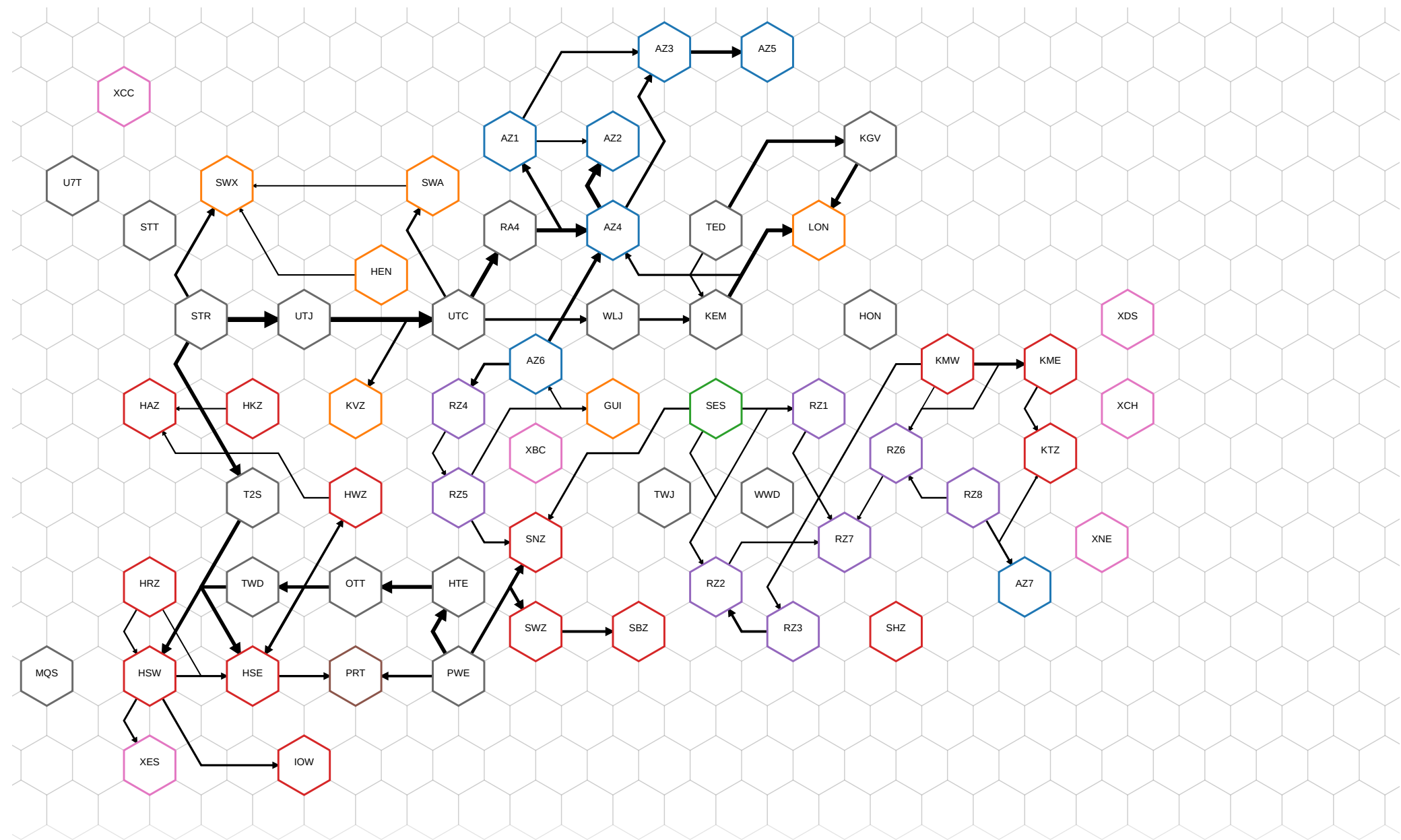
Situation 4 - 2026



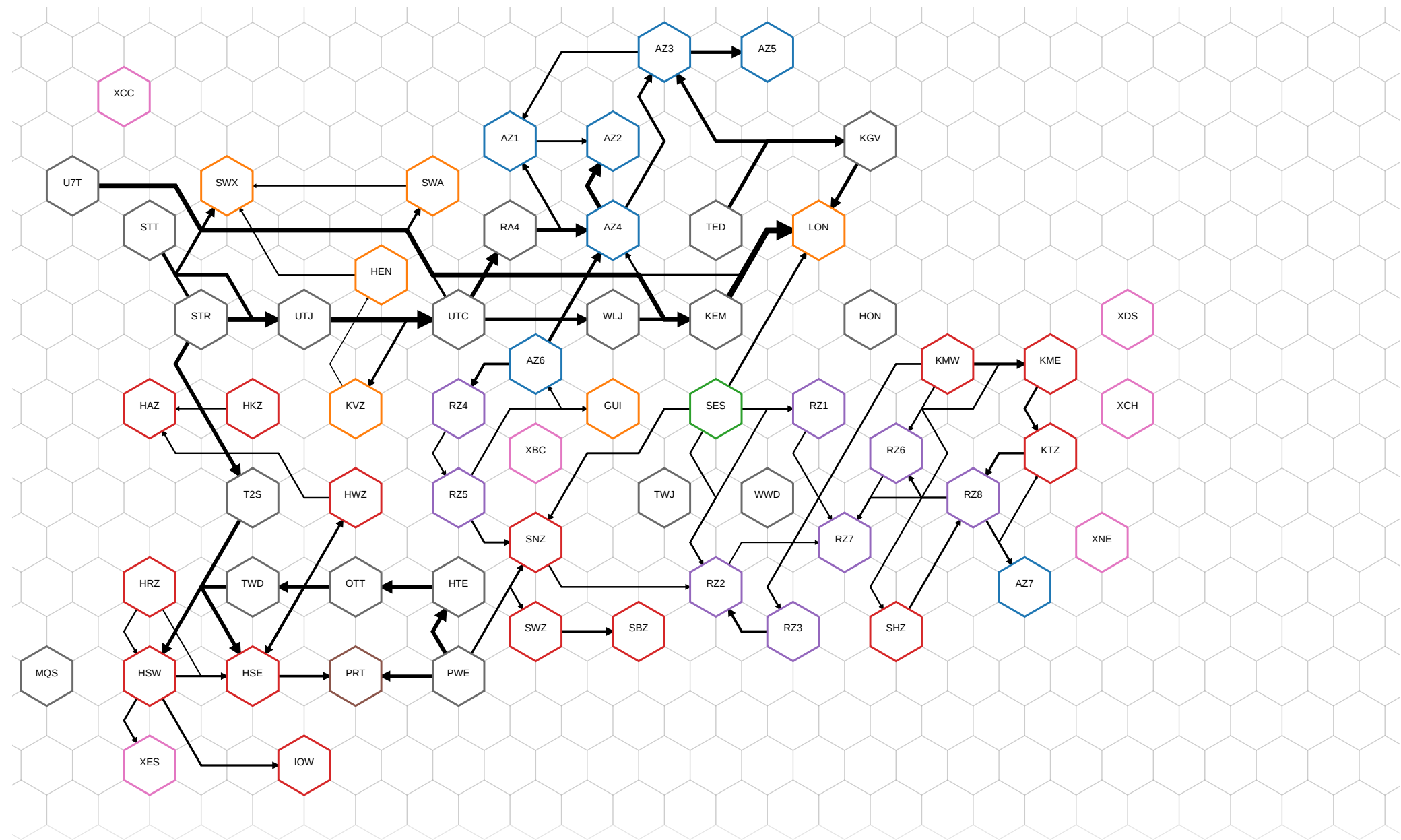
Situation 4 - 2040



Situation 4 - 2050



Situation 4 - 2075



IVM RUN DOSSIER

GOVERNMENT-LED SCENARIO A

IVM Summary: Thames Water

Metadata

General Settings

Name	st-hybrid-dy-w1-tree16.05-options-v37-gov-led-hybrida-2075
Created at	18/08/2022, 17:39:58
Tree	tree16.05: Root and branch tree 16.05: Stage 1 - Begins Hplan and LOW LCED, Stage 2 - Branches on growth (OxCam1a, Hplan and ONS18c), Stage 3 - Branches on licenced capped environmental destination, climate change and further growth scenarios (Hmax and Hmin) 🔗
Setting name	options-v37-gov-led-hybrida 🔗
Setting description	Emergency options in HSE, SBZ, and PRT.
Optimised discount rate	STPR

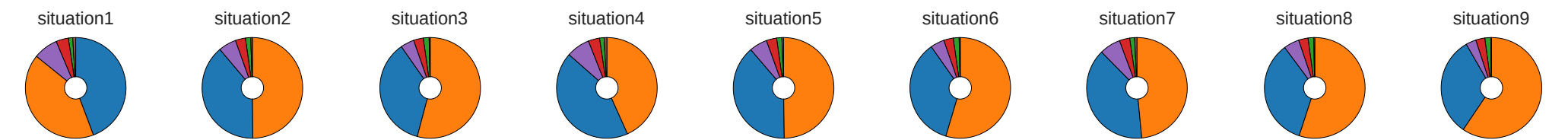
Metrics

Net present value (Cost)

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Cost w/ deficit (STPR)	16,409	12,973	11,785	15,448	13,012	11,679	13,473	11,618	10,615	(£m)
Cost w/o deficit (STPR)	16,409	12,973	11,785	15,448	13,012	11,679	13,473	11,618	10,615	(£m)
Cost w/ deficit (IGEQ)	26,577	20,057	17,879	24,739	20,182	17,711	21,288	17,829	15,937	(£m)
Cost w/o deficit (IGEQ)	26,577	20,057	17,879	24,739	20,182	17,711	21,288	17,829	15,937	(£m)
Cost w/ deficit (LTDR)	18,331	14,333	12,962	17,212	14,387	12,844	14,960	12,812	11,646	(£m)
Cost w/o deficit (LTDR)	18,331	14,333	12,962	17,212	14,387	12,844	14,960	12,812	11,646	(£m)

Cost breakdown (STPR)

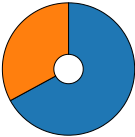
Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Capex	7,265	5,054	4,261	6,672	5,065	4,160	5,273	4,043	3,419	(£m)
Fixed opex	6,812	6,469	6,380	6,686	6,478	6,378	6,528	6,392	6,311	(£m)
Fixed operational carbon	232	222	220	228	223	221	217	210	206	(£m)
Embedded carbon	655	424	370	561	434	359	447	352	311	(£m)
Variable opex	1,291	737	514	1,164	745	518	908	580	347	(£m)
Variable carbon opex	154	67	41	137	68	42	99	41	20	(£m)



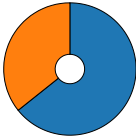
Emissions breakdown

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Capital emissions	4,211,551	2,599,208	2,227,441	3,584,636	2,690,630	2,163,996	2,813,535	2,152,129	1,863,425	(tonnes)
Operational emissions	2,066,521	1,443,999	1,293,318	1,921,384	1,445,998	1,306,250	1,610,201	1,197,171	1,070,129	(tonnes)

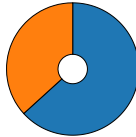
situation1



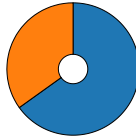
situation2



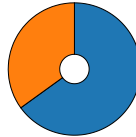
situation3



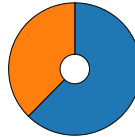
situation4



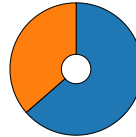
situation5



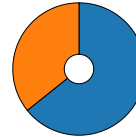
situation6



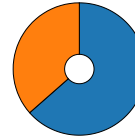
situation7



situation8



situation9



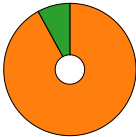
Electricity breakdown

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Generated (on site)	0	0	0	0	0	0	0	0	0	(GWh)
Grid	24,724	12,418	6,637	21,276	13,139	7,021	17,162	10,753	4,765	(GWh)
Renewable	2,252	1,072	635	1,507	1,131	594	1,348	781	135	(GWh)

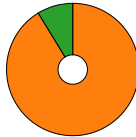
situation1



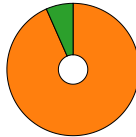
situation2



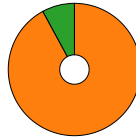
situation3



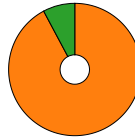
situation4



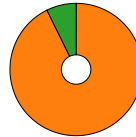
situation5



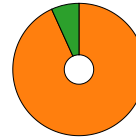
situation6



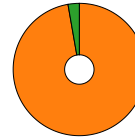
situation7



situation8



situation9



Environmental

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
SEA environmental benefit	87,473.00	80,891.00	79,398.00	86,113.00	81,149.00	79,472.00	82,629.00	78,761.00	76,829.00	
SEA environmental disbenefit	125,244.00	91,758.00	83,234.00	120,381.00	94,394.00	84,686.00	105,537.00	82,988.00	70,917.00	
Natural capital	7,295,093.92	8,384,891.54	8,527,817.98	6,691,466.84	7,851,279.27	8,537,069.98	11,964,252.01	13,421,793.00	16,048,010.36	
Bio-diversity net gain	-260,373.00	-158,398.00	-132,958.00	-235,636.00	-150,494.00	-127,018.00	-226,160.00	-172,619.00	-145,901.00	

Social

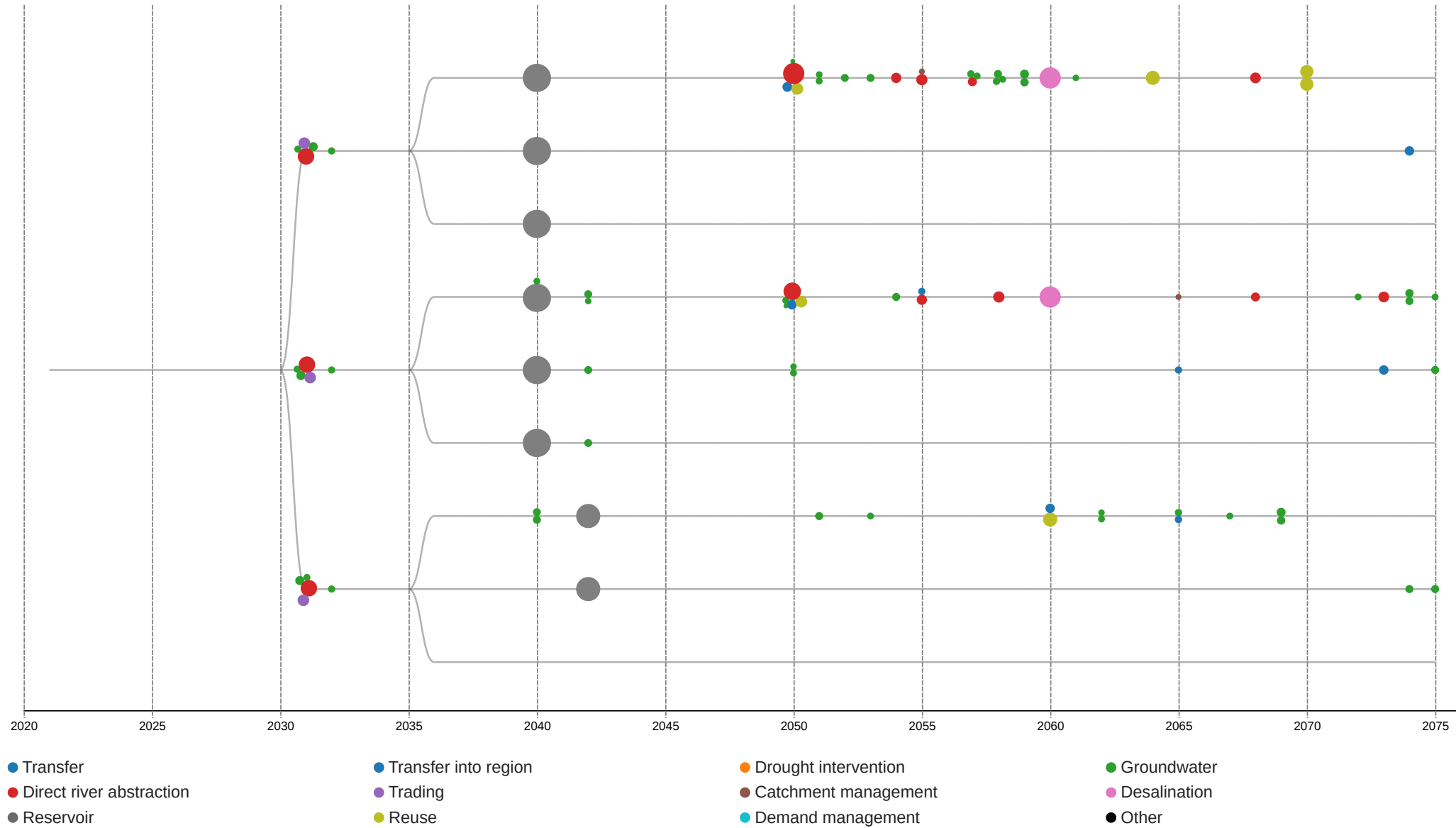
Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Customer preference	33,051.00	30,853.00	30,285.00	32,597.00	31,036.00	30,389.00	31,803.00	30,108.00	29,320.00	

Reliability

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Reliability	38.15	39.76	42.23	37.66	39.95	41.95	37.93	39.52	44.81	
R1: Uncertainty of option supply/demand benefit	11.07	11.24	11.82	10.77	11.32	11.73	10.89	10.97	12.43	
R3: Risk of service failure due to other physical hazards	9.90	10.34	11.09	9.76	10.43	11.03	9.80	10.37	11.91	
R4: Availability of additional headroom	6.65	7.11	7.32	6.70	7.05	7.25	7.02	7.38	7.90	
R5: Catchment/raw water quality risks (incl. climate change)	1.04	1.12	1.22	1.07	1.11	1.21	0.81	0.86	1.01	
R6: Capacity of catchment services	0.06	0.05	0.03	0.06	0.05	0.03	0.05	0.02	0.02	
R7: Risk of service failure to other exceptional events	9.39	9.88	10.74	9.27	9.95	10.68	9.32	9.90	11.54	
R8: Soil health	0.02	0.02	0.01	0.02	0.02	0.01	0.02	0.01	0.01	

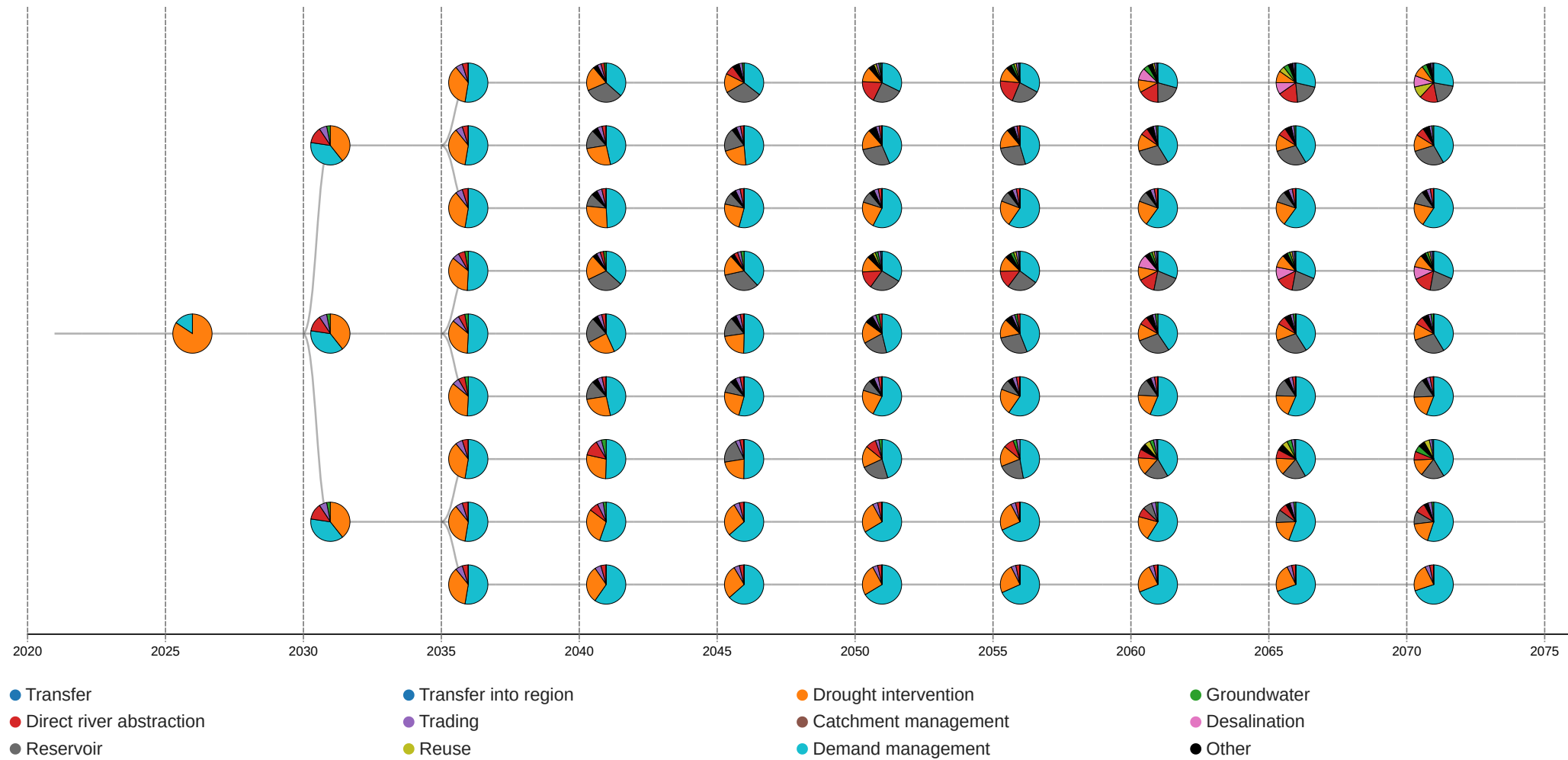
Adaptability										
Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Adaptability	18.73	20.81	22.61	19.40	20.93	22.18	19.87	21.64	24.99	
A3: Operational complexity and flexibility	9.19	9.78	10.63	9.12	9.85	10.57	9.18	9.80	11.43	
A4: WRZ connectivity	9.47	10.98	11.93	10.21	11.01	11.56	10.63	11.83	13.54	
A7: Customer relations support engagement with demand management	0.07	0.06	0.05	0.07	0.06	0.05	0.06	0.02	0.02	
Evolvability										
Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Evolvability	27.08	27.15	29.07	26.30	27.28	28.92	27.12	28.53	32.79	
E1: Scaleability and modularity of proposed changes	10.93	11.27	12.14	10.71	11.33	12.05	11.45	12.14	13.98	
E2: Intervention lead times	7.33	6.74	7.14	6.95	6.76	7.13	6.87	7.18	8.16	
E3: Reliance on external bodies to deliver changes	8.70	9.04	9.72	8.53	9.10	9.66	8.70	9.17	10.61	
E5: Collaborative land management	0.11	0.10	0.07	0.11	0.10	0.07	0.10	0.04	0.04	

Option Selection (Thames Water)

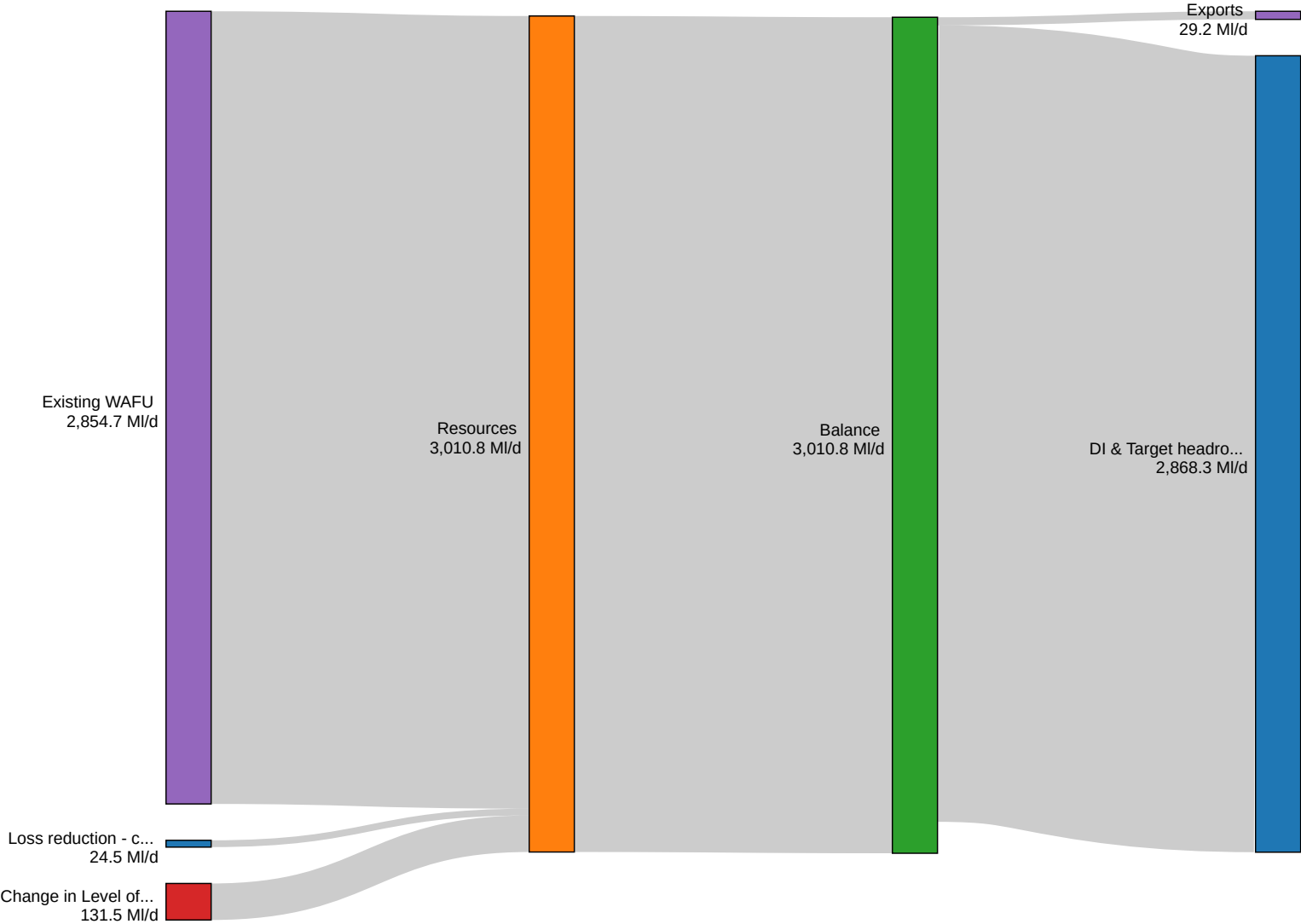


Utilisation (Thames Water)

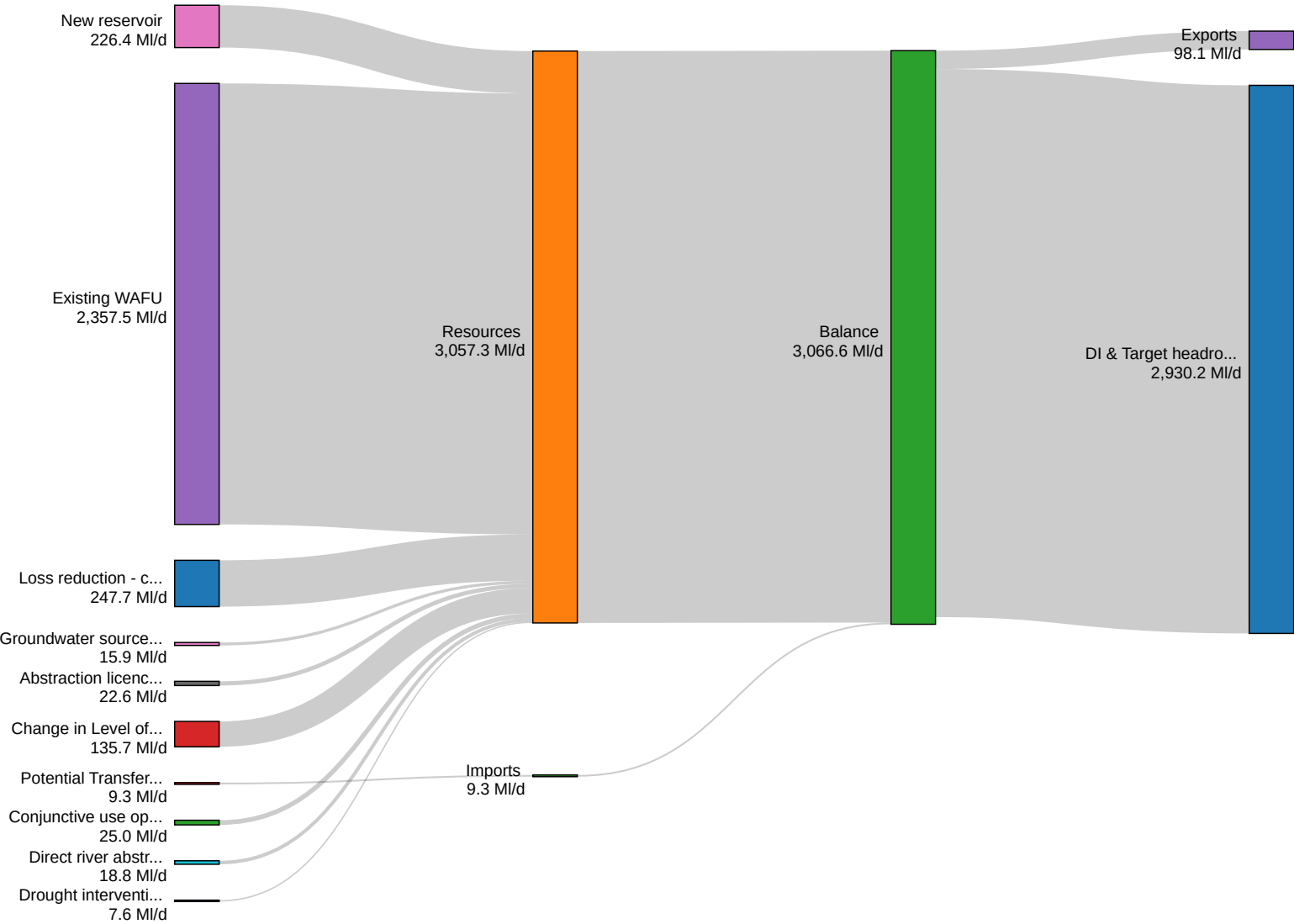
Pie charts show the breakdown of option utilisation by option category.



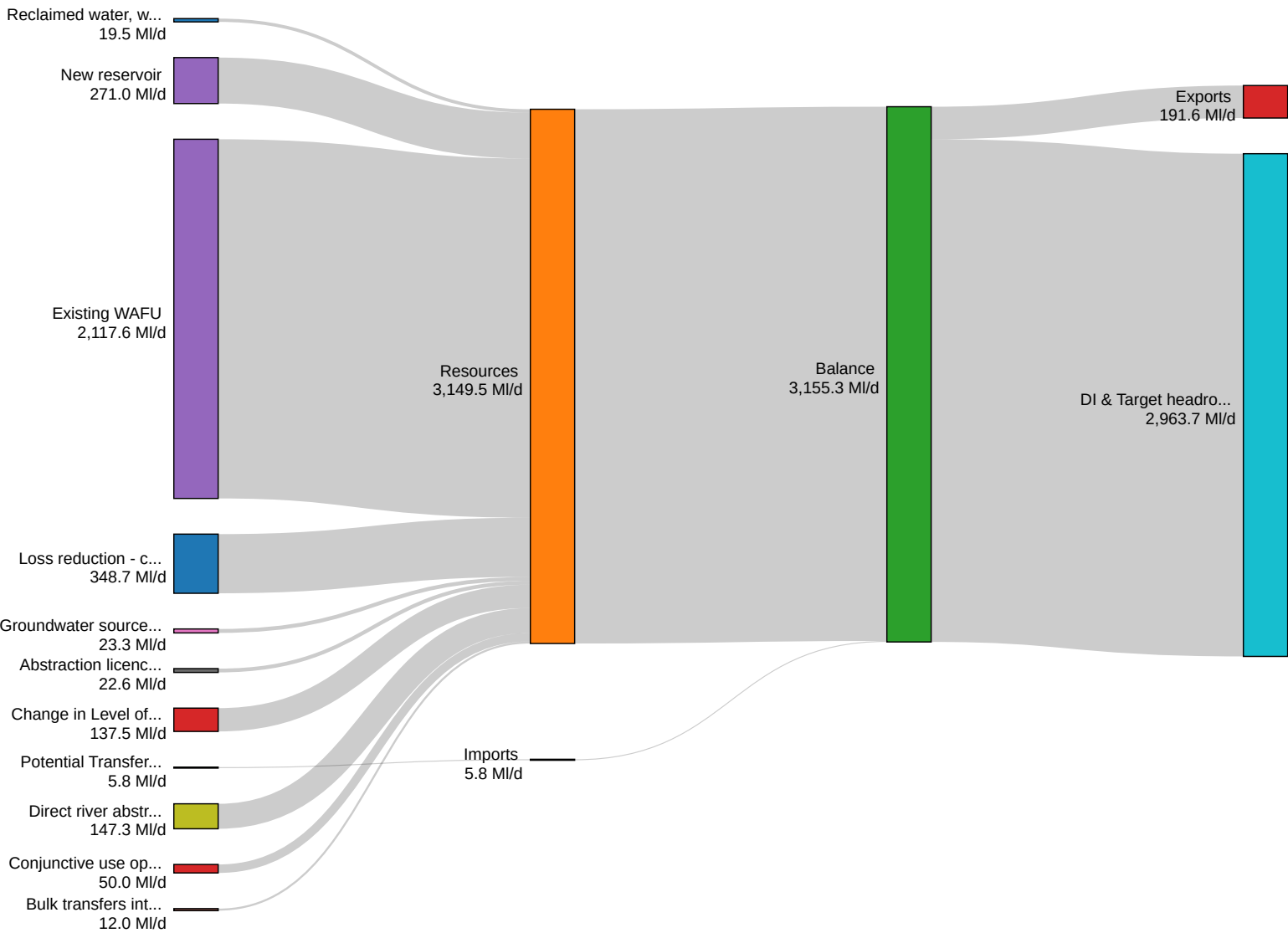
Situation 4 - 2026 (Thames Water)



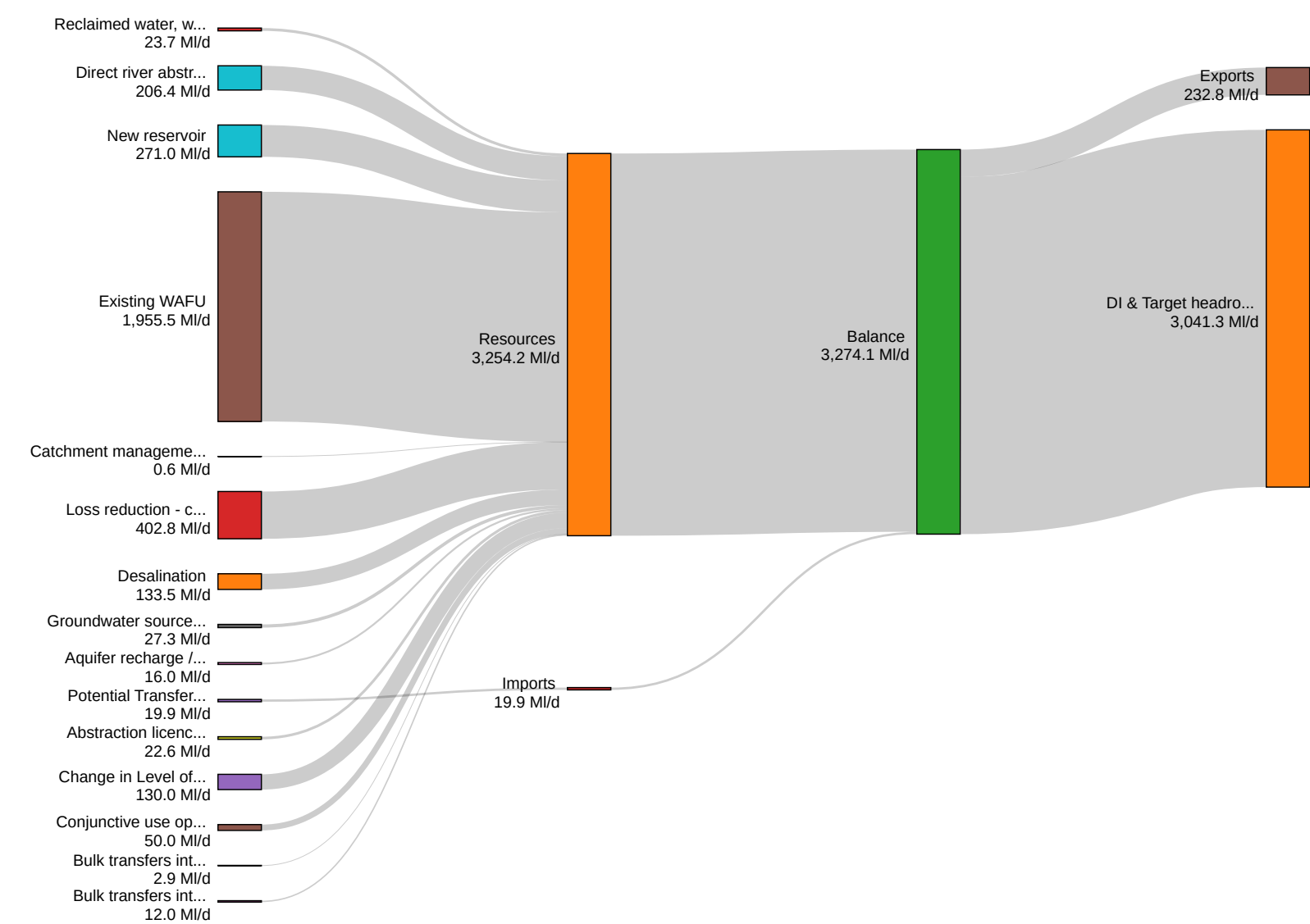
Situation 4 - 2040 (Thames Water)



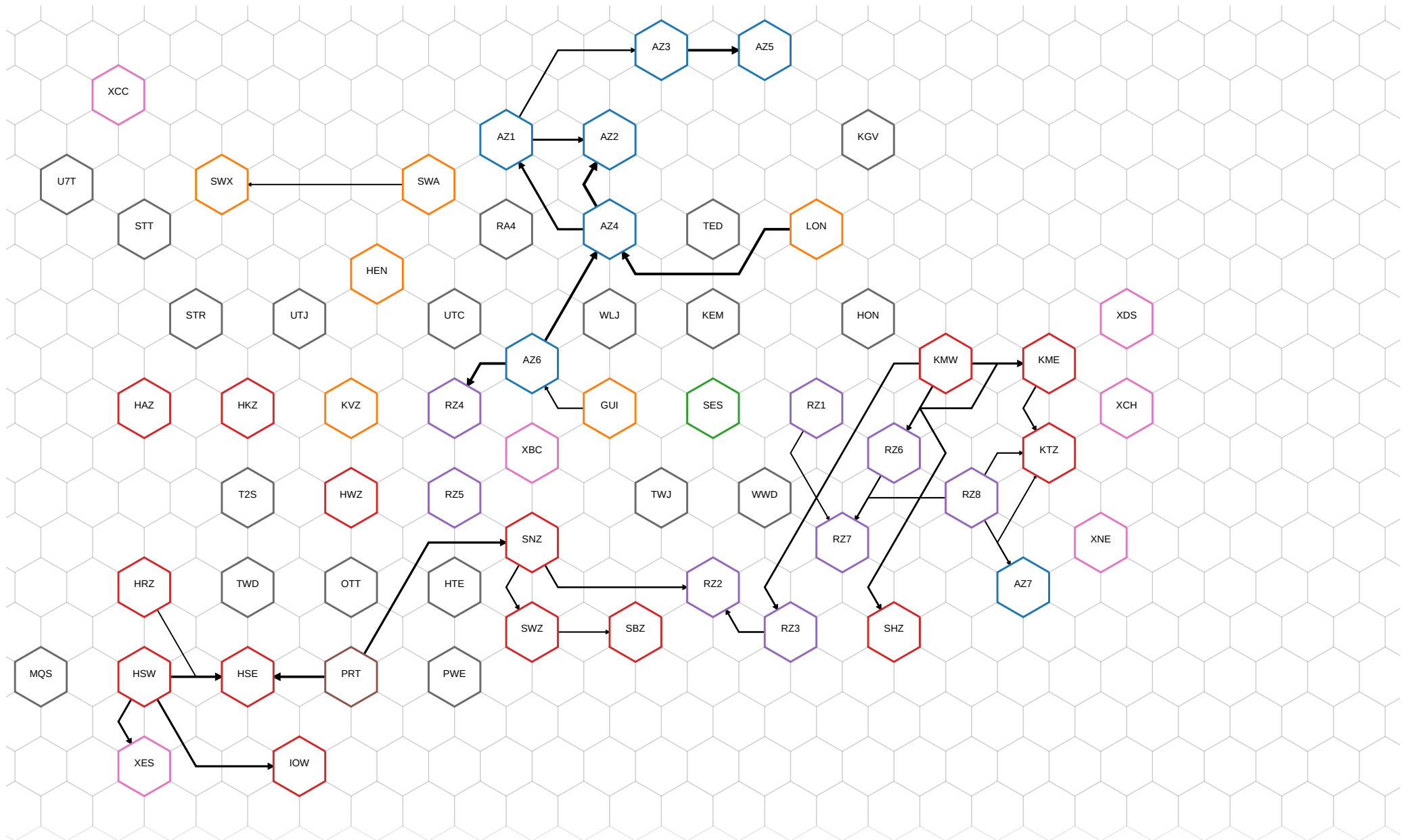
Situation 4 - 2050 (Thames Water)



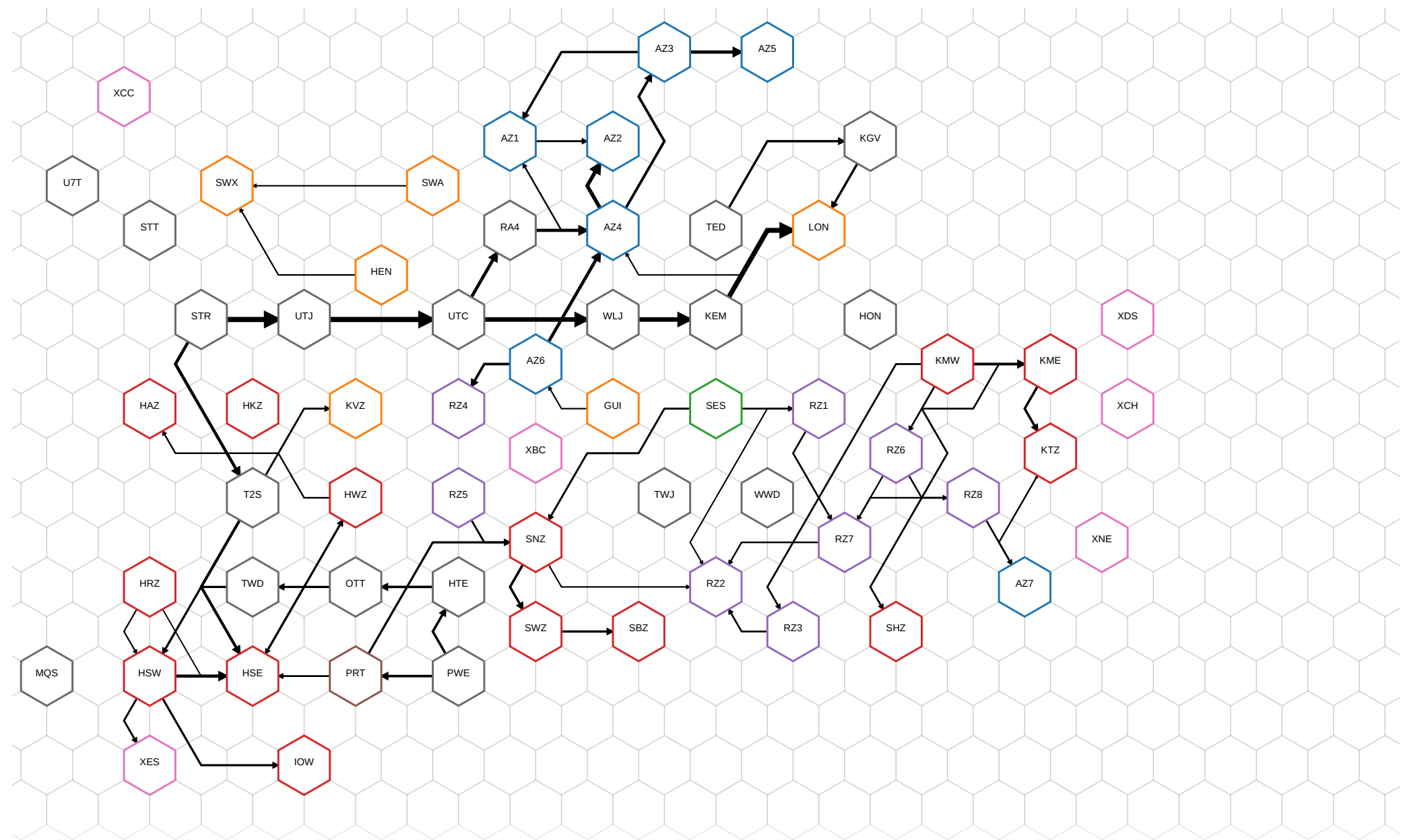
Situation 4 - 2075 (Thames Water)



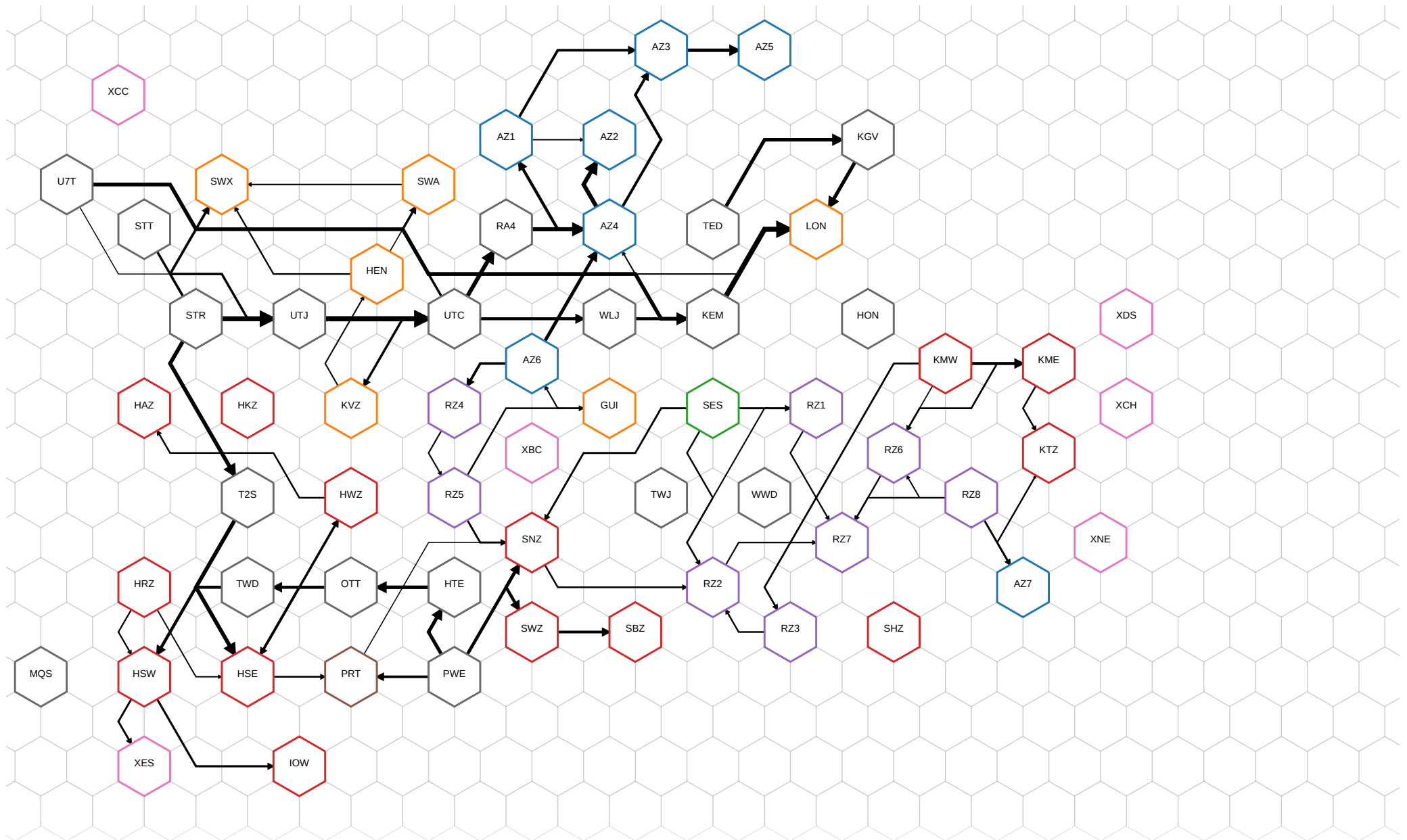
Situation 4 - 2026



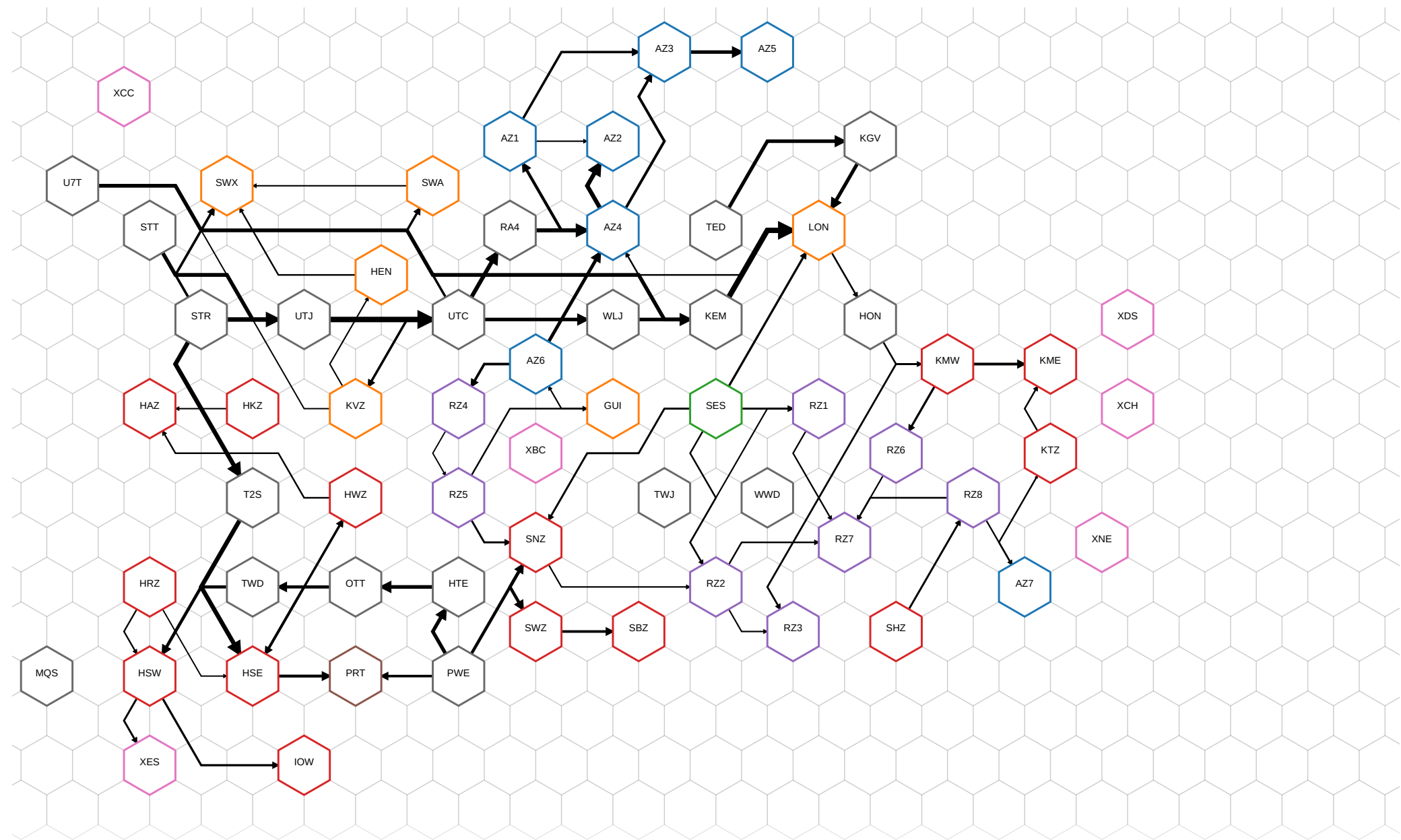
Situation 4 - 2040



Situation 4 - 2050



Situation 4 - 2075



IVM RUN DOSSIER

GOVERNMENT-LED SCENARIO C

IVM Summary: Thames Water

Metadata

General Settings

Name	st-hybrid-dy-w1-tree16.05-options-v37-gov-led-hybridc-2075
Created at	19/08/2022, 15:48:19
Tree	tree16.05: Root and branch tree 16.05: Stage 1 - Begins Hplan and LOW LCED, Stage 2 - Branches on growth (OxCam1a, Hplan and ONS18c), Stage 3 - Branches on licenced capped environmental destination, climate change and further growth scenarios (Hmax and Hmin) 🔗
Setting name	options-v37-gov-led-hybridc 🔗
Setting description	Emergency options in HSE, SBZ, and PRT.
Optimised discount rate	STPR

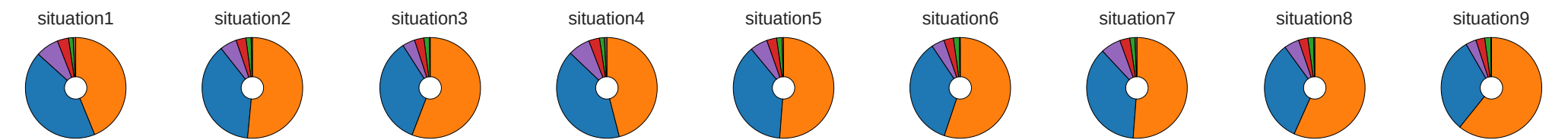
Metrics

Net present value (Cost)

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Cost w/ deficit (STPR)	15,222	12,537	11,423	14,315	12,646	11,598	12,648	11,284	10,403	(£m)
Cost w/o deficit (STPR)	15,222	12,537	11,423	14,315	12,646	11,598	12,648	11,284	10,403	(£m)
Cost w/ deficit (IGEQ)	24,319	19,307	17,248	22,564	19,493	17,554	19,737	17,236	15,600	(£m)
Cost w/o deficit (IGEQ)	24,319	19,307	17,248	22,564	19,493	17,554	19,737	17,236	15,600	(£m)
Cost w/ deficit (LTDR)	16,949	13,839	12,550	15,888	13,961	12,750	14,004	12,430	11,410	(£m)
Cost w/o deficit (LTDR)	16,949	13,839	12,550	15,888	13,961	12,750	14,004	12,430	11,410	(£m)

Cost breakdown (STPR)

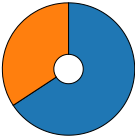
Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Capex	6,523	4,739	4,010	5,885	4,774	4,112	4,659	3,756	3,211	(£m)
Fixed opex	6,671	6,461	6,377	6,586	6,478	6,393	6,476	6,395	6,323	(£m)
Fixed operational carbon	227	212	208	226	223	219	215	211	207	(£m)
Embedded carbon	552	401	346	500	403	357	406	338	299	(£m)
Variable opex	1,123	675	456	1,004	707	480	812	542	344	(£m)
Variable carbon opex	125	50	26	113	62	38	80	42	19	(£m)



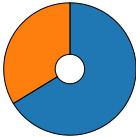
Emissions breakdown

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Capital emissions	3,526,591	2,461,632	2,075,576	3,137,205	2,469,368	2,153,354	2,533,056	2,059,214	1,784,375	(tonnes)
Operational emissions	1,836,388	1,251,621	1,102,399	1,737,803	1,404,214	1,260,242	1,471,771	1,202,782	1,071,382	(tonnes)

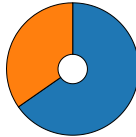
situation1



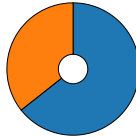
situation2



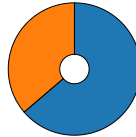
situation3



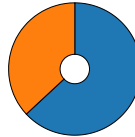
situation4



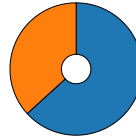
situation5



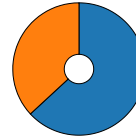
situation6



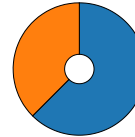
situation7



situation8



situation9



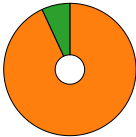
Electricity breakdown

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Generated (on site)	0	0	0	0	0	0	0	0	0	(GWh)
Grid	21,425	12,129	6,288	19,617	13,468	6,842	14,532	11,045	4,503	(GWh)
Renewable	1,420	899	327	1,318	900	329	1,145	619	113	(GWh)

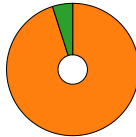
situation1



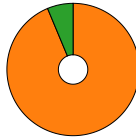
situation2



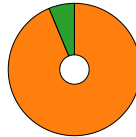
situation3



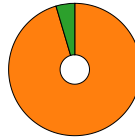
situation4



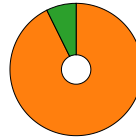
situation5



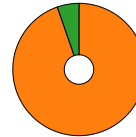
situation6



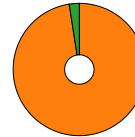
situation7



situation8



situation9



Environmental

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
SEA environmental benefit	86,000.00	80,448.00	79,217.00	84,166.00	80,770.00	79,521.00	81,162.00	78,053.00	77,061.00	
SEA environmental disbenefit	119,859.00	87,207.00	79,496.00	111,190.00	89,020.00	80,718.00	98,301.00	80,764.00	72,590.00	
Natural capital	6,043,516.33	8,306,896.28	8,666,496.18	7,611,017.13	8,227,777.76	8,601,601.70	12,088,763.02	14,548,167.88	15,665,466.48	
Bio-diversity net gain	-221,323.00	-124,059.00	-116,151.00	-218,513.00	-124,853.00	-121,003.00	-226,913.00	-173,744.00	-160,594.00	

Social

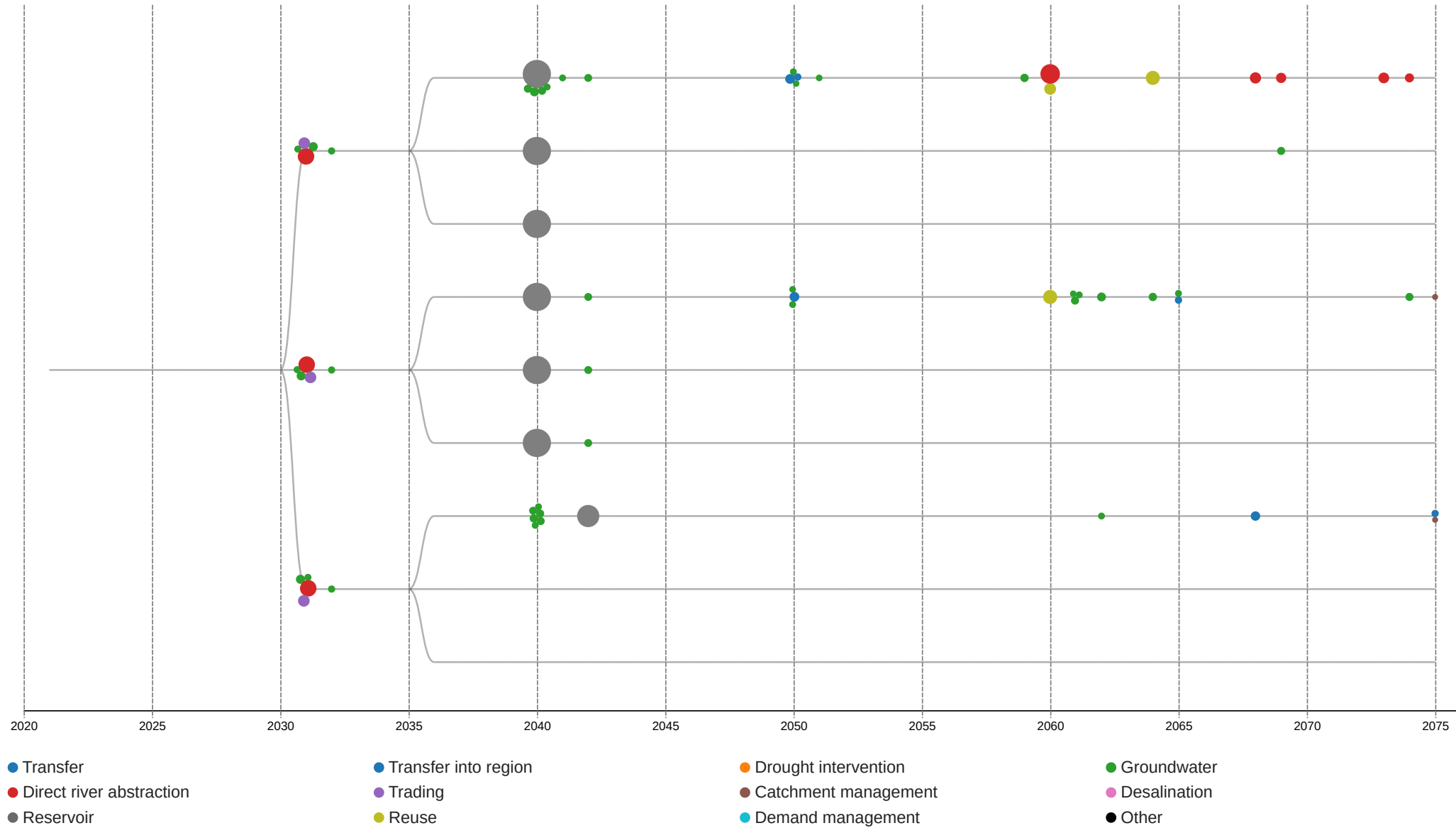
Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Customer preference	32,640.00	30,445.00	29,956.00	32,010.00	30,535.00	30,057.00	31,109.00	29,938.00	29,435.00	

Reliability

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Reliability	37.69	39.34	41.48	37.54	40.22	43.39	37.60	40.09	46.04	
R1: Uncertainty of option supply/demand benefit	10.58	10.57	10.94	10.53	11.03	11.86	10.44	10.90	12.54	
R3: Risk of service failure due to other physical hazards	9.88	10.46	11.13	9.85	10.73	11.66	9.92	10.76	12.53	
R4: Availability of additional headroom	6.70	7.17	7.38	6.69	7.10	7.30	7.00	7.41	7.93	
R5: Catchment/raw water quality risks (incl. climate change)	1.02	1.11	1.22	1.00	1.11	1.21	0.67	0.69	0.85	
R6: Capacity of catchment services	0.05	0.02	0.02	0.06	0.02	0.02	0.06	0.02	0.02	
R7: Risk of service failure to other exceptional events	9.43	10.01	10.79	9.38	10.24	11.32	9.48	10.31	12.17	
R8: Soil health	0.02	0.01	0.01	0.02	0.01	0.01	0.02	0.01	0.01	

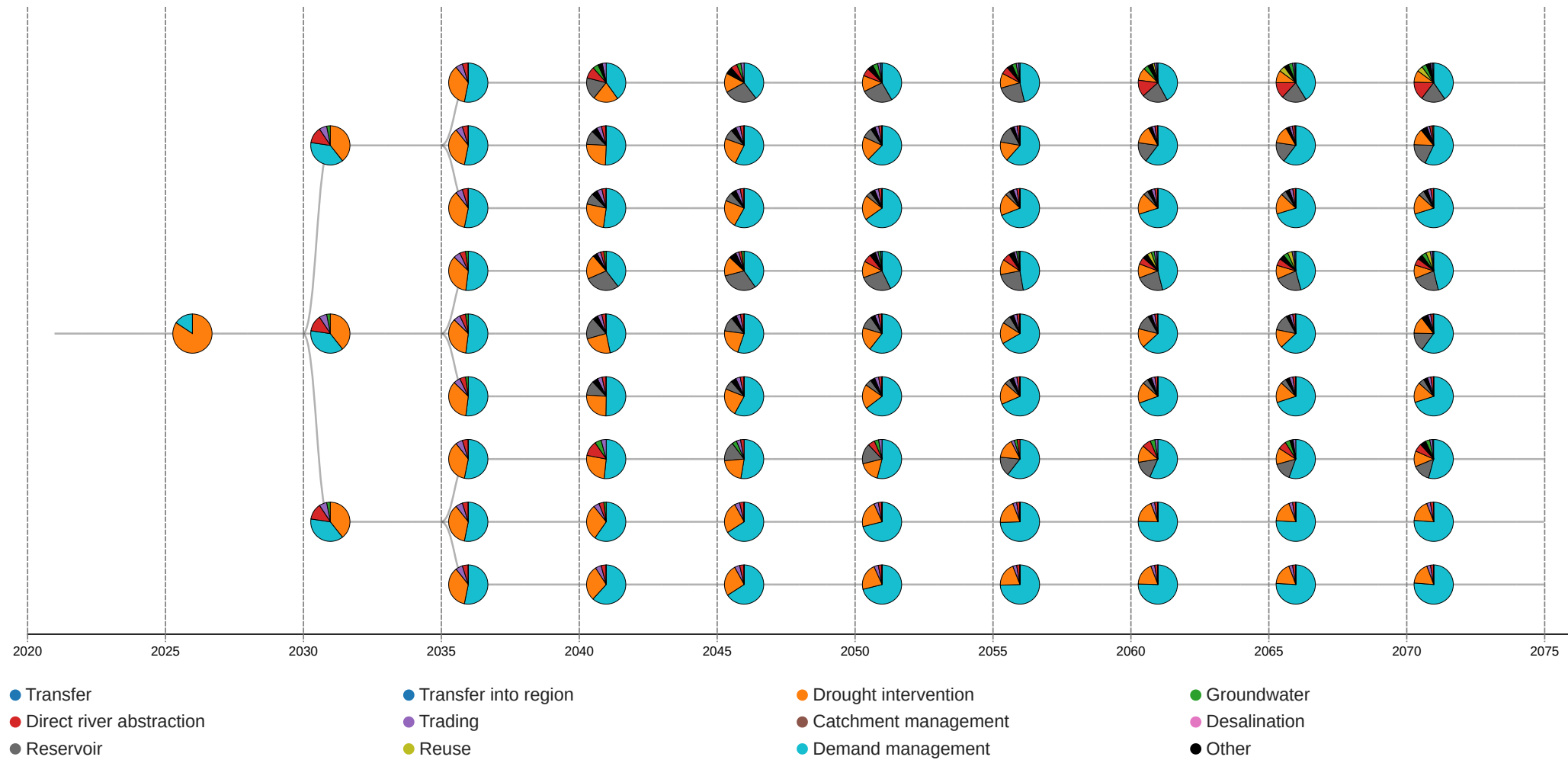
Adaptability										
Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Adaptability	18.67	21.01	22.52	19.43	20.56	22.77	19.49	19.71	23.20	
A3: Operational complexity and flexibility	9.31	9.92	10.68	9.28	10.15	11.21	9.40	10.19	12.06	
A4: WRZ connectivity	9.31	11.07	11.83	10.08	10.39	11.54	10.01	9.50	11.12	
A7: Customer relations support engagement with demand management	0.05	0.02	0.02	0.07	0.02	0.02	0.08	0.02	0.02	
Evolvability										
Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Evolvability	27.35	28.43	30.49	26.86	29.03	31.68	28.35	31.05	36.20	
E1: Scaleability and modularity of proposed changes	11.09	11.76	12.61	11.06	12.01	13.13	11.90	13.14	15.29	
E2: Intervention lead times	7.48	7.47	8.08	7.05	7.57	8.22	7.36	8.16	9.52	
E3: Reliance on external bodies to deliver changes	8.69	9.16	9.75	8.65	9.40	10.29	8.98	9.70	11.36	
E5: Collaborative land management	0.10	0.04	0.04	0.11	0.04	0.04	0.11	0.04	0.04	

Option Selection (Thames Water)

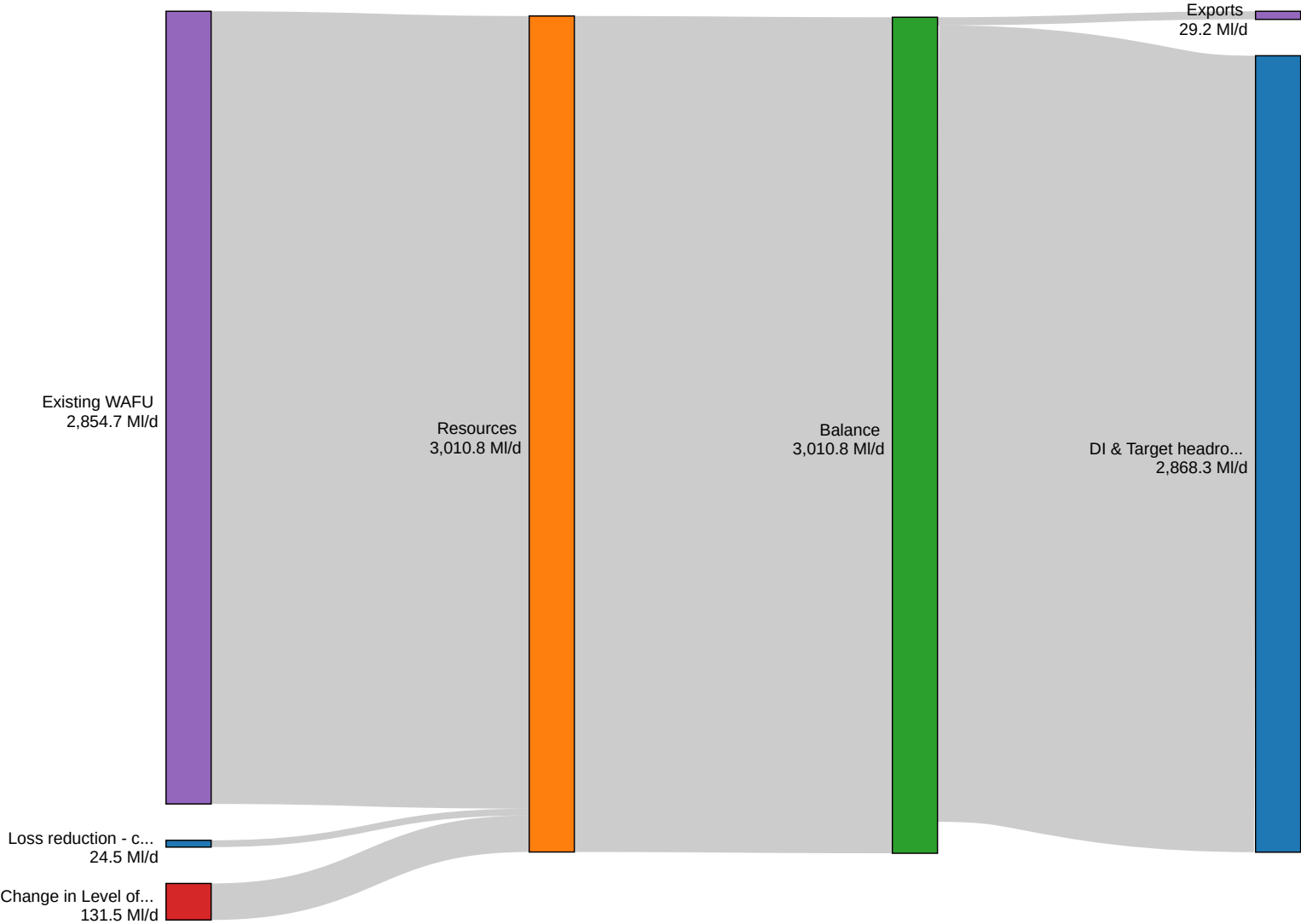


Utilisation (Thames Water)

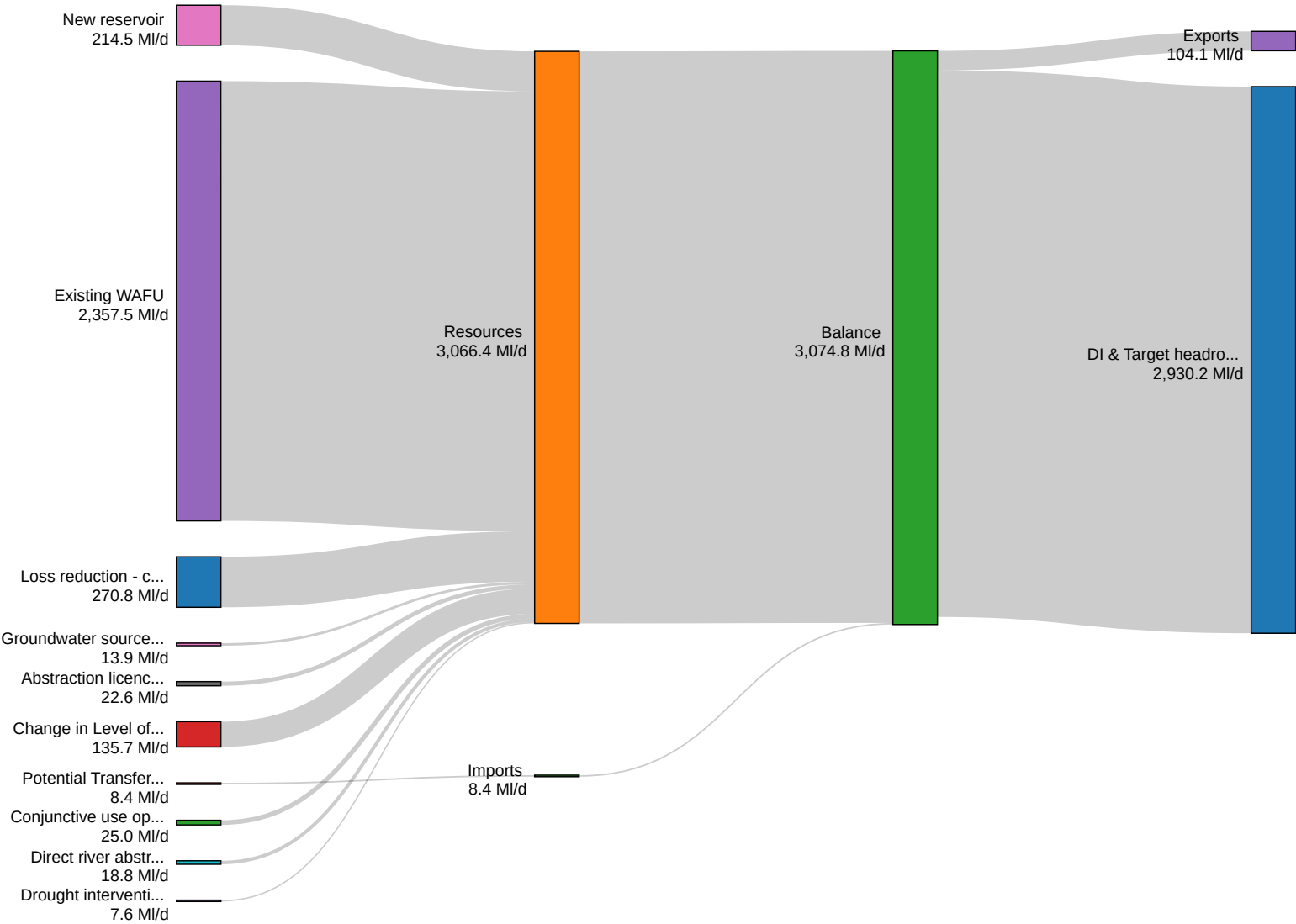
Pie charts show the breakdown of option utilisation by option category.



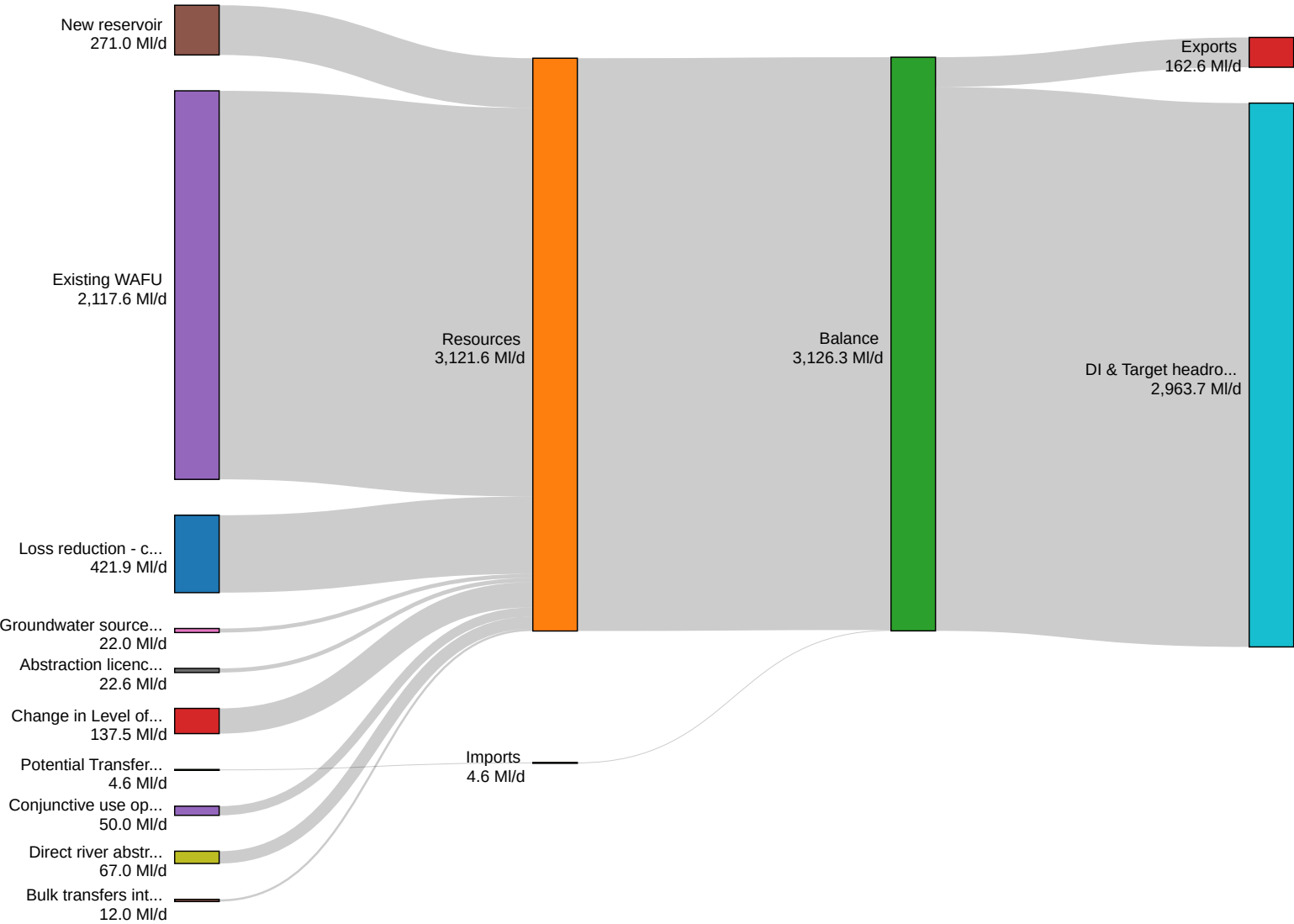
Situation 4 - 2026 (Thames Water)



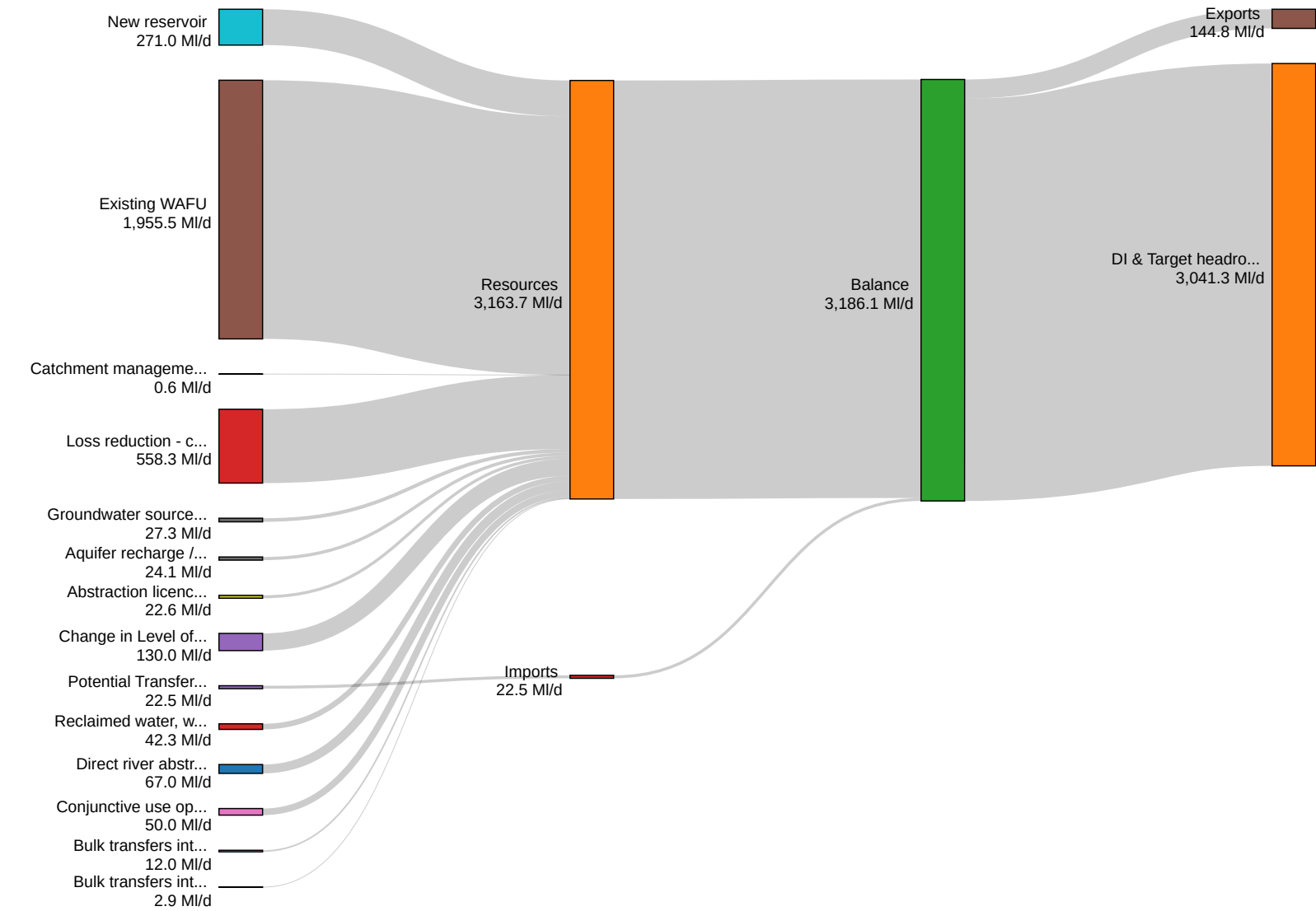
Situation 4 - 2040 (Thames Water)



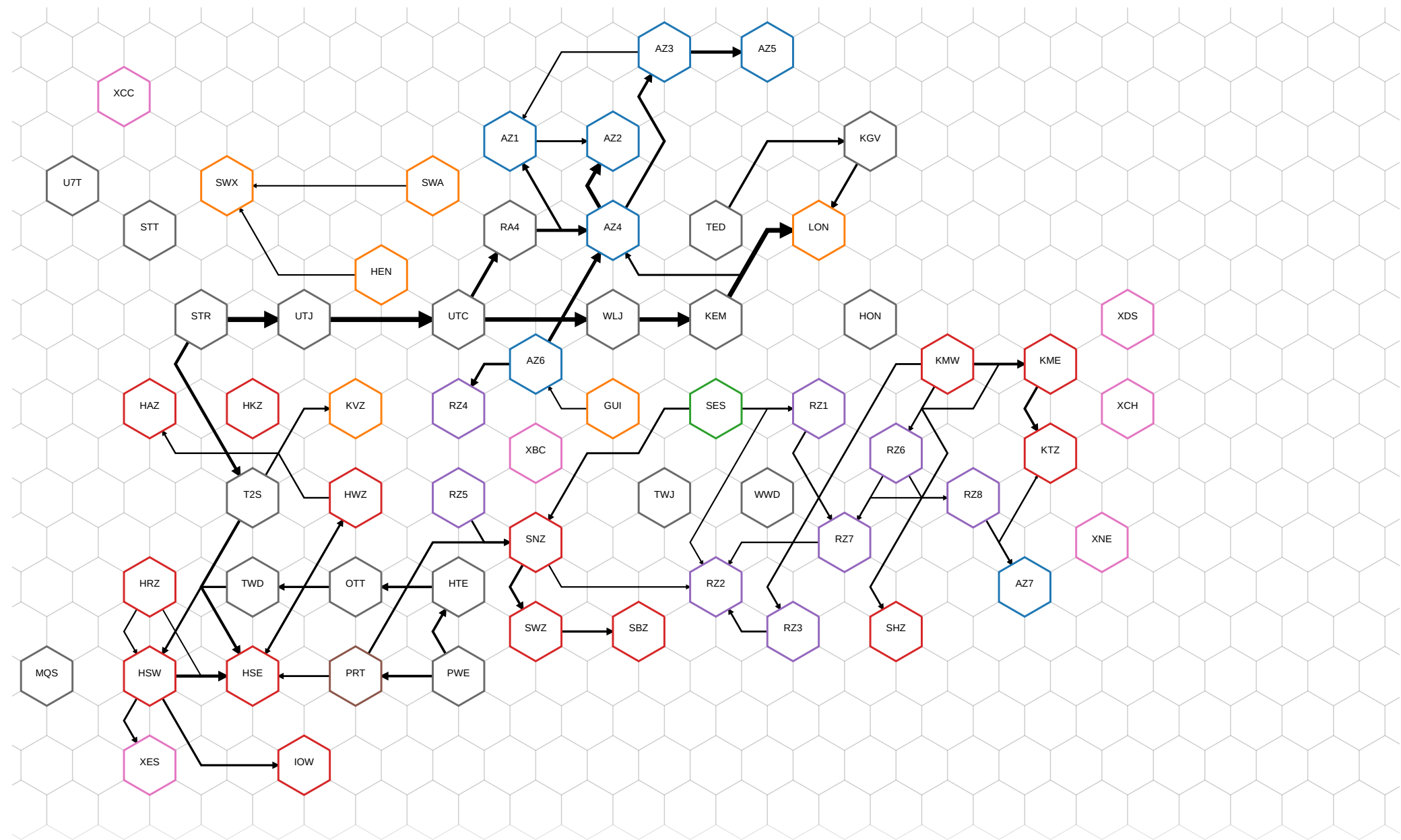
Situation 4 - 2050 (Thames Water)



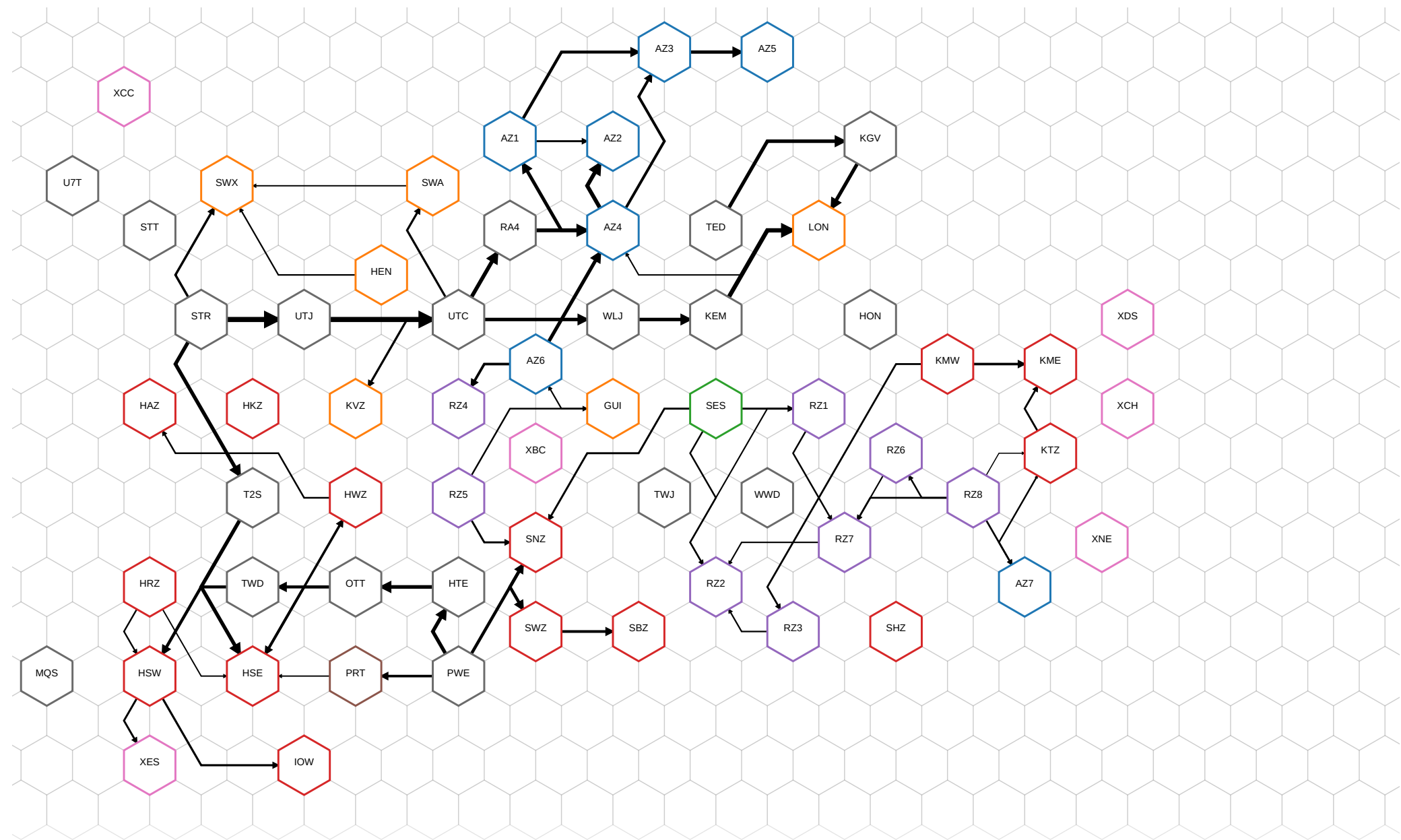
Situation 4 - 2075 (Thames Water)



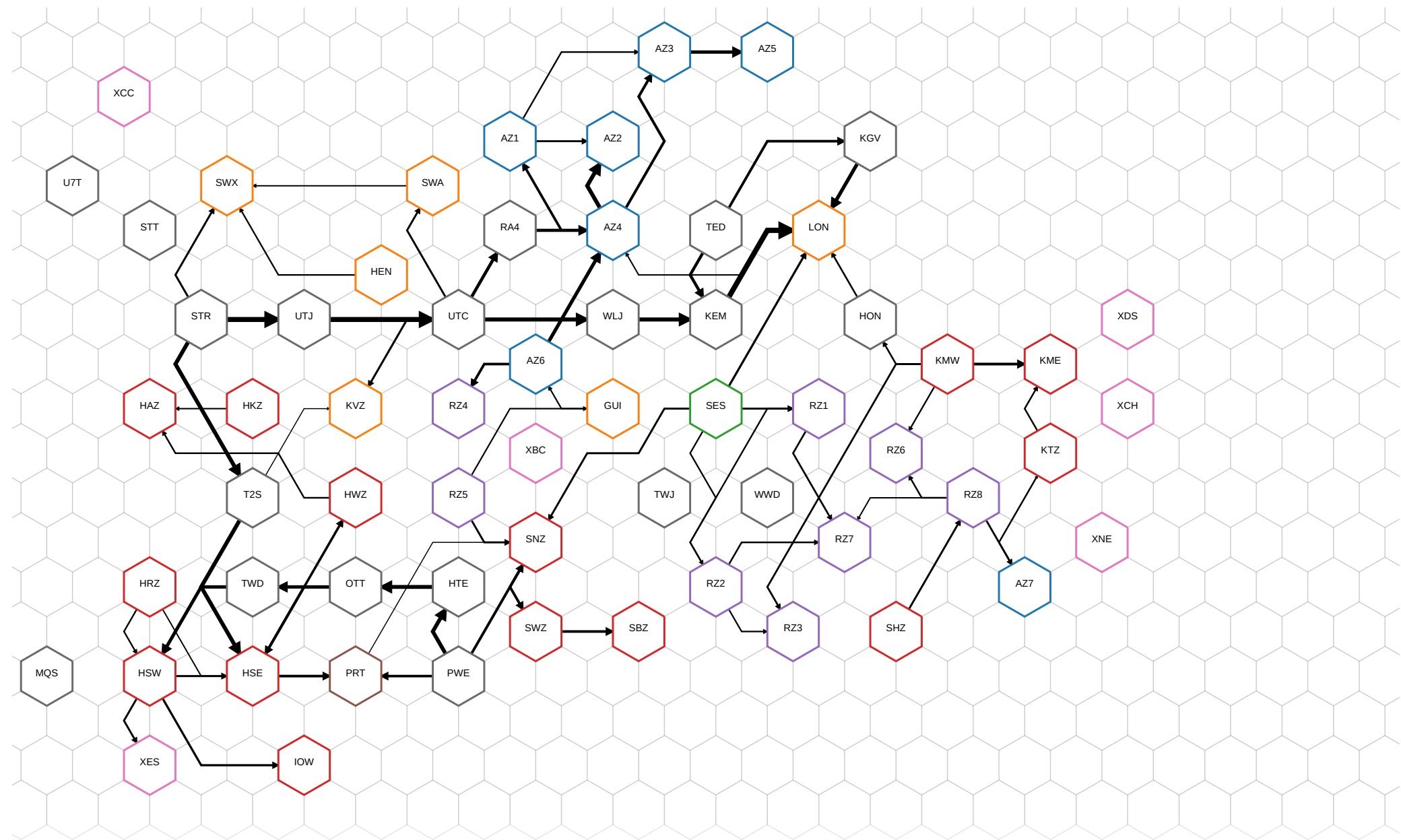
Situation 4 - 2040



Situation 4 - 2050



Situation 4 - 2075



IVM RUN DOSSIER

GOVERNMENT-LED SCENARIO D

IVM Summary: Thames Water

[Home](#) / [jet-20220805-000002](#) / [st-hybrid-dy-w1-tree16.05-options-v37-gov-led-hybridd-2075](#)

Metadata

General Settings

Name	st-hybrid-dy-w1-tree16.05-options-v37-gov-led-hybridd-2075
Created at	18/08/2022, 17:40:08
Tree	tree16.05: Root and branch tree 16.05: Stage 1 - Begins Hplan and LOW LCED, Stage 2 - Branches on growth (OxCam1a, Hplan and ONS18c), Stage 3 - Branches on licenced capped environmental destination, climate change and further growth scenarios (Hmax and Hmin) ↗
Setting name	options-v37-gov-led-hybridd ↗
Setting description	Emergency options in HSE, SBZ, and PRT.
Optimised discount rate	STPR

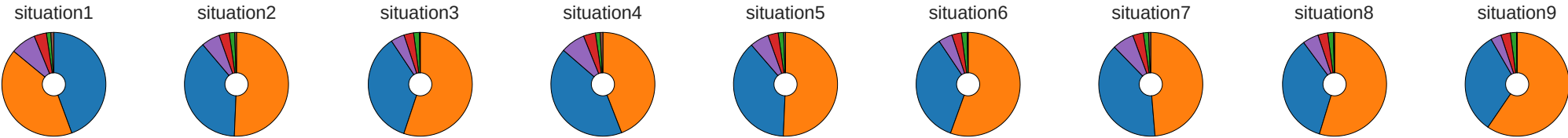
Metrics

Net present value (Cost)

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Cost w/ deficit (STPR)	16,272	12,788	11,568	15,301	12,777	11,482	13,361	11,709	10,621	(£m)
Cost w/o deficit (STPR)	16,272	12,788	11,568	15,301	12,777	11,482	13,361	11,709	10,621	(£m)
Cost w/ deficit (IGEQ)	26,367	19,813	17,505	24,494	19,814	17,379	21,063	17,956	15,921	(£m)
Cost w/o deficit (IGEQ)	26,367	19,813	17,505	24,494	19,814	17,379	21,063	17,956	15,921	(£m)
Cost w/ deficit (LTDR)	18,180	14,134	12,715	17,045	14,125	12,621	14,828	12,910	11,648	(£m)
Cost w/o deficit (LTDR)	18,180	14,134	12,715	17,045	14,125	12,621	14,828	12,910	11,648	(£m)

Cost breakdown (STPR)

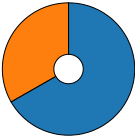
Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Capex	7,225	4,879	4,115	6,462	4,854	4,030	5,214	4,119	3,414	(£m)
Fixed opex	6,766	6,479	6,375	6,750	6,474	6,371	6,505	6,405	6,320	(£m)
Fixed operational carbon	226	215	210	226	216	210	218	210	206	(£m)
Embedded carbon	626	407	349	574	410	342	441	356	312	(£m)
Variable opex	1,277	735	490	1,158	748	498	890	579	349	(£m)
Variable carbon opex	152	74	30	131	76	31	93	40	20	(£m)



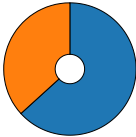
Emissions breakdown

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Capital emissions	4,051,539	2,507,833	2,093,085	3,670,193	2,535,129	2,052,997	2,781,385	2,173,583	1,866,921	(tonnes)
Operational emissions	2,018,733	1,456,511	1,144,233	1,879,488	1,472,345	1,151,746	1,580,877	1,192,070	1,069,042	(tonnes)

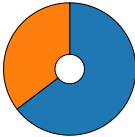
situation1



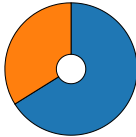
situation2



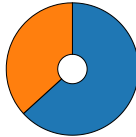
situation3



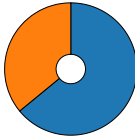
situation4



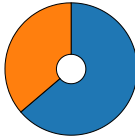
situation5



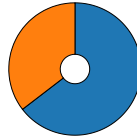
situation6



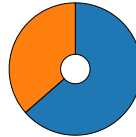
situation7



situation8



situation9



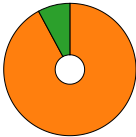
Electricity breakdown

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Generated (on site)	0	0	0	0	0	0	0	0	0	(GWh)
Grid	25,205	13,708	6,520	21,469	14,313	6,792	17,158	10,537	4,717	(GWh)
Renewable	1,988	1,168	618	1,736	1,108	620	1,194	767	110	(GWh)

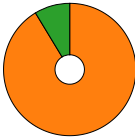
situation1



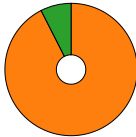
situation2



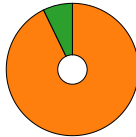
situation3



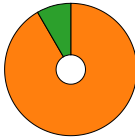
situation4



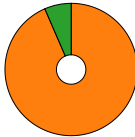
situation5



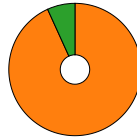
situation6



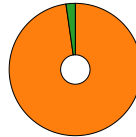
situation7



situation8



situation9



Environmental

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
SEA environmental benefit	86,781.00	80,479.00	78,831.00	85,644.00	80,531.00	78,611.00	81,956.00	78,280.00	76,008.00	
SEA environmental disbenefit	125,872.00	91,760.00	81,442.00	117,459.00	91,376.00	81,248.00	102,239.00	82,833.00	69,784.00	
Natural capital	7,224,643.01	8,103,357.48	8,608,990.27	7,553,866.80	8,101,347.01	8,619,647.13	8,255,478.27	9,703,512.14	14,770,602.94	
Bio-diversity net gain	-247,457.00	-133,470.00	-118,142.00	-233,967.00	-130,427.00	-113,275.00	-155,722.00	-115,716.00	-102,365.00	

Social

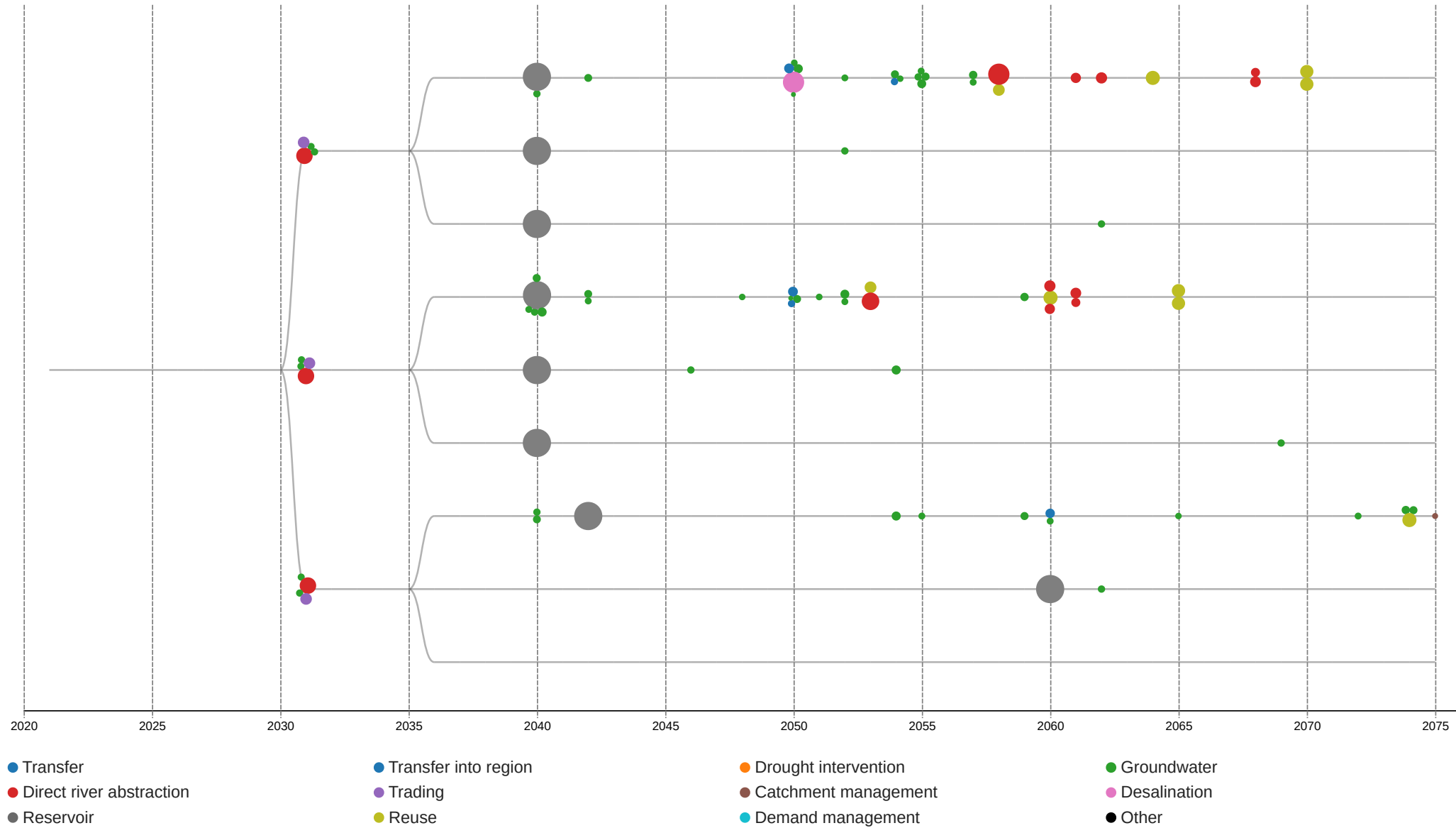
Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Customer preference	32,955.00	30,728.00	30,067.00	32,488.00	30,723.00	30,022.00	31,370.00	30,030.00	29,301.00	

Reliability

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Reliability	37.68	38.99	40.64	38.53	38.67	40.31	39.49	41.81	47.19	
R1: Uncertainty of option supply/demand benefit	10.78	10.67	10.89	11.03	10.57	10.80	11.02	11.31	12.82	
R3: Risk of service failure due to other physical hazards	9.80	10.18	10.69	9.98	10.12	10.61	10.27	11.02	12.58	
R4: Availability of additional headroom	6.78	7.20	7.40	6.79	7.12	7.32	7.17	7.59	8.08	
R5: Catchment/raw water quality risks (incl. climate change)	1.11	1.30	1.39	1.19	1.26	1.38	1.25	1.40	1.56	
R6: Capacity of catchment services	0.03	0.05	0.03	0.05	0.05	0.03	0.06	0.03	0.02	
R7: Risk of service failure to other exceptional events	9.16	9.57	10.22	9.47	9.52	10.15	9.68	10.45	12.12	
R8: Soil health	0.01	0.02	0.01	0.02	0.02	0.01	0.02	0.01	0.01	

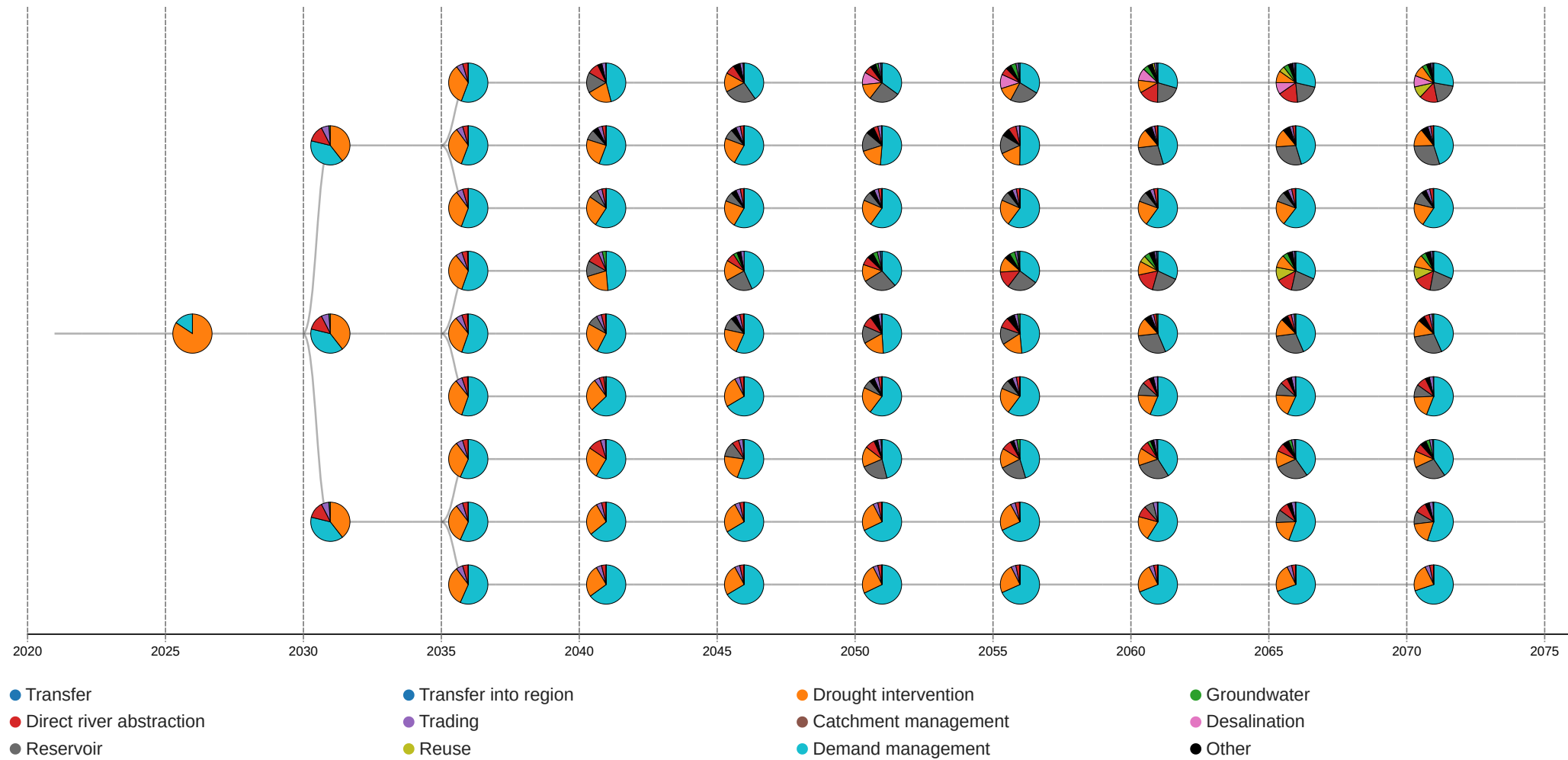
Adaptability										
Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Adaptability	18.70	20.24	22.21	19.18	20.07	21.78	19.97	21.37	23.37	
A3: Operational complexity and flexibility	9.14	9.63	10.28	9.44	9.57	10.21	9.73	10.53	12.18	
A4: WRZ connectivity	9.52	10.56	11.88	9.69	10.44	11.52	10.16	10.79	11.17	
A7: Customer relations support engagement with demand management	0.04	0.06	0.05	0.06	0.06	0.05	0.08	0.05	0.02	
Evolvability										
Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Evolvability	26.58	26.71	28.07	26.84	26.54	27.86	27.11	29.00	33.27	
E1: Scaleability and modularity of proposed changes	10.80	11.03	11.66	10.88	10.95	11.58	11.20	12.08	13.88	
E2: Intervention lead times	7.15	6.77	7.06	7.15	6.73	6.99	6.85	7.28	8.35	
E3: Reliance on external bodies to deliver changes	8.57	8.82	9.29	8.71	8.76	9.22	8.95	9.57	10.99	
E5: Collaborative land management	0.07	0.10	0.07	0.10	0.10	0.07	0.11	0.07	0.04	

Option Selection (Thames Water)

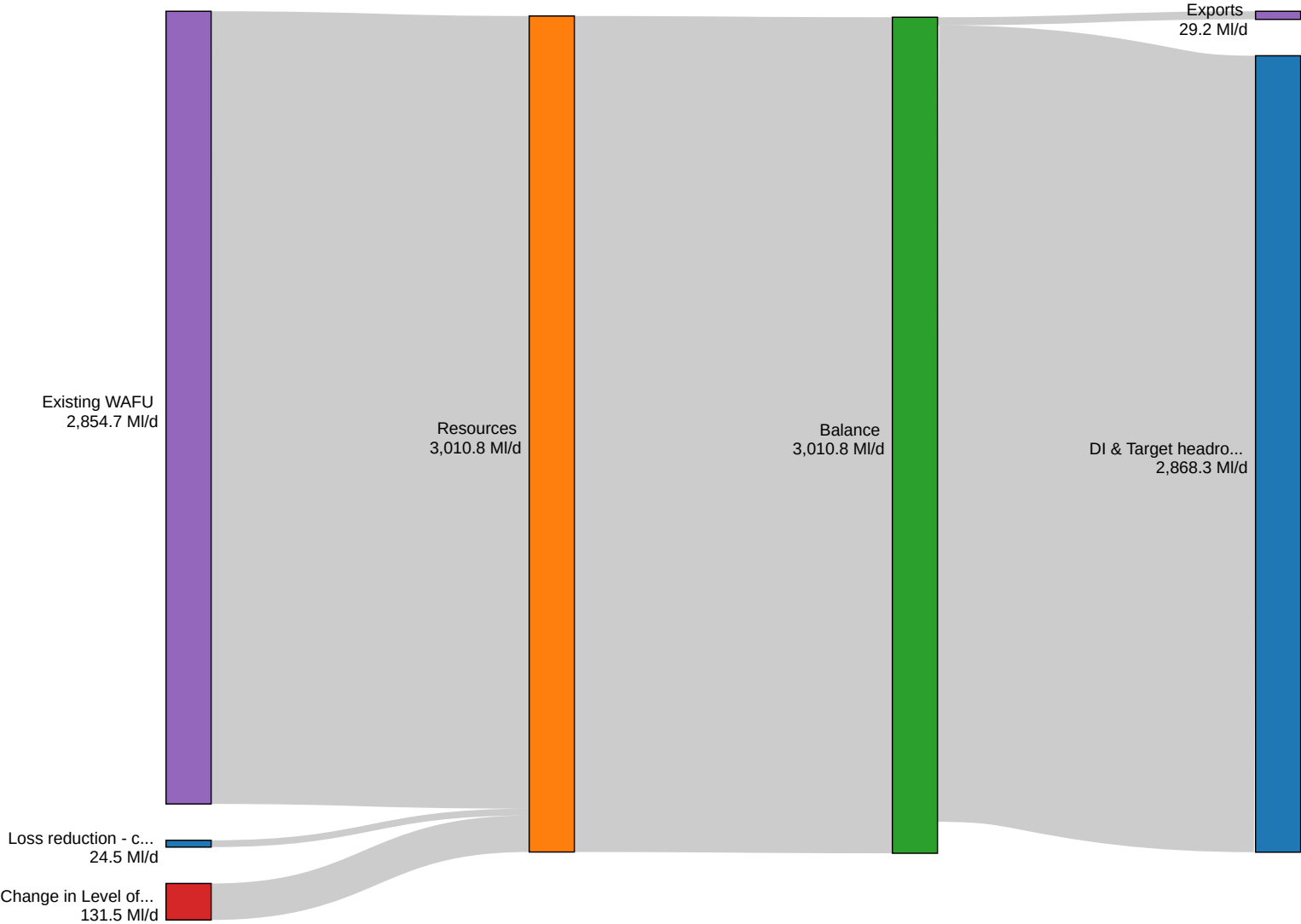


Utilisation (Thames Water)

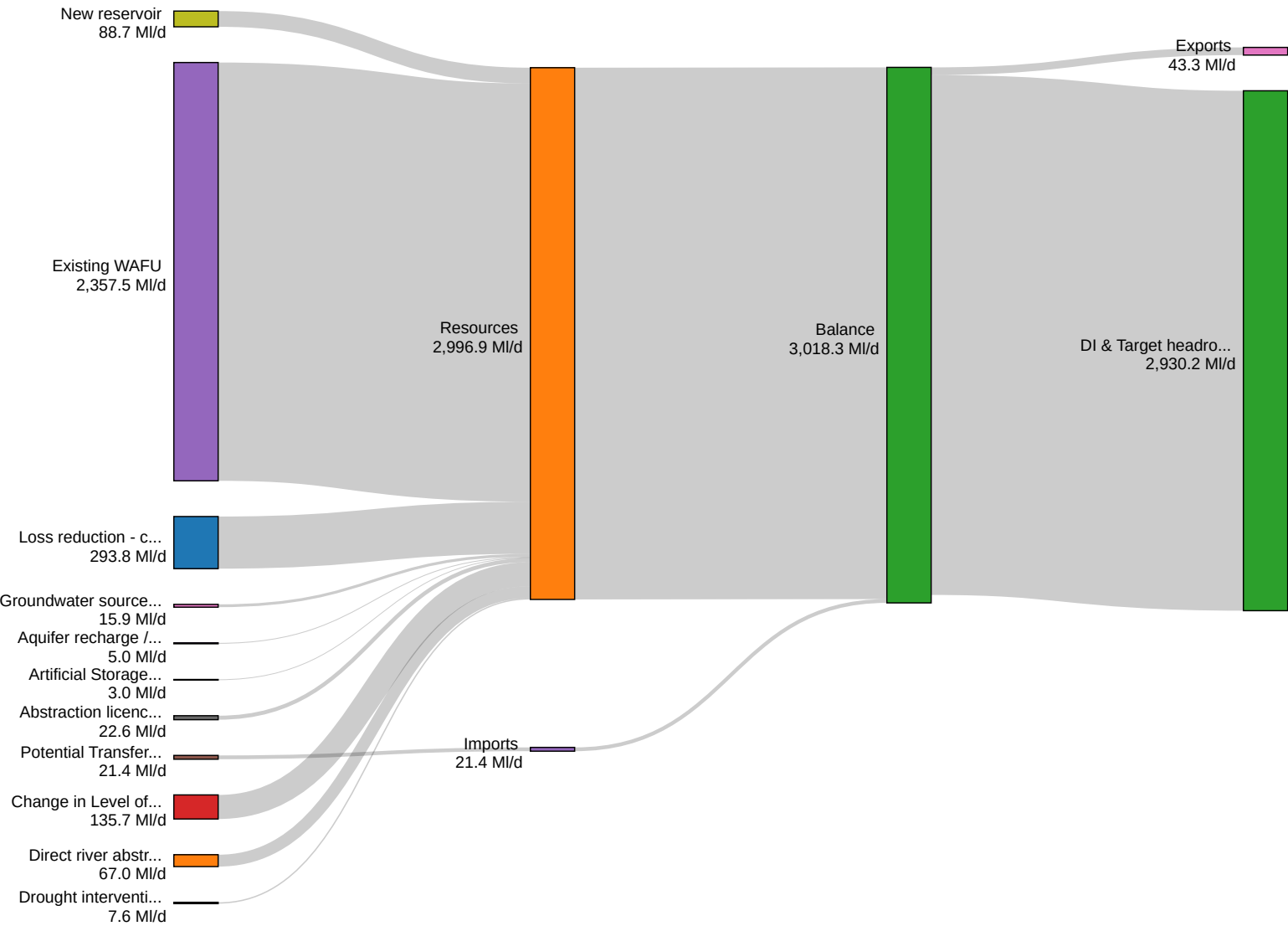
Pie charts show the breakdown of option utilisation by option category.



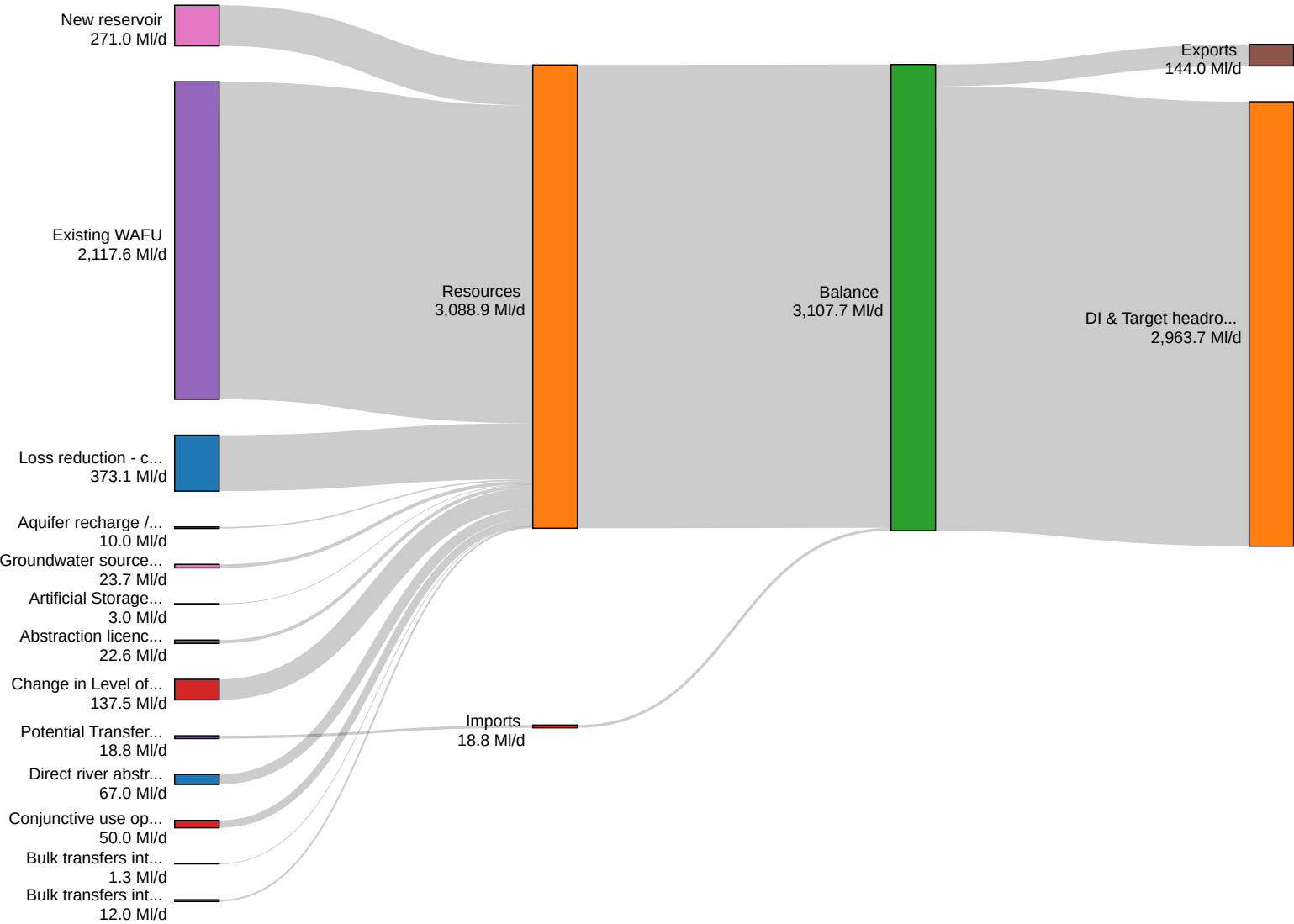
Situation 4 - 2026 (Thames Water)



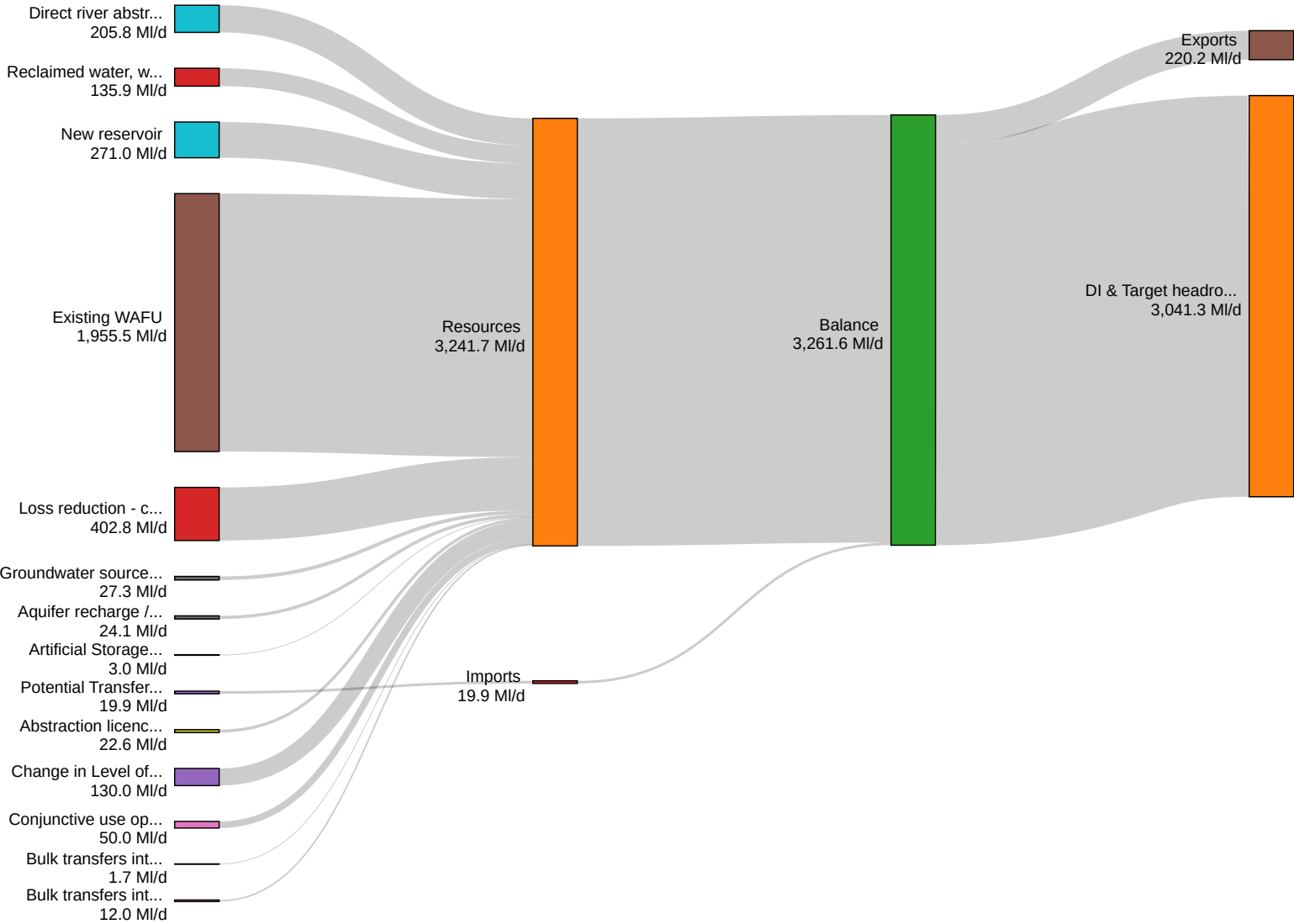
Situation 4 - 2040 (Thames Water)



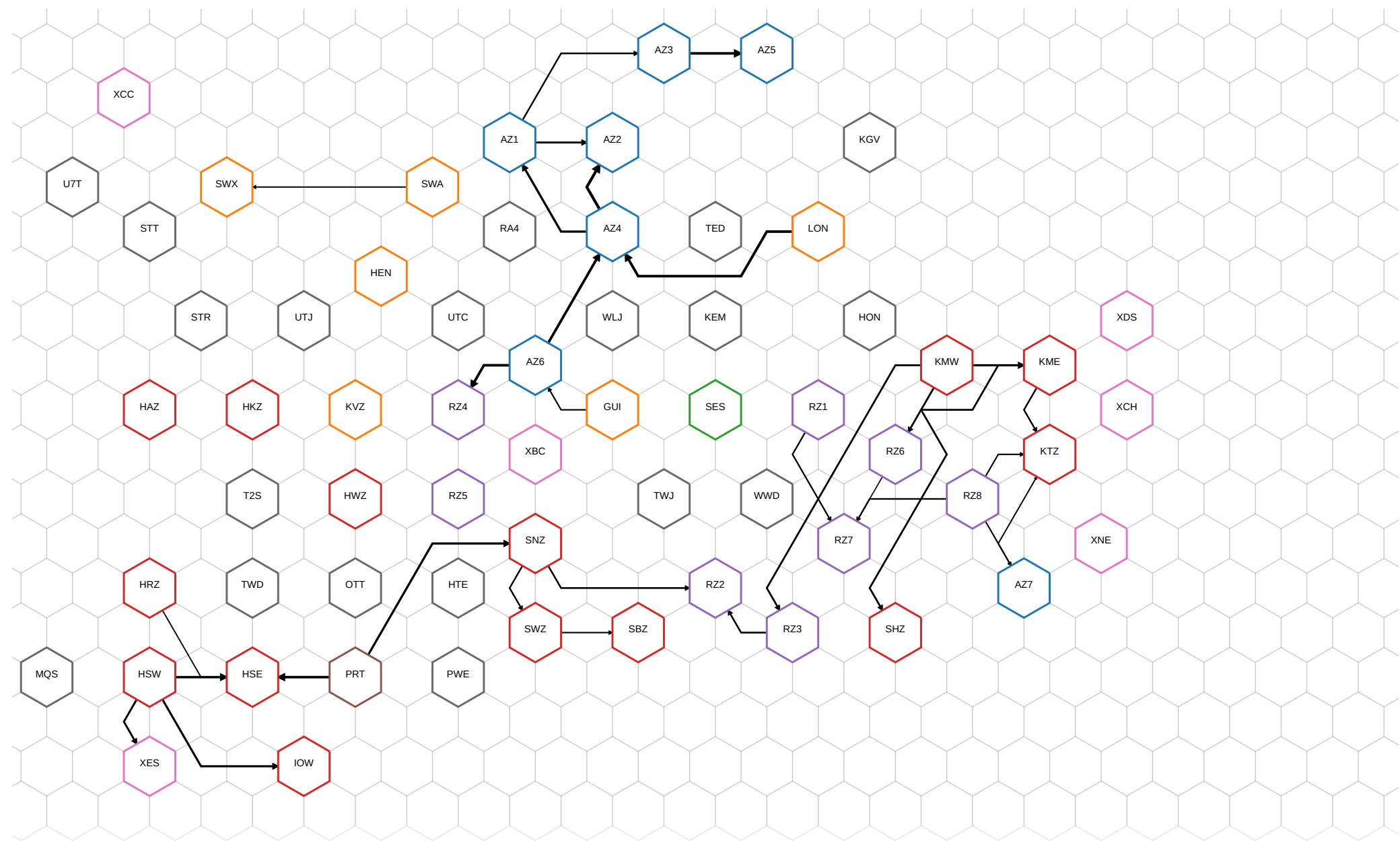
Situation 4 - 2050 (Thames Water)



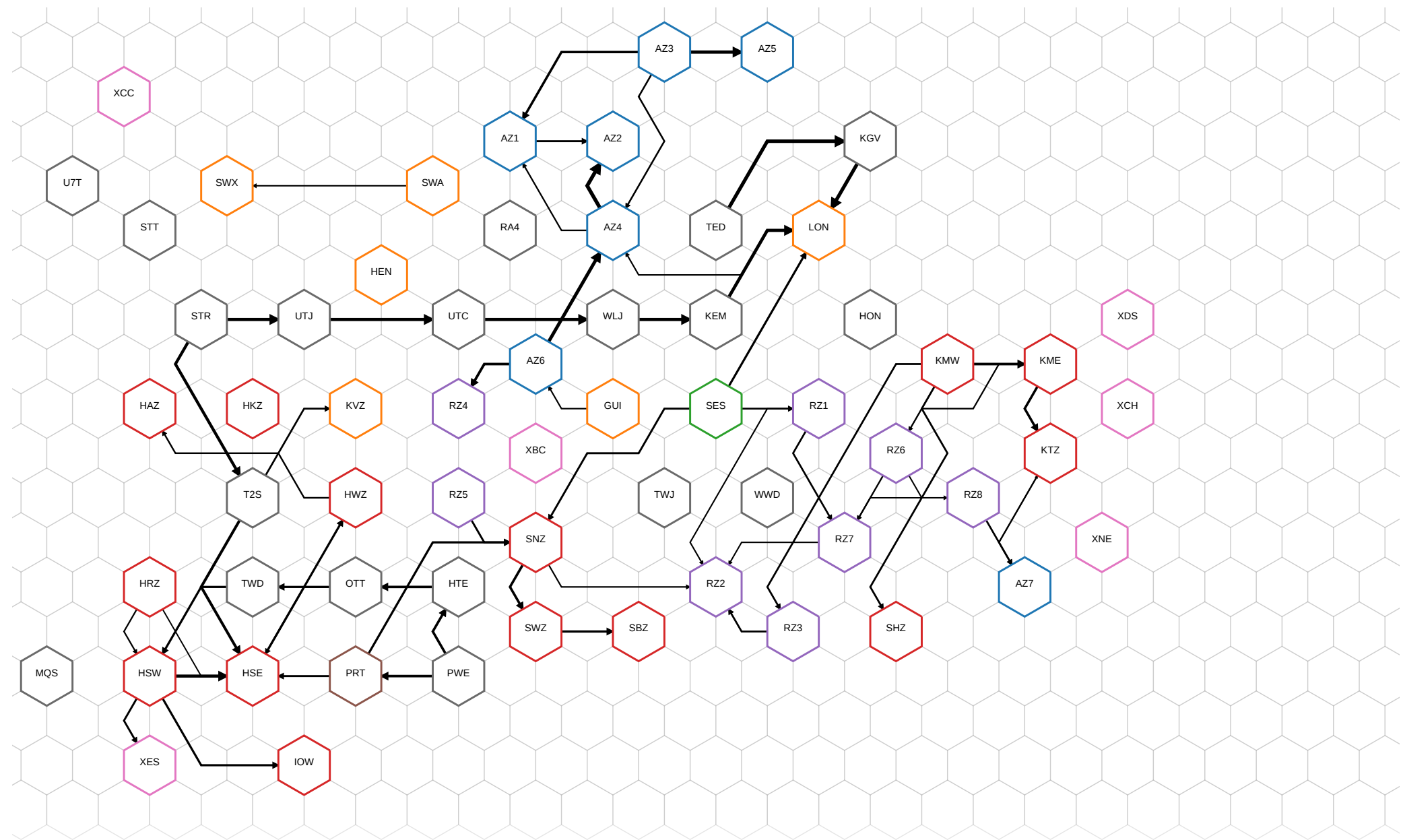
Situation 4 - 2075 (Thames Water)



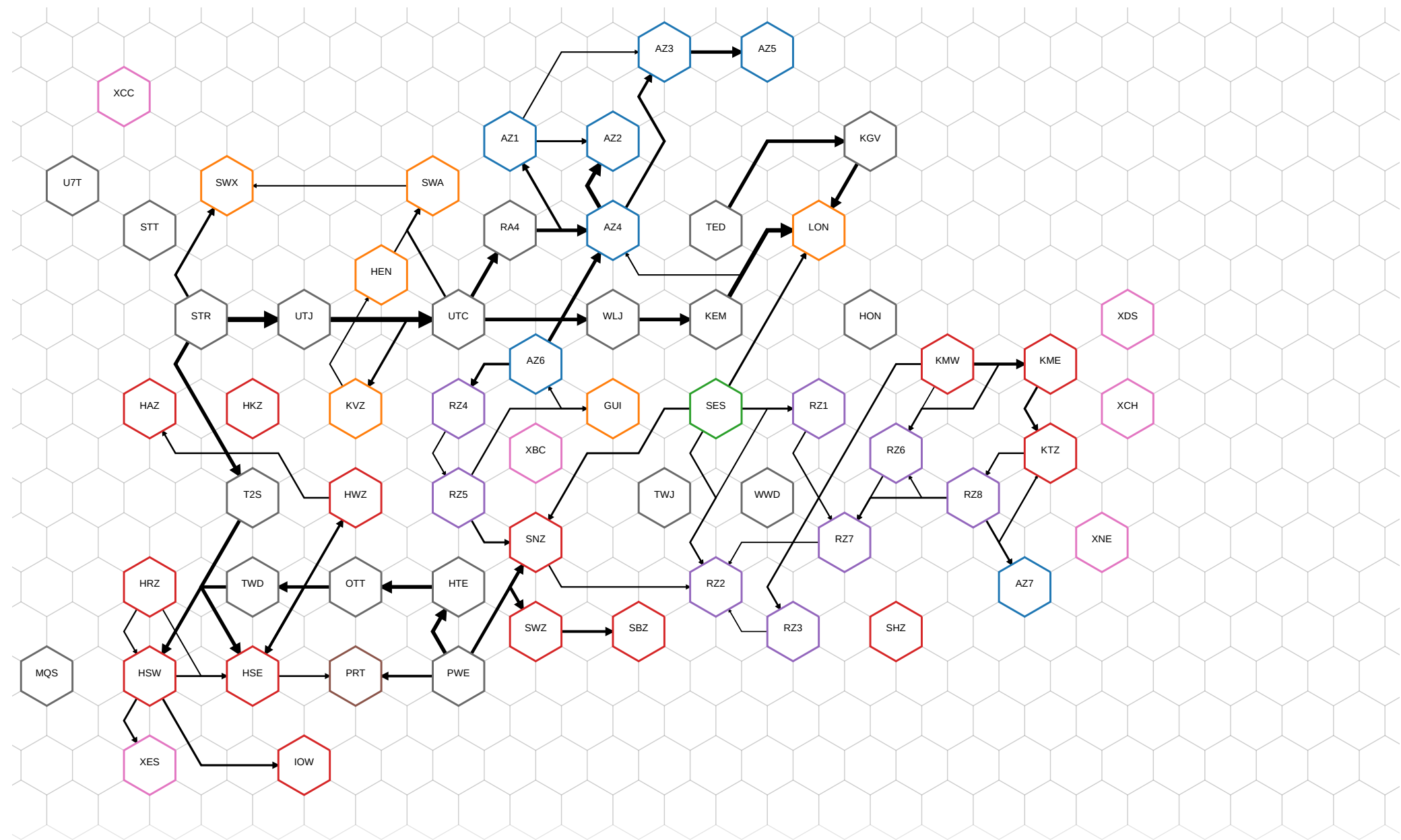
Situation 4 - 2026



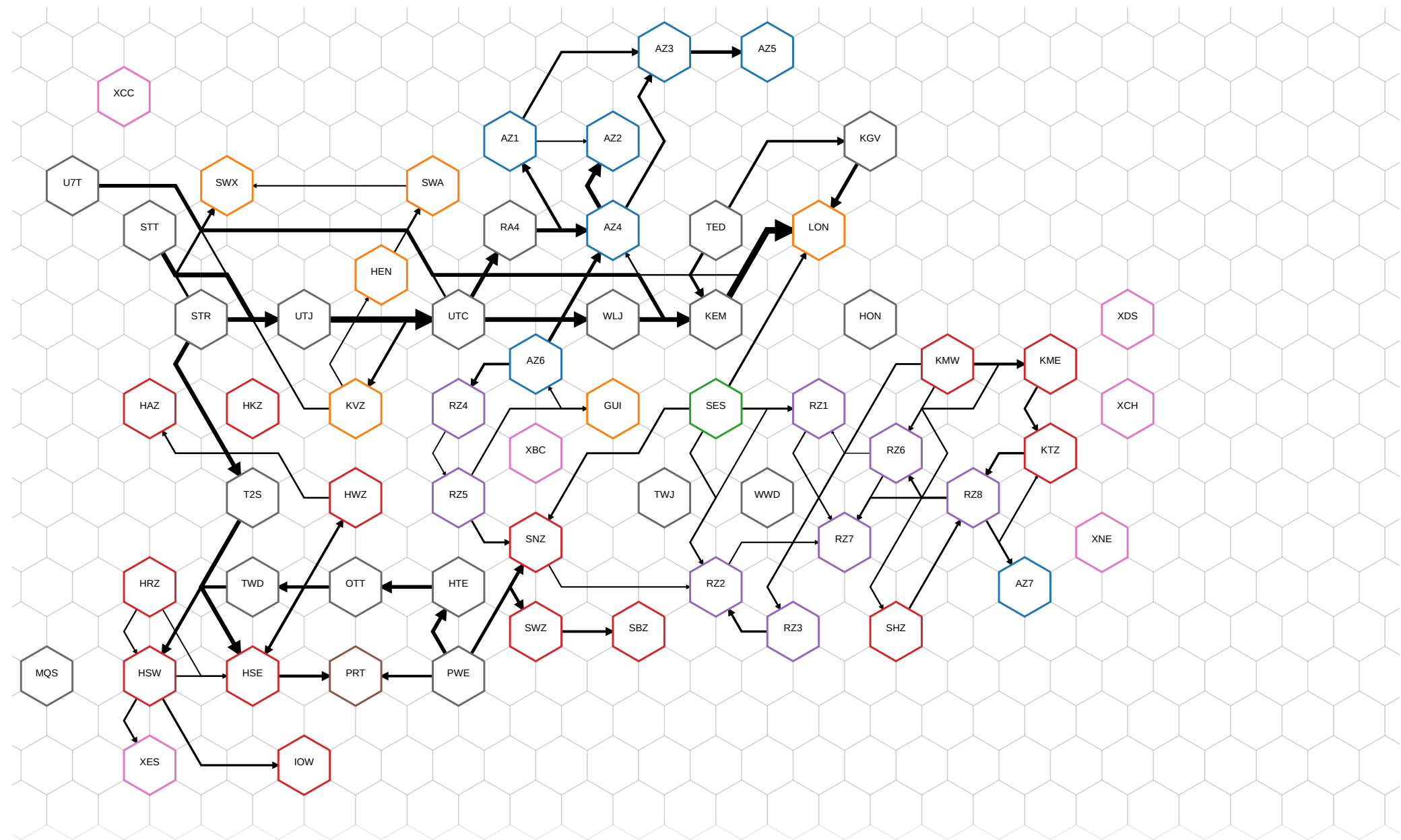
Situation 4 - 2040



Situation 4 - 2050



Situation 4 - 2075



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Metadata

General Settings

Name	st-hybrid-dy-w1-tree16.05-options-v37-gov-led-hybride-2075
Created at	20/08/2022, 14:49:28
Tree	tree16.05: Root and branch tree 16.05: Stage 1 - Begins Hplan and LOW LCED, Stage 2 - Branches on growth (OxCam1a, Hplan and ONS18c), Stage 3 - Branches on licenced capped environmental destination, climate change and further growth scenarios (Hmax and Hmin) 
Setting name	options-v37-gov-led-hybride 
Setting description	Emergency options in HSE, SBZ, and PRT.
Optimised discount rate	STPR

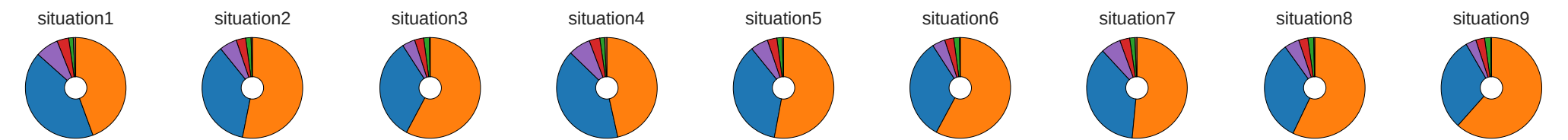
Metrics

Net present value (Cost)

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Cost w/ deficit (STPR)	14,875	12,040	10,924	14,023	12,084	10,908	12,473	11,107	10,173	(£m)
Cost w/o deficit (STPR)	14,875	12,040	10,924	14,023	12,084	10,908	12,473	11,107	10,173	(£m)
Cost w/ deficit (IGEQ)	23,904	18,545	16,442	22,192	18,643	16,434	19,530	16,950	15,210	(£m)
Cost w/o deficit (IGEQ)	23,904	18,545	16,442	22,192	18,643	16,434	19,530	16,950	15,210	(£m)
Cost w/ deficit (LTDR)	16,584	13,289	11,991	15,578	13,341	11,977	13,819	12,232	11,150	(£m)
Cost w/o deficit (LTDR)	16,584	13,289	11,991	15,578	13,341	11,977	13,819	12,232	11,150	(£m)

Cost breakdown (STPR)

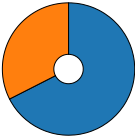
Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Capex	6,272	4,337	3,616	5,707	4,375	3,600	4,564	3,659	3,059	(£m)
Fixed opex	6,606	6,399	6,311	6,523	6,397	6,311	6,425	6,343	6,265	(£m)
Fixed operational carbon	221	210	206	218	210	206	214	209	206	(£m)
Embedded carbon	561	369	319	482	371	318	398	328	288	(£m)
Variable opex	1,100	675	447	991	679	449	793	529	336	(£m)
Variable carbon opex	116	50	24	103	51	25	80	39	20	(£m)



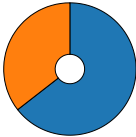
Emissions breakdown

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Capital emissions	3,619,609	2,252,016	1,909,539	3,032,855	2,273,628	1,904,689	2,495,396	1,996,660	1,716,797	(tonnes)
Operational emissions	1,741,890	1,240,594	1,083,218	1,635,062	1,243,410	1,086,128	1,471,180	1,180,300	1,063,407	(tonnes)

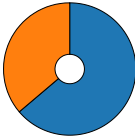
situation1



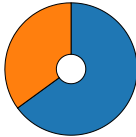
situation2



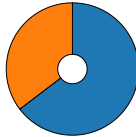
situation3



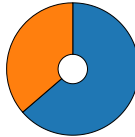
situation4



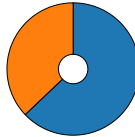
situation5



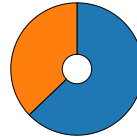
situation6



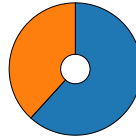
situation7



situation8



situation9



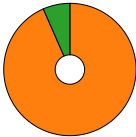
Electricity breakdown

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Generated (on site)	0	0	0	0	0	0	0	0	0	(GWh)
Grid	20,246	13,169	6,137	18,112	13,279	6,360	14,977	10,062	4,672	(GWh)
Renewable	1,761	927	303	1,223	894	305	1,058	618	86	(GWh)

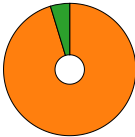
situation1



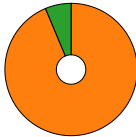
situation2



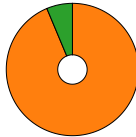
situation3



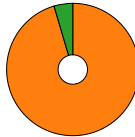
situation4



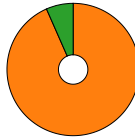
situation5



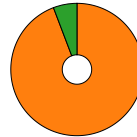
situation6



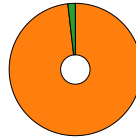
situation7



situation8



situation9



Environmental

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
SEA environmental benefit	84,341.00	78,412.00	76,489.00	82,084.00	78,269.00	76,164.00	79,382.00	75,768.00	74,386.00	
SEA environmental disbenefit	116,126.00	87,433.00	73,943.00	107,531.00	86,131.00	74,897.00	96,177.00	76,187.00	66,430.00	
Natural capital	7,107,239.04	9,118,140.47	8,921,899.33	7,442,070.23	9,958,031.33	12,439,567.92	12,380,646.83	14,477,717.39	17,668,600.73	
Bio-diversity net gain	-247,017.00	-121,118.00	-112,205.00	-190,560.00	-126,949.00	-113,210.00	-232,050.00	-176,929.00	-164,484.00	

Social

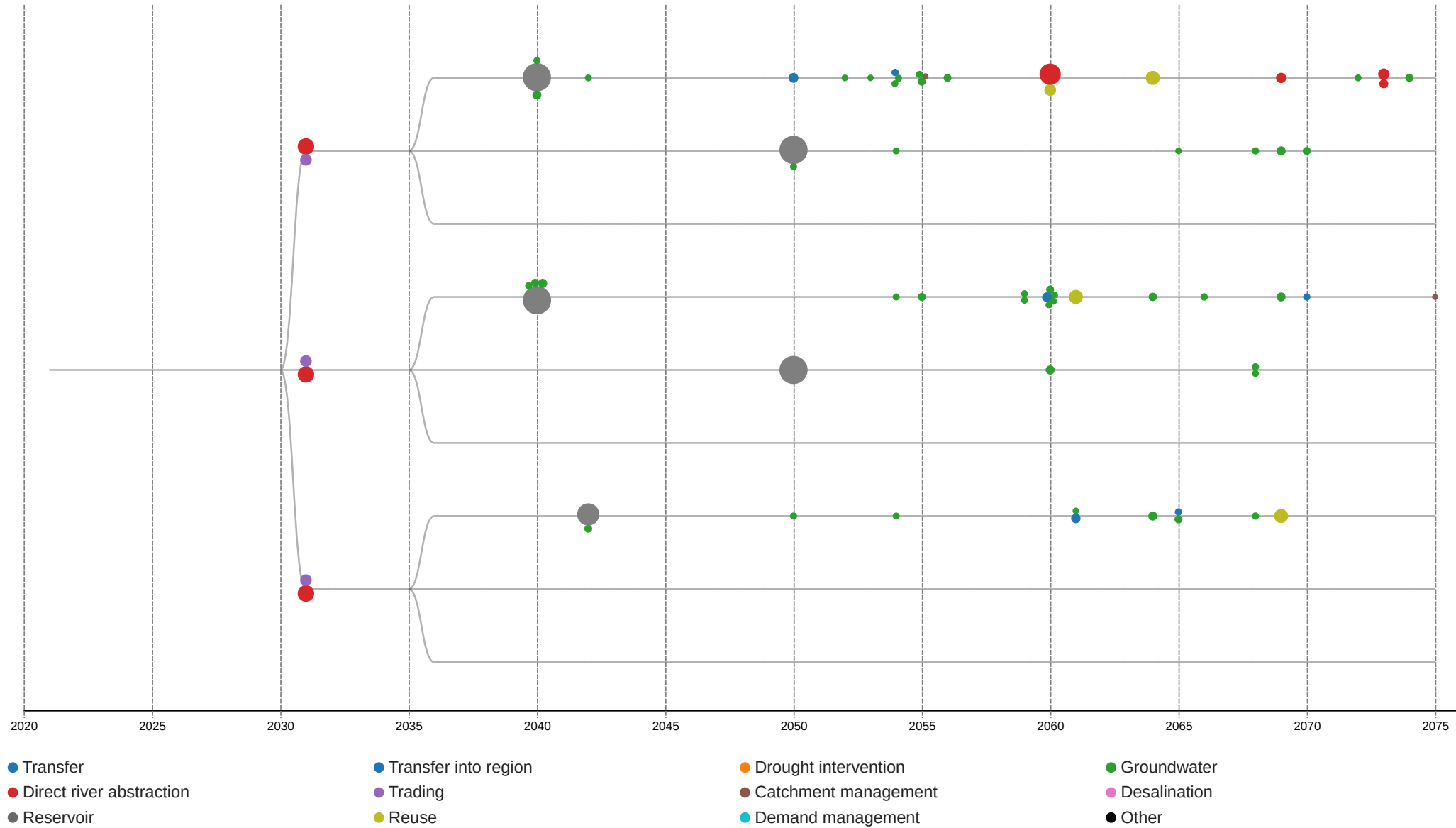
Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Customer preference	32,514.00	30,392.00	29,569.00	31,743.00	30,278.00	29,578.00	30,914.00	29,617.00	29,106.00	

Reliability

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Reliability	37.70	38.89	41.82	37.46	38.54	41.50	37.75	40.52	46.17	
R1: Uncertainty of option supply/demand benefit	10.42	10.20	10.90	10.25	10.11	10.82	10.38	10.87	12.42	
R3: Risk of service failure due to other physical hazards	9.90	10.38	11.25	9.84	10.30	11.17	10.02	10.91	12.60	
R4: Availability of additional headroom	6.81	7.27	7.50	6.86	7.19	7.42	7.12	7.56	8.06	
R5: Catchment/raw water quality risks (incl. climate change)	1.02	1.09	1.21	1.03	1.08	1.21	0.67	0.70	0.79	
R6: Capacity of catchment services	0.06	0.02	0.02	0.06	0.02	0.02	0.02	0.02	0.02	
R7: Risk of service failure to other exceptional events	9.47	9.91	10.93	9.40	9.83	10.85	9.53	10.46	12.27	
R8: Soil health	0.02	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01	

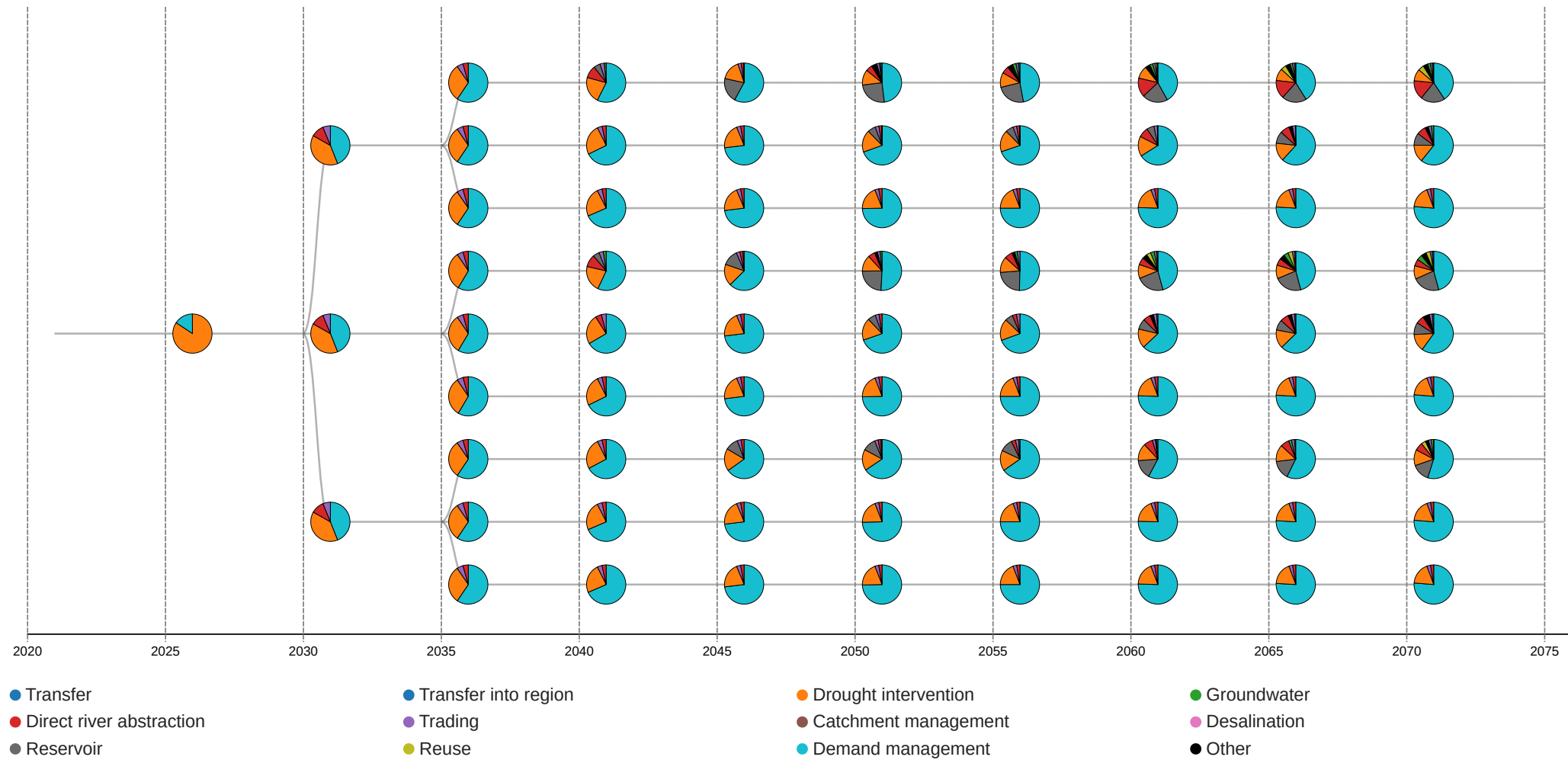
Adaptability										
Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Adaptability	18.71	18.37	20.25	19.08	19.12	19.76	19.07	19.89	23.15	
A3: Operational complexity and flexibility	9.31	9.82	10.83	9.29	9.74	10.75	9.45	10.34	12.12	
A4: WRZ connectivity	9.33	8.53	9.40	9.72	9.37	8.99	9.61	9.52	11.00	
A7: Customer relations support engagement with demand management	0.07	0.02	0.02	0.07	0.02	0.02	0.02	0.02	0.02	
Evolvability										
Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Evolvability	27.75	28.82	31.25	27.30	28.56	31.03	28.88	31.89	37.06	
E1: Scaleability and modularity of proposed changes	11.25	11.89	12.94	11.23	11.79	12.85	12.16	13.48	15.65	
E2: Intervention lead times	7.67	7.81	8.37	7.32	7.73	8.32	7.64	8.52	9.92	
E3: Reliance on external bodies to deliver changes	8.73	9.08	9.90	8.64	9.00	9.82	9.04	9.85	11.46	
E5: Collaborative land management	0.11	0.04	0.04	0.11	0.04	0.04	0.04	0.04	0.04	

Option Selection (Thames Water)

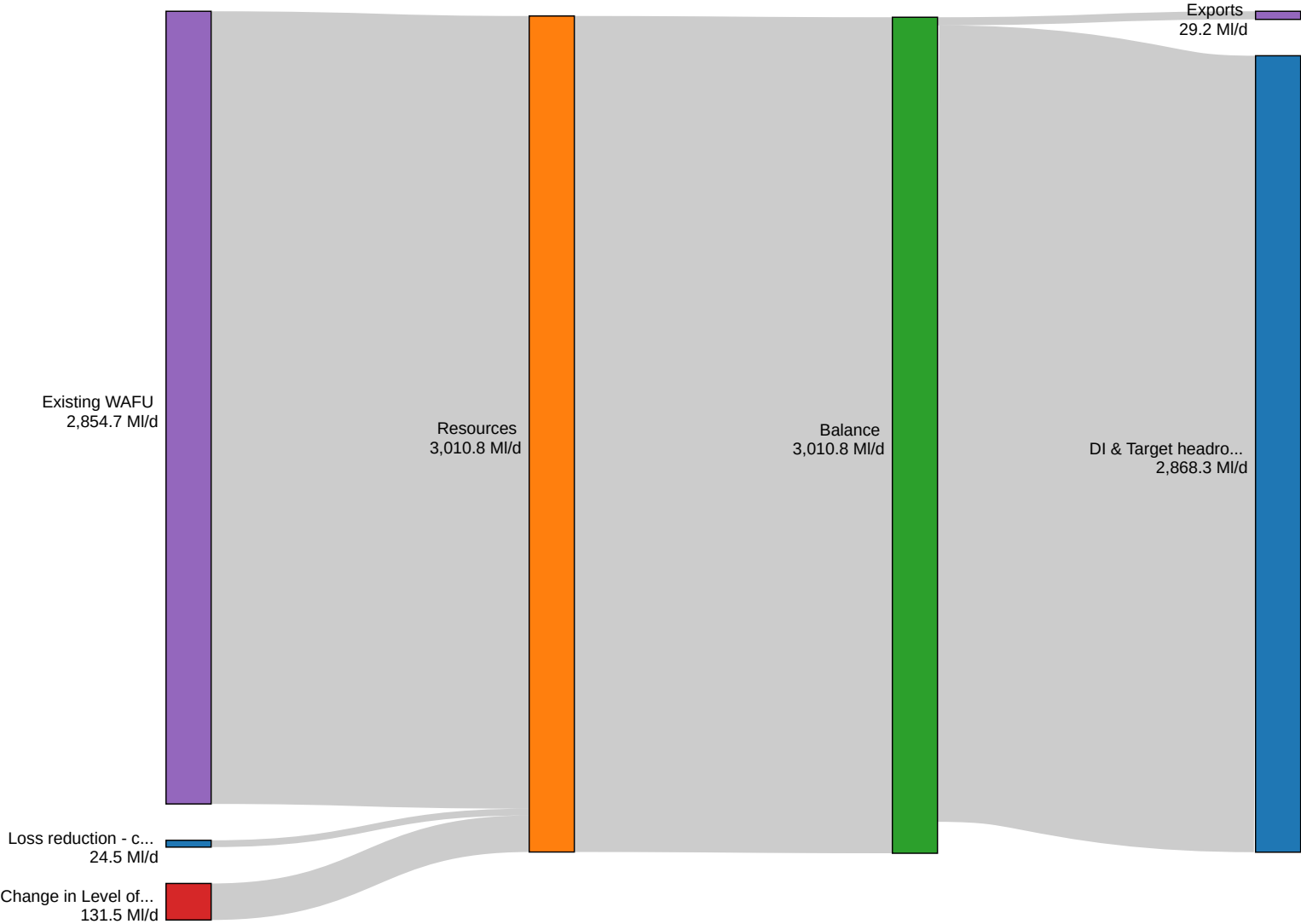


Utilisation (Thames Water)

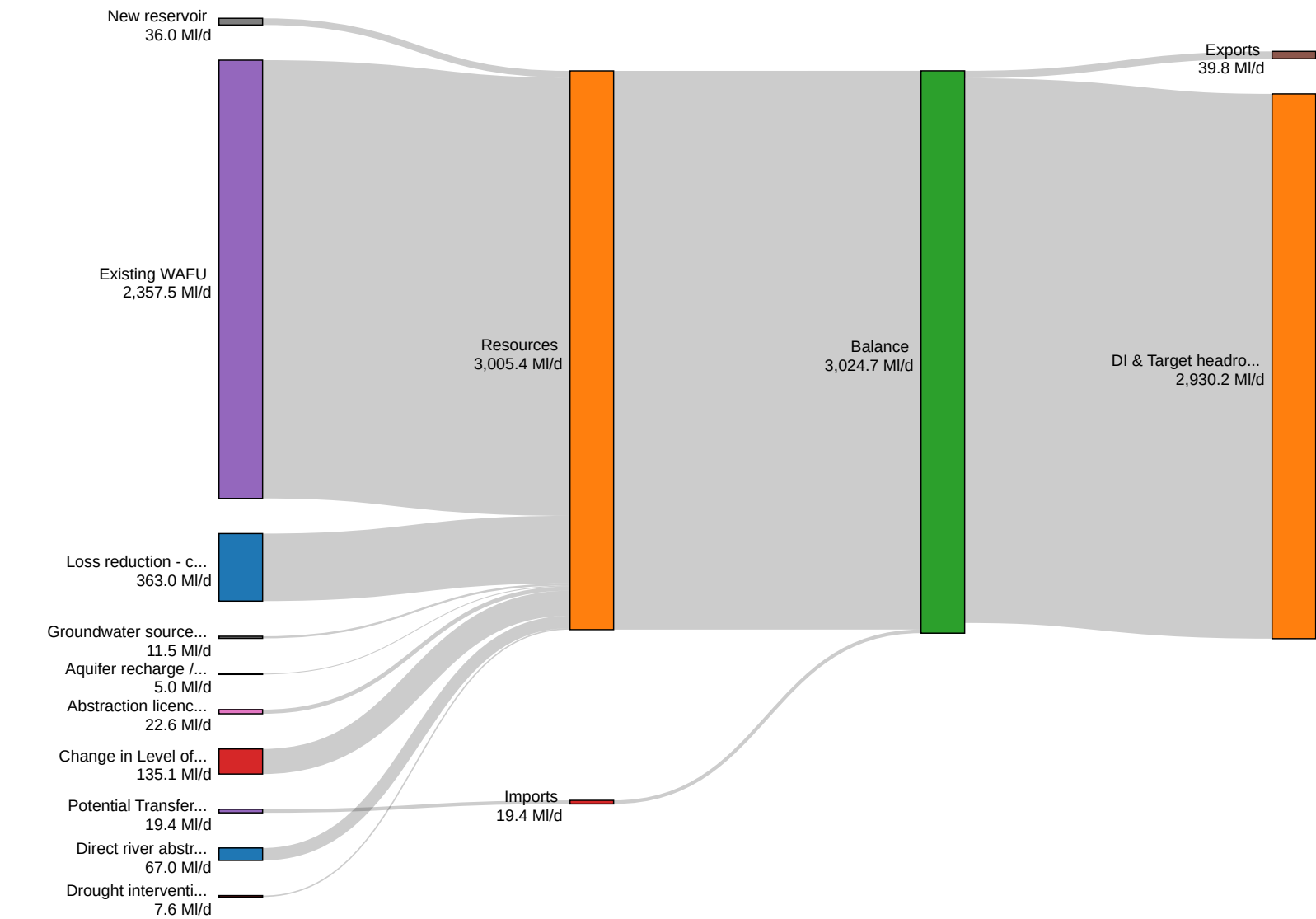
Pie charts show the breakdown of option utilisation by option category.



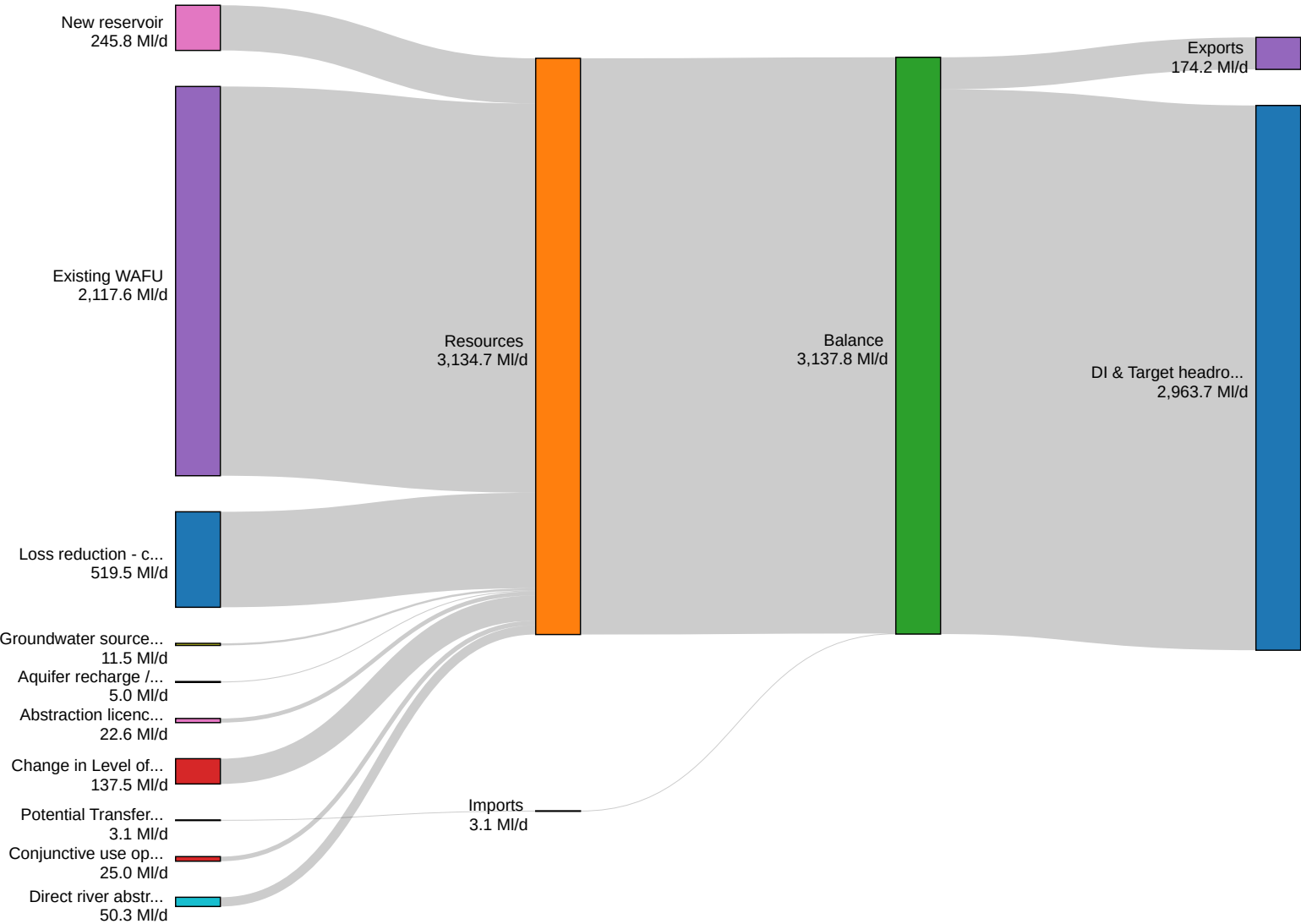
Situation 4 - 2026 (Thames Water)



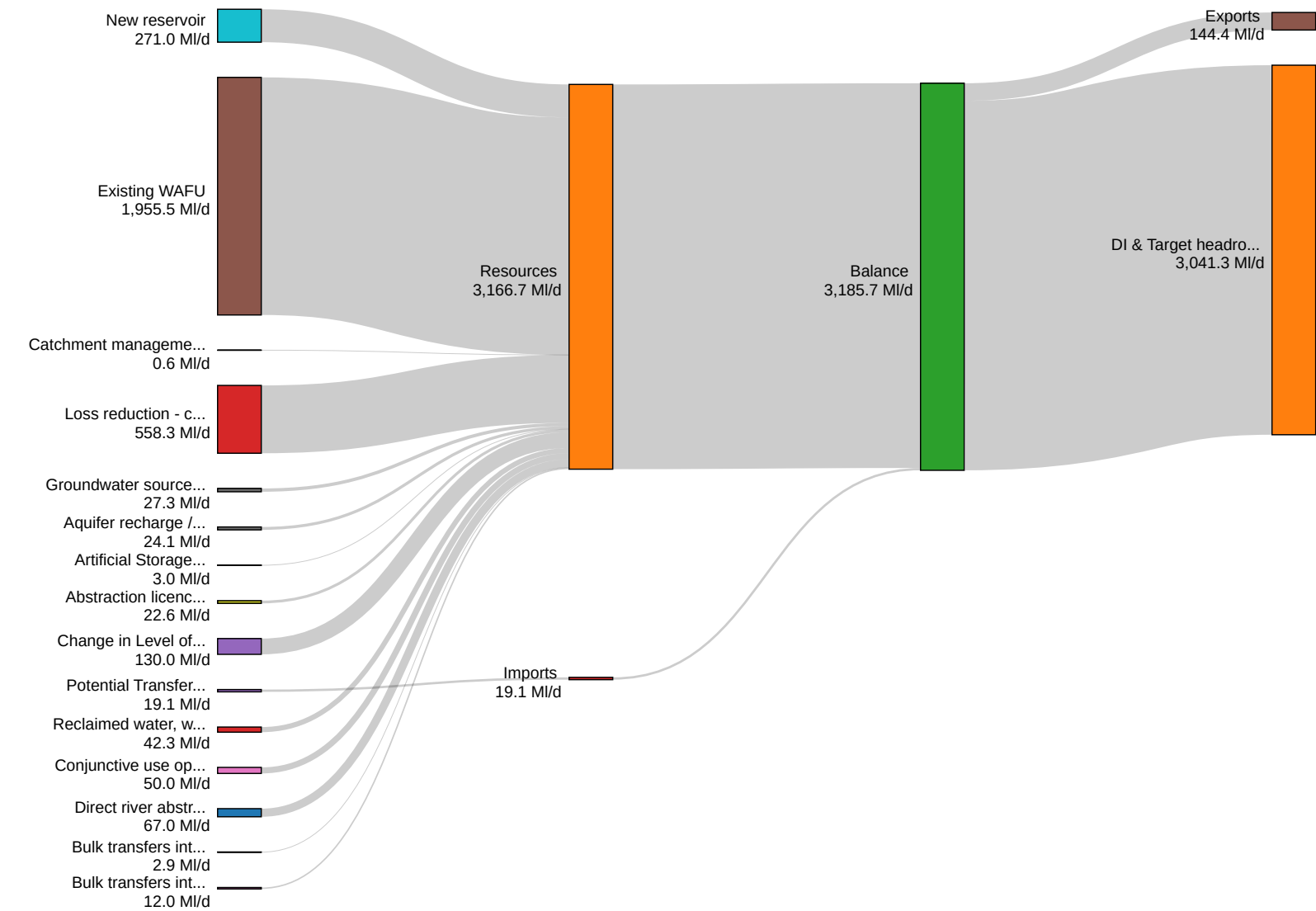
Situation 4 - 2040 (Thames Water)



Situation 4 - 2050 (Thames Water)

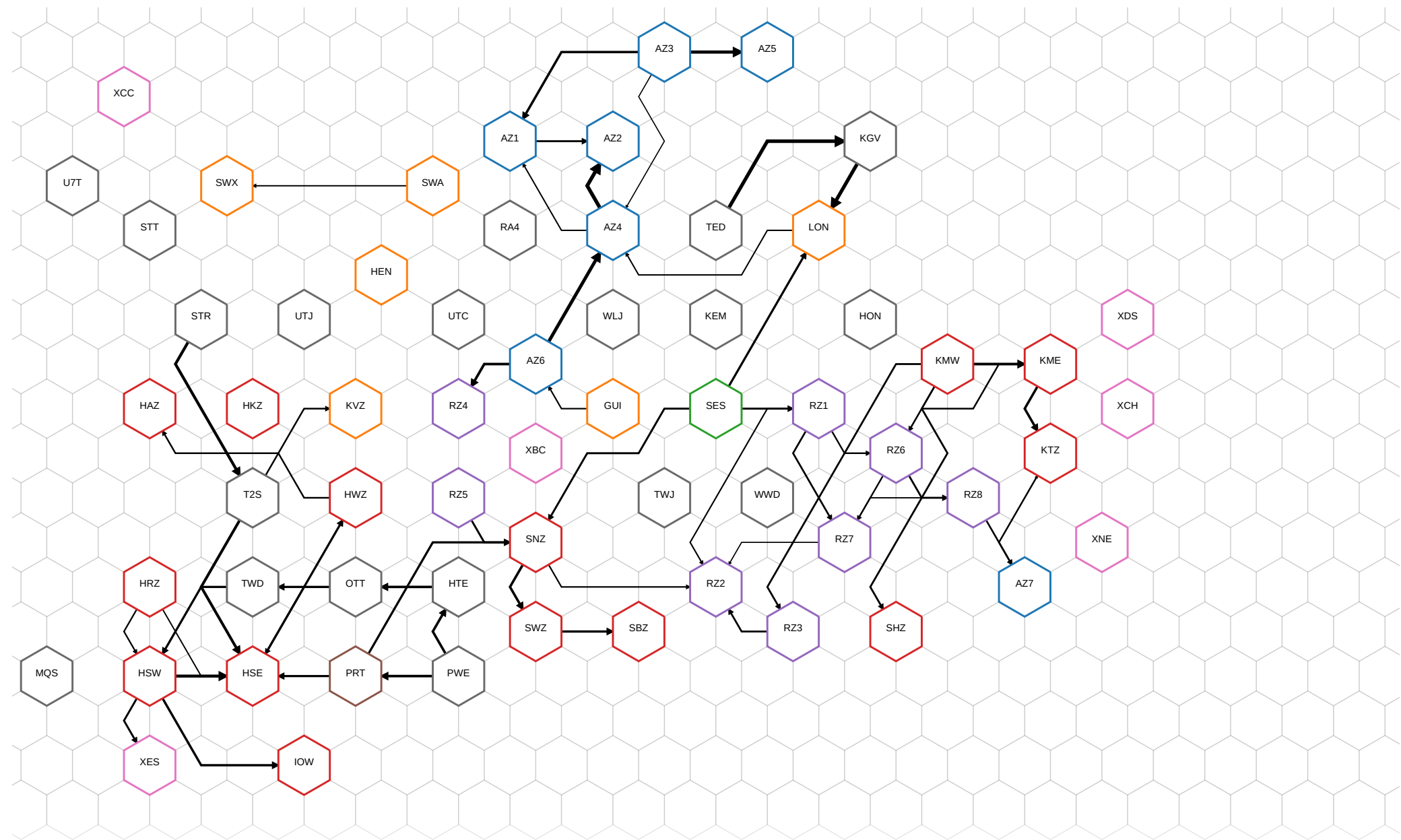


Situation 4 - 2075 (Thames Water)

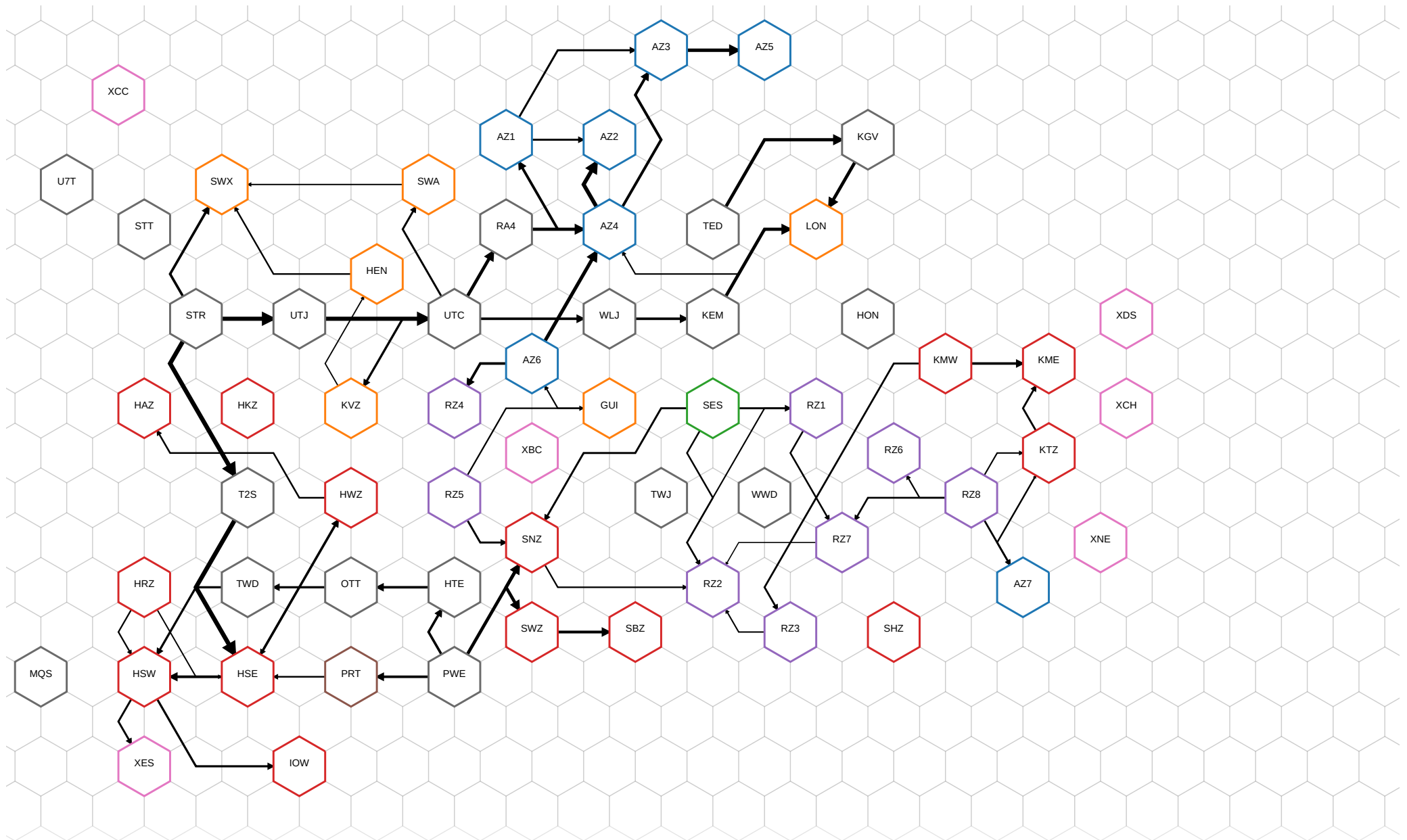


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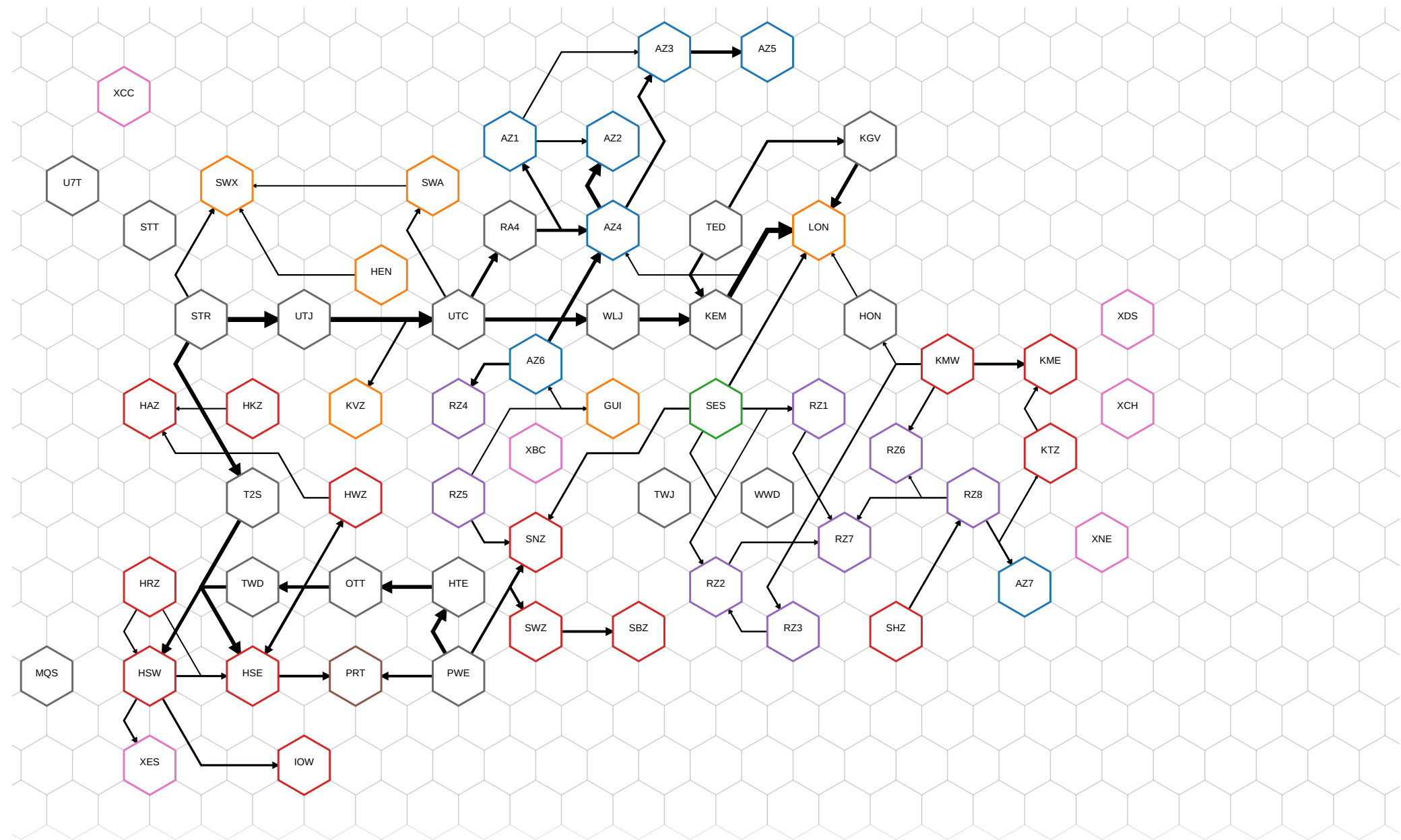
Situation 4 - 2040



Situation 4 - 2050



Situation 4 - 2075



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IVM Summary: Thames Water

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Metadata

General Settings

Name	st-hybrid-dy-w1-tree16.05-options-v37-gov-led-hybridf-2075
Created at	20/08/2022, 14:49:32
Tree	tree16.05: Root and branch tree 16.05: Stage 1 - Begins Hplan and LOW LCED, Stage 2 - Branches on growth (OxCam1a, Hplan and ONS18c), Stage 3 - Branches on licenced capped environmental destination, climate change and further growth scenarios (Hmax and Hmin) ↗
Setting name	options-v37-gov-led-hybridf ↗
Setting description	Emergency options in HSE, SBZ, and PRT.
Optimised discount rate	STPR

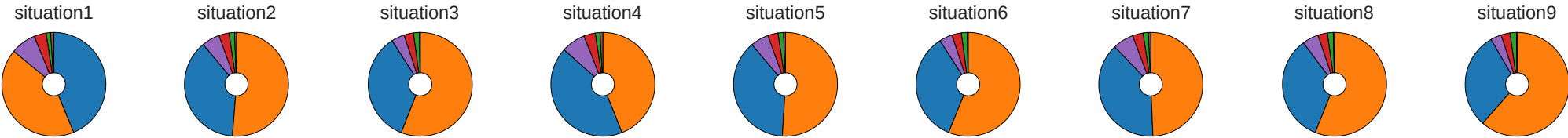
Metrics

Net present value (Cost)

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Cost w/ deficit (STPR)	16,053	12,575	11,308	15,084	12,653	11,269	13,105	11,328	10,181	(£m)
Cost w/o deficit (STPR)	16,053	12,575	11,308	15,084	12,653	11,269	13,105	11,328	10,181	(£m)
Cost w/ deficit (IGEQ)	26,111	19,531	17,135	24,172	19,689	17,080	20,733	17,395	15,249	(£m)
Cost w/o deficit (IGEQ)	26,111	19,531	17,135	24,172	19,689	17,080	20,733	17,395	15,249	(£m)
Cost w/ deficit (LTDR)	17,951	13,907	12,434	16,810	14,000	12,392	14,557	12,494	11,164	(£m)
Cost w/o deficit (LTDR)	17,951	13,907	12,434	16,810	14,000	12,392	14,557	12,494	11,164	(£m)

Cost breakdown (STPR)

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Capex	7,031	4,740	3,954	6,431	4,795	3,919	5,046	3,824	3,069	(£m)
Fixed opex	6,771	6,444	6,325	6,636	6,449	6,323	6,466	6,348	6,260	(£m)
Fixed operational carbon	227	216	210	223	217	210	218	210	206	(£m)
Embedded carbon	608	398	334	541	405	331	431	334	283	(£m)
Variable opex	1,256	702	456	1,120	712	456	848	568	342	(£m)
Variable carbon opex	159	75	29	133	76	29	96	44	20	(£m)



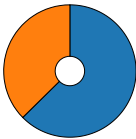
Emissions breakdown

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Capital emissions	3,960,089	2,471,022	2,018,221	3,468,336	2,517,607	2,004,195	2,738,322	2,064,481	1,705,644	(tonnes)
Operational emissions	2,070,308	1,474,794	1,141,084	1,869,644	1,486,738	1,140,596	1,595,514	1,217,821	1,070,187	(tonnes)

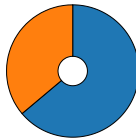
situation1



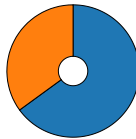
situation2



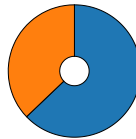
situation3



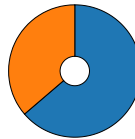
situation4



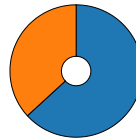
situation5



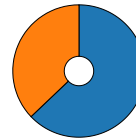
situation6



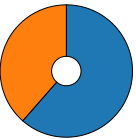
situation7



situation8



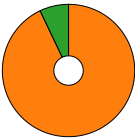
situation9



Electricity breakdown

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Generated (on site)	0	0	0	0	0	0	0	0	0	(GWh)
Grid	25,772	14,123	6,752	22,026	13,914	6,783	17,272	10,934	4,897	(GWh)
Renewable	1,958	1,058	607	1,425	1,160	580	1,183	752	104	(GWh)

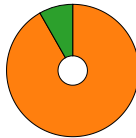
situation1



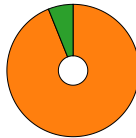
situation2



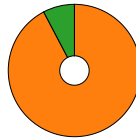
situation3



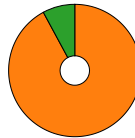
situation4



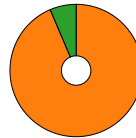
situation5



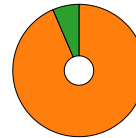
situation6



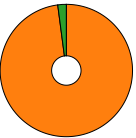
situation7



situation8



situation9



Environmental

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
SEA environmental benefit	87,008.00	81,551.00	79,041.00	85,732.00	80,637.00	78,920.00	82,048.00	77,795.00	75,297.00	
SEA environmental disbenefit	126,822.00	94,535.00	84,223.00	118,222.00	93,340.00	82,890.00	104,881.00	82,686.00	70,005.00	
Natural capital	7,725,341.06	8,515,803.86	9,038,971.24	6,901,286.79	8,362,966.37	9,031,938.46	8,388,413.04	11,328,336.07	14,560,498.86	
Bio-diversity net gain	-245,758.00	-110,437.00	-93,954.00	-206,662.00	-127,146.00	-88,337.00	-201,769.00	-143,885.00	-127,145.00	

Social

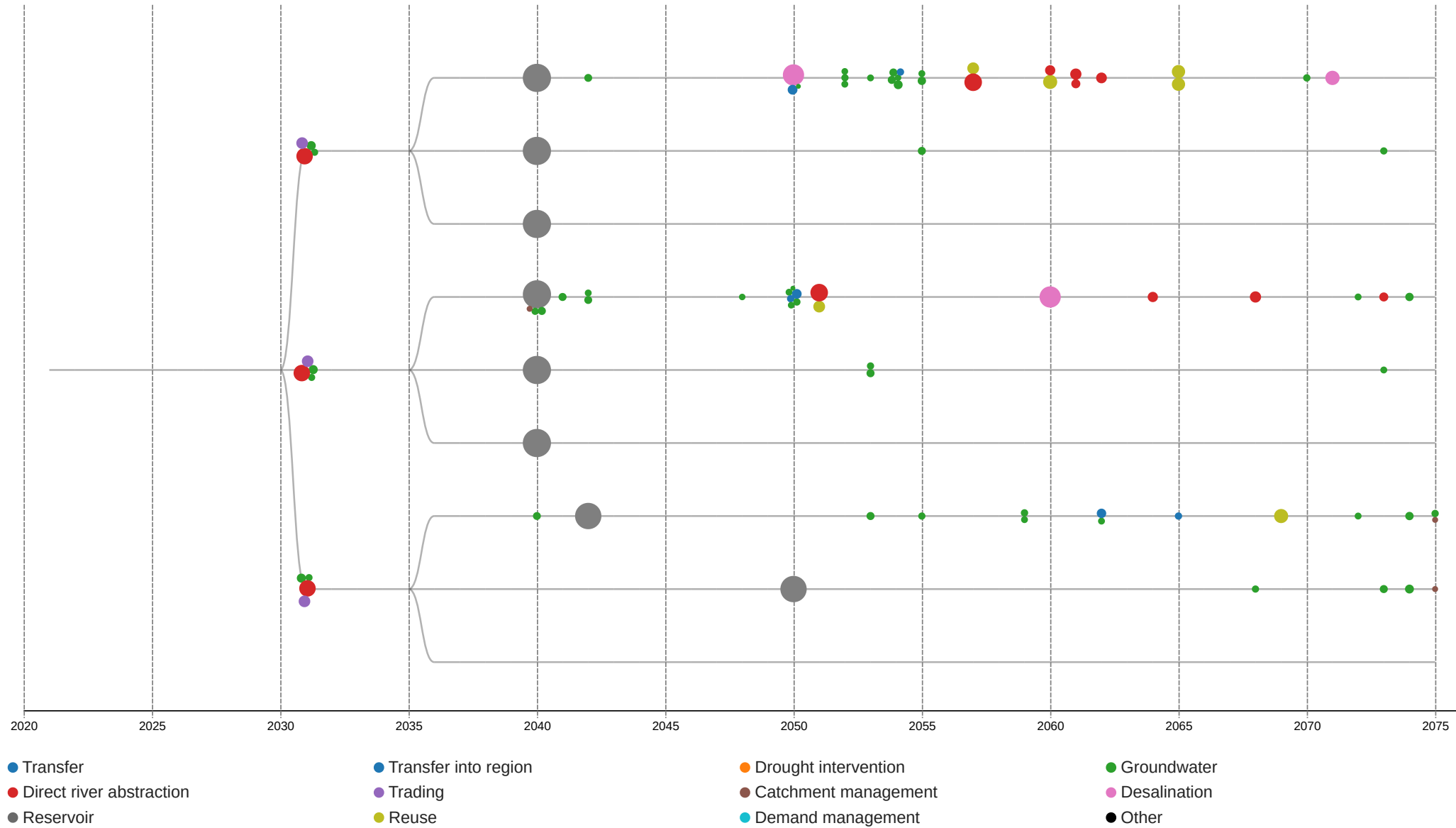
Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Customer preference	32,888.00	31,073.00	30,231.00	32,573.00	30,777.00	30,175.00	31,572.00	30,104.00	29,273.00	

Reliability

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Reliability	37.93	38.86	40.60	37.87	39.20	40.23	38.84	40.65	46.03	
R1: Uncertainty of option supply/demand benefit	10.80	10.49	10.75	10.63	10.71	10.65	10.84	10.90	12.39	
R3: Risk of service failure due to other physical hazards	9.86	10.20	10.76	9.87	10.28	10.67	10.14	10.76	12.35	
R4: Availability of additional headroom	6.81	7.21	7.43	6.81	7.15	7.34	7.13	7.54	8.04	
R5: Catchment/raw water quality risks (incl. climate change)	1.19	1.33	1.42	1.20	1.32	1.42	1.14	1.23	1.42	
R6: Capacity of catchment services	0.05	0.05	0.02	0.06	0.05	0.02	0.04	0.06	0.02	
R7: Risk of service failure to other exceptional events	9.20	9.54	10.21	9.29	9.66	10.12	9.53	10.12	11.80	
R8: Soil health	0.02	0.02	0.01	0.02	0.02	0.01	0.01	0.02	0.01	

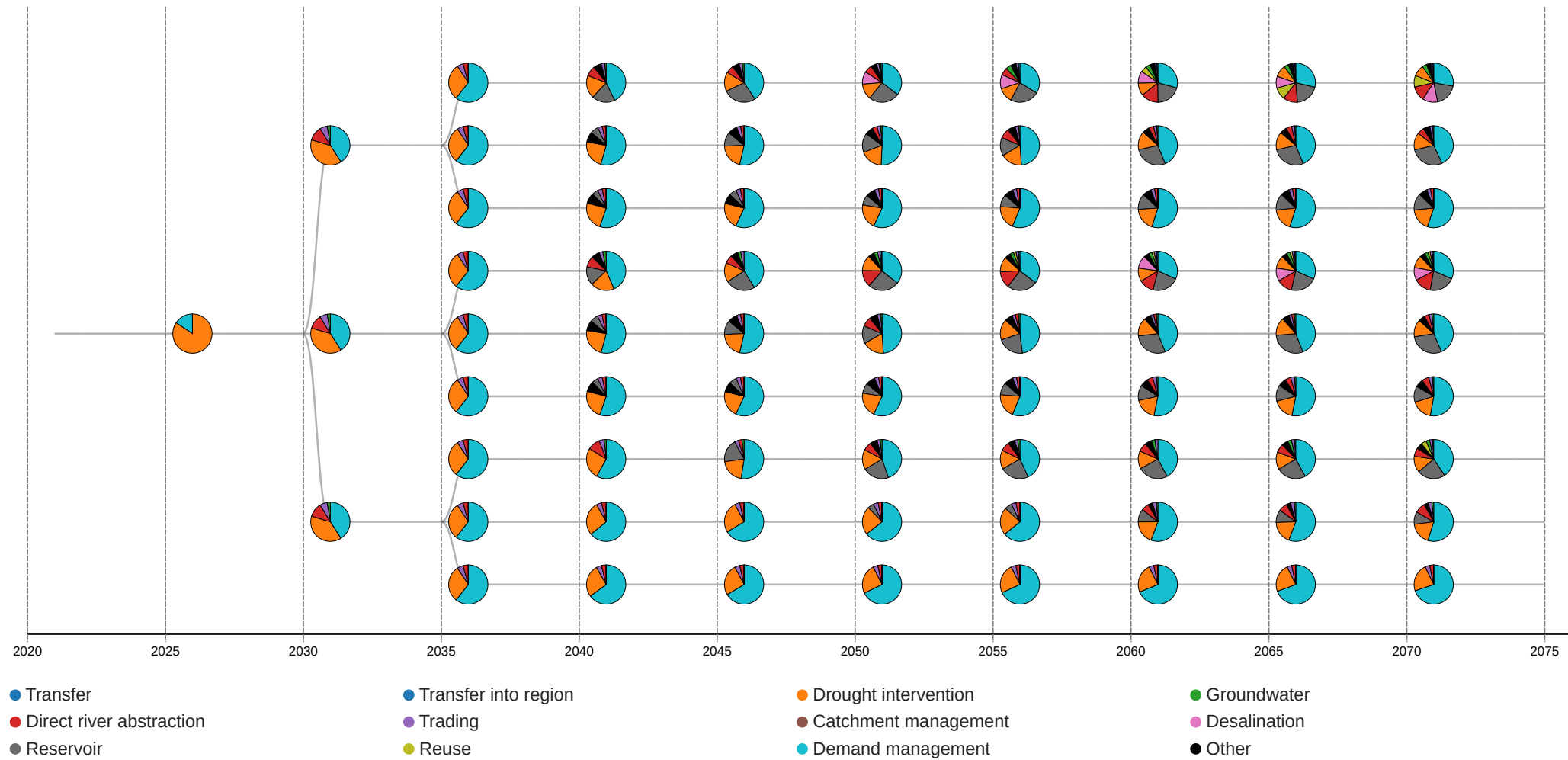
Adaptability										
Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Adaptability	18.80	20.64	22.45	19.07	20.48	22.21	20.20	21.13	22.95	
A3: Operational complexity and flexibility	9.15	9.66	10.33	9.28	9.74	10.24	9.59	10.25	11.95	
A4: WRZ connectivity	9.60	10.92	12.10	9.71	10.68	11.95	10.54	10.79	10.98	
A7: Customer relations support engagement with demand management	0.05	0.06	0.02	0.07	0.06	0.02	0.06	0.09	0.02	
Evolvability										
Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Evolvability	26.52	26.72	28.26	26.42	27.03	27.99	27.01	28.68	32.88	
E1: Scaleability and modularity of proposed changes	10.73	10.96	11.63	10.68	11.13	11.53	11.16	11.94	13.74	
E2: Intervention lead times	7.06	6.83	7.26	7.00	6.88	7.18	6.87	7.21	8.23	
E3: Reliance on external bodies to deliver changes	8.63	8.82	9.33	8.63	8.92	9.25	8.90	9.42	10.87	
E5: Collaborative land management	0.10	0.10	0.04	0.11	0.10	0.04	0.08	0.11	0.04	

Option Selection (Thames Water)

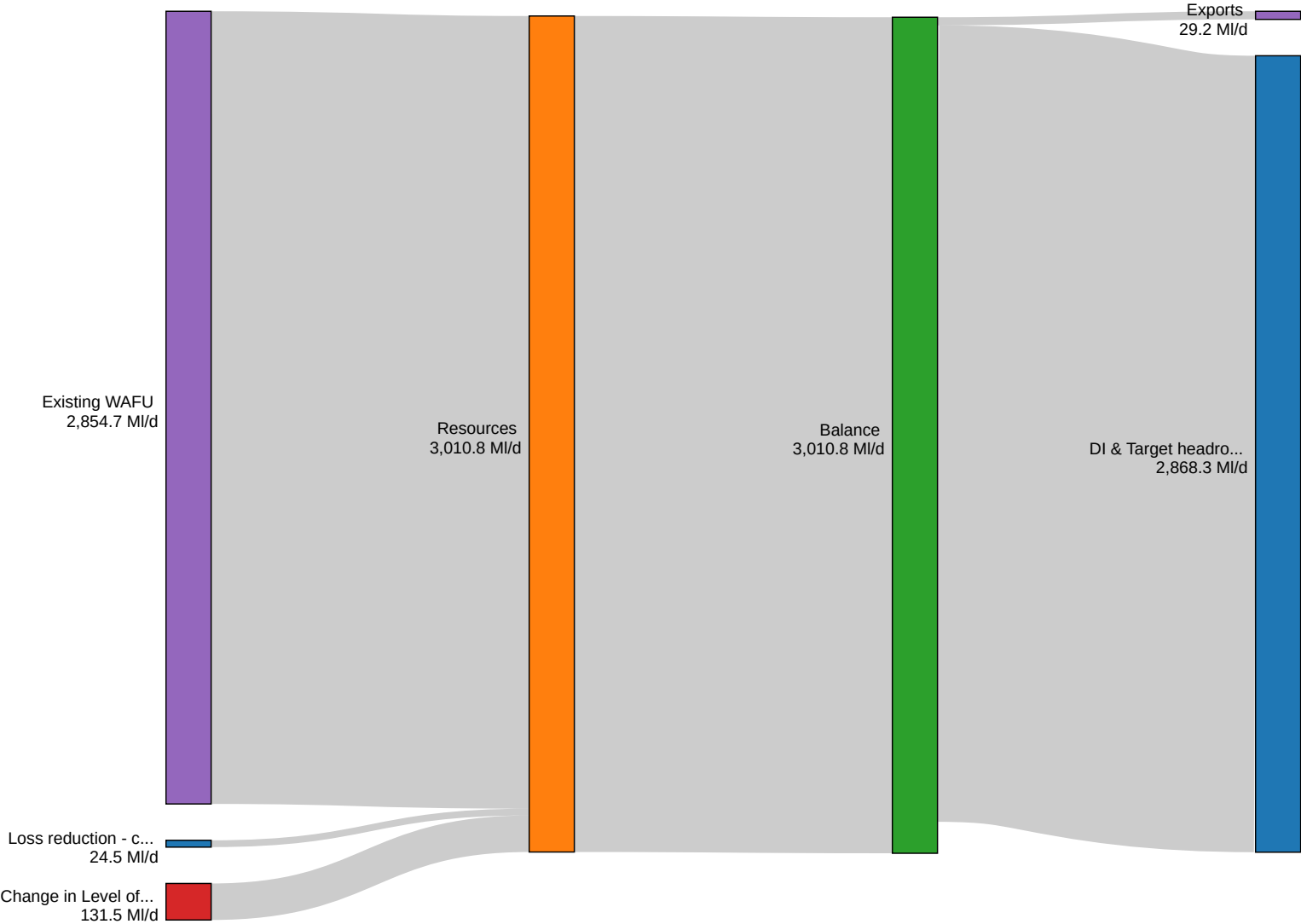


Utilisation (Thames Water)

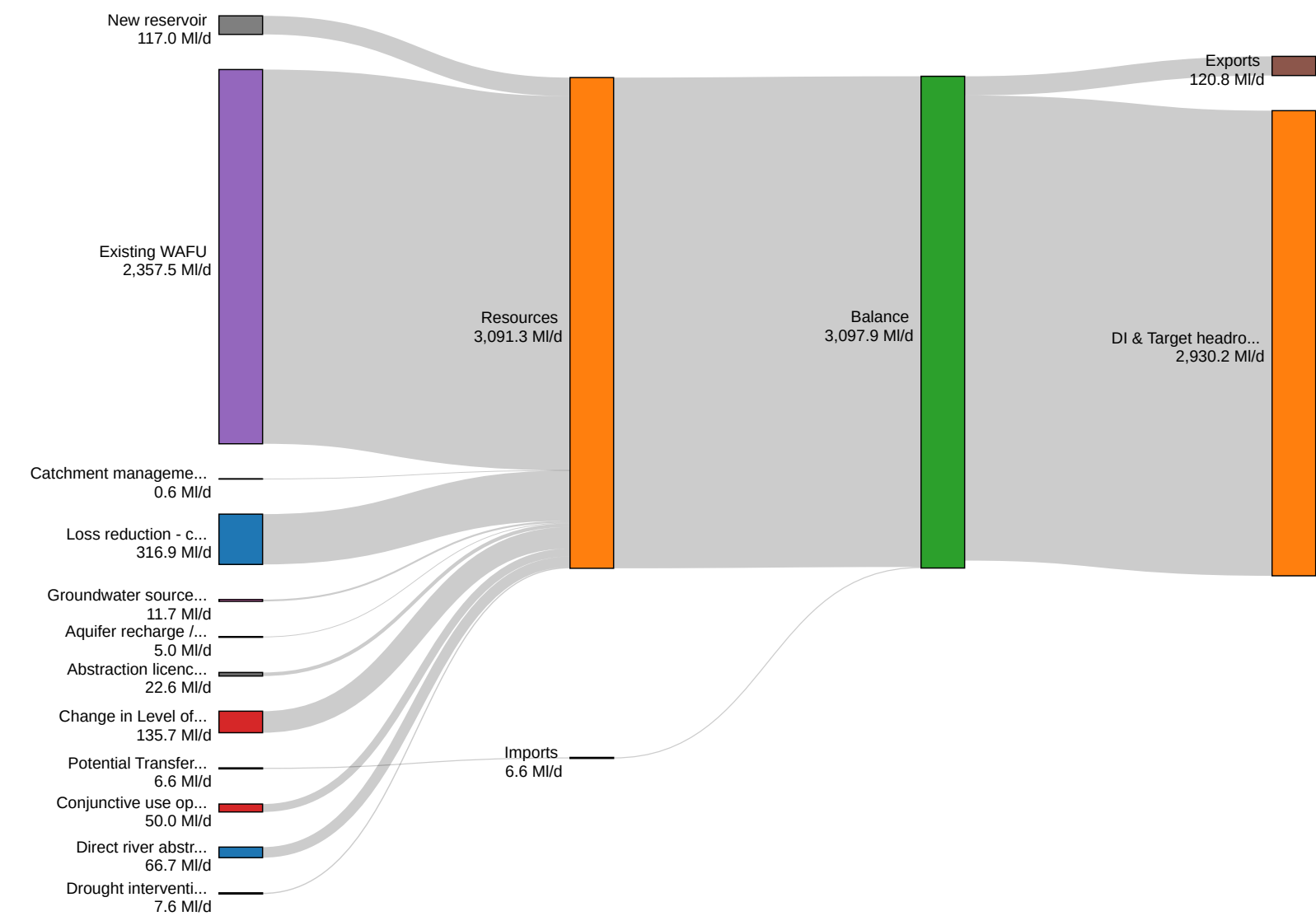
Pie charts show the breakdown of option utilisation by option category.



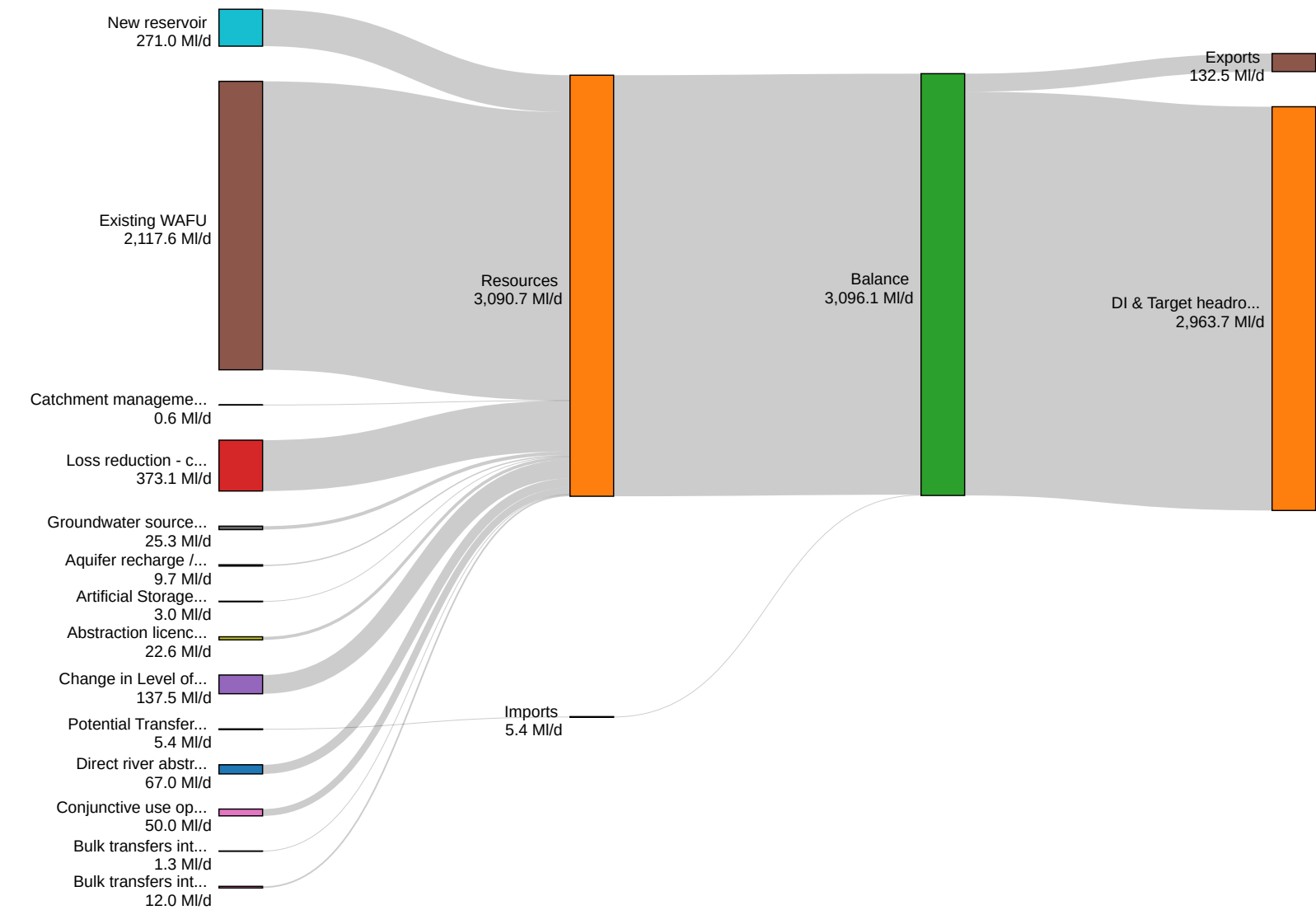
Situation 4 - 2026 (Thames Water)



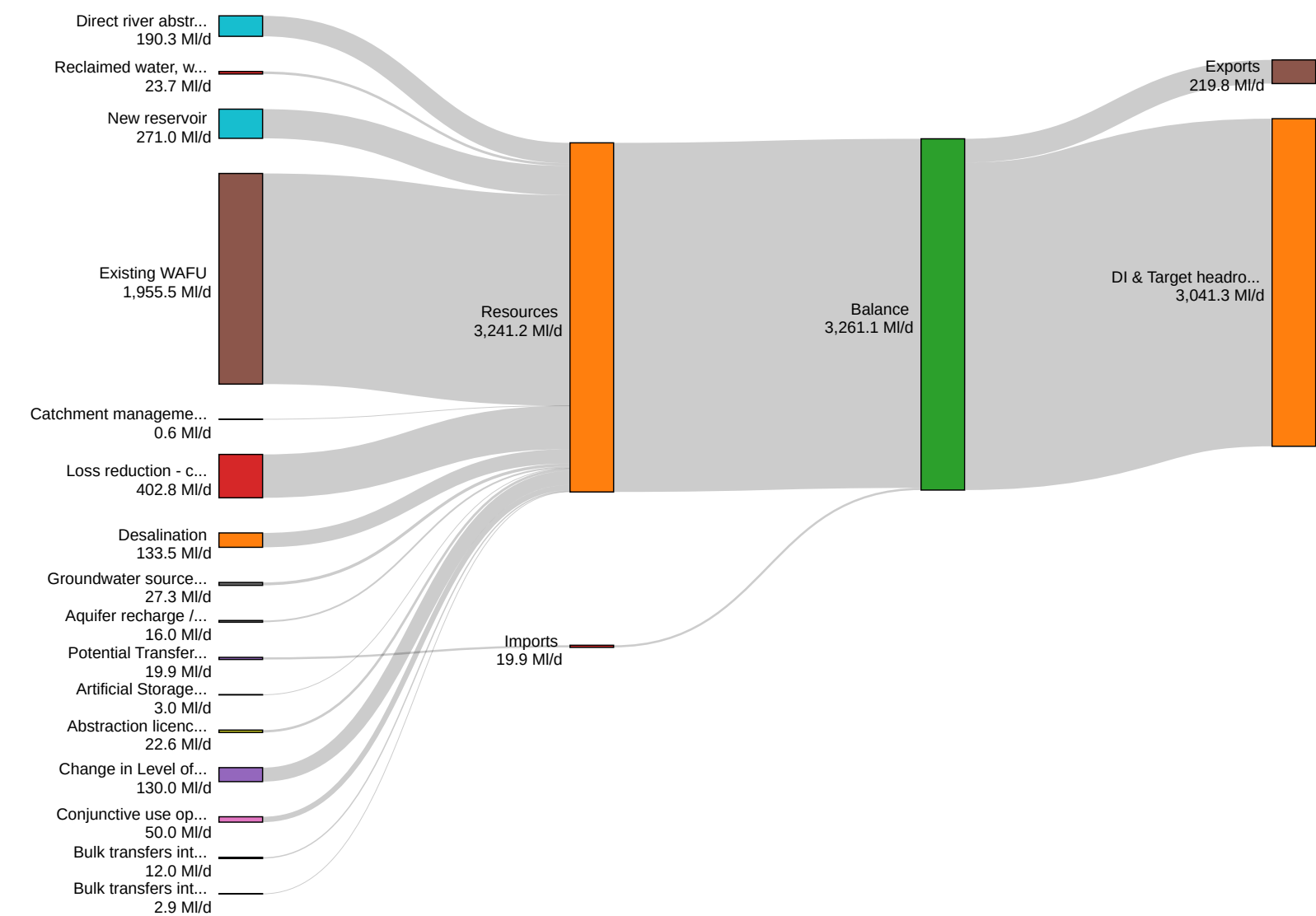
Situation 4 - 2040 (Thames Water)



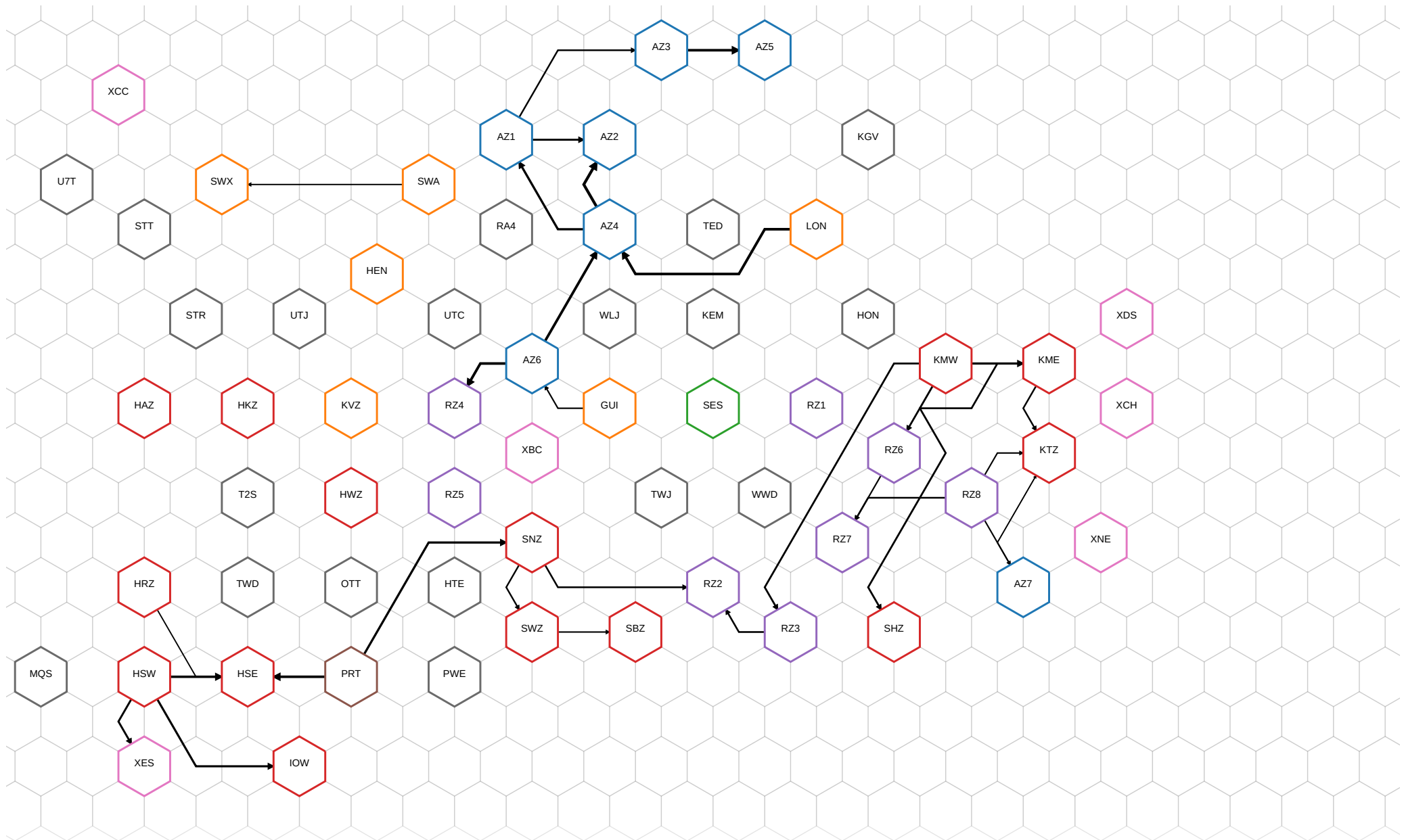
Situation 4 - 2050 (Thames Water)



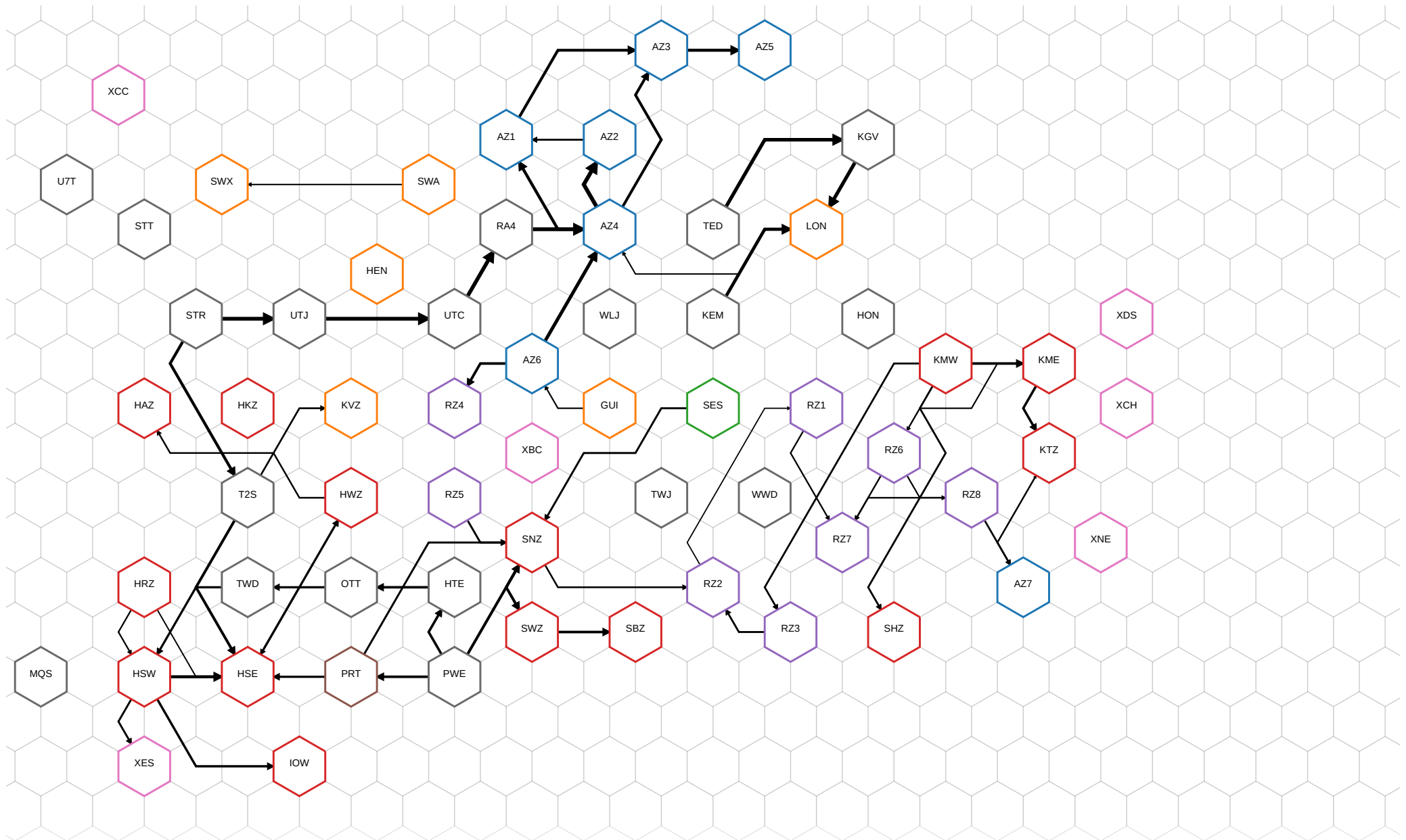
Situation 4 - 2075 (Thames Water)



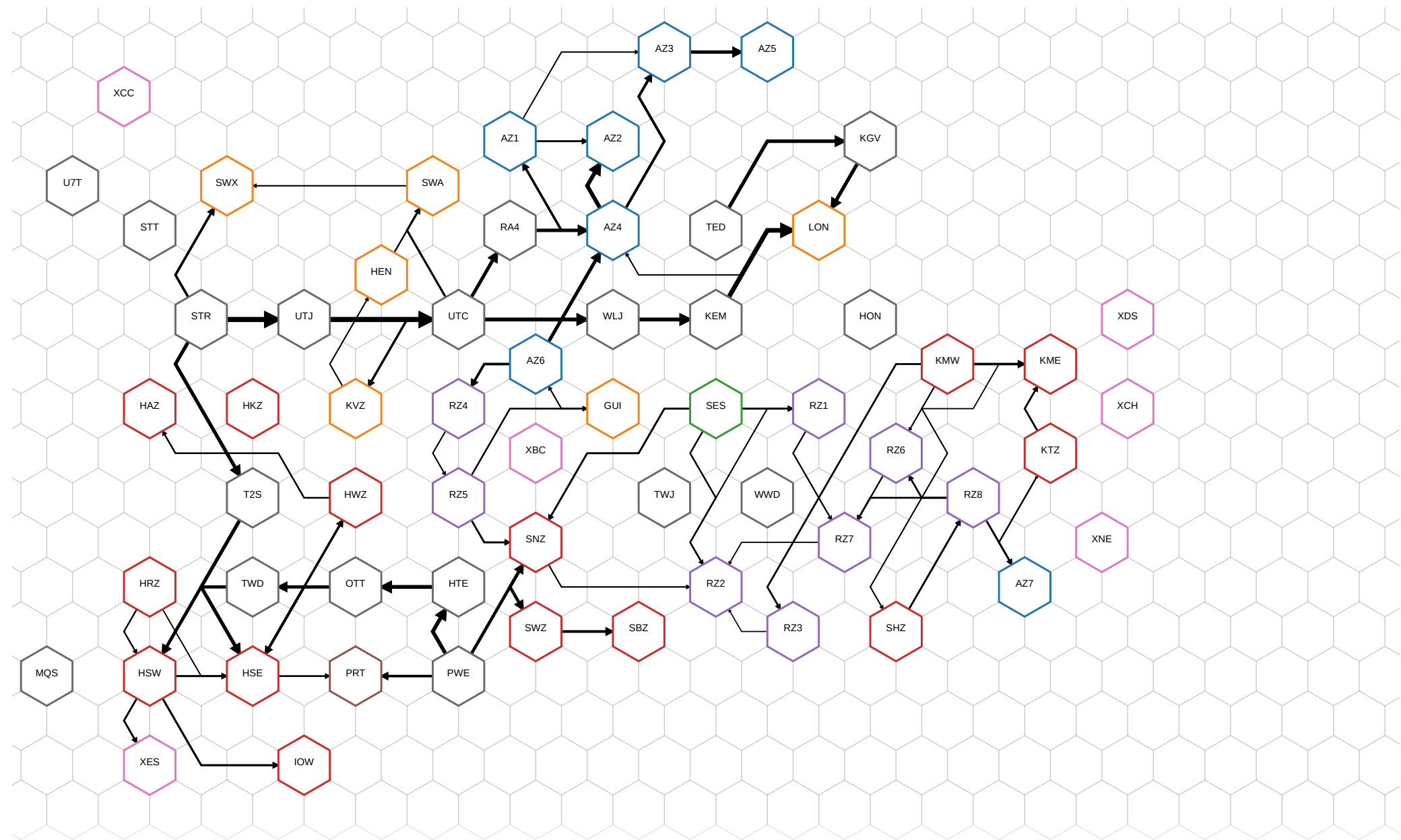
Situation 4 - 2026



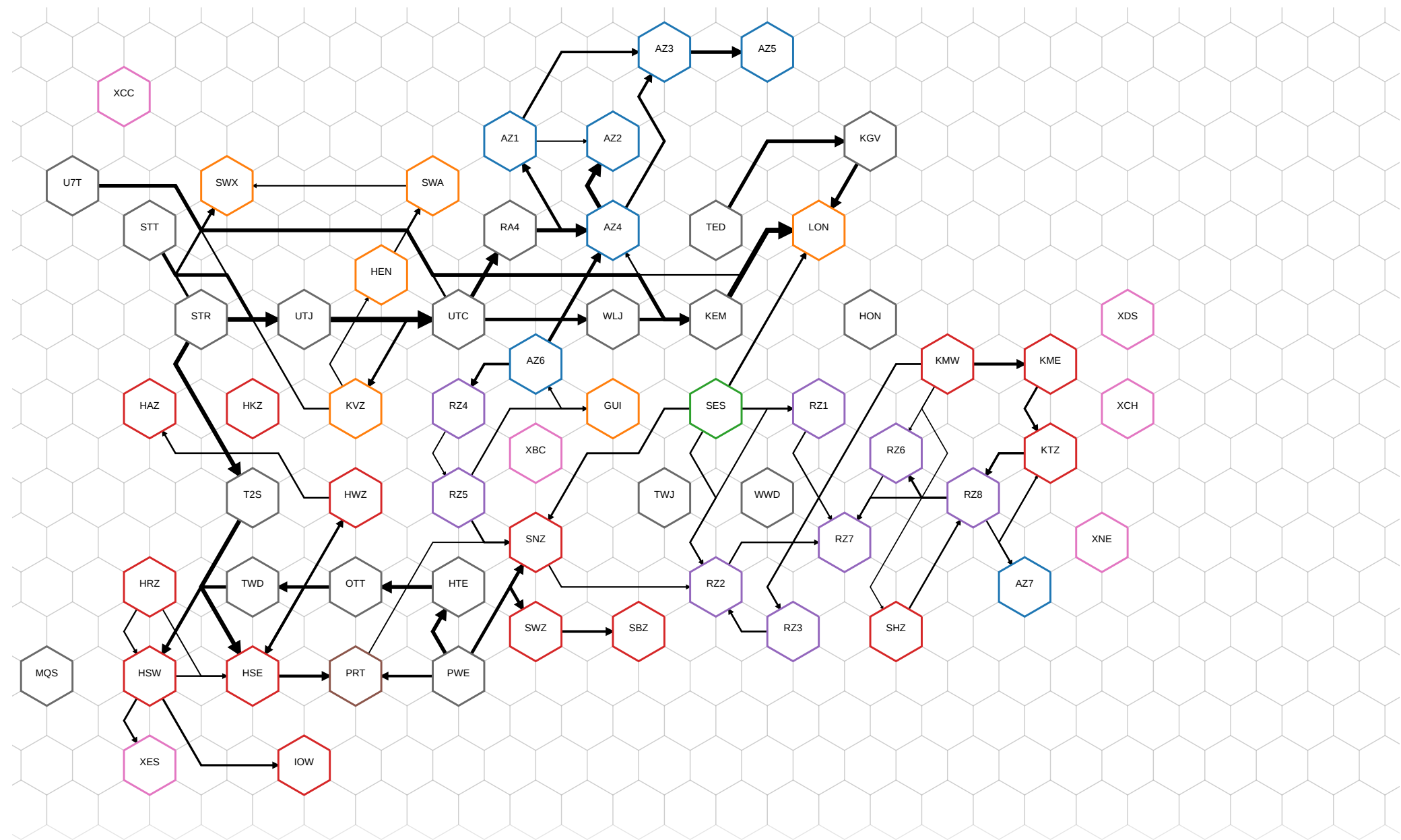
Situation 4 - 2040



Situation 4 - 2050



Situation 4 - 2075



IVM RUN DOSSIER

GOVERNMENT-LED SCENARIO G

IVM Summary: Thames Water

Metadata	
General Settings	
Name	st-hybrid-dy-w1-tree16.05-options-v37-gov-led-hybridg-2075
Created at	20/08/2022, 14:49:34
Tree	tree16.05: Root and branch tree 16.05: Stage 1 - Begins Hplan and LOW LCED, Stage 2 - Branches on growth (OxCam1a, Hplan and ONS18c), Stage 3 - Branches on licenced capped environmental destination, climate change and further growth scenarios (Hmax and Hmin) 
Setting name	options-v37-gov-led-hybridg 
Setting description	Emergency options in HSE, SBZ, and PRT.
Optimised discount rate	STPR

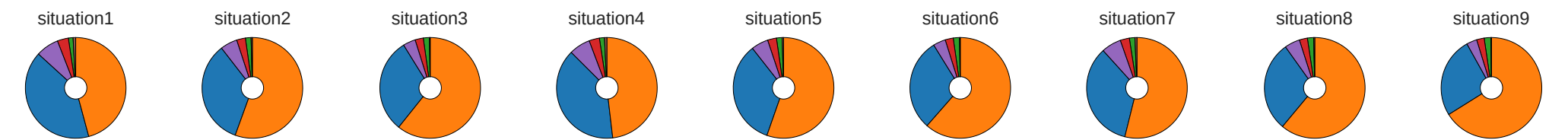
Metrics

Net present value (Cost)

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Cost w/ deficit (STPR)	14,282	11,407	10,289	13,475	11,453	10,154	11,842	10,261	9,365	(£m)
Cost w/o deficit (STPR)	14,282	11,407	10,289	13,475	11,453	10,154	11,842	10,261	9,365	(£m)
Cost w/ deficit (IGEQ)	23,098	17,670	15,546	21,491	17,786	15,325	18,677	15,682	14,012	(£m)
Cost w/o deficit (IGEQ)	23,098	17,670	15,546	21,491	17,786	15,325	18,677	15,682	14,012	(£m)
Cost w/ deficit (LTDR)	15,948	12,607	11,306	14,998	12,665	11,154	13,143	11,305	10,266	(£m)
Cost w/o deficit (LTDR)	15,948	12,607	11,306	14,998	12,665	11,154	13,143	11,305	10,266	(£m)

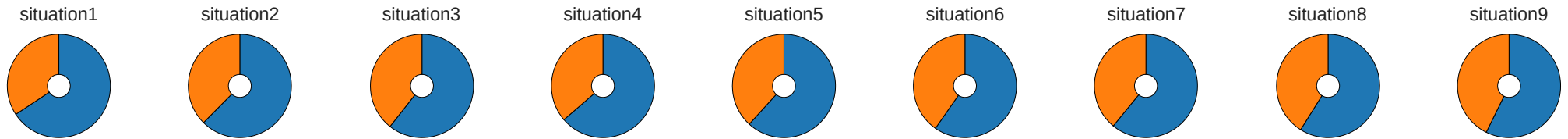
Cost breakdown (STPR)

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Capex	5,847	3,874	3,130	5,299	3,896	3,016	4,075	2,982	2,415	(£m)
Fixed opex	6,543	6,335	6,250	6,486	6,342	6,242	6,379	6,266	6,192	(£m)
Fixed operational carbon	216	207	205	219	212	205	212	206	203	(£m)
Embedded carbon	511	323	273	452	327	264	350	267	228	(£m)
Variable opex	1,047	620	409	915	626	403	750	504	311	(£m)
Variable carbon opex	119	47	23	103	50	23	75	36	16	(£m)



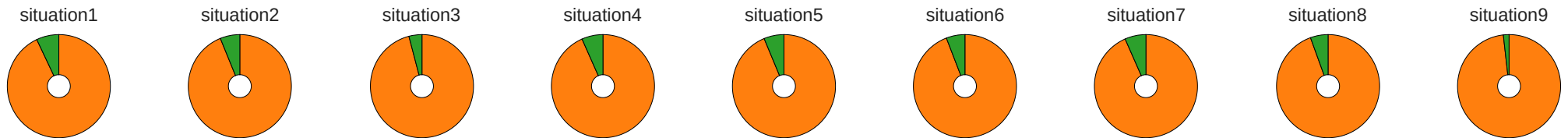
Emissions breakdown

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Capital emissions	3,311,720	2,007,433	1,646,087	2,890,316	2,045,959	1,596,153	2,230,928	1,643,071	1,374,963	(tonnes)
Operational emissions	1,726,261	1,208,026	1,068,738	1,650,130	1,267,386	1,077,418	1,431,613	1,145,322	1,024,596	(tonnes)



Electricity breakdown

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Generated (on site)	0	0	0	0	0	0	0	0	0	(GWh)
Grid	21,861	12,903	6,449	18,839	13,296	6,304	15,270	9,909	4,461	(GWh)
Renewable	1,656	848	274	1,343	891	392	1,082	581	81	(GWh)



Environmental

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
SEA environmental benefit	83,465.00	77,993.00	76,440.00	82,037.00	78,103.00	75,743.00	79,582.00	74,934.00	73,615.00	
SEA environmental disbenefit	117,387.00	87,586.00	75,985.00	108,846.00	87,359.00	75,688.00	97,403.00	74,540.00	65,238.00	
Natural capital	8,194,954.58	9,492,512.27	11,277,207.97	8,122,171.74	10,457,178.97	14,796,853.90	12,520,111.81	14,825,997.46	18,082,271.68	
Bio-diversity net gain	-226,316.00	-102,351.00	-86,793.00	-172,608.00	-91,099.00	-89,773.00	-203,532.00	-147,629.00	-133,080.00	

Social

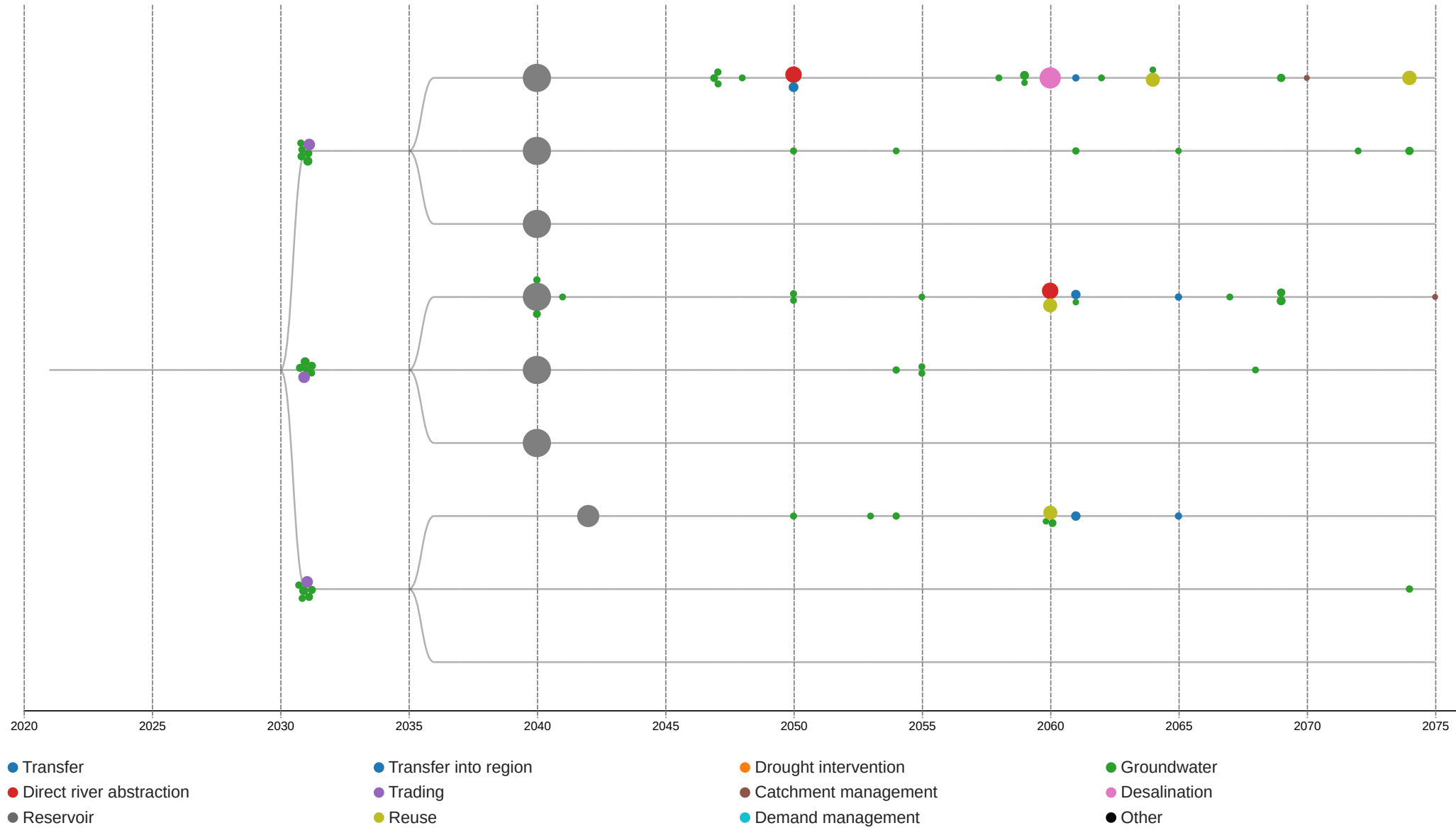
Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Customer preference	32,280.00	30,178.00	29,625.00	31,673.00	30,186.00	29,538.00	30,986.00	29,328.00	28,761.00	

Reliability

Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Reliability	37.03	38.67	41.36	37.96	39.27	40.88	37.61	40.00	45.57	
R1: Uncertainty of option supply/demand benefit	10.04	9.96	10.61	10.38	10.29	10.47	10.17	10.47	11.99	
R3: Risk of service failure due to other physical hazards	9.76	10.35	11.16	10.01	10.52	11.02	9.97	10.79	12.47	
R4: Availability of additional headroom	6.87	7.32	7.54	6.89	7.25	7.45	7.17	7.59	8.10	
R5: Catchment/raw water quality risks (incl. climate change)	1.05	1.18	1.25	1.06	1.18	1.24	0.81	0.81	0.90	
R6: Capacity of catchment services	0.06	0.02	0.02	0.06	0.03	0.02	0.03	0.02	0.02	
R7: Risk of service failure to other exceptional events	9.23	9.84	10.77	9.54	9.99	10.66	9.44	10.31	12.08	
R8: Soil health	0.02	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01	

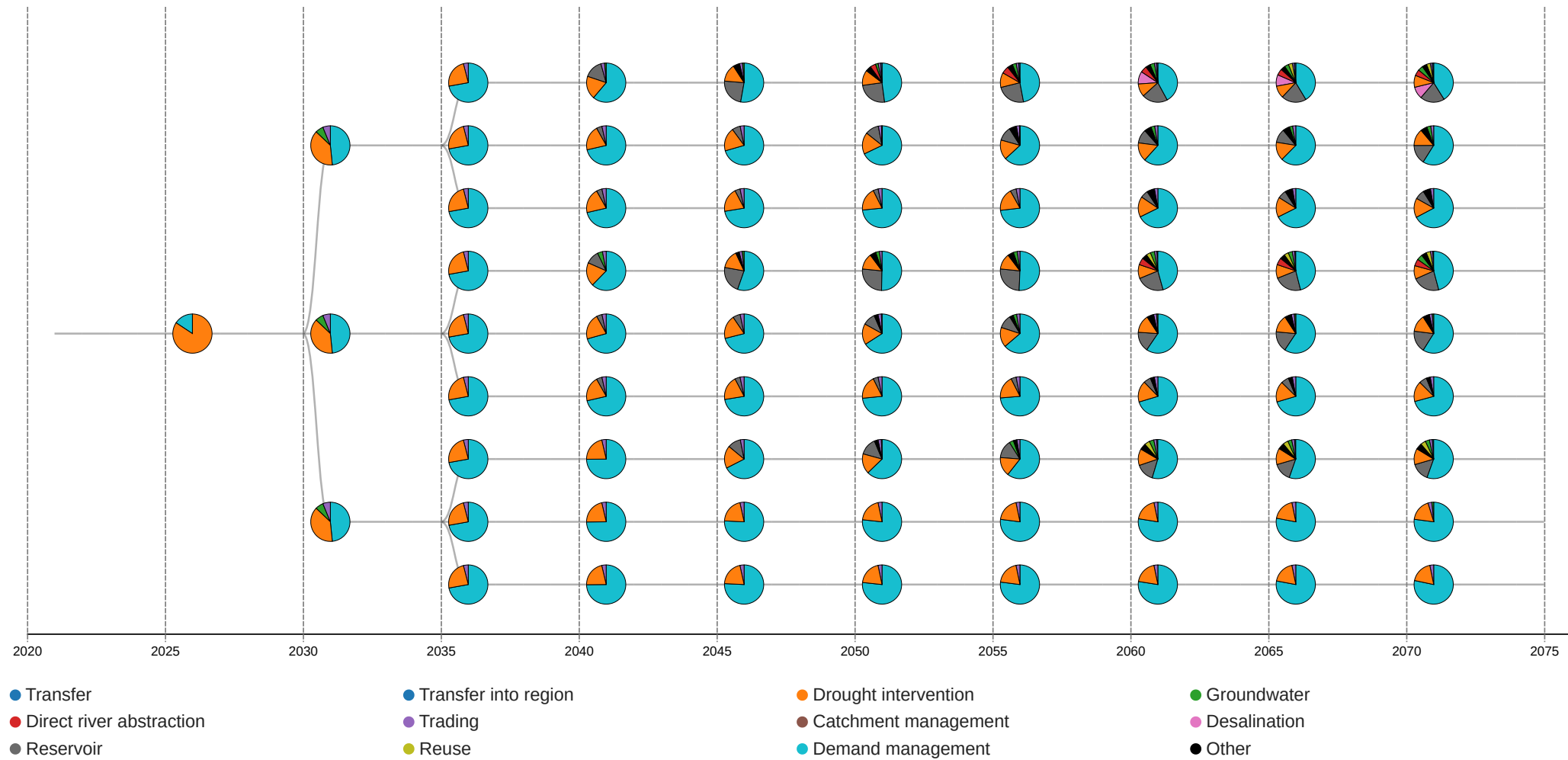
Adaptability										
Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Adaptability	18.17	19.35	20.16	18.80	19.30	19.64	18.93	19.36	22.48	
A3: Operational complexity and flexibility	9.09	9.79	10.69	9.44	9.95	10.60	9.38	10.26	12.01	
A4: WRZ connectivity	9.02	9.54	9.45	9.29	9.31	9.03	9.51	9.09	10.45	
A7: Customer relations support engagement with demand management	0.07	0.02	0.02	0.07	0.04	0.02	0.04	0.02	0.02	
Evolvability										
Metric	situation1	situation2	situation3	situation4	situation5	situation6	situation7	situation8	situation9	Units
Evolvability	27.35	29.03	31.60	27.93	29.37	31.08	29.21	31.82	37.02	
E1: Scaleability and modularity of proposed changes	11.20	11.90	12.96	11.44	12.06	12.84	12.22	13.42	15.60	
E2: Intervention lead times	7.45	8.04	8.78	7.58	8.03	8.49	7.94	8.60	10.04	
E3: Reliance on external bodies to deliver changes	8.59	9.05	9.82	8.81	9.22	9.72	8.98	9.75	11.34	
E5: Collaborative land management	0.11	0.04	0.04	0.11	0.07	0.04	0.07	0.04	0.04	

Option Selection (Thames Water)

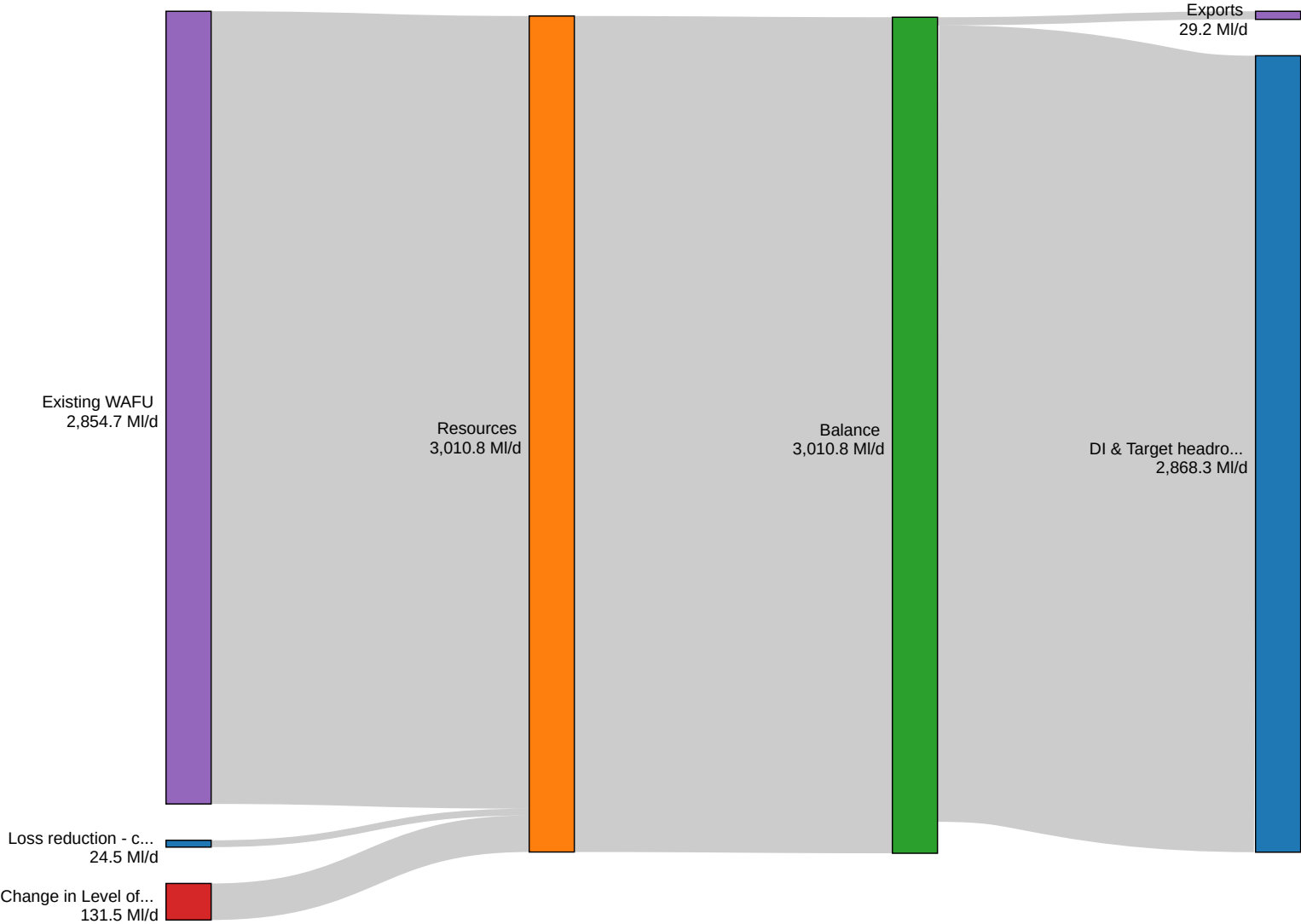


Utilisation (Thames Water)

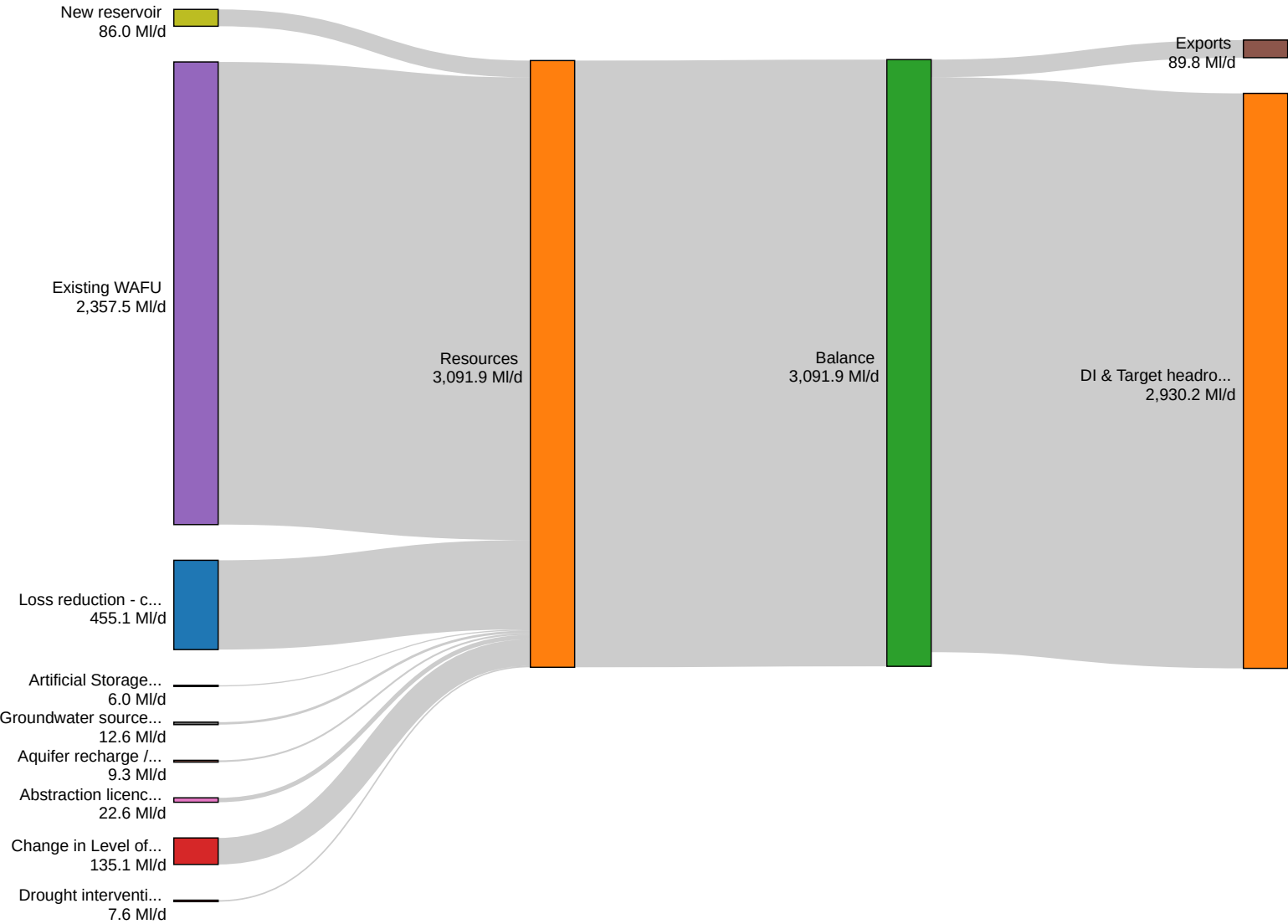
Pie charts show the breakdown of option utilisation by option category.



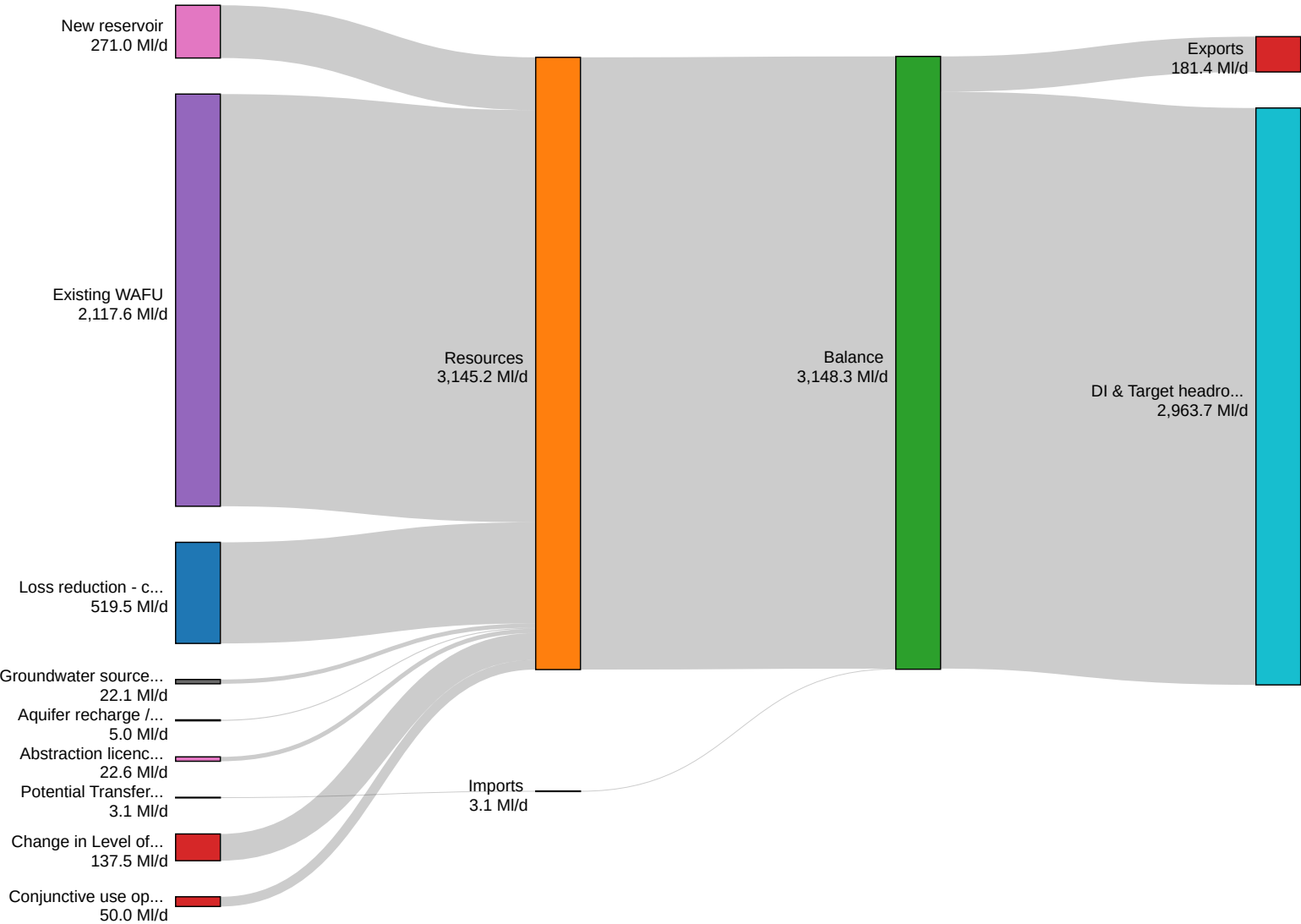
Situation 4 - 2026 (Thames Water)



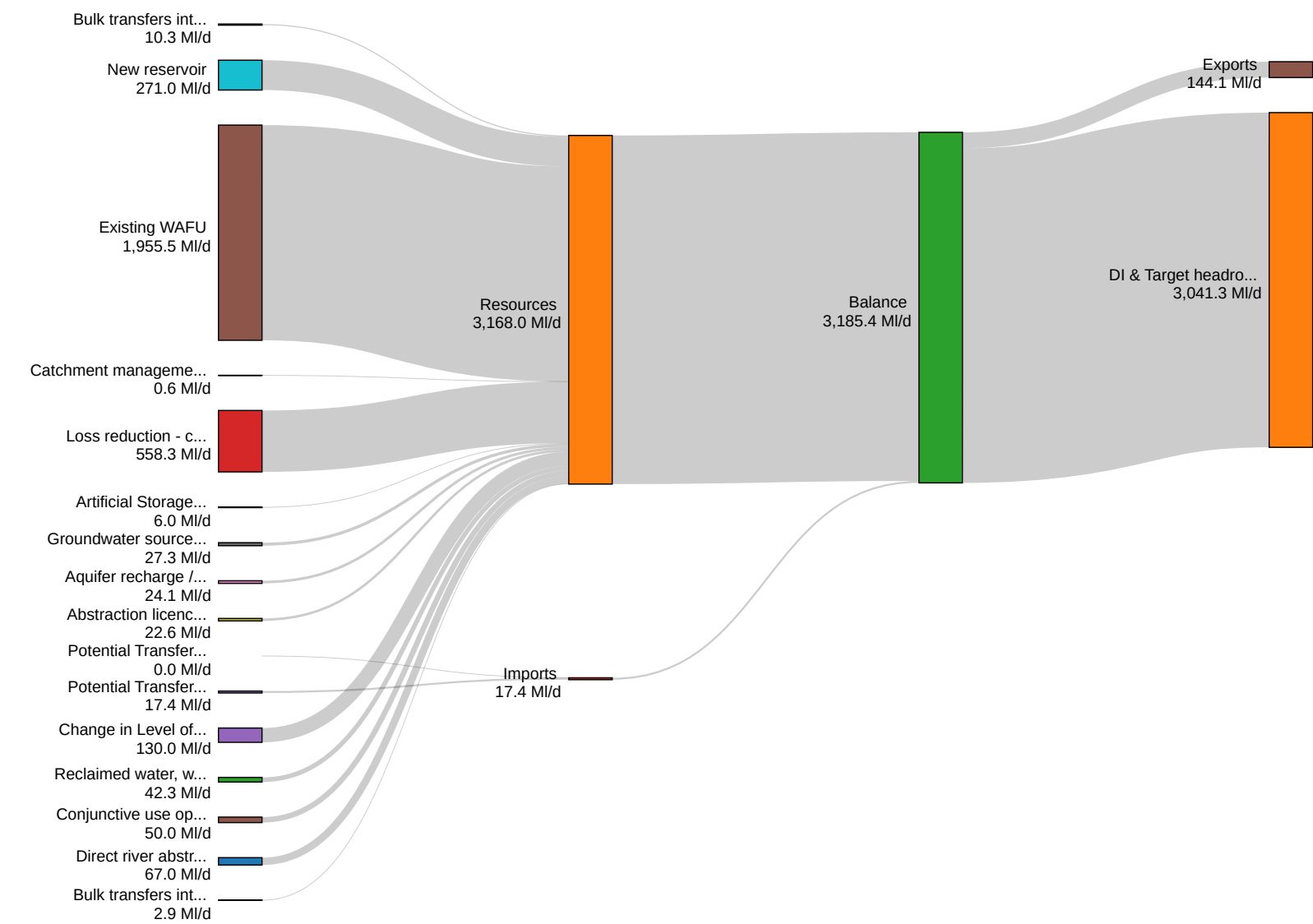
Situation 4 - 2040 (Thames Water)



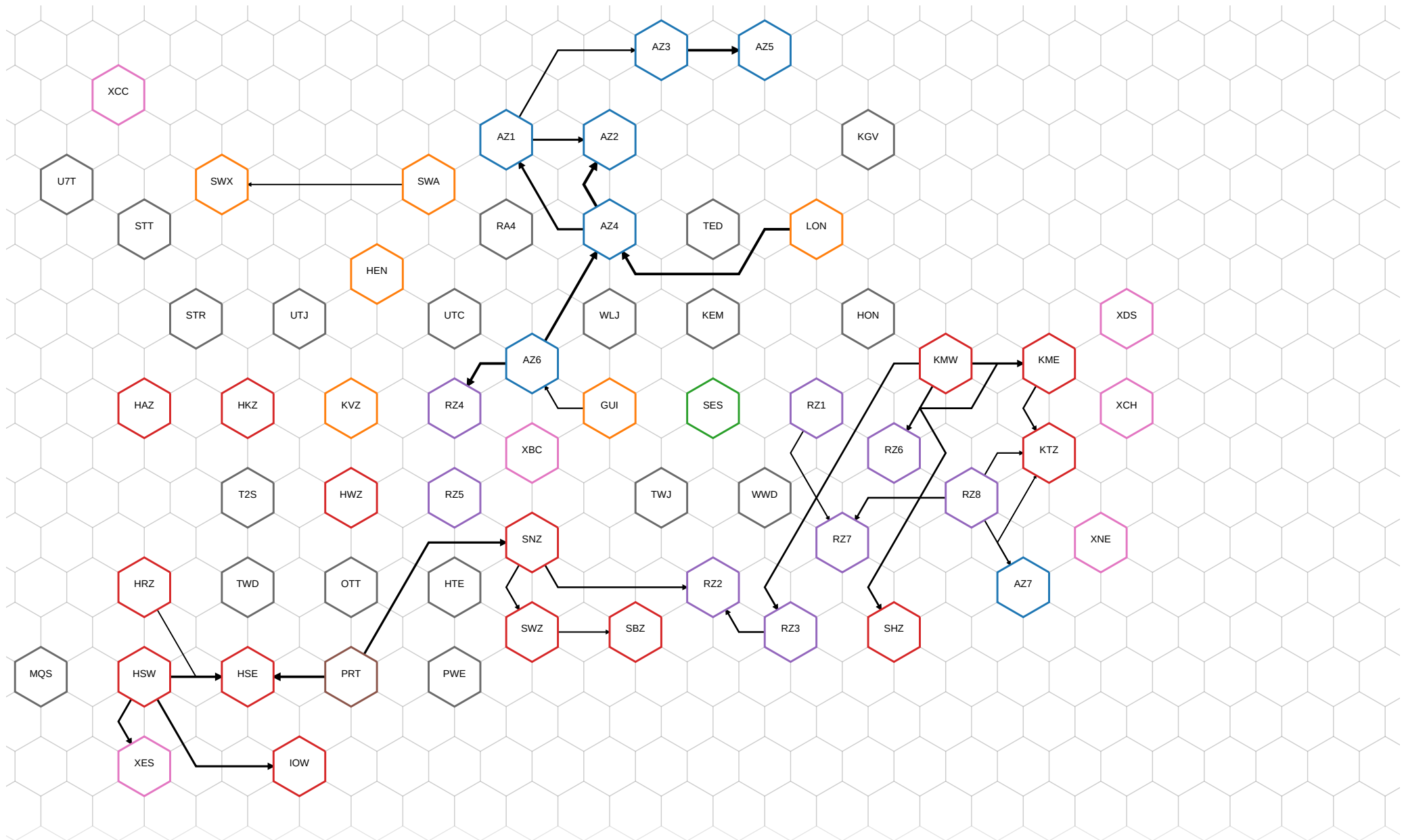
Situation 4 - 2050 (Thames Water)



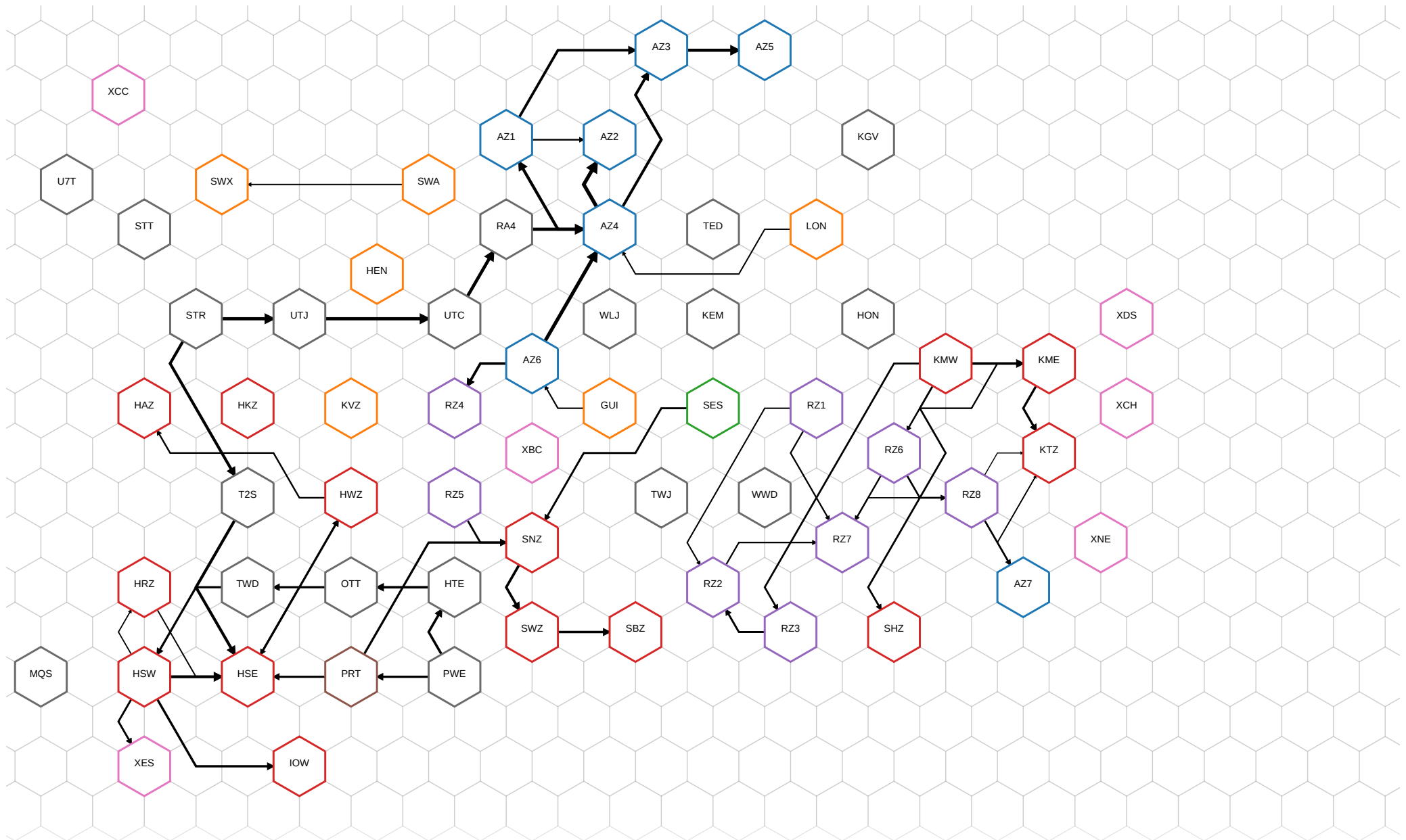
Situation 4 - 2075 (Thames Water)



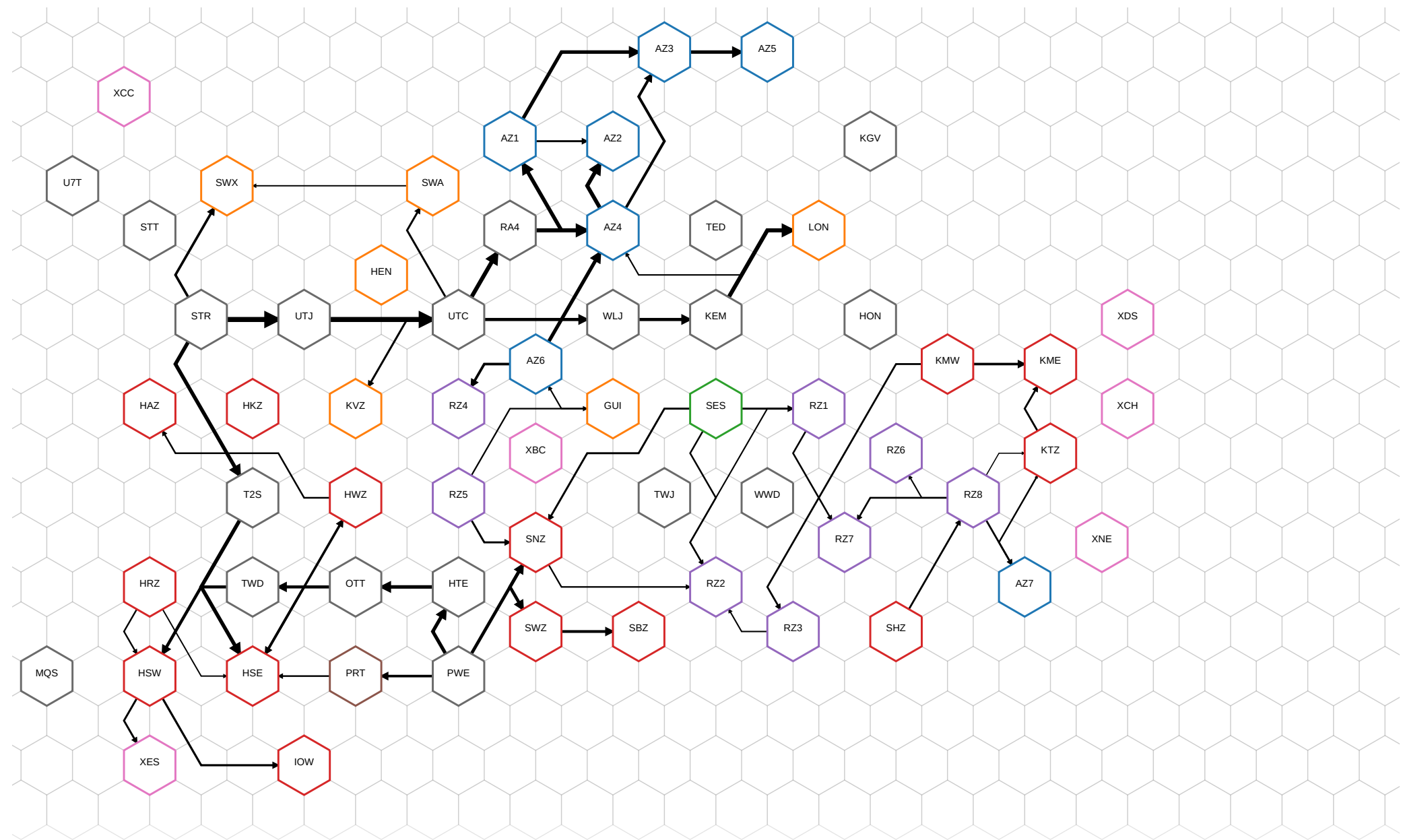
Situation 4 - 2026



Situation 4 - 2040



Situation 4 - 2050



Situation 4 - 2075

