Appendix
YKY04_Frontier Economics affordability report

YorkshireWater

Water affordability analysis – FY24-FY30

A presentation prepared for Yorkshire Water

15 September 2023

Objectives for this phase of work and key assumptions

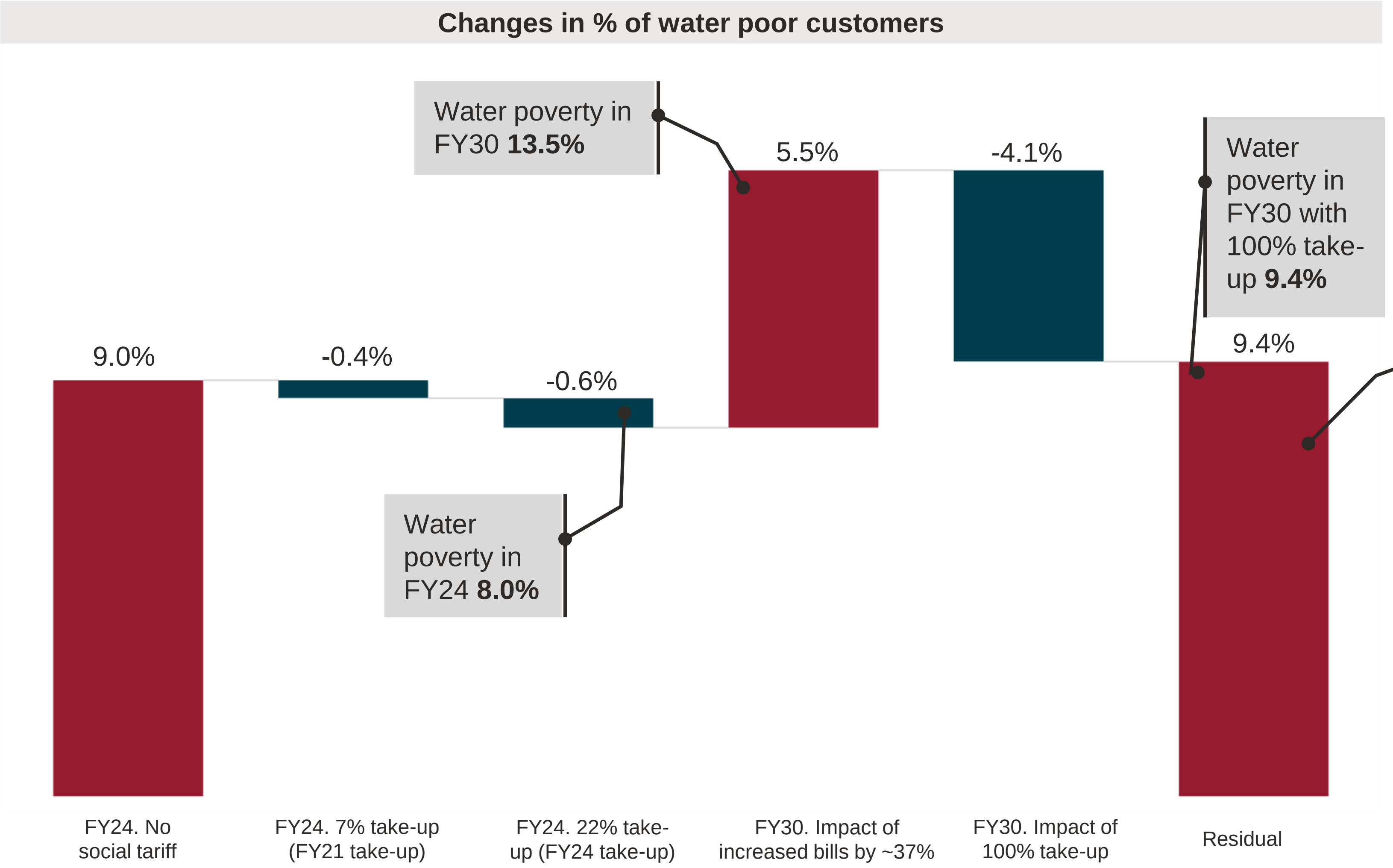
Questions we addressed

- What is your affordability position in FY24?
- What is your expected affordability position in FY30?
- What could you do to improve your position?

Key assumptions

- For the purposes of this pack, **social tariff customers include both WaterSupport customers and WaterSure customers**
- The basis of our estimates is data from FY21. We have calculated the FY24 position by:
  - Inflating bills and income
  - Using the latest social tariff structure (£350 cap, eligibility by customer group)
  - Scaling down water poverty statistics by the additional take-up in social tariff between FY21 and FY24
- Results presented are central estimates from our Monte Carlo methodology (hence there is a degree of uncertainty around these estimates).

Yorkshire Water's position and potential ways of reducing water poverty



The most recent England & Wales estimate is 8.5% of households[1] (2021) - whereas in your region we estimate this to be 8.0% of households (FY24)

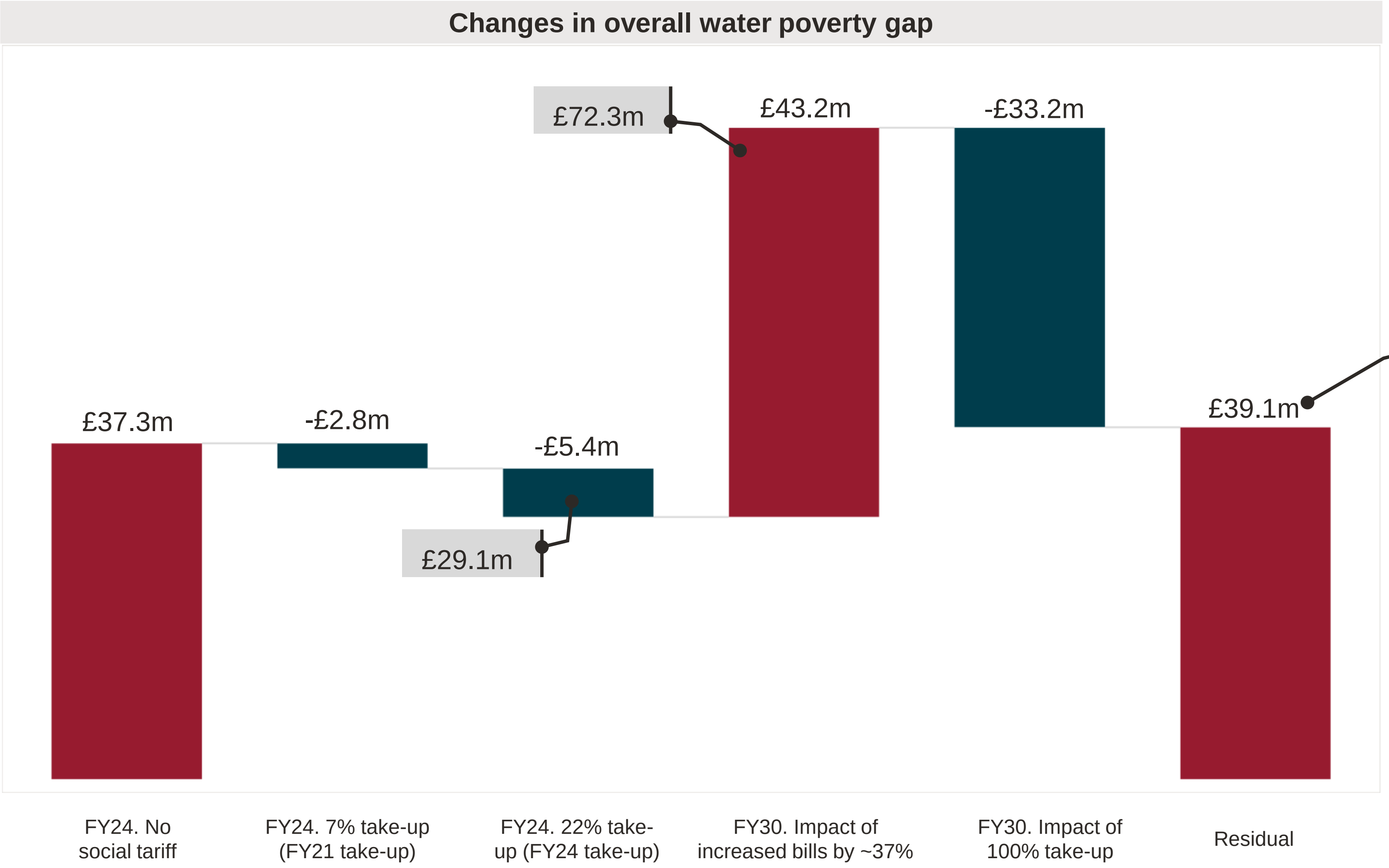
Of the 9.4% of customers than remain in water poverty, 5.6% have negative disposable incomes (in financial distress) or are not on low incomes. They might be best assisted through alternative or additional measures.

- 0.3% of customers in financial distress could be additionally assisted through flexible payment plans beyond your social tariff.
- 5.3% of customers are on higher than average incomes and you may wish to target these through water efficiency assistance and innovative tariffs rather than social tariffs.

Note: Estimate of FY24 position
The results are the expected value based on 100 Monte Carlo runs. There is a degree of uncertainty around these results.

1 Frontier Economics study for WaterUK, June 2022

Yorkshire Water's position and potential ways of reducing water poverty



Of the £39.1m water poverty gap remaining:

- Customers with negative disposable incomes have a total water poverty gap of £4m
- Customers with higher than average incomes have a total water poverty gap of £26.4m

1 Frontier Economics study for WaterUK, June 2022

Note: Estimate of FY24 position
The results are the expected value based on 100 Monte Carlo runs. There is a degree of uncertainty around these results.

Yorkshire Water's affordability actions on social tariffs have reduced water poverty from 9% to 8%

This is due to a combination of:

- Bills increasing by less than income (bills have increased by 9.0% and income by 11.8%, the total bill to gross income ratio has decreased by 2.5%)
- Increase in take-up of social tariffs from 7% in FY21 to 22% in FY24
- Changes to your social tariff bill cap.

	FY24 position		
	Counterfactual (0% take-up)	**FY21 take-up (7% take-up)**	**FY24 take-up (22% take-up)**
Number of customers	1,974,355		
Eligible customers	371,560		
On a social tariff (80% WaterSupport, 20% WaterSure)	-	26,000	81,000
WPG (£)	£37.3m	£34.5m	£29.1m
Cross-subsidy per customer (£/cust)	-	£3.11	£9.32
Water poverty (%)	9.0%	8.6%	8.0%

In FY21, 7% of eligible customers were on the social tariff (including customers on WaterSure). In FY24, this increased to 22%. As we do not know the bills and income of these additional customers the number of water poor customers, additional cross subsidy required and water poverty gap for the FY24 position has had to be estimated. The methodology is outlined in the annex.

This compares to a water poverty value of **9.3%** and a water poverty gap of **£32.4m** in the Water UK work. Some of this difference is due to changes to the Water UK methodology to tailor to your specific use case. Residual changes are due to simulation and approximations.

Note: Estimate of FY24 position
The results are the expected value based on 100 Monte Carlo runs. There is a degree of uncertainty around these results.

Yorkshire Water's interventions have reduced water poverty for WaterSure customers

- Yorkshire Water's interventions have likely reduced water poverty for WaterSure customers by **6.6%**, from 22.6% to 16%.

	FY24 position		
	Without £350 cap (FY21 WaterSure customers)	**With £350 cap (FY21 WaterSure customers)**	**With £350 cap (FY24 WaterSure customers)**
WaterSure customers	9,813	9,813	15,000
WaterSure customers that are water poor	2,214	1,568	2,397
Water poverty amongst WaterSure customers (%)	22.6%	16.0%	16.0%

Note: Estimate of FY24 position
The results are the expected value based on 100 Monte Carlo runs. There is a degree of uncertainty around these results.

Without any form of financial support, water poverty in FY24 would be 9%. This would increase to 14.6% in FY30, driven by bills increasing more than income

	FY24	FY25	FY26	FY27	FY28	FY29	FY30
	No social tariff (0% take-up)						
Number of customers	1,974,355						
Eligible customers	371,560						
WPG (£m)	£37.3m	£37.2m	£64.2m	£70.0m	£74.5m	£80.7m	£88.2m
Water poverty (%)							
WaterSure	22.6%	22.2%	32.5%	33.9%	34.5%	35.8%	37.3%
Total	9.0%	8.8%	12.8%	13.3%	13.5%	14.0%	14.6%

- As a result of a significant increase in bills in FY26, which will cover improvements in service (WINEP, WRMP and Storm Overflows), there is a jump in the water poverty rate and water poverty gap to 12.8%.
- Beyond this, bill growth continues to exceed income growth and therefore water poverty continues to increase.

The FY30 position assumes that bills increase by 36.9% in real terms and incomes by 11.4%.

Note: The results are the expected values based on 100 Monte Carlo runs. There is a degree of uncertainty around these results.

At the current level of social tariff take-up, and without further interventions or social tariff take-up, we expect water poverty to increase from 8% in FY24 to 13.5% in FY30

	FY24	FY25	FY26	FY27	FY28	FY29	FY30
	22% take-up						
Number of customers	1,974,355						
Eligible customers	371,560						
WPG (£m)	£29.1m	£29.0m	£51.9m	£56.8m	£60.6m	£65.9m	£72.3m
CS per customer (£/cust)	£9.32	£9.44	£11.38	£11.91	£12.42	£12.98	£13.61
Water poverty (%)							
WaterSure	16.0%	15.7%	22.7%	23.7%	24.2%	25.2%	26.3%
Total	8.0%	7.8%	11.6%	12.2%	12.4%	12.9%	13.5%

- As a result of a significant increase in bills in FY26, which will cover improvements in service (WINEP, WRMP and Storm Overflows), there is a jump in the water poverty rate and water poverty gap to 11.6%.
- Beyond this, bill growth continues to exceed income growth and therefore water poverty continues to increase.

The FY30 position assumes that bills increase by 36.9% in real terms and incomes by 11.4%.

Note: The results are the expected values based on 100 Monte Carlo runs. There is a degree of uncertainty around these results.

Increasing take-up of the current social tariff has the potential to reduce water poverty in FY30 from 13.5% to 9.4%

	FY24	FY30	
	22% take-up	22% take-up	100% take-up
Numbr of customers	1,974,355	1,974,355	1,974,355
Eligible customers	371,560	371,560	371,560
WPG (£m)	£29.1m	£72.3m	£39.1m
CS per customer (£/cust)	£9.32	£13.61	£46.24
Water poverty (%)	8.0%	13.5%	9.4%

We note that reducing water poverty to zero via a social tariff may not be achievable as:

- **0.3%** of all customers have a negative equivalised disposable income (**1.6%** of those eligible for a social tariff)
- **36%** of customers in water poverty are on higher than average household incomes

Note: The results are the expected value based on 100 Monte Carlo runs. There is a degree of uncertainty around these results.

36% of water poor customers are on a higher than average income (>£30k)

36% of water poverty is in households with gross incomes above £30k – the forecasted median annual gross income for the Yorkshire & The Humber region in 2030 (see Annex for assumption on high-income). This may be a level above which a social tariff should not be applicable. One could argue that these households are best supported via targeted demand reduction measures (water efficiency assistance, innovative tariffs, etc.)

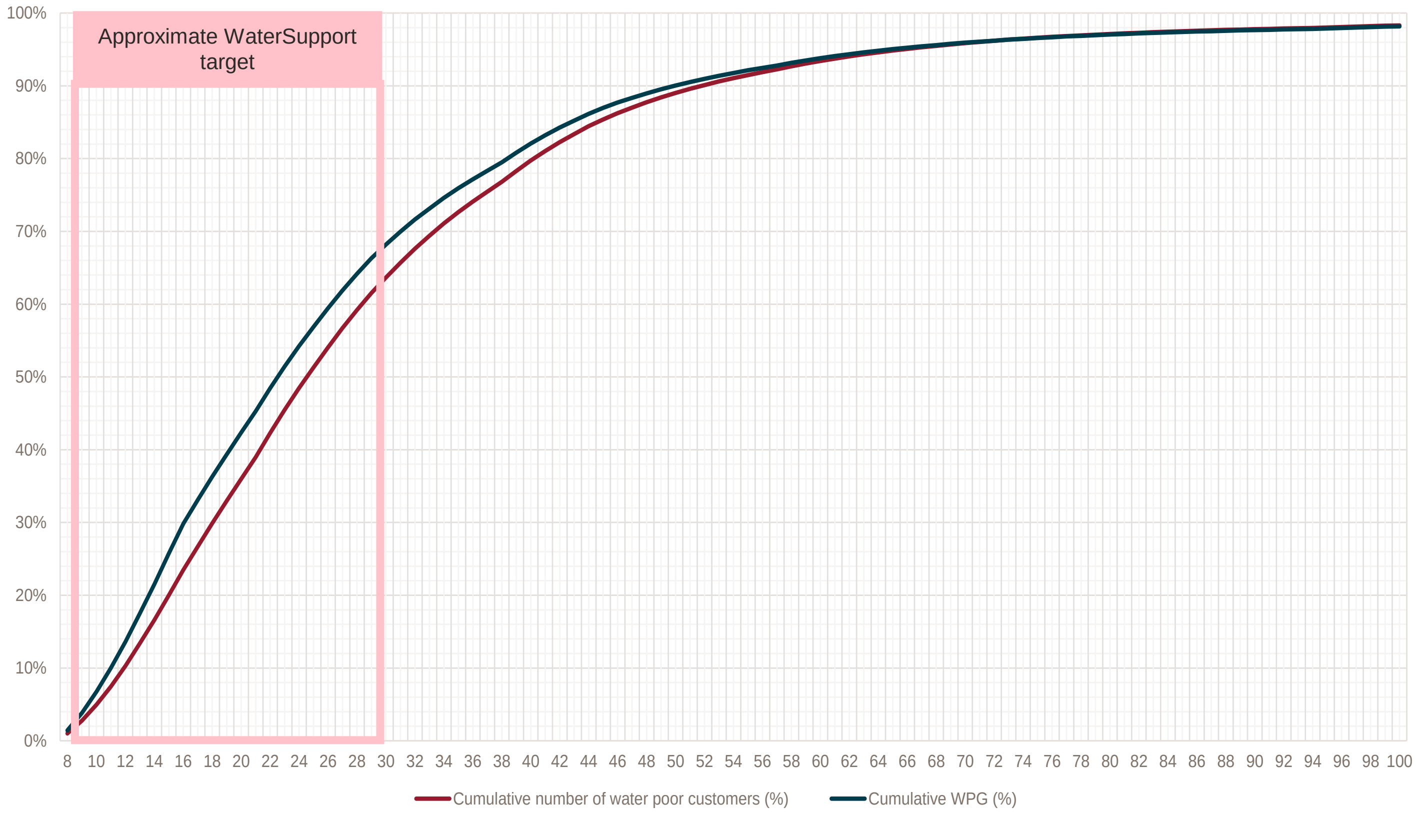


Table: Yorkshire Water WaterSupport eligibility criteria

Household composition	Eligibility threshold	Proportion of total customers
Single Adult	£18,000	21%
Couple	£26,000	36%
Single parent, one child	£23,000	2%
Single parent, up to 2 children	£28,000	2%
Single parent, 3+ children	£31,000	1%
Couple, one child	£29,000	9%
Couple, up to 2 children	£34,000	11%
Couple, 3+ children	£39,000	4%
Three adults	£32,500	13%

Note: Estimate of FY24 position
The results are the expected value based on 100 Monte Carlo runs. There is a degree of uncertainty around these results.

Majority of customers fall in the £26,000 threshold. **Weighted average is about £25,000.**

2.2% of water poor customers cannot be technically lifted out of water poverty, other means could be used to help these customers

- Our modelling estimates that about **6,000** of the 267,000 water poor customers in FY2030 (**2.2%**) have a negative net equivalised disposable income**.**
- Hence, these 6,000 customers can be lifted out of water poverty only with a bill of £0.
- A bill of £0 is unlikely to be acceptable. Other forms of support could be identified as being used to help support these customers, such as **ultra-flexible payment plans**.

Note: Estimate of FY24 position
The results are the expected value based on 100 Monte Carlo runs. There is a degree of uncertainty around these results.

Annex: Key assumptions used in the modelling (1)

Dropping customers

- We did not consider water only customers - 2% of customers.

Impact of increasing support on standard tariff customers

- We assume there is no additional impact on standard tariff customers when moving from no social tariff to implementing a social tariff i.e. the possibility of standard tariff customers becoming water poor due to needing to pay a higher cross-subsidy.

Bill inflation

- From FY2021 to FY2024, annual household bills are inflated using data from the Discover Water webpage. From FY2024 to FY2030, bills are assumed to increase by approximately 37% in real terms.
- The bill cap for social tariff and Water Sure customers (£350 per year) is inflated at the same rate.

Assumed Bill Profile (real terms)

Year	FY2024	FY2025	FY2026	FY2027	FY2028	FY2029	FY2030
Value (£)	426	429	518	538	551	566	583

Household and eligibility criteria inflation

- Household incomes and the social tariff eligibility criteria are both inflated by the Office for Budget Responsibility (OBR) forecasts on household income growth.

Estimating gross income

- To estimate gross income of customers on a social tariff, we use a weighted average of the eligibility criteria shared by Yorkshire Water. The weights are the proportion of households that map onto the household makeup provided, taken from the Family Resources Survey. This gives a threshold of £25,014.
- When assessing a particular household's eligibility for the social tariff, we assess this using the specific eligibility thresholds.

Determining customers that are 'high-income'

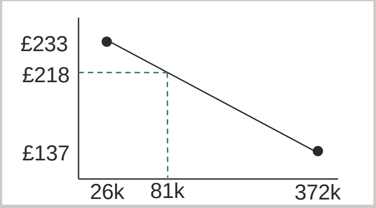
- To determine which customers could be considered to be high-income customers, we take the median annual gross income of the Yorkshire & The Humber region in 2022 (£26,000), obtained from the Office for National Statistics (ONS). To forecast what proportion of customers would be high-income in 2030, we inflate this median value by the Office for Budget Responsibility (OBR) forecasts on household income growth.

Annex: Key assumptions used in the modelling (2)

In FY21, 25,969 customers were on the social tariff out of the 371,560 that were eligible – 7% (including customers on WaterSure). In FY24, this increased to 81,000 (22%). As we do not know the bills and income of these additional customers, only that they are eligible for a social tariff, the number of water poor customers, additional cross-subsidy required and water poverty gap for the FY24 position needs to be estimated. Below, we outline the methodology used estimate these variables.

Cross subsidy in FY24

- We estimate the average cross-subsidy per social tariff customer for additional customers through linear interpolation of the cross-subsidy per social tariff customer when moving from 0 – 7% take-up and from 7 – 100%. The average cross-subsidy per social tariff customer in FY24 is estimated to be £218.



- We derive the implied total cross-subsidy by multiplying the average cross-subsidy per social tariff customer in FY24 (£218) by the total number of social tariff customers in FY24 (81,000). This gives a total cross-subsidy of £17.6 million.
- The average cross-subsidy per standard tariff customer is estimated as the total cross-subsidy divided by the number of standard tariff customers. This is estimated to be £9.32.

Water poverty gap in FY24

- We estimate the proportion of the total cross-subsidy that contributes towards reducing the total water poverty gap when moving from 0 – 7% take-up and from 7 – 100% take-up i.e. for a given change in the cross-subsidy, how much does the water poverty gap change?. This is estimated to be around 46%.
- Derive the implied water poverty gap by multiplying 46% by the total cross-subsidy in FY24 estimated above (£17.6 million). This gives an estimated water poverty gap of £29.1 million.

Number of water poor customers in FY24

- We calculate the number of customers lifted out of water poverty for each £ reduction in the water poverty gap when moving from 0 – 7% take-up and from 7 – 100%. This is approximately 0.002 customers for every £ reduction in the water poverty gap.
- To estimate the number of customers lifted out of water poverty in FY24, we multiply the estimated change in the water poverty gap from FY21 to FY24 (~£5m) by the estimated number of customers lifted out of water poverty for every £ reduction in the water poverty gap above. This gives an estimate of approximately 13,000 additional customers lifted out of water poverty in FY24.
- The number of water poor customers in FY24 is estimated as the number of water poor customers in FY21 minus 13,000. This is approximately 158,000.

Frontier Economics Ltd is a member of the Frontier Economics network, which consists of two separate companies based in Europe (Frontier Economics Ltd) and Australia (Frontier Economics Pty Ltd). Both companies are independently owned, and legal commitments entered into by one company do not impose any obligations on the other company in the network. All views expressed in this document are the views of Frontier Economics Ltd.

Water poverty levels in Yorkshire without bill affordability support

	FY24	FY25	FY26	FY27	FY28	FY29	FY30
	No social tariff						
Number of customers	1,974,355						
Eligible customers	371,339						
WPG (£m)	£37.3m	£37.2m	£57.8m	£55.9m	£55.1m	£54.9m	£54.6m
Water poverty (%)							
WaterSure	22.6%	22.2%	30.0%	28.6%	27.6%	26.9%	26.4%
Total	9.0%	8.8%	11.9%	11.4%	11.0%	10.8%	10.5%