PC Mapping: Update for outcomes working group
April 2023

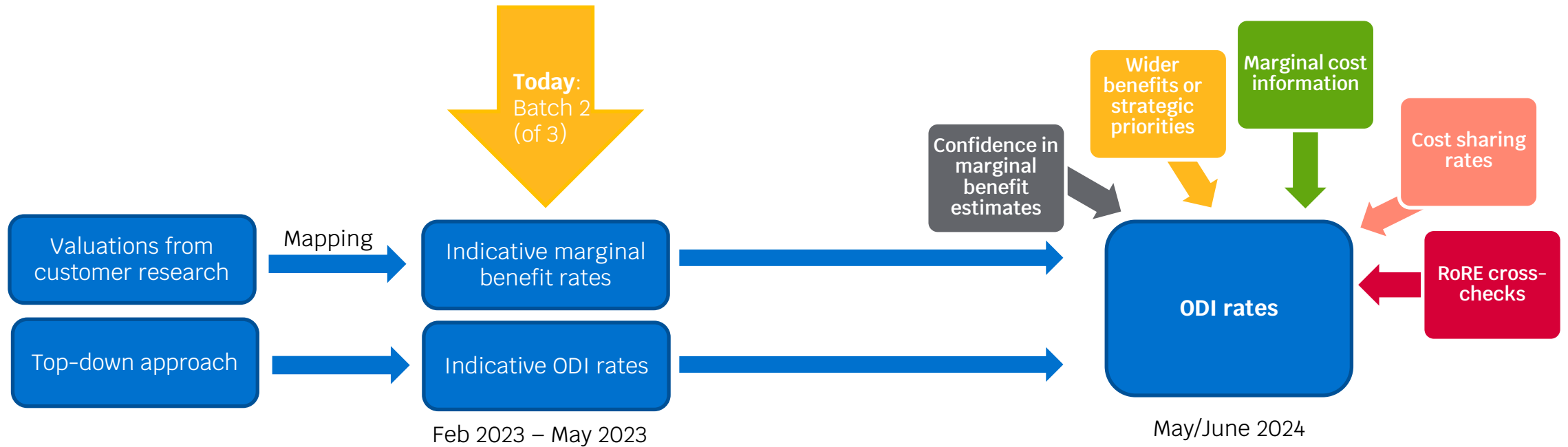19 April 2023

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Agenda

Item	Time
Intro and recap	10mins
Update to Batch 1 rates	10mins
Batch 2 results – CRI	10mins
Batch 2 results – Asset health • Mains repairs • Unplanned outages • Sewer collapses	25mins
Next steps and close	5mins

Recap

Today: Batch 2 (of 3)

Valuations from customer research	→ Mapping →	Indicative marginal benefit rates
Top-down approach	→	Indicative ODI rates

Feb 2023 – May 2023

Confidence in marginal benefit estimates

Wider benefits or strategic priorities

Marginal cost information

Cost sharing rates

ODI rates ← RoRE cross-checks

May/June 2024

- We are sharing the second batch of indicative rates in this slide pack.

- For the compliance risk index (CRI) PC, we are sharing **indicative marginal benefit rates**, which have been calculated based on underlying customer valuations.

- For the asset health PCs, we are sharing **indicative ODI rates**, which have been calculated based on a top-down approach.

Update to Batch 1 rates

Quality Assurance

Our econometrics consultants (PJM Economics) have identified an error in their calculations for the non-household valuations which underpin our marginal benefit calculations, including the Batch 1 rates we shared with you in February.

How did the error arise?
- The NHH models generated incident estimates as % of bills and need to be converted to estimates in £s by multiplying by average bills for each company
- In the final stage, PJM made the mistake of multiplying by the separate areas of the bill instead of the average i.e. water only separate to wastewater
- This mistake was not picked up until the report was written up because the quality assurance until then was focussed on the modelling code as the area of highest risk

Quality Assurance
- The modelling has been thoroughly quality assured which involved a suitably technically qualified econometrician within PJM who hadn't hitherto been involved in the project
- Following the identification of the error, PJM have performed additional quality assurance of the calculations outside the modelling

Correcting the error approximately doubles the non-household valuations from the survey.

The impact differs across the different PCs due to: (1) scale of change in error corrected valuations and (2) different weightings applied in the mapping process.

The modelling of survey valuations has been thoroughly quality assured and our teams have performed a range of further sense checks to ensure the updated rates are robust.

Following the meeting we will send you updated indicative marginal benefit rates for your company.

£m change in indicative marginal benefit rate using updated NHH valuations
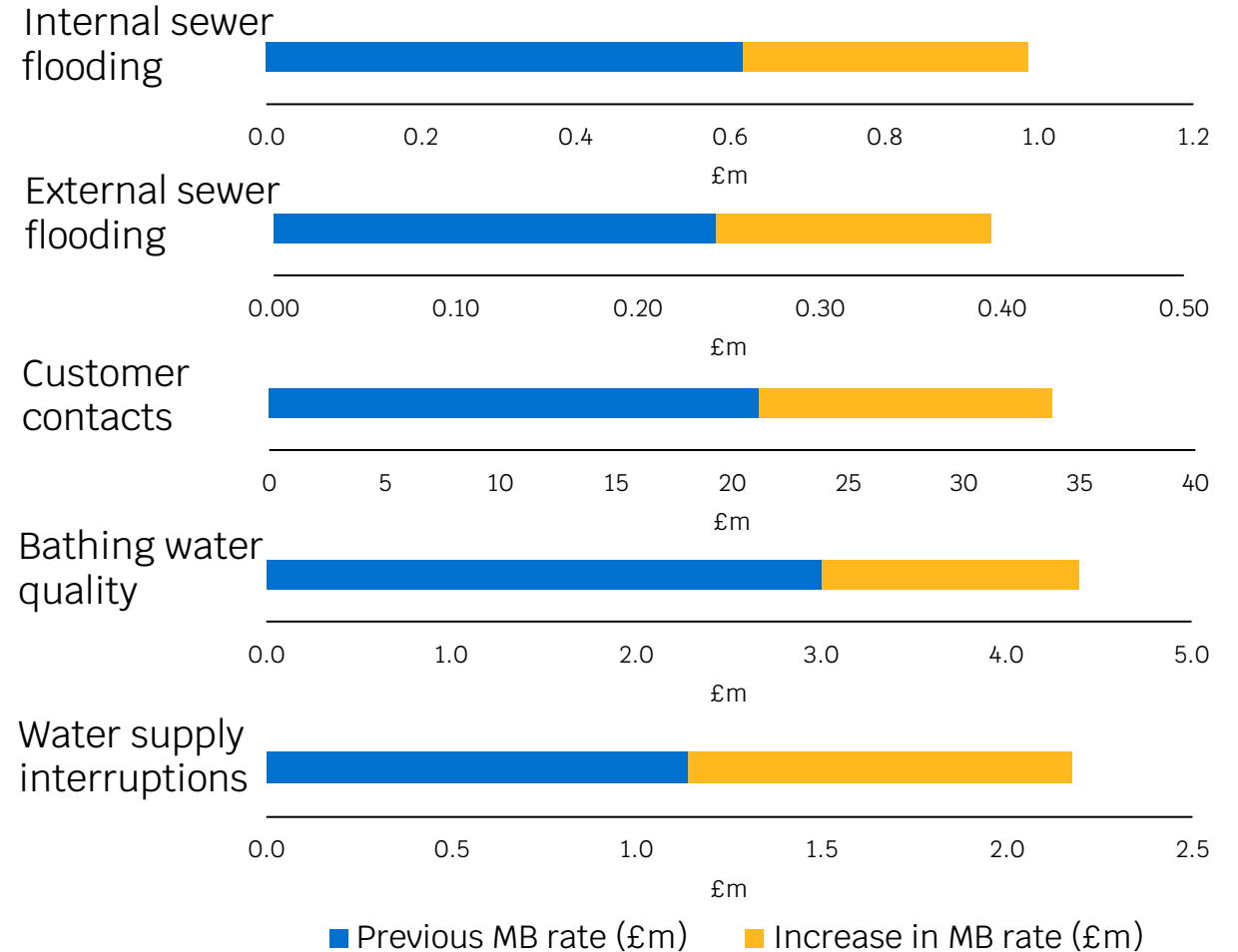
■ Previous MB rate (£m)   ■ Increase in MB rate (£m)

Batch 2 Results – CRI

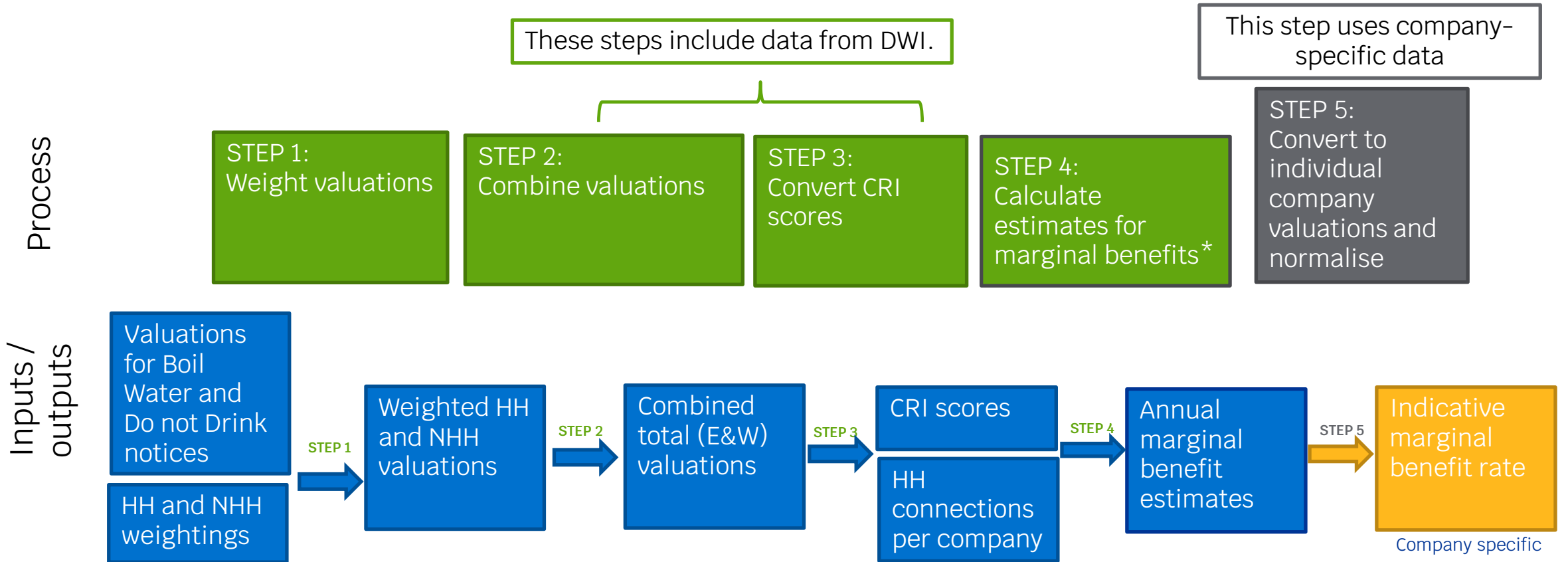# Recap of approach to calculating marginal benefit rates

Assumptions

- **England & Wales combined valuations**: rather than company-specific valuations. This is because the error margins around the company estimates are too wide to identify clearly meaningful differences in customer preferences between companies and because we wouldn't expect the batch 1 valuations to be driven by company-specific or regional factors.
- **HH and NHH connections used for weighting:** we have weighted HH and NHH valuations using the industry number of HH and NHH connections for the relevant sector (i.e. water or wastewater).
- **2020-21 data used for normalisation**: when calculating the final marginal benefit rates we normalise using HH and NHH connections data from 2020-21.
- **Case by case consideration of historic weightings**: we have considered whether historic weightings should be calculated on a company specific or national basis. We have set out on the flow charts what approach we have used for each PC.

As for Batch 1, following the meeting we will send you an Excel version of the flowchart populated with figures and the indicative marginal benefit rates for your company.

Compliance Risk Index PC – Marginal benefit calculation

The CRI mapping approach links changes in the number of boil water and do not drink notices to changes in CRI scores.

These steps include data from DWI.

This step uses company-specific data

Process

| STEP 1:
Weight valuations | STEP 2:
Combine valuations | STEP 3:
Convert CRI scores | STEP 4:
Calculate estimates for marginal benefits* | STEP 5:
Convert to individual company valuations and normalise |

Inputs / outputs

Valuations for Boil Water and Do not Drink notices

HH and NHH weightings

→ STEP 1 → Weighted HH and NHH valuations → STEP 2 → Combined total (E&W) valuations → STEP 3 → CRI scores / HH connections per company → STEP 4 → Annual marginal benefit estimates → STEP 5 → Indicative marginal benefit rate

Company specific

* This is the key stage in the method. The total (E&W) value of boil water and do not drink/use notices experienced by household customers is divided by the corresponding combined CRI scores (suitably scaled to take account of different numbers of HH water connections per company). This gives an empirical valuation per unit of CRI. This calculation is conducted for each of the years 2017 to 2021 and an average is taken.

Valuation	£
Valuation: Boil water notice HH (£)	148
Valuation: Do not drink notice HH (£)	184
Valuation: Boil water notice NHH (£)	9,926
Valuation: Do not drink notice NHH (£)	12,295

Split of HH and NHH connections		
C HH water connections	24,263,655	0.95
NHH water connections	1,292,661	0.05

	Valuation: HH and NHH (£)	
Boil water notice		643
Do not drink notice		796

	2017	2018	2019	2020	2021
B HH connections *CRI (m)	89.2	95.7	71.8	56.6	87.4

	2017	2018	2019	2020	2021
Industry marginal benefit (£m) = A*C/B	119.2	6.7	15.8	2.1	0.6

	2017	2018	2019	2020	2021
A Total annual valuation of notices (£m)	438.3	26.6	46.8	5.0	2,2

	2017	2018	2019	2020	2021
Boil water notice Total incident hrs	156,912	25,147	5,209	2,809	1,381
Do not drink notice Total incident hrs	423,864	13,087	54,627	3,985	1,698

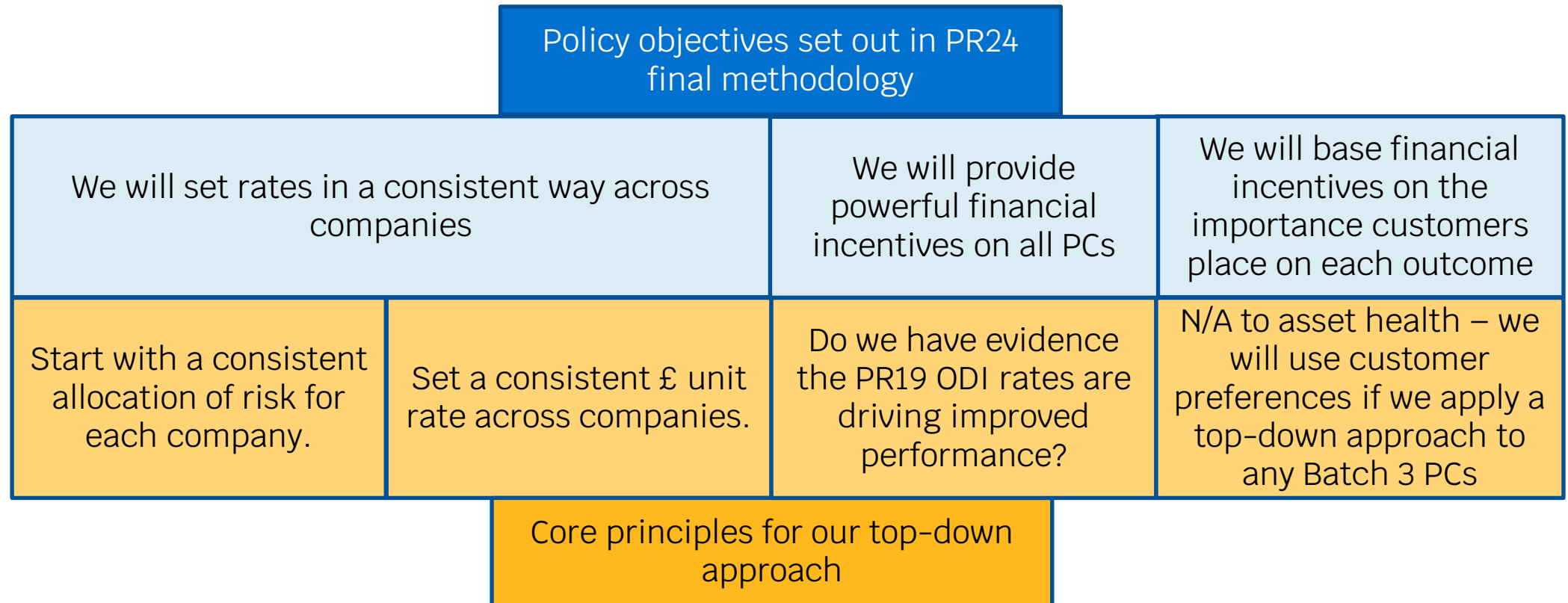| Industry marginal benefit 5 year average (£m)	28.9

Average company Marginal benefit rate (£M)	1.7

Note: numbers don't add exactly due to rounding

Batch 2 results – Asset health

Intro to top-down approach

At the Outcomes Working Group in December 2022, we agreed to use a top-down approach instead of an inferred benefits approach to map asset health marginal benefit rates to customer valuations due to complex mapping and data challenges.
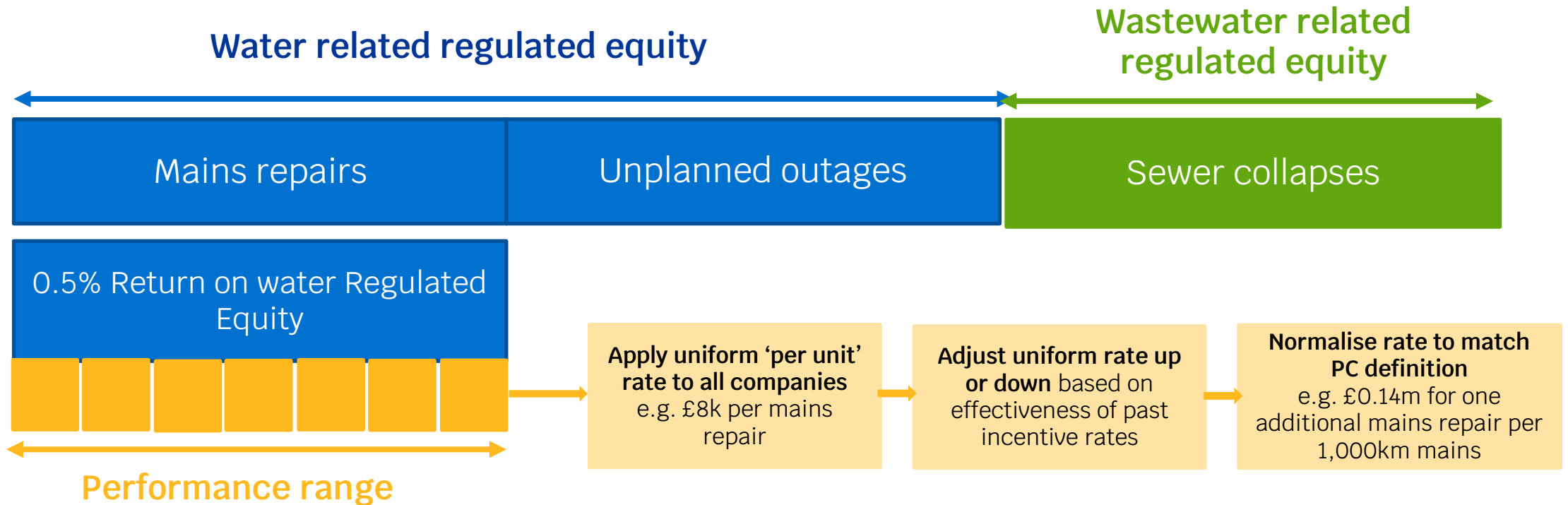
We have aligned our proposed top-down approach with the policy objectives set out in the PR24 final methodology.

Policy objectives set out in PR24 final methodology		
We will set rates in a consistent way across companies	We will provide powerful financial incentives on all PCs	We will base financial incentives on the importance customers place on each outcome
Start with a consistent allocation of risk for each company.	Set a consistent £ unit rate across companies.	Do we have evidence the PR19 ODI rates are driving improved performance?	N/A to asset health – we will use customer preferences if we apply a top-down approach to any Batch 3 PCs

Core principles for our top-down approach

Example of how top-down approach works for mains repairs

We start by putting a level of investor return at risk for each performance commitment. For asset health, we signalled in the PR24 final methodology that our starting position is to set collars at 0.5% of the return on regulated equity (RoRE).

We then set a hypothetical level of performance at which companies would receive the full assigned RoRE allocation. We divide the RoRE allocation by this performance level to derive the marginal rate. This yields a marginal value per unit.

Water related regulated equity

Wastewater related regulated equity

| Mains repairs | Unplanned outages | Sewer collapses |

0.5% Return on water Regulated Equity

Performance range

Apply uniform 'per unit' rate to all companies
e.g. £8k per mains repair

Adjust uniform rate up or down based on effectiveness of past incentive rates

Normalise rate to match PC definition
e.g. £0.14m for one additional mains repair per 1,000km mains

Summary of indicative ODI rates

The table below summarises ODI rates for each asset health PC

Asset health PC	PR24 indicative ODI rate: Industry median*	PR19 ODI rate: Industry median	Adjustment based on past performance
Mains repairs	**£0.14 million** (£8k per unit)	£0.11 million (£7k per unit)	**Adjust up** – performance is improving, but mains renewals are falling
Unplanned outage	**£1.02 million** (£110k per unit)	£1.04 million (£105k per unit)	**No adjustment** – performance is improving
Sewer collapses	**£0.80 million** (£20k per unit)	£0.36 million (£14k per unit)	**Adjust up** - performance is flat or worsening for most companies

*2022 FYE prices

See annex 1 for charts

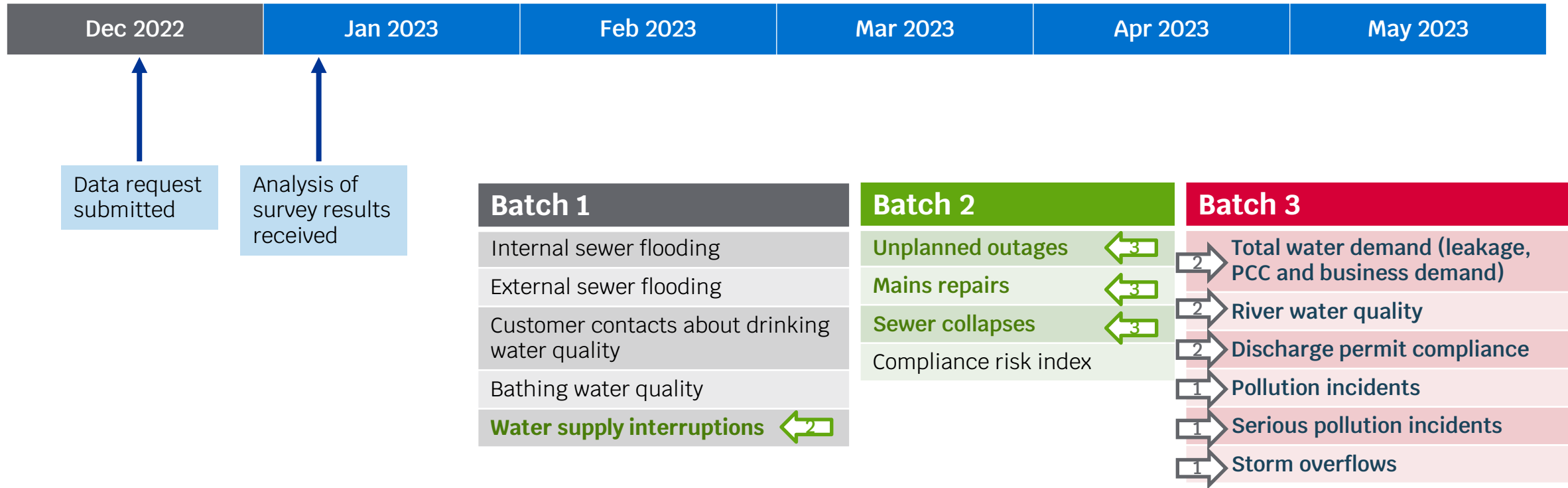**As for Batch 1, following the meeting we will send you the ODI rates for your company.**
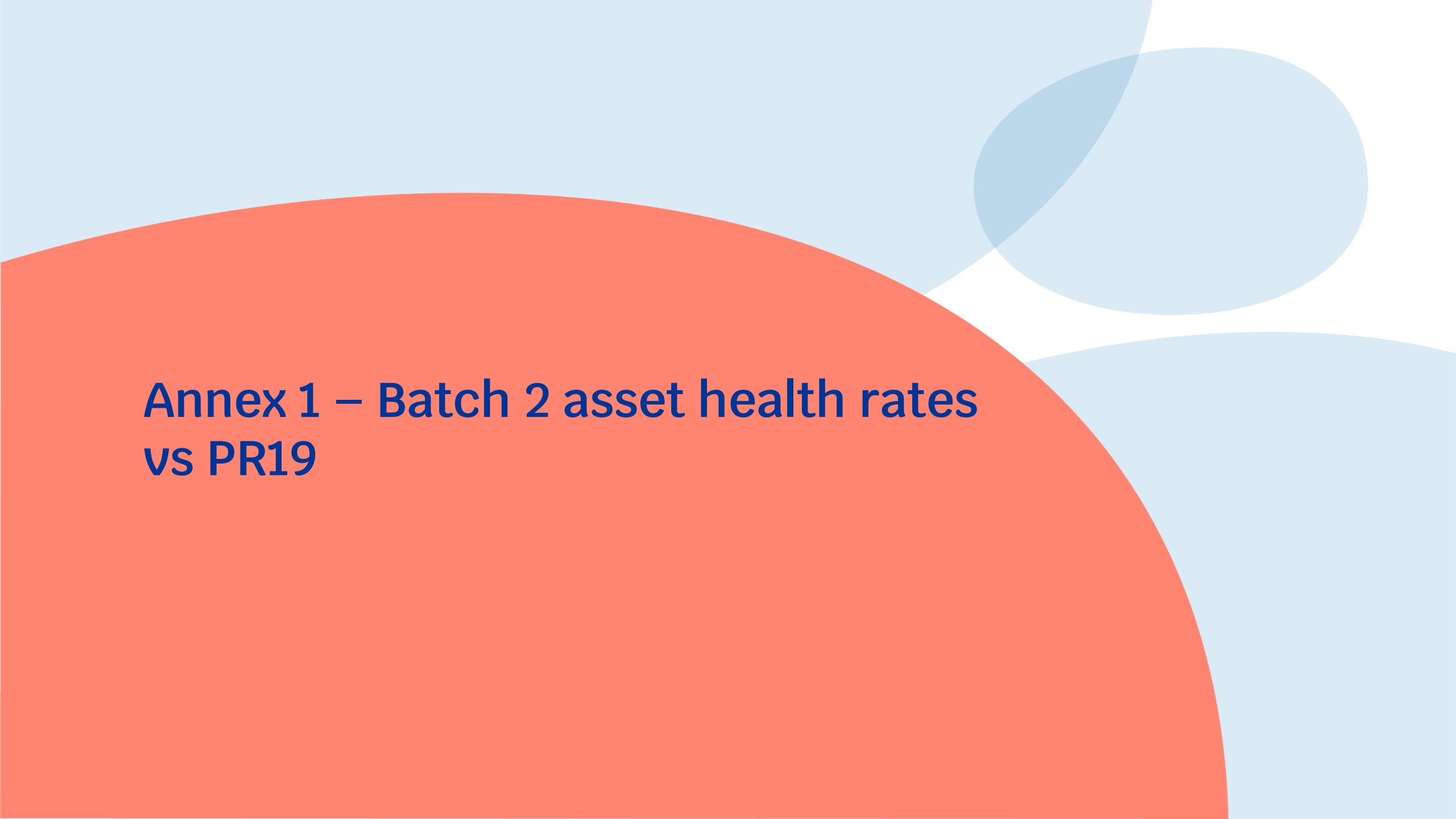
Next Steps

Next steps – Update on Batch 3

We will arrange another working group meeting in the next fortnight to update you on our progress to derive marginal benefit rates for the Batch 3 PCs.

Dec 2022	Jan 2023	Feb 2023	Mar 2023	Apr 2023	May 2023

Data request submitted

Analysis of survey results received

Batch 1
- Internal sewer flooding
- External sewer flooding
- Customer contacts about drinking water quality
- Bathing water quality
- **Water supply interruptions** ⟵2

Batch 2
- **Unplanned outages** ⟵3
- **Mains repairs** ⟵3
- **Sewer collapses** ⟵3
- Compliance risk index

Batch 3
- 2⟶ **Total water demand (leakage, PCC and business demand)**
- 2⟶ **River water quality**
- 2⟶ **Discharge permit compliance**
- 1⟶ **Pollution incidents**
- 1⟶ **Serious pollution incidents**
- 1⟶ **Storm overflows**

Key to changes since last timeline:

⟵ **PC brought forward**
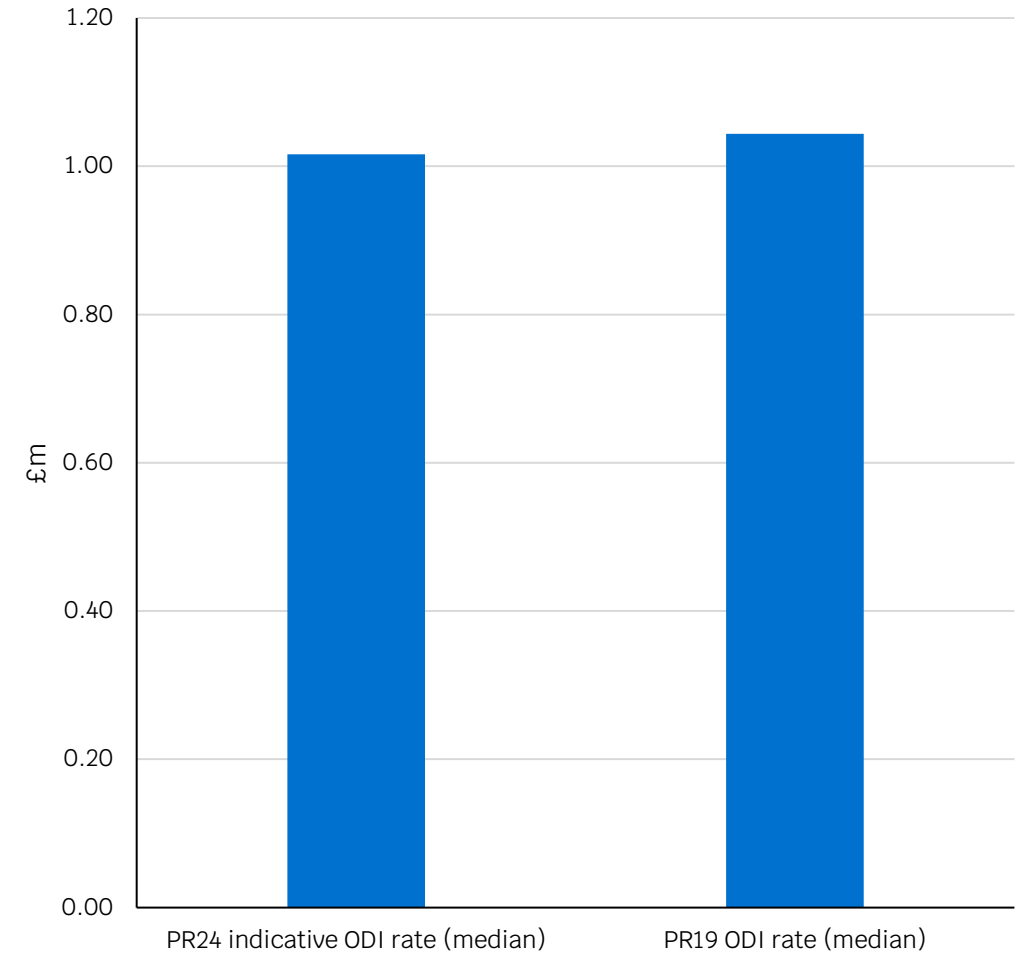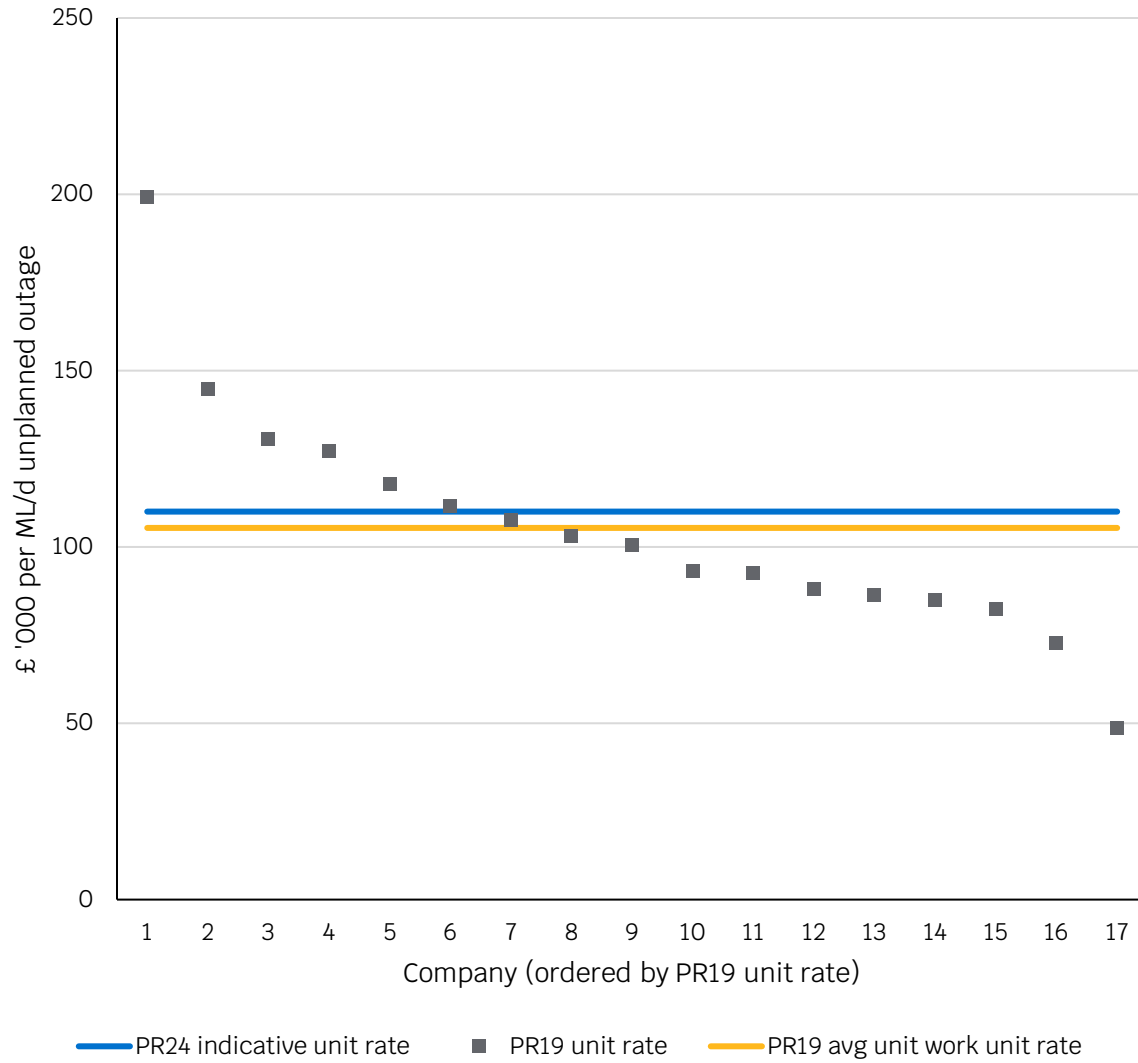⟶ **PC delayed**

Annex 1 – Batch 2 asset health rates vs PR19

Mains repairs charts
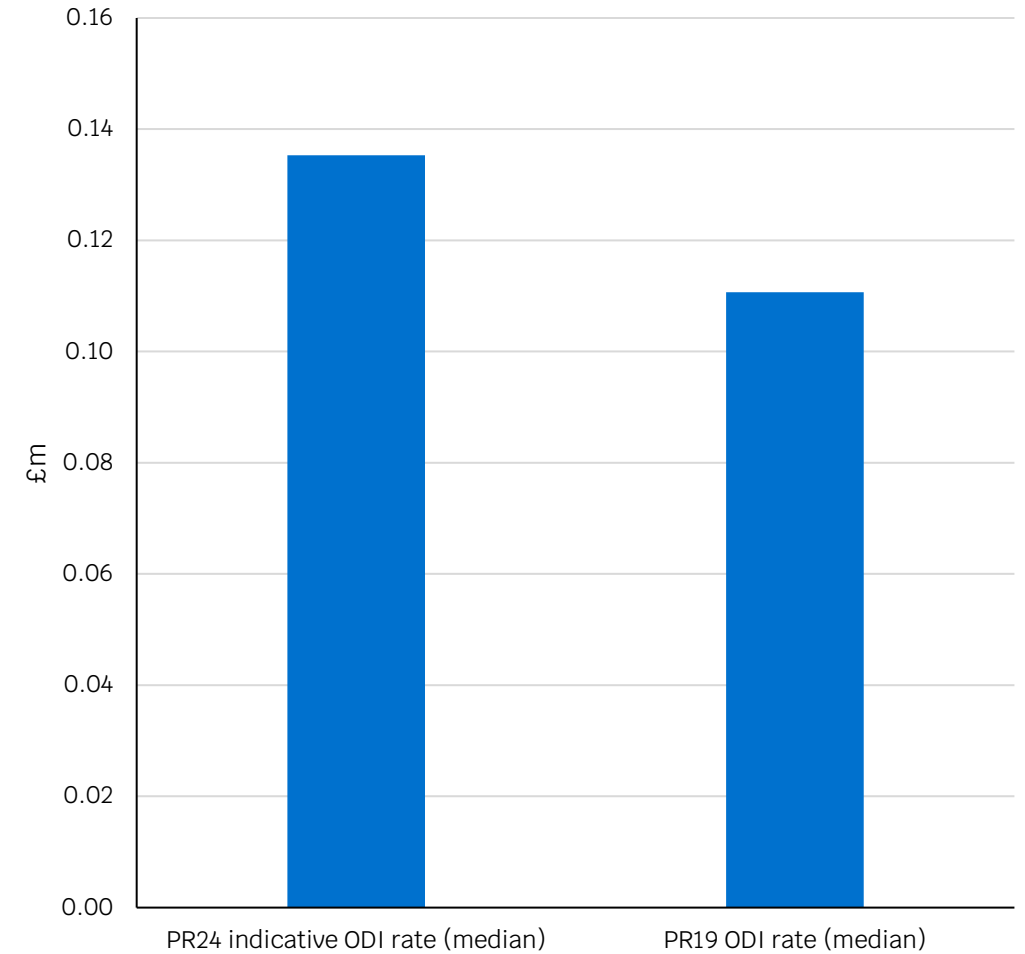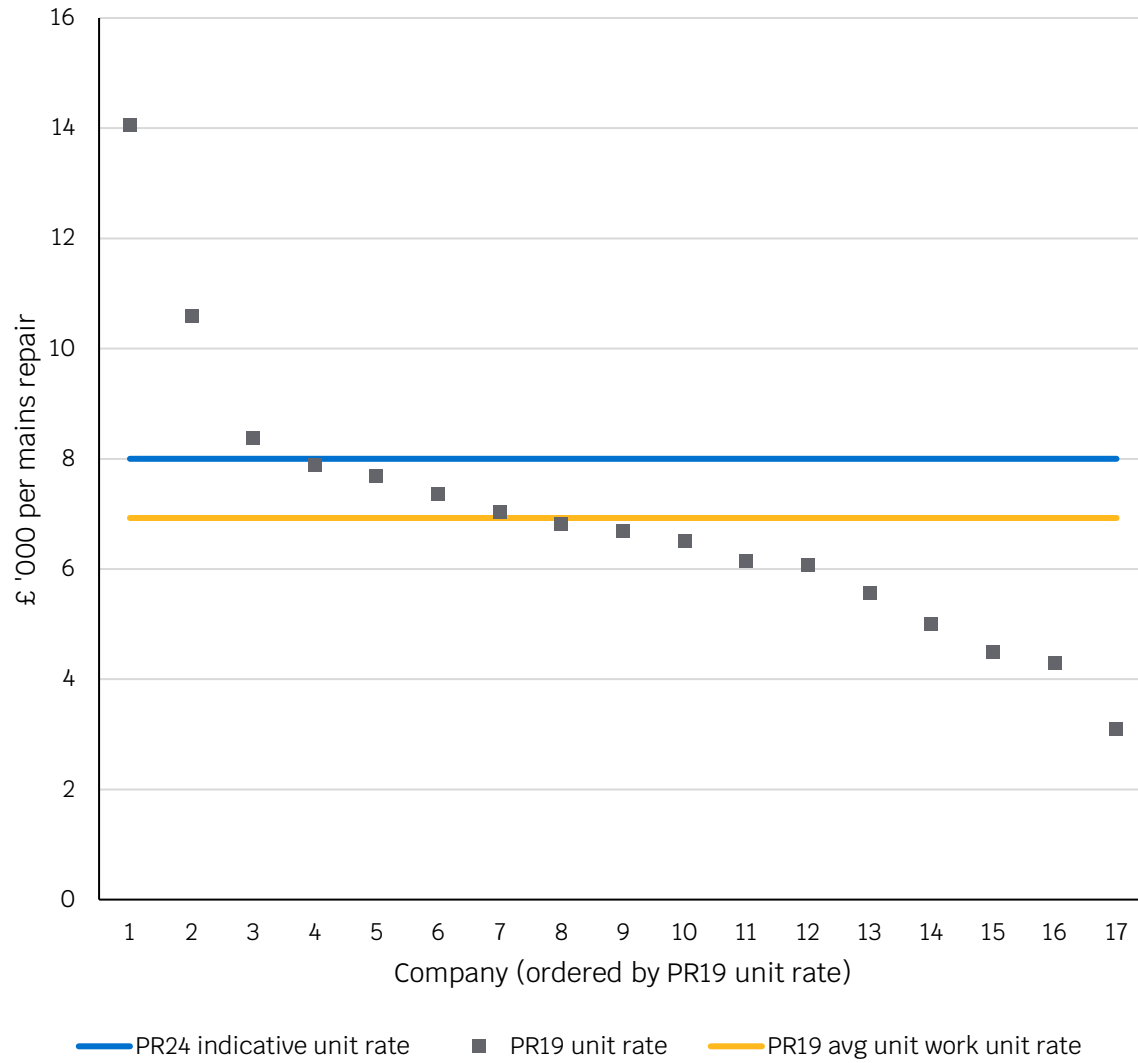
Unplanned outage charts

Sewer collapses charts