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Repex WG
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- **Tier 1 mains PCD**
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Tier 1 mains PCD – algebra from licence condition

[See accompanying spreadsheet – Licence Formula Walkthrough]

- The licence condition algebra provides for the calculation of the end of period adjustment only (since the ex ante allowance is contained within overall totex).

1. $$T1MRt = min\left[\sum_i C_i(DV_i \cdot FVM - BV_i), T1MRA \cdot 0.02\right] \cdot \frac{T1MRAt}{T1MRA}$$

2. $$FVM = \min\left(\frac{\sum_i BV_i}{\sum_i DV_i}, 1\right)$$

T1MRt	The adjustment to be made to each year's totex allowance
i	The 12 Tier 1 Mains Decommissioned Workload Activities
DV_i	Outturn Workload for each of the 12 activities
FVM	the Funded Volume Multiplier – this accounts for any NARM allocation
BV_i	the Baseline Volume of the 12 activities
C_i	the ex ante unit costs for each activity
T1MRA	the Tier 1 Mains Baseline Value (as disaggregated from overall totex)

Interaction with the TIM

- The Tier 1 PCDs (mains and services) **adjust** the **ex-ante Tier 1 repex allowances** for **outturn volumes** and changes to the **workload mix**.
- Outperformance or underperformance of **'unit costs'** is considered through the **TIM**, like with any other activity.
- In principle, the TIM works by comparing the **revised ex-ante Tier 1 repex allowance** (after taking into account differences between allowed and outturn volumes) with **outturn Tier 1 repex costs**.
- But it is important to remember that **the TIM considers expenditure in the round** as it is assessed on a totex basis.
- There are **no exclusions from outturn Tier 1 repex costs** for the TIM mechanism.

Tier 1 mains PCD example:

(A) Set **baseline ex-ante Tier 1 mains repex allowance at FD**

(B) **Calculate the Tier 1 mains PCD adjustments** to the ex-ante allowance based on outturn delivery

(C) Determine the **adjusted ex-ante Tier 1 mains repex allowance** [A + B], which feeds into the adjusted ex-ante totex allowance

(D) TIM is applied to the difference between **adjusted ex-ante totex allowance** and **outturn totex**

Interaction with the TIM

(A) Set baseline tier 1 repex ex-ante allowance	• Based on the totex benchmarking model • Set at the final determination

(B) Calculate the PCD adjustment to the ex-ante tier 1 repex allowance at RIIO-GD2 close out	• Ex-ante unit costs are applied to the difference between planned and outturn volumes. The ex-ante unit costs are set at the **final determination**.
	• Over delivery at a 'total mains abandoned' level is transferred to the NARM
	• Adjustments are made to the baseline tier 1 repex ex-ante allowance due to changes to the diameter band mix or under delivery on total workloads
	  • Lower value programme delivered = negative adjustment
	  • Higher value programme delivered = positive adjustment
	• The maximum upward adjustment to the ex-ante allowance is set to 2% of the baseline tier 1 repex allowance (A) and is GDN specific
	• There is no restriction on the size of the negative adjustment for a lower value programme delivered and/or under delivery on total workloads

(C) Determine the adjusted tier 1 repex ex-ante allowance	• Baseline tier 1 repex ex-ante allowance (A) + PCD adjustment (B) • The adjusted tier 1 repex ex-ante allowance feeds into the adjusted ex-ante totex allowance
(D) TIM is applied to the difference between adjusted ex-ante totex allowance and outturn totex	• It is important to remember that the TIM works on a totex basis

Tier 1 mains Unit Costs: Lay vs. Decommissioned Data

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Using data on a decommissioned basis appears to lower the unit cost spread between GDNs for all 4 diameter bands.

Diameter band	Standard Deviation: Lay data	Standard Deviation: Decommissioned data
75mm / ≤3”	17,459	12,942
75 – 125mm / 4”-5”	24,387	21,275
125 – 180mm / 6”-7”	37,835	22,231
180-250mm / 8”	96,092	30,563

At Draft Determinations, we said (GD Annex, p.62):

*"Our **preferred approach** is to calculate the industry average unit costs for each activity, and adjust for regional factors, to derive distribution network-specific unit costs."*

To calculate the unit costs presented in these slides, we did the following:

1. **Start with industry average unit costs** (total cost / total workload, over GD1 and GD2) after application of synthetic unit cost methodology.
2. **Apply repex regional adjustments**
   - Labour and urbanity productivity adjustments, which affect Cadent EoE, Cadent London and SGN Southern.
   - Average regional adjustment factors over GD1 and GD2 period applied. Hence, the change in regional factor indices over time has not been taken into account for simplicity and to ensure each GDN is allocated a unit cost for each category.
   - We also tested a 'weighted' approach that takes into account the change in workloads and the regional adjustment factors over time but the results were not significantly different.
   - No catch-up challenge has been applied

Question: should we apply regional adjustments **before** and **after** calculation of industry average unit costs?

Tier 1 mains PCD unit costs – preliminary results based on proposed methodology

Following the proposed methodology outlined above, we have considered the following types of unit cost disaggregation, which takes the feedback received in the previous working group into consideration.

# of UCs	Diameter band	Material	Abandon only	Technique
4	■			
8	■	■		
8	■			■
12	■	■	■	
12	■		■	■

The slides below present preliminary results based on our proposed methodology for the five different types of unit cost disaggregation.

Results are shown at an industry level, and for the 3 networks to which regional adjustments apply.

Tier 1 mains PCD unit costs – preliminary results based on proposed methodology

Disaggregated by diameter band, material and abandon only

Diameter	Material	Industry	EoE	Lon	So
≤3"	[Abandon-only]				
4"-5"					
6"-7"					
8"					
≤3"	Cast & Spun Iron		Data in table redacted		
4"-5"					
6"-7"					
8"					
≤3"	Ductile Iron				
4"-5"					
6"-7"					
8"					

Tier 1 mains PCD unit costs – preliminary results based on proposed methodology

Disaggregated by diameter band, material and abandon only

Chart redacted

Tier 1 mains PCD unit costs – preliminary results based on proposed methodology

Disaggregated by diameter band, technique and abandon only

Diameter	Material	Industry	EoE	Lon	So
≤3"	[Abandon-only]				
4"-5"					
6"-7"					
8"					
≤3"	Insertion		Data in table redacted		
4"-5"					
6"-7"					
8"					
≤3"	Open cut				
4"-5"					
6"-7"					
8"					

Tier 1 mains PCD unit costs – preliminary results based on proposed methodology

Disaggregated by diameter band, technique and abandon only

Chart redacted

Tier 1 mains PCD unit costs – preliminary results based on proposed methodology

Disaggregated by diameter band and material (abandon-only allocated across)

Diameter	Material	Industry	EoE	Lon	So
≤3"	Cast & Spun Iron				
4"-5"					
6"-7"					
8"					
≤3"	Ductile Iron				
4"-5"					
6"-7"					
8"					

Data in table redacted

Tier 1 mains PCD unit costs – preliminary results based on proposed methodology

Disaggregated by diameter band and technique (abandon-only allocated across)

Chart redacted

Tier 1 mains PCD unit costs – preliminary results based on proposed methodology

Disaggregated by diameter band only

Diameter	Industry	EoE	Lon	So
≤3"		Data in table		
4"-5"		redacted		
6"-7"				
8"				

Chart redacted

Tier 1 mains PCD unit costs – preliminary results based on proposed methodology

Discussion questions

Aggregation level

- Do you consider aggregating unit costs (i.e. less dimensions) improves data consistency?
  - Diameter band only?
  - Diameter band and Material type?
  - Diameter band and Replacement technique?

Abandon only

- Would the removal of the ‘abandon-only’ unit cost category address data consistency / reporting concerns raised in the SQP responses and previous Repex WG?

Technique

- Might repex project planning be distorted if unit costs were to be disaggregated by technique?

Scenario analysis – working level results

Allowances under the Tier 1 mains PCD will be automatically adjusted at close-out to reflect outturn workload.

- Upward adjustments to the Baseline Cost Allowance following changes to diameter band mix limited to 2%.
- Baseline Cost Allowance can be adjusted downwards with no limit.

We have undertaken scenario analysis to identify circumstances under which outturn costs associated with workload variations may exceed the cap.

Across the industry, RIIO-GD2 workloads are predominantly in 4”-5” and 6”-7” categories (see table below).

While our analysis considered a range of scenarios, we have focused on upward, single-diameter shifts between the three largest diameter bands.

We note that a redistribution of workloads that ‘jumps’ up diameter bands (i.e. shifting workloads from 4”-5” category to 8”) would have a larger impact.

Diameter band	Industry diameter band mix
≤3"	3%
4"-5"	52%
6"-7"	30%
8"	15%

Scenario analysis – working level results

Assuming total km workloads remain in line with forecasts, we have found that a 2% upwards adjustment cap is sufficient to allow for up to a:

- **16% to 20% increase in 6”-7” category workloads** across GDNs (assume shift from 4”-5” category)
- **16% to 35% increase in 8” category workloads** across GDNs (assume shift from 6”-7” category)

Tier 1 service PCD unit costs - preliminary results based on proposed methodology

Disaggregated by workload activity

Relay / Transfer	Domestic / Non-Domestic	Industry	EoE	Lon	So
Relay	Domestic				
	Non-Domestic		Data in table redacted		
Transfer	Domestic				
	Non-Domestic				

Chart redacted

Tier 2A – synthetic unit costs

- We have applied our synthetic unit cost methodology to the Tier 2A mains unit cost data based on the latest data submission (on an abandoned basis).
- Our analysis has found that **Tier 2A mains unit costs vary quite significantly** between GDNs and over time.
- This is partly due to **workloads in this category being very low** across the industry, especially in the GD2 period.
- This was also reflected in our synthetic unit cost analysis for our Draft Determination, which is why we chose to combine Tier 2A and Tier 2B together as part of our assessment.
- A potential mitigation is to base the Tier 2A volume driver units costs on total Tier 2 costs and workloads (Tier 2A + Tier 2B). But for this we would **require additional data**.

At Draft Determinations, we said (GD Annex, p.127):

"We propose to calculate an industry average unit cost for each diameter band, inclusive of associated service costs, based on the following assumptions for services:

- *an average rate of service interventions*
- *an average split between relay and transfer."*

"We will then account for regional factors, to create distribution network-specific unit costs for each diameter band that will be used to adjust allowances."

To calculate the unit costs presented in these slides, we did the following:

1. **Determine industry average unit costs for mains and services** (total cost / total workload, over GD1 and GD2) after applying synthetic unit cost methodology.
   - Tier 2A mains are assessed at the diameter band level (9", 10"-12" and >12"-17")
   - Services are assessed at the aggregate level
2. **Calculate a combined Tier 2A mains and services unit cost** for each diameter band based on the industry average services to mains ratio.
3. **Apply repex regional adjustments**
   - Labour and urbanity productivity adjustments, which affect Cadent EoE, Cadent London and SGN Southern.
   - Average regional adjustment factors over GD1 and GD2 period applied.
   - No catch-up challenge has been applied

Question: should we apply regional adjustments **before** and **after** calculation of industry average unit costs?

Tier 2A volume driver unit costs – preliminary results based on proposed methodology

Disaggregated by diameter band only

Diameter	Industry	EoE	Lon	So
9"				
10”-12"			Data in table redacted	
>12"-17"				

Data in table redacted

Connections UCs (Gross Costs)

New / Existing Housing	Diameter	Industry	EoE	Lon	So
New and existing housing	<=180mm		Data in table redacted		
	>180mm				

Data in table redacted

Connections UCs (Net Costs)

New / Existing Housing	Diameter	EoE	Lon	NW	WM	NGN	Sc	So	WWU
New and existing housing	<=180mm	47,189	48,944	51,991	49,633	39,921	36,408	34,756	37,897
	>180mm	72,408	75,100	79,777	76,158	61,255	55,865	53,330	58,149

Data in table redacted

Next steps…

- Stakeholders submit consultation responses –4thSept
- Repex WG –17th Sept
  - Summary of feedback from consultation responses
  - Update on preferred approach
  - Discussion of any key outstanding questions
- w/c 21st Sept –bilateral calls for any further discussion (if required)
- Informal Licence consultation published –end of Sept

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