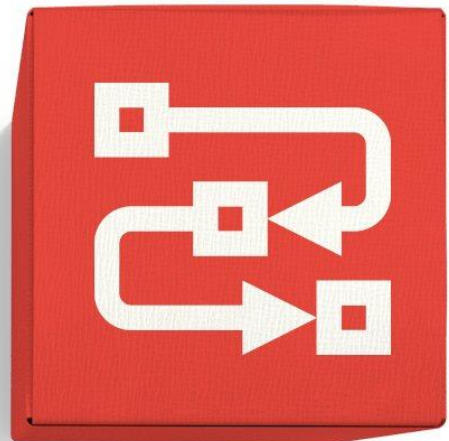


RIIO-GD2: Repex Services Policy

Ofgem

28 February 2020



FINAL REPORT FOR PUBLICATION (REDACTED)

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1. INTRODUCTION

Chapter summary

The Iron Mains Risk Reduction Programme (IMRRP) mandates that all Tier 1 mains must be replaced by 2032, in addition to Tier 2A mains above a risk-action threshold. Steel service pipes are expected to be replaced as they are found. In line with this objective, this report assesses four policy options for the replacement of steel service pipes associated with Tier 1 mains replacement, taking account of the different cost allocation methodologies used by gas distribution networks, and the perceived uncertainty in workload volume and unit costs.

The four policy options are:

- Price control deliverable (PCD) with a target
- PCD with a target and a deadband
- Network Asset Risk Metric (NARM)
- Volume driver

1.1. CONTEXT

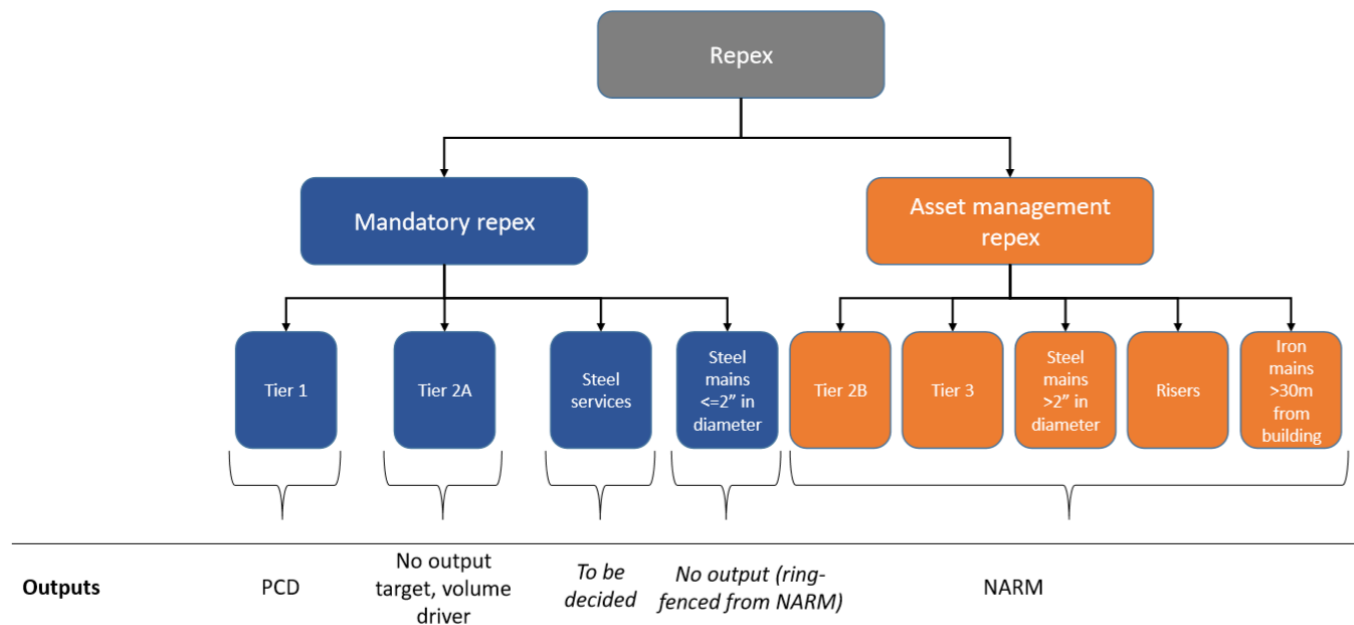
Replacement expenditure (repex) refers to the replacement of old iron mains under the Health and Safety Executive's (HSEs) Iron Mains Risk Reduction Programme (IMRRP), which states that all Tier 1 mains and Tier 2A mains above a risk-action threshold must be replaced by 2032. Specifically, "at risk" gas mains, (i.e. within 30 metres of buildings), are separated into three tiers:

- Tier 1: Less than or equal to 8 inches in diameter, all of which must be decommissioned by the end of the programme;
- Tier 2A: greater than 8 inches to less than 18 inches, which breach a given risk threshold and therefore must be decommissioned by the end of the programme;
- Tier 2B, greater than 8 inches and less than 18 inches, which are below the given risk threshold, can remain operational but can be decommissioned if supported by cost-benefit analysis (CBA); and
- Tier 3: greater than 18 inches, which can remain operational, but can be decommissioned if supported by CBA.

Tier 1 mains made up approximately 80% of the iron pipes "at risk". Under GD1, gas distribution networks (GDNs) were required to decommission an agreed length of Tier 1 mains, with 20% of this length being considered "high risk".

In light of the upcoming RIIO-GD2 price control starting in 2021, Ofgem has been considering its approach to setting allowances for GDNs. Many of the approaches to specific areas of the price control were set out in Ofgem's May 2019 Sector Specific Methodology Decision (SSMD) core document and sector-specific annexes. For repex, the figure below summarises how Ofgem will be setting allowances across different areas.

Figure 1.1: Ofgem GD2 repex decision, May 2019



Source: Ofgem (2019) RIIO-2 Sector Specific Methodology Decision – Gas Distribution

As the figure shows, Ofgem noted that further consideration would be needed to decide how repex allowances for steel services (repex services) would be set. Repex services refers to the replacement of steel gas service pipes, which connect gas mains to consumers' premises, with polyethylene² (PE) pipes to reduce the risk of injuries, fatalities and damage to buildings. The total cost of replacing Tier 1 service pipes over the course of GD1 is estimated to make up 21% of all repex, and 9% of total expenditure (totex).³ Similar to Tier 1 mains, Tier 1 associated services replacements are high volume and repeatable. Under the HSE policy, when Tier 1 mains are replaced, steel service pipes must be removed and replaced, or "relayed", with PE pipes. If the services are already made of PE when the main is being replaced, these services must be tested and transferred to the new PE mains pipe. The majority of service replacement occurs as part of mains replacement, making up 85% of all service replacement workloads in GD1, as it is far more economically efficient to do so and reduces the level of disruption to households.⁴ It is generally assumed that steel service pipes will be in place where iron mains are located.

At the time of writing this report, Ofgem had yet to finalise its GD2 repex policy. It is anticipated that a PCD target will be set for the total length of Tier 1 mains abandoned, as this constitutes high volume, repeatable work and should incentivise companies to deliver against the HSE objectives. Unit costs would be derived for each mains diameter band.⁵ GDNs would receive ex-ante allowances for their projected Tier 1 replacement workload based on the associated unit costs for their proposed mix of diameter bands. If the delivered workload profile differs from the forecast, allowances would be adjusted accordingly at close out. Ofgem is also considering the introduction of an upper limit on allowances to ensure a balanced workload across diameter bands and to protect customers from significant bill increases. Current thinking is that workload over-delivery may contribute to the company's Network

² Polyethylene is the approved material for transmitting gas through lower pressure mains pipes and services.

³ CEPA calculation based on GDN outturn between 2013 and 2018, and forecasts from 2019 to 2021.

⁴ Alternative approaches include block replacement of services not linked to mains replacement, whereby services are replaced in a certain zone where service records suggest specific areas are "hotspots" for leakages. Another approach to replacing services is undertaking relays after gas escapes, where service pipes are replaced individually following gas leaks reported by the public.

⁵ Diameter band unit costs may be used in GD2, rather than a singular mains unit cost as in GD1, to ensure that GDNs are not incentivised to prioritise the replacement of smaller diameter pipes in order to reduce short-term costs. This has partly explained why repex has accounted for a large proportion of out-performance in RIIO1 to date. See CEPA (2018), Review of the RIIO framework and RIIO-1 performance, for further details of company outperformance. Available at: https://www.ofgem.gov.uk/system/files/docs/2018/03/cepa_review_of_the_riio_framework_and_riio-1_performance.pdf

Asset Risk Metric (NARM) score. It is currently anticipated that as HSE requirements and reputational incentives will limit the likelihood of workload under-delivery, no specific financial penalties for under-delivery will be put in place.

Despite the linkages between mains and services replacements, it may not be appropriate to apply Tier 1 mains policy to service repex allowances as the workload drivers and characteristics differ. There are a number of issues to consider when setting allowances for repex services, specifically:

- The GDNs have incomplete data on the density, material and condition of service pipes, making workload and cost forecasting challenging.
- As the bulk of service repex is driven by mains replacement, the number of services requiring replacement is uncertain ex-ante for GDNs and for Ofgem even more so. This also applies to the type, and therefore cost, of the required replacement work.
- When a project involves mains and services replacement, the shared costs, (such as excavation), and indirect costs, (such as site management), must be allocated between activities, yet the cost allocation methodologies differ between GDNs. This creates uncertainty for Ofgem when considering the comparability of unit costs between GDNs.

Ofgem is now considering four policy options for RIIO-GD2 for the replacement of steel services related to Tier 1 mains repex.⁶ The policy options under consideration are:

- **Price Control Deliverable (PCD) with a fixed target.** Under this policy option, Ofgem would set an absolute target for the number of steel services that needed to be replaced by each GDN over the course of GD2. Cost allowances may be adjusted for under-delivery, while GDNs would not be compensated for over-delivery.⁷
- **PCD with a funded deadband around the target.** This approach is similar to the fixed target option, with the key difference being the inclusion of a +/-% funded deadband. This creates a threshold around the target, allowing companies to deliver a workload level within this threshold and be compensated accordingly. Additional mechanisms, such as financial penalties, can be introduced to manage over- or under-delivery.
- **Network Asset Risk Metric (NARM).** This policy option would not set a specific volume target for GDNs to meet with regards to services. Instead, services would be included as an asset class within the NARM output for RIIO-GD2. In practice, this would mean that GDNs would be required to deliver service replacements that meet a specific monetised risk score (£MR) for delivering those assets, and failing to deliver the assets set out in the NARM will cause companies to miss their NARM targets. For GD2, the NARM may be used as the primary mechanism for incentivising companies to deliver their asset management repex.⁸
- **Volume driver.**⁹ Under this approach, GDNs will be set allowances based on annual forecasted workloads. This differs from a PCD in that there is no workload target. Allowances would be adjusted each year to reflect the actual volumes delivered. At the time of writing this report, Ofgem have proposed using a volume driver for Tier 2A mains replacement, with the rationale for its use being that volumes are low and uncertain.

A detailed explanation of each of these policy options and their mechanics is presented in Section 3.

⁶ Services related to Tier 1 mains repex account for majority of service pipe replacement. For service repex associated to other mains tiers, Ofgem is likely to use an approach consistent with the associated mains policy.

⁷ The rationale for not adjusting allowances for over-delivery is that this could encourage companies to undertake unnecessary replacement activities, and in turn be compensated for them.

⁸ Asset management repex includes Tier 2B, Tier 3, steel mains greater than 2" in diameter, risers and iron mains greater than 30m from buildings.

⁹ This option has been put forward by Northern Gas Networks (NGN) in their response to Ofgem's 2018 consultation on GD2: https://www.ofgem.gov.uk/system/files/docs/2018/12/riio-gd2_sector_annex_0.pdf

1.2. STRUCTURE OF THIS REPORT

Ofgem commissioned a partnership of CEPA, AFRY Management Consulting (AFRY) and Economic Consulting Associates (ECA) to provide economic advice for RIIO-2. This independent report has been prepared by CEPA under this Economic Strategic Partner contract for RIIO-2. Following this brief introduction to the work, the rest of the report is structured as follows:

- Section 2 highlights some key issues for consideration as part of the assessment of the policy options.
- Section 3 summarises our assessment of the policy options, and includes the framework that has been used to assess the different options.
- Section 4 provides a summary of our conclusions and key considerations on the favoured policy option.

2. ISSUES FOR CONSIDERATION

Chapter summary

There are two key issues that could affect the appropriate policy choice for the replacement of steel service pipes.

- First, there is perceived uncertainty regarding workload volumes for service pipe replacements. In GD1, service delivery has been considerably more varied than mains workload delivery. This supports the feedback from GDNs and other stakeholders that service workloads are relatively uncertain.
- Secondly, gas distribution companies allocate shared and indirect costs to activities in different ways. This contributes to differences in unit costs, which are subsequently used to determine appropriate allowances. If the selected service policy allowed for an unconstrained workload, such as a volume driver, this could incentivise companies to adjust their cost allocation methodologies and workload profile in order to maximise financial gain.

In this section we look at issues that may impact the appropriate policy choice for service repex. First, we discuss the perceived uncertainties that are associated with repex for services, which could make achieving a fixed target more challenging, and assess this through an analysis of the GD1 outturn to date relative to forecast. We then summarise the different methods that GDNs use when allocating costs within a project that has multiple activities, and consider how this may create certain incentives under different policy options.

2.1. COST AND WORKLOAD UNCERTAINTY

Service pipe replacement is perceived to have a considerable amount of workload uncertainty. The location of mains and associated services that will be replaced throughout the price control period are not known with accuracy at the time of business plan submission. Rather, the submitted forecasts are estimations of the expected workload characteristics. Typically, mains projects are planned only one to two years in advance, depending on the contract model. Planning also hinges on aspects such as local authority approval and coordination with other utility activities. Workload uncertainty also creates cost uncertainty, although this is inherent within the price control as allowances rely on forecasted unit costs.

GDNs suggest that the lack of advanced activity knowledge makes it challenging to accurately forecast both costs and workload, compounded by the poor records of service pipes in some areas. In regard to workload uncertainty, when a GDN plans a mains project, they must estimate the number of services per kilometre of main. However, this uncertainty can be managed by gauging the service:main ratio based on density (i.e. it will be higher in city centres relative to rural areas), and other variants from historical records.

The locations, times and characteristics of replacement activities are likely to differ from forecasts. This may result in cost differences through, for example, local highway authority charges, access challenges in city centre locations or a higher proportion of relays or non-domestic replacements. Analysis by Ofgem suggests that relays for domestic properties over GD1 to date cost, on average, £537 per unit. This rises four-fold to £1,904 per unit for non-domestic properties. Regardless of the various elements that are unknown at the initial planning stage, it is our understanding that GDNs have sufficient historical data over many years of mains and service replacement activity to make a reasonably reliable statistically-based forecasts.

Any outsourced service replacement work, and its associated cost, will need to be agreed with contractor(s). These elements therefore remain uncertain, subject to contract negotiations, which occur only after Ofgem's final decision on the price control.

2.1.1. GD1 outturn

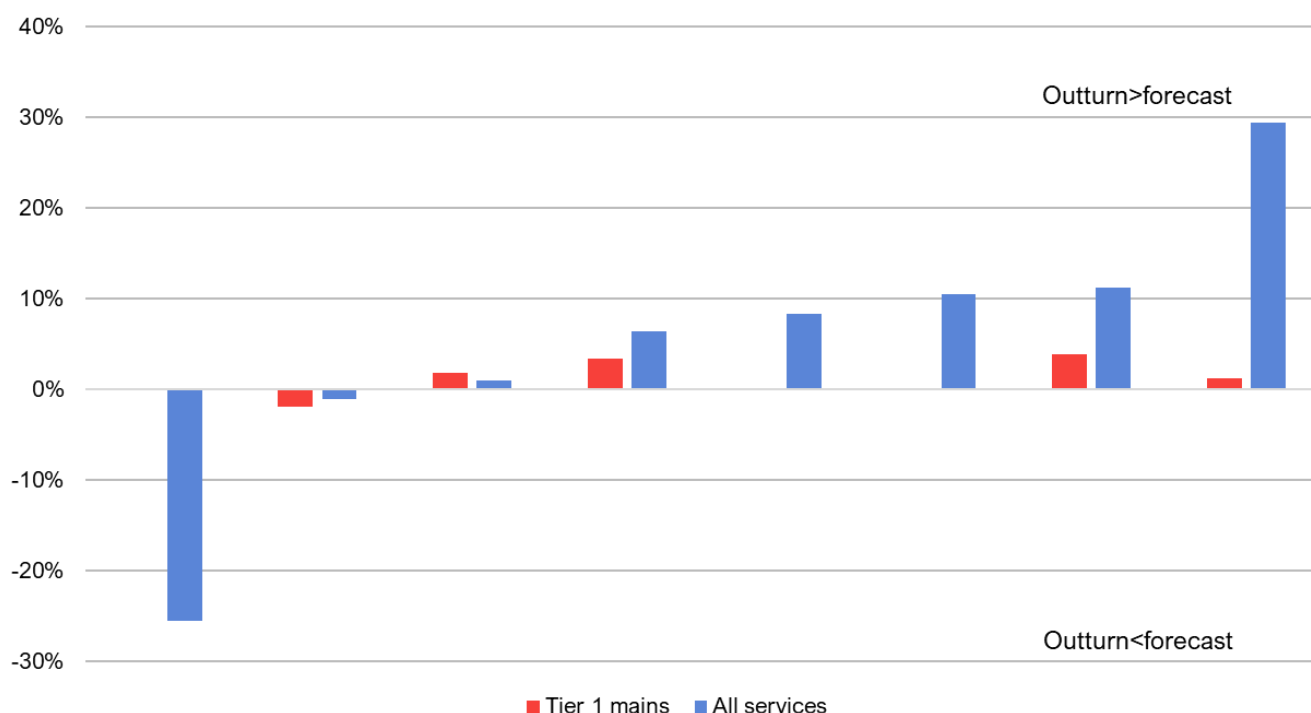
In order to gain insight into the level of service replacement workload uncertainty, we have undertaken an analysis of the difference between GD1 workload forecasts and eventual outturn.¹⁰ The results of this analysis have then been compared with the forecast to outturn variation in mains workloads over GD1 in order to understand the relative

¹⁰ Our initial analysis included an assessment of cost uncertainty in relation to workload uncertainty. However, after assessing the comparability of forecast and outturn cost data it was concluded that this was not suitable to include in the analysis.

uncertainty of service replacements. The workload data used in this analysis has been provided by Ofgem, and has been taken from final proposals and business plan documents. Actual outturn is used to calculate variation for 2013/14 to 2018/19, while updated forecasts from December 2019 are used as outturn to calculate variation for 2019/20 and 2020/21.

Figure 2.1 below depicts the overall workload variations for services and mains across GDNs over GD1. We note that GDNs are almost consistently on track to deliver mains workloads on or above target. Where they are not, the level of under-delivery is projected to be around only 2%. This aligns with expectations given the HSE requirements around mains replacement. Variation in services workload is considerably higher, and in some cases is close to 30%. This is consistent with services workload being primarily driven by the mains workload.

Figure 2.1: Tier 1 mains and services workload variation over GD1 (2013/14 – 2020/21)



Source: CEPA analysis

To further understand the relative variations, we took the differences between *total* workload forecast and outturn for both mains and services across all eight gas distribution networks. We converted these workload differences into absolute percentage differences (i.e. without regard to the sign). We then calculated the average of these differences for both GD1 and GDPCR. A higher absolute average indicates that there is a greater overall variation between forecast and outturn. As Table 2.1 below shows, average absolute variation of services was higher than mains for both GDPCR and for GD1.

Table 2.1: Absolute average for mains and services workload variance, GD1 (2013/14–2020/21) and GDPCR (2007–2013)

| Price control | Mains | Services |
|---------------|-------|----------|
| GDPCR | 4% | 12% |
| GD1 | 2% | 12% |

Source: CEPA analysis

2.2. DIFFERENCES IN ALLOCATION METHODOLOGIES

The four UK gas distribution companies have different methods of allocating indirect and shared costs between services, mains or other activities when projects comprise multiple activities. Indirect costs include overheads, while shared include excavation or disruption. There is significant variation in both the allocation methodologies used by

GDNs, and their level of complexity. For example, two of the network companies use a similar top-down allocation method based on standardised unit costs, while the other two companies use bottom-up approaches that are dissimilar to one another. The reported repex service costs therefore include different types and/ or proportions of indirect and shared costs across GDNs, making the process of comparison, and the development of standard costs, more complex.

The policy choice for services may impact a company's chosen method of allocating indirect and shared costs. For example, if a volume driver is selected for Tier 1 associated services policy while the Tier 1 mains policy is a PCD, companies may see a benefit in over-allocating shared and indirect costs to services and over-delivering on services, or vice versa, in order to maximise their financial gain. This is because the volume driver essentially has no workload target, meaning companies will receive allowances in line with workload. However, this would only be the case where companies are in control of their allocation methodologies. In the case of one company, for example, the contractor undertakes the cost allocation task.

The allocation approaches of the four gas distribution companies are outlined in more detail in Table 2.2 below.

Table 2.2: GDN cost allocation methodologies

| [REDACTED] | [REDACTED] | [REDACTED] | [REDACTED] |
|------------|------------|--|--|
| [REDACTED] | [REDACTED] | <ul style="list-style-type: none"> • [REDACTED] • [REDACTED] • [REDACTED] | <ul style="list-style-type: none"> • [REDACTED] • [REDACTED] |
| [REDACTED] | [REDACTED] | <ul style="list-style-type: none"> • [REDACTED] • [REDACTED] • [REDACTED] | <ul style="list-style-type: none"> • [REDACTED] |
| [REDACTED] | [REDACTED] | <ul style="list-style-type: none"> • [REDACTED] • [REDACTED] • [REDACTED] | <ul style="list-style-type: none"> • [REDACTED] |
| [REDACTED] | [REDACTED] | <ul style="list-style-type: none"> • [REDACTED] • [REDACTED] | <ul style="list-style-type: none"> • [REDACTED] |

The information in the table above indicates that cost allocation methodologies differ. Without further detail, it is challenging to ascertain the impact on unit costs. However, we know that unit costs for service replacement differ significantly across GDNs. Figure 2.2 below shows the implied unit costs based on outturn from 2013/14 to 2018/19, and unit costs forecasts (updated December 2019) for 2019/20 and 2020/21, as indicated by the grey area.

Unit costs vary significantly across regions. This may be due to regional factors, and potentially cost allocation methodologies. [REDACTED]. With reference to cost allocation, we would expect to see similar unit costs within the same companies, or where the same contractor is used across companies. [REDACTED]¹¹ This suggests that cost allocation methodologies may have an impact on unit costs.

Figure 2.2: [REDACTED]

Source: CEPA analysis

¹¹ EOE and NL also use the same contractor. However, we expect unit costs in NL to be significantly different due to regional factors.

3. ASSESSMENT OF POLICY OPTIONS

Chapter summary

We assessed each of the policy options against a set of six criteria: delivery of repex objectives; cost efficiency; addresses uncertainties; complexity; consistency; and minimises perverse incentives.

A PCD with a target limits flexibility in workload delivery, which is valuable to companies given the uncertainties discussed in the previous section. The NARM and the volume driver policy options both provide flexibility, but are inconsistent with Tier 1 mains policy and could potentially result in the adjustment of cost allocation methodologies. The divergence of these two policy options from historic repex policy could also create additional complexity and administrative burden.

Overall, the PCD with a target and a funded deadband scores the highest against the primary and secondary criteria used for this assessment. It retains a workload target, consistent with both the IMRRP and the Tier 1 mains policy, and encourages companies to deliver workloads efficiently. This policy also provides companies with workload flexibility through the use of a funded deadband. The policy could be designed to include a NARM contribution for over-delivery that could further increase flexibility in workload delivery. Under this option, funds would be clawed-back in the case of under-delivery, with no additional penalties.

This section first sets out the criteria we have used to assess each of the policy options outlined in Section 1. Based on this criteria, the section then sets out each of the policy options conducted.

3.1. ASSESSMENT FRAMEWORK

We have assessed each policy option against six criteria, which we have separated into primary and secondary criteria. The primary criteria refer to the extent to which the policy options are likely to achieve key policy outcomes in the price review. We consider this to be the highest priority in selecting a policy, and as such, these three criteria are considered as **the primary metrics for evaluating each of the policies**. The criteria are as follows:

- **Delivery of repex objectives:** The policy option should deliver the objectives of the IMRRP, notably improving customer safety, but also improving network reliability and reducing greenhouse gas emissions.
- **Cost efficiency:** The policy should encourage companies to minimise costs where feasible, and where it is not a detriment to the overall HSE policy. Where possible or relevant, it should also uncover improved cost data that can inform the approach for GD3.
- **Addresses uncertainties:** The policy should effectively deal with cost and volume uncertainties that exist beyond the control of companies.

The remaining secondary criteria **are regarded as lower priority than the primary criteria**. While these criteria are important to consider, a policy that scores highly in these areas will not necessarily achieve the key policy outcomes. The three secondary criteria are:

- **Minimises complexity:** Complexity will impact administration and reporting requirements during the price control period and at RIIO-GD2 closeout. Therefore, the acceptable level of policy complexity should be reflective of the scale of the allowances for repex services. The ease of explaining the policy to stakeholders (internal and external) will also be considered.
- **Consistency:** The policy should align with the repex policy approaches used in RIIO2 to avoid conflicting incentives. The policy should also be aligned with the overall approach being taken in the RIIO2 price control, unless there is a good justification not to do so to meet the specific needs of repex services.
- **Minimises perverse incentives:** The policy should minimise gaming opportunities for companies. This includes incentivising the manipulation of inputs or cost allocations to increase company allowances. The policy should encourage an efficient level of service delivery in GD2, with regards to balancing workload with subsequent price control periods. We note that the level of influence that services have on Tier 1 workloads more generally is unclear.

When undertaking the assessment, we considered the total scores of the primary and secondary criteria separately, giving priority to the former. Overall, the objective is to strike a balance between the two while recognising the ultimate importance of achieving the intended policy outcomes.

The assessment is done on an absolute numerical scale, and each policy option scores between one and five for each criterion. Table 3.1 below summarises the scoring approach used.

Table 3.1: Scoring approach for policy assessment

| Score | Definition |
|-------|---|
| 5 | Criteria is fully met with no concerns being found. |
| 4 | Criteria is met, but minor concerns exist. |
| 3 | Criteria is met, but several concerns exist. |
| 2 | Criteria is somewhat met, but major concerns are present. |
| 1 | Criteria is not met. |

3.2. SUMMARY OF OPTIONS ASSESSMENT

As is shown in the table below, the PCD option with a target and deadband is the highest-scoring policy option under the primary criteria, indicating it will most effectively achieve the policy outcomes. This option does not score the highest under secondary criteria, however we do not consider it to have sufficient weaknesses in this area to outweigh the primary score. Overall, therefore, the preferred policy option is a PCD with a target and deadband.

Table 3.2: Assessment summary

| | PCD with target | PCD with target and deadband | NARM | Volume driver |
|------------------------------|-----------------|------------------------------|-----------|---------------|
| Primary criteria | | | | |
| Delivery of repex objectives | 5 | 5 | 3 | 3 |
| Cost efficiency | 5 | 5 | 5 | 5 |
| Addresses uncertainties | 1 | 3 | 4 | 4 |
| Total | 11 | 13 | 12 | 12 |
| Secondary criteria | | | | |
| Minimises complexity | 5 | 4 | 2 | 4 |
| Consistency | 5 | 5 | 3 | 3 |
| Perverse incentives | 3 | 3 | 3 | 3 |
| Total | 13 | 12 | 8 | 10 |

Source: CEPA analysis

The following sections discuss the policy and assessment in further detail.

3.3. OPTION 1 – PCD WITH TARGET

The first policy option under consideration is a PCD, which would set a fixed target for the level of service workload that GDNs must achieve over the price control period. This approach would be similar to the approach that Ofgem is considering taking forward for Tier 1 mains in GD2. Under this policy, GDNs would receive a cost allowance based on the workload target. If they under-deliver against the target, allowances will be adjusted downwards at GD2 close-

out to reflect actual workloads undertaken. However, should companies over-deliver on workloads, allowances would not be adjusted upwards. Additional workloads that are delivered could contribute to the NARM scores if Ofgem chooses to design and include this structure. There would be no additional penalty or reward for under- or over-delivery; the other incentives placed on company repex programmes (HSE statutory policy and the PCD targets for mains) alleviate the need for a specific financial penalty to discourage under-delivery. In addition, such a penalty would not align with the proposed policy for Tier 1 mains.

Service replacements are high-volume and repeatable work which can be benchmarked across GDNs, making them theoretically well-suited to a PCD. Additionally, given the importance of service pipes to the HSE due to their proximity to buildings, a PCD would encourage companies to undertake the appropriate level of workload in order to reduce the level of risk to the public.

As outlined in Ofgem's SSMD, companies are concerned that, given the high levels of uncertainty associated with service workloads, introducing a PCD similar to Tier 1 mains could result in companies not receiving allowances as a result of inaccurate forecasts. Given how the PCD functions, the key concern for companies is over-delivery of services, which was an issue during the GD1 price control for four GDNs (which included the SGN networks and Cadent's NL and WM networks). This issue is described in more detail in Section 2.1.

3.3.1. Assessment of Option 1

Table 3.3 below summarises the assessment that has been undertaken regarding the option of using a PCD with a fixed target. The PCD scores highly in delivering against repex objectives and encouraging cost efficiency. However, as service workload delivery is driven by Tier 1 mains replacement, we believe the uncertainty this causes in regard to meeting the workload target, and the associated allowance recovery, is cause for concern. In addition, the policy may incentivise companies to target less efficient projects, or strategically adjust their cost allocation methodologies.

Overall, this option has the highest score under the secondary criteria, but fails to address the uncertainty, thereby reducing the primary criteria score. This option is therefore not considered to be well-balanced between the criteria.

Table 3.3: Assessment of PCD with fixed target policy option

| Criteria | Score (1-5) | Justification |
|-------------------------------------|-------------|---|
| Primary criteria | | |
| Delivery of repex objectives | 5 | This option uses targets to ensure that companies replace services in line with the HSE objectives. The profiling of the services replaced is expected to depend on the profiling of mains works. |
| Cost efficiency | 5 | Allowances will be set ex ante as part of the PCD, incentivising companies to deliver services at the most efficient cost. As this policy is similar to the approach taken in GD1, we do not expect it to uncover improved cost data. |
| Addresses uncertainties | 1 | The fixed allowance based on a specific workload and unit costs do not provide flexibility to manage uncertainties. In the event of over-delivery, completion of services replacement works could contribute to the NARM risk reduction score if this structure is taken forward by Ofgem. However, companies will not be directly compensated for work being carried out and therefore risk non-recovery of expenditures. |
| Secondary criteria | | |
| Minimises complexity | 5 | The PCD is a relatively easy concept for stakeholders to understand and is well understood by GDNs. In addition, setting an ex ante target for the price control period, without ongoing adjustments, would be straightforward for Ofgem to administer. |
| Consistency | 5 | This policy is consistent with the overall policy that has been put forward by Ofgem for Tier 1 mains, which would set a fixed PCD target. |

| Criteria | Score (1-5) | Justification |
|--------------------------------------|-------------|--|
| Minimises perverse incentives | 3 | <p>Companies may be encouraged to allocate costs to the area where they feel they are least likely to over-deliver, or where they have more control over the extent to which they over-deliver, which in this context is likely to be mains rather than services.</p> <p>In the event that companies are anticipating under-delivering on their services target, they may undertake replacement projects where there is higher density of services to mains in order to meet their target. Conversely, companies may be encouraged to focus on rural areas if they are expecting to over-deliver on their services target and not their mains target, despite the possibility of these not being the most suitable areas to replace mains (for example, if the condition of assets is better here than in other areas). The extent to which services impact on Tier 1 workload profiling is unclear.</p> <p>The potential contribution of over-delivery to the NARM risk score could incentivise GDNs to deliver an inefficient workload above the PCD if it enables them to achieve large risk reductions at a relatively low cost.</p> |

3.4. OPTION 2 – PCD WITH TARGET AND FUNDED DEADBAND

The second policy option is an extension of the PCD with target option. Here, an acceptable margin of error around the workload target is included, allowing GDNs more flexibility to deviate from the PCD target. This has been considered as a potential policy option due to the concerns expressed about level of uncertainty regarding service replacement volumes.

Two approaches can be used to apply error bands around regulatory targets:

- **Tolerance band:** In this case, companies are set a specific target and are given cost allowances linked to the delivery of these targets. Should the target fall within a percentage tolerance range above or below the target, company allowances would not change to reflect this. However, should the target fall outside of this range, allowances would be able to adjust, provided that companies provide justifiable reasons for deviation from the target.
- **Funded deadband:** As with a tolerance band, a specific target and a percentage range above and below the target is set when using a funded deadband. The key difference with a funded deadband is that companies are funded for their workload within the deadband. This provides them with workload flexibility, and they will be deemed to have met their target if their delivered workload is within this range. Additional mechanisms can be used to discourage delivery outside of this deadband.

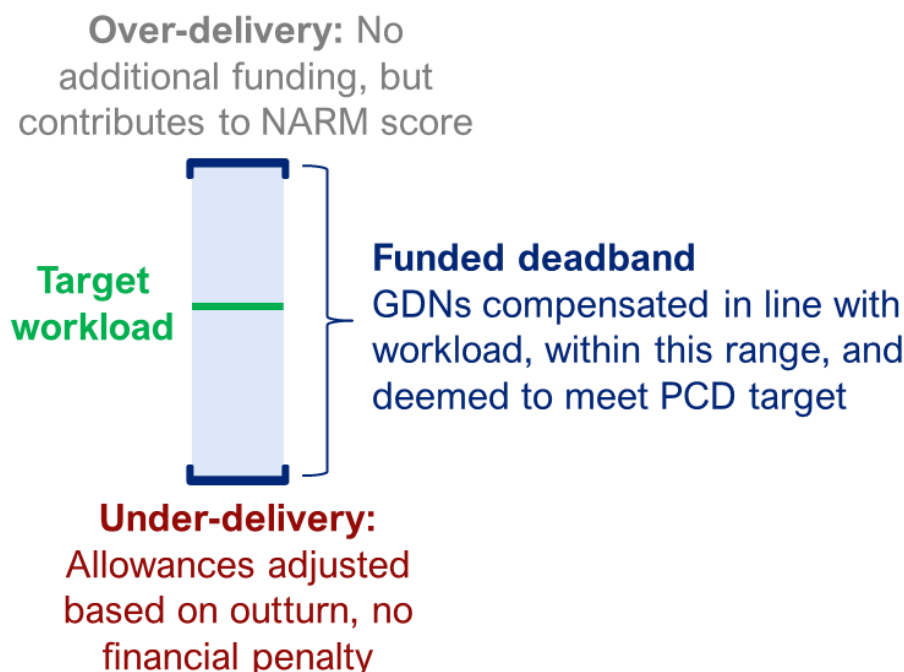
In the context of repex services, the key issue for companies is whether they will be funded for delivering work they carry out; a company will be concerned that if it over-delivers against its PCD, its allowances will not be adjusted to compensate it for work it believes it has justifiably carried out. Given these uncertainties, a **funded deadband** rather than a tolerance band would help overcome these issues. Companies would still be compensated should they not meet their exact targets, but at the same time, the deadband ensures that customers are not required to fund over-delivery beyond the deadband and ensures delivery in line with the IMRRP.

This policy requires additional consideration of how to encourage delivery within the workload deadband. We recommend that:

- If companies under-deliver beyond the deadband, allowances will be adjusted to reflect actual delivery. Companies will not face an additional financial penalty (under this policy) for any under-delivery below the deadband for the reasoning outlined in Section 3.3.
- For over-delivery above the deadband, companies would not be provided with additional funding. Any additional replacement that does take place could contribute to companies' NARM monetised risk reduction score if Ofgem chooses to pursue this structure in other repex areas.

Both these aspects align with Ofgem’s expected approach for setting the PCD target for Tier 1 mains in the SSMD; namely that companies will not face an additional penalty for under-delivery. Also, additional allowances will not be provided for over-delivery, but the additional workload could contribute to a company’s NARM monetised risk reduction score.

Figure 3.1: PCD with target and funded deadband



If this policy option were to be taken forward, a key consideration would be the size of the deadband. A wider deadband would reduce the level of uncertainty faced by companies but would mean that companies are less accountable to delivering against their targets. A narrower deadband, on the other hand, would reduce the extent to which uncertainties are addressed, but may protect customers from funding potential over-delivery. Determination of an appropriate deadband threshold is outside the scope of this report. It would require further assessment, such as a more detailed analysis of historic service workload deviations and a thorough consideration of the impact of the relevant policy framework at the time.

3.4.1. Assessment of Option 2

Table 3.4 below summarises our assessment of the PCD with deadband policy option. As the table shows, the second option helps to address the main concerns raised with regard to Option 1, mainly that some of the uncertainties associated with setting a PCD target for companies is mitigated through the use of a funded deadband. This approach maintains some of the positive properties associated with the first option in encouraging companies to deliver against the IMRRP objectives and act efficiently. While there could be scope for companies to aim for the upper end of a deadband threshold, this is likely to be limited, given that services replacement is largely linked to mains delivery in practice. Therefore, the extent to which these incentives exist, and that companies are likely to have control over them, are limited.

This policy has the highest score under the primary criteria, suggesting it will most effectively achieve the intended policy outcomes which is considered a priority under this assessment. Additionally, it has the second highest score under the secondary criteria, making it a well-balanced option.

Table 3.4: Assessment of PCD with deadband policy option

| Criteria | Score (1-5) | Justification |
|--------------------------------------|-------------|--|
| Primary criteria | | |
| Delivery of repex objectives | 5 | Similar to the first option, setting a PCD target helps to ensure that companies are incentivised to deliver the level of services replacement workload that aligns with the IMRRP objectives. |
| Cost efficiency | 5 | As with Option 1, companies will be incentivised under this option to minimise costs where feasible. As this policy is similar to the approach taken in GD1, we do not expect it to uncover improved cost data. |
| Addresses uncertainties | 3 | The inclusion of a deadband helps companies to address some of the volume uncertainty associated with a PCD, although the extent to which these uncertainties are addressed will depend on the width of the deadband. |
| Secondary criteria | | |
| Minimises complexity | 4 | The addition of the deadband makes this approach more complex to implement than the simple fixed target. Allowances will be adjusted in a similar way to that of Option 1. |
| Consistency | 5 | This approach mirrors the policy that has been proposed by Ofgem for Tier 1 mains in the May 2019 SSMD. |
| Minimises perverse incentives | 3 | The perverse incentives for this option will be similar to the PCD with target option. Companies could be incentivised to try and hit the top end of the deadband, which could be significantly different from the efficient delivery level if unit costs are set too high and the deadband is particularly wide. However, given that the services workload is driven by what is delivered under mains, the extent to which this incentive has an impact in practice is likely to be limited. |

3.5. OPTION 3 – NARM USED TO DETERMINE ALLOWANCES

Under the third option, GDNs would not be set a specific target for services during RIIO-GD2. Instead, companies would be incentivised to manage service replacement through investments that reduced their monetised risk target set as part of their overall NARM target. This NARM target would be an overall target denominated in £m monetised risk terms (or £MR), which companies can reach through management a range of assets during the price control.

For GDNs, there are six primary asset classes which collectively contribute to the £MR, which comprise of 18 secondary asset classes.¹² Asset classes can also be grouped into specific “cohorts”, or groupings of individual assets which have the same characteristics and as such can be assessed and scored according to asset health in a similar way.

The overall £MR target would be the sum of the differences between “with intervention” and “without intervention” calculated as part of Engineering Justification Papers (EJPs) and CBAs for the different asset classes justified in company business plans. To deliver the £MR target, companies would be funded to carry out the work proposed through their allowances. If companies over-deliver on their target, the cost of the over-delivery would be subject to the totex incentive mechanism (TIM), meaning that not all costs will be able to be recovered from customers. But in exceptional cases, companies would be able to make the case to Ofgem for the over-delivery to be held cost-neutral (i.e. all costs can be recovered from customers). If companies under-deliver on their £MR targets, Ofgem would claw

¹² The primary asset classes for GD are mains, services, pipes multi-occupancy buildings (MOBs), local transmission system (LTS), pressure reduction stations (PRS) & offtakes and governors. For further details of the secondary asset classes, please see p. 18 of the NOMs methodology at:

https://www.ofgem.gov.uk/system/files/docs/2017/09/noms_methodology_version_no._v3.2.pdf

back any allowances associated with the under-delivery plus a penalty amount which is proportionate to the clawed-back amount (with the exact proportion to be determined as part of draft and final determinations).

For some assets, the NARM would not act as the primary mechanism that incentivises companies to deliver what is set out in their business plan. For example, for Tier 1 iron mains, the primary incentive mechanisms are a statutory (i.e. the HSE regulations) and a policy (the PCD target) driver. However, given that the NARM is not the primary driver of GDNs implementing these activities, the Tier 1 mains £MR contribution would be reported but as part of the price control are “ring-fenced”, or the £MR contribution is separated out from the overall NARM to avoid creating conflicting incentives.¹³ The exact arrangements for ring-fencing such assets in the NARM has yet to be decided, but the essential idea is that companies would have separated out NARM scores for assets where other elements of the price control are driving delivery for that asset type.

If the NARM was used as the primary mechanism for services, companies could replace other assets covered by the NARM methodology to reduce their £MR target. Hence, under the NARM, companies would not be tied to delivering a specified workload for services.

3.5.1. Assessment

Our assessment of utilising the NARM as the primary incentive is summarised in Table 3.5 below. As outlined in the table, the use of the NARM will help address the volume uncertainty associated with the PCD options outlined above, while also incentivising companies to deliver the services due to the contribution to reducing the £MR score. The NARM approach aligns less with the repex policy objectives than other options, mainly because the level of incentive on companies to deliver the services within the price control are lower, although the overall HSE policy will still be in place which will encourage companies to meet the long-term objectives. In addition, adopting this policy will mean that there is misalignment with the Tier 1 mains policy, which could create incentives for companies to allocate more costs to services than mains than they would if the policies were aligned. This is especially the case if companies are approaching their PCD targets for mains, as they could then seek to justify and recover these costs as part of the close-out process for the NARM allowances for RIIO-GD2.

Companies have a considerable degree of flexibility in the way in which they cohort assets in the NARM and the metrics used in the CBA analyses, which could limit the extent to which Ofgem has oversight on whether the appropriate works and amount of works being undertaken is appropriate. The approach is relatively more complex than the other options, and could also create greater administrative burdens for Ofgem due to the close-out process used for determining whether companies have a justifiable case for under- or over-delivery of the NARM.

Overall, the NARM assessment scores suggests this policy would be relatively effective at achieving the policy objectives. However, the complexity that is required to implement and operate the NARM may not be justified in this context. This results in this policy option scoring the lowest in the secondary criteria.

Table 3.5: Assessment of NARM policy option

| Criteria | Score (1-5) | Justification |
|-------------------------------------|-------------|--|
| Primary criteria | | |
| Delivery of repex objectives | 3 | <p>Depending on the nature of its implementation, the NARM approach could incentivise companies to deliver against repex objectives. For example, companies are set a long-term objective of replacing all steel services as they are encountered, in line with the IMRRP, but no in-period targets are set. However, the profiling of the replacements could be determined as part of the NARM process.</p> <p>The drawback of this approach is that, despite the long-run targets, companies are less accountable for delivering specific targets related to services during the RIIO-GD2 price control period, which in the event of lower delivery could result in companies having to undertake significant</p> |

¹³ For example, companies may target mains that will achieve a higher scoring NARM but are a higher cost than those that are associated with a lower NARM score but require lower costs to deliver due to them being close to or part of existing projects.

| Criteria | Score (1-5) | Justification |
|--------------------------------------|-------------|---|
| | | amounts of potentially inefficient works as the deadline of the IMRRP approaches. |
| Cost efficiency | 5 | Companies are still encouraged to deliver costs efficiently through use of the NARM for the work they are undertaking. We do not anticipate this policy to uncover improved cost data. |
| Addresses uncertainties | 4 | The NARM approach to some extent removes the uncertainties that companies face on whether they will be compensated for undertaking service works that is associated with previous options. However, some levels of uncertainty still remain with customers, since it is less clear what companies will commit to deliver as part of the NARM approach, given that they may choose to deviate from their proposed works in order to better meet their NARM target through other investments. |
| Secondary criteria | | |
| Minimises complexity | 2 | <p>Relative to other options, the NARM is generally regarded as the most complex approach of all being considered, and many stakeholders have noted that it is difficult for customers to fully understand how it will be implemented for replex services. This is compounded by the fact that many aspects of how the NARM will be implemented (including how ring-fencing and trade-in/out will work in practice) have yet to be determined.</p> <p>In addition, the mechanism outlined above for determining under of over-delivery through the NARM is likely to be more administratively burdensome than the other options being considered.¹⁴</p> <p>On the other hand, setting a specific target, as opposed to incentivising companies within the NARM, would involve adjusting allowances ex post, whereas these adjustments, at least in the context of services, will be less necessary if the NARM is used.</p> |
| Consistency | 3 | The NARM approach is not consistent with the approach that is being considered for Tier 1 mains, but it is consistent with the approach for non-mandatory replex. Using the NARM as the primary incentive to deliver replex services would also align with the wider approach Ofgem is proposing of utilising the NARM to promote asset management. |
| Minimises perverse incentives | 3 | <p>A key issue with the NARM is that, at present, companies utilise slightly different approaches to undertaking their CBA assessments that feed into the NARM. Specifically, companies draw on different probability of failure (PoF) and consequence of failure (CoF) scores which determine the benefit (or avoided cost) scores that enter the NARM. In addition, companies can divide assets into different sub-cohorts based on assessments of characteristics of assets under the NARM. This could mean that companies have a considerable level of discretion on what areas they prioritise for replacement. Ofgem has relatively less oversight in this regard and as such is less able to hold GDNs to account on activities for specific asset types.</p> <p>Given that this will be a different approach to that used for Tier 1 mains, companies could be incentivised to allocate more costs to services if they believe they are going to reach their mains target. This is because if GDNs over-deliver on their Tier 1 mains target no additional funding will be provided. If more costs are allocated to services than what would be otherwise, companies could then seek to justify these costs as part of the close-out process for the NARM allowances for RIIO-GD2 if they over-deliver on their NARM target, meaning that there is more scope for them to</p> |

¹⁴ It should be noted that this does not suggest that the NARM is not an effective tool that can be used for other asset management activities, but that the complexity that is required is not justified in this context.

| Criteria | Score (1-5) | Justification |
|----------|-------------|--|
| | | recover these costs compared to if the policy for Tier 1 mains and services are aligned. |

3.6. OPTION 4 – VOLUME DRIVER

This policy option provides allowances that are in line with actual workload volume on an annual basis, based on a fixed, ex ante unit cost. Ofgem uses volume drivers to encourage network companies to deliver projects efficiently where there is considerable uncertainty in workloads, but where the cost of the work has limited variability. For example, a volume driver is proposed in RIIO-GD2 for the relatively small workload of Tier 2A mains due to the volume uncertainty stemming from changing risk scores.

Under a volume driver, allowance adjustments could be made on an annual basis, rather than at the end of the price control. While this has potential to return money to consumers sooner if workload volume is lower than expected, it may also result in increased bill variability. No penalties or rewards would be imposed for deviating from a workload target as a volume driver does not specify a target level of replacement.

The volume driver scores below Option 2 (PCD with target and deadband) on both assessment categories.

3.6.1. Assessment

Our assessment of utilising a volume driver as the primary incentive is summarised in Table 3.6 below. This policy would remove workload uncertainties, but the lack of a workload target may potentially risk workload delivery significantly below the efficient level, as companies are not held accountable to delivering a specific workload. In addition, and similar to the NARM option, the interaction with the Tier 1 mains PCD may incentivise GDNs to allocate more shared or indirect costs to services as there is no workload cap. The determination of more accurate unit costs may be necessary, which could have result in significant transition costs and potentially alter the reporting structure beyond the annual reporting requirements that would need to be introduced under this policy.

Table 3.6: Assessment of volume driver policy assessment

| Criteria | Score (1-5) | Justification |
|-------------------------------------|-------------|---|
| Primary criteria | | |
| Delivery of repex objectives | 3 | As there is no target set, this policy creates a risk that service replacement workload delivery may be significantly below the efficient level. However, the policy for Tier 1 mains may indirectly drive GDNs toward meeting the steel services objective. |
| Cost efficiency | 5 | If unit costs are set correctly, a volume driver would encourage companies to undertake replacement activities in the most cost-effective way, as they would be able to retain any difference between unit cost allowance and actual cost incurred from undertaking the activity. |
| Addresses uncertainties | 4 | This policy addresses volume uncertainties as companies will be compensated for actual workload based on a stable unit cost. As with the other options, the use of stable unit costs does not provide flexibility to manage uncertainties. Unless more granular reporting requirements are introduced, we do not anticipate this policy to uncover improved cost data. |
| Secondary criteria | | |
| Minimises complexity | 4 | As a concept, a volume driver is simple to understand and is used elsewhere in the price control. The policy is also straightforward to explain to stakeholders. The reliance on unit cost accuracy means a singular unit cost for service replacements may not be sufficient. Ofgem and the GDNs may need to agree on more precise, disaggregated synthetic unit costs, and potentially |

| Criteria | Score (1-5) | Justification |
|--------------------------------------|-------------|---|
| | | standardise cost allocation methodologies. This could result in considerable transition costs and potentially alter the reporting structure beyond the additional annual requirements. |
| Consistency | 3 | <p>A volume driver is consistent with the proposed policy for Tier 2A mains replacement, but not with Tier 1 mains. However, it remains straightforward to combine with the proposed Tier 1 mains policy.</p> <p>Volume drivers tend to be used where there is uncertainty around a low volume of expected workload; Tier 1 services are not consistent with these types of activities.</p> |
| Minimises perverse incentives | 3 | <p>If a volume driver were taken forward, services would only impact the selection of mains replacement insofar as companies could make a better return on one project over another based on service unit costs. Therefore, the effectiveness of a volume driver policy relies on unit cost accuracy.</p> <p>A singular, overarching unit cost for service replacement would unduly benefit those companies that allocate a smaller amount of shared or indirect costs to service replacements.</p> <p>Additionally, the volume driver, which has no workload requirements, will be working in tandem with the Tier 1 mains PCD. This may influence the workload profile. For instance, if a GDN's actual unit cost for service replacement is significantly lower than the unit cost used to calculate the allowance, perhaps due to cost allocation methodologies, the GDN may be incentivised to target mains replacement projects with a higher number of services per kilometre, with less regard to economic efficiency. However, the increased costs associated with high-density replacements may neutralise this incentive. Despite this possibility, it is unclear to what extent services impact Tier 1 workloads.</p> |

4. CONCLUSIONS AND RECOMMENDED OPTION

Chapter summary

Our assessment of four policy options highlights the pros and cons of each, in light of the key issues that Ofgem is trying to address. Option 2 (a PCD target for workloads with a deadband) is the highest scoring approach in our assessment.

If this approach is taken forward by Ofgem, we recommend the following areas be considered in more detail:

- The appropriate size of the deadband, informed by historic levels of uncertainty and different policy framework.
- Whether under-delivery should be penalised, or if the reputational incentive is sufficient to ensure workload delivery.
- Whether approaches to reduce potential perverse incentives are necessary, such as more granular reporting standards or consistent cost allocation methodologies.
- The best method of managing cost uncertainty, which historically appears to impact variations in repex.
- The ring-fencing of service delivery within the NARM to avoid the creation of conflicting incentives.

The principal need for a specific policy for repex services, as opposed to taking the same approach as is being planned for Tier 1 mains, is that GDNs face a relatively higher level of uncertainty with regards to services. This is primarily because:

- GDNs are unable to determine the specific areas that will be targeted for replacement;
- the fact that some services need to be replaced separately from the mains (e.g. relays after escapes); and
- service records in some areas are not complete.

Our assessment of four policy options highlights the strengths and weaknesses of the different approaches proposed based on the nature of the options as well as our understanding of the key issues that Ofgem is trying to address through these options. The scoring has been based on a qualitative assessment of the different policy options against the evaluation criteria, with scores intended to provide an illustrative quantitative comparison.

Option 2, **a PCD target for workloads with a deadband, is the highest scoring approach in our assessment** under both primary and secondary criteria. In this option, companies will be set a target, but will be able to recover costs related to over-delivery up to the limit of the deadband, but not beyond it. For under-delivery, companies would only be allocated funding for the work delivered. Allowances will need to be clawed back at close-out if workload delivery is below the level of the ex-ante allowance. This policy therefore has an upper limit on expenditure, but no lower limit, making it similar in nature to a volume driver (below the upper limit). However, the use of a target and deadband will work as a reputational incentive; should companies deliver service workloads within the deadband, they will be deemed to have achieved their target. This also reflects the health and safety importance of service pipe replacement. Finally, the use of a PCD relative to a volume driver retains consistency with Ofgem's proposed approach for Tier 1 mains.

This policy provides the most suitable balance between meeting the key assessment criteria above, particularly in relation to addressing the repex objectives while also dealing with some of the uncertainties associated with service workloads. A funded deadband, rather than a tolerance band, will be most suitable for addressing these perceived uncertainties.

Should this approach be pursued by Ofgem, the following areas will need to be considered in further detail:

- **Size of deadband:** Specifically, it will be important for Ofgem to consider the size of the deadband that it feels is reasonable to accept to account for the level of uncertainty being experienced by companies. Based on our analysis of RIIO-GD1, workload capacities did not vary by more than 20% for any companies, though it will be important to consider whether a deadband of this size is warranted. For example, Ofgem may consider aligning the magnitude of the deadband with that being used for the different diameter bands for Tier 1 mains, which at the time of writing had yet to be determined.
- **Inclusion of financial penalty for under-delivery to support the reputational incentive:** The rationale for including a penalty for under-delivery would be to provide a stronger incentive on companies to attain

their targets. Such a penalty may be justified, as the inclusion of a deadband is designed to address volume uncertainties. However, given the other incentives placed on company repex programmes (including HSE statutory policy and the PCD targets for mains), a penalty may not be needed to discourage under-delivery for services. In addition, this approach would not align with the proposed policy for Tier 1 mains, as companies will not have to pay additional penalties for under-delivering on their PCD targets.¹⁵

- **Minimising perverse incentives created by deadband:** As outlined in the assessment of the PCD with funded deadband option, companies could be encouraged to aim for the upper end of their deadband threshold in order to increase their allowances. In addition, the current approach to cost allocation between mains and services varies by company, and as a result there could be scope for companies to allocate costs in a way that benefits them most under the regulatory framework. In this context, this issue may arise if companies believe they will not receive allowances as part of their Tier 1 mains allowance, and instead may allocate more costs to their services allowances to enable them to recover more costs if they are unlikely to reach the upper limit of their services target. To overcome this issue, Ofgem may need to ensure that companies follow consistent approaches to allocating costs through suggesting more granular reporting of costs, or imposing industry-wide standards for sharing costs between mains and services.
- **Cost uncertainty:** While volume uncertainties are reduced through this option, it does not overcome the issue of cost uncertainty. Generally, cost uncertainty is inherent in the price control. Although steps can be taken to reduce this, for example by setting unit costs at a more granular level, none of the policy options put forward for consideration will alone be able to address cost uncertainty.
- **Ring-fencing services in the NARM:** Given that the PCD is likely to act as the primary mechanism for ensuring companies deliver their services, Ofgem may need to consider ring-fencing services within the NARM to avoid creating conflicting incentives for companies, as outlined in Section 3.5. As part of its next steps in the price control, Ofgem is considering how ring-fencing in the NARM will take place, and this will be relevant for how repex services are reported on as part of the NARM.

Going forward, the main priority for Ofgem will be to determine whether the deadband approach is most aligned with their thinking for repex services, and further consider the key aspects outlined above.

¹⁵ We are aware that companies could be indirectly penalised for missing their commitments under Tiers 2B and 3, given that under-delivery within the NARM could result in companies being additionally penalised. However, we believe closer alignment with the treatment of Tier 1 mains would appear more relevant in this regard.



UK

Queens House

55-56 Lincoln's Inn Fields

London WC2A 3LJ

T. +44 (0)20 7269 0210

E. info@cepa.co.uk

www.cepa.co.uk



cepa-ltd



@cepald

Australia

Level 20, Tower 2 Darling Park

201 Sussex St

Sydney NSW2000

T. +61 2 9006 1307

E. info@cepa.net.au

www.cepa.net.au