

Energy Licence Modification 2026 Appeal: SGN reply to GEMA Response

- (1) This document sets out Southern Gas Networks plc and Scotland Gas Networks plc (together “SGN”) reply to GEMA’s response to SGN’s Notice of Appeal (“NoA”) dated 23 April 2026 (“Response”). Defined terms used in this reply have the meanings given in the NoA and the Response, unless otherwise indicated. SGN has limited its reply to the 10-page limit set by the CMA and reserves its position in relation to any points in GEMA’s Response which are not addressed in this reply. This includes in relation to material which has been redacted and underlying evidence and analysis which has not been provided.

1. Introduction

- (2) Grounds 1(a) and (b) of SGN’s NoA concern the workload assumptions GEMA applies to determine its modelled allowances. Those workloads are misaligned with the operational and engineering reality facing SGN today and the actual workloads that it must deliver in GD3 under its licence. GEMA’s adjustment to Tier 1 repex forecasts assumes a delivered capacity below that considered safe for SGN’s network, and its CSV weightings are inconsistent with the workloads approved by GEMA’s engineers.
- (3) As regards **Ground 1(a)**, SGN is surprised that GEMA now cites concerns about SGN’s Tier 1 repex forecasts to justify overwriting them (Response §196). This was not raised in the Final Determination (“FD”) or with SGN during the GD3 process, despite “*extensive consultation*” that GEMA describes post-Draft Determination (Response §217). In its Response, GEMA has raised a single piece of new quantitative evidence (GD2 forecast/actual delivery of Tier 1 workload mix) to support its intervention (Response §164). However, GEMA’s analysis appears to contain errors, and (once corrected) it shows that SGN’s GD2 forecast accuracy was comparable to that of WWU. GEMA has also accepted that its RCAF analysis was incorrectly calculated at FD (CM Annex 1) – but ignores the updated analysis which confirms both (i) that SGN’s forecasts are highly robust and (ii) that WWU’s should not be considered a reliable proxy for SGN’s network.¹ Ultimately, SGN’s forecast is both appropriate for its network and operationally feasible; GEMA’s alternative is not. This lies at the heart of SGN’s appeal and GEMA does not adequately engage with that engineering reality in its Response.
- (4) As regards **Ground 1(b)**, GEMA’s Response misunderstands or ignores the core issue which SGN has raised in its NoA: GEMA approves GDNs’ workloads that are set in licence outputs, but then fails to reflect them in the CSV weightings which it applies in its cost modelling. This inconsistency leaves SGN accountable for work which it is not funded to deliver in GD3. GEMA claims that its weightings approach, and the alternative which SGN proposes, differ only in trivial respects (Response §230). This is a significant mischaracterisation. Crucially, SGN’s proposed alternative removes the inconsistency, and therefore remedies the central flaw, in GEMA’s approach.

2. Legal framework

- (5) GEMA criticises the framing of legal errors in the NoA. SGN reserves its position on those points, but notes the following.²
- (6) First, GEMA relies heavily on the process it followed to defend its decisions. As recognised by the Competition Appeal Tribunal in *Spreadex Limited v CMA*, errors of law and irrationality can relate to both process irrationality and outcome irrationality. As regards process irrationality, the “*process of reasoning should contain no logical error or critical gap... a decision that “does not add up” is one where there is an error of reasoning which robs the decision of logic*” (§49-51). GEMA asserts wide discretion to insulate

¹ The ‘RCAF’ refers to the ratio of volume (m3) of mains lay:volume (m3) of mains abandoned for Tier 1 mains, i.e. the rate of change of capacity across the network (with a lower RCAF meaning more capacity is being taken off the network). In the FD, GEMA states the analysis is “*designed to check whether the forecast data in company plans is consistent with observed historical relationships across the industry. In principle, we would expect these relationships to be broadly stable over time. A significant increase or decrease in the ratio between these capacities implies a relative growth or decline in overall network capacity.*” (FD GD Annex §5.318 – 5.324)

² Additionally, please see paragraphs 53 to 57 of the Joint Response on OE.

individual errors of reasoning as immaterial to the final decision. However, an error in part of GEMA's reasoning is sufficient to vitiate the ultimate decision.

- (7) Second, GEMA characterises SGN's submission on the "*materially better*" approach as an attempt to create a standalone ground of appeal (Response §30). This is not in dispute. It is clear from SGN's NoA (e.g. §6.7.4) that the "materially better" test is raised in the context of the cited grounds of appeal, not as a standalone ground.

3. Ground 1A: Tier 1 repex forecasts

- (8) While GEMA raises new arguments and evidence in its Response, SGN maintains that GEMA had no reasonable basis for overwriting SGN's decommission-to-lay workload assumption (the "**banding mix**") or for concluding that WWU's forecast methodology was a reliable proxy for the workload banding mix that SGN is funded to deliver in GD3.

3.1. GEMA's Response does not establish that SGN's Tier 1 repex forecasts lack credibility

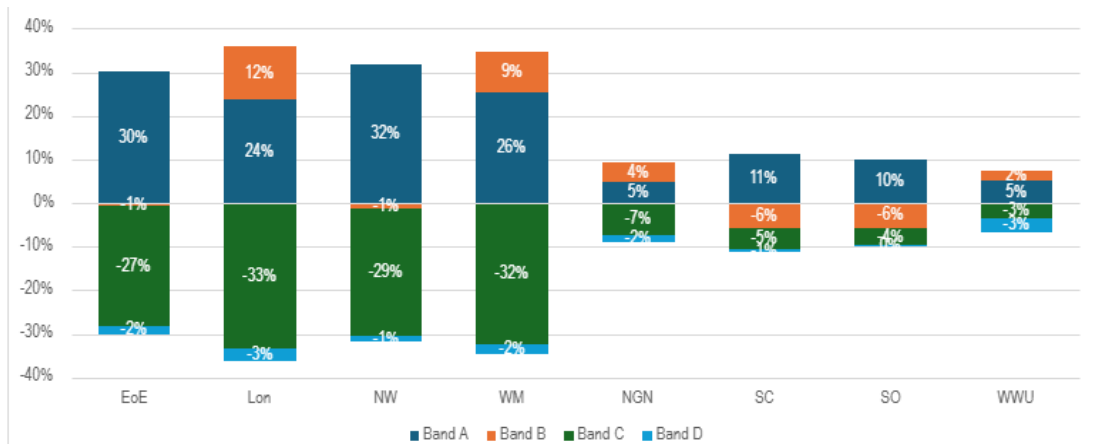
- (9) As a preliminary observation, SGN considers that no fair reading of the FD would support the proposition that a material part of GEMA's reasoning was that SGN's data was "*not of sufficient quality to support robust economic benchmarking*" (First Witness Statement of Callum Mayfield ("**CM**") §204). No specific issues with SGN's Tier 1 repex forecasts were identified in the FD — which expressly called out Cadent and NGN (FD GD Annex §5.321 and §5.324) — or in any communication between GEMA and SGN prior to the FD.
- (10) SGN put forward a robust and efficient forecast workload banding mix for GD3, derived from 10.5 years and thousands of kilometres of asset-level historical information based on actual, optimised project delivery.³ This detailed data set informed the proportion of each band that would be commissioned and included an embedded assumption that 90.3% (Southern) and 88.9% (Scotland) of this work would be delivered via the insertion technique. SGN's submitted GD3 forecast reflected: (i) the most efficient lay-to-abandonment ratio in the sector (0.967 Scotland / 0.983 Southern, with other networks forecasting bluntly at 1.0); (ii) the most efficient insertion-to-open-cut ratio in the sector (9.7% Southern / 11.1% Scotland open cut); and (iii) an RCAV that shows SGN's forecast capacity to be most closely aligned with its historical averages, meaning SGN is the only GDN aligned with GEMA expectations in this regard (FD GD Annex §5.323-5.324). These are highly relevant factors that should have given GEMA confidence in SGN's forecasts and demonstrated that SGN was not a GDN which "*appeared to be overstating [its] repex banding forecasts*" (Response §164).

3.1.1. New (post FD) evidence cited by GEMA

- (11) In the Response, GEMA has referred to the following new evidence and arguments (Response §196):
- (a) **GD2 Tier 1 data forecast/actual:** GEMA's assessment of the variance between forecast and actual GD2 Tier 1 data is used to support its claim that SGN overstated its GD3 workload banding mix (Response §196.1, CM Figure 9). This is flawed for three reasons. First, SGN has been unable to replicate GEMA's results and considers there to be an error in GEMA's analysis. Using the data GEMA has made available, SGN calculates its GD2 forecast vs actual to be broadly comparable with NGN and WWU.

³ Since the start of GD1 to the submission point of the 23/24 year, SGN has delivered 2,295km of Tier 1 repex in Scotland and 6,418km in Southern. This gives a historical data set of over 120,000 observations across both networks. In GD3, SGN plans to deliver 3,144km in Southern and 1,089km in Scotland of Tier 1 repex.

Figure 1: Corrected Figure 9 (Difference in GD2 Forecasted and actual Tier 1 repex Diameter Band) Volumes



Second, there are legitimate reasons why SGN's Tier 1 GD2 forecasts differed from actuals, including the impact of COVID on working practices, and challenges in repex delivery in the first half of the GD2 price control period (DH §22-25), all of which have been well documented through annual reports, the business plan and other documents. Third, as noted in paragraph (10), SGN has provided a detailed GD3 forecast, which should give GEMA confidence that its forecasts are robust.

- (b) **SGN's use of "historical data" to inform Tier 1 repex forecasts:** GEMA is wrong to criticise SGN's forecasting approach on the basis that it is based on historical data rather than a detailed modelling approach (Response §196.3). Forecasts based on a large, robust data set of delivered and optimised projects are highly accurate. SGN's process is also highly efficient as it reduces costs arising from unnecessary duplication when plans are (invariably) revised later in the process.⁴ SGN's forecasting approach is both consistent with GEMA's broader modelling approach (e.g., FD GD Annex §5.261 and §5.318) and is supported by statements in the Response confirming that historical data is well-suited to repex forecasting.⁵ There is no reason to expect a forecast based on an alternative detailed modelling approach will provide a more accurate forecast relative to a forecast based on a granular historical dataset.
- (c) **SQ Data errors:** GEMA inappropriately criticises SGN's Tier 1 repex forecasts on the basis of immaterial data errors in an SQ Response (Response §196.2). It is important to provide context to this claim. These 'errors' were outside of the BPDTs and contained in a response to an SQ

[REDACTED]

[REDACTED] The approach taken and difficulty in disaggregating the data into the template was made clear to GEMA at the time, and no concerns were raised. The issue arose from three spreadsheet formula errors – which were corrected immediately – and cannot reasonably be used to suggest that the source forecast data (from which this granular data was

[REDACTED]

⁵ For example, GEMA notes that the Tier 1 repex cost driver uses historical data because "[t]his allows for a long (since the start of RIIO-GD1) and consistent dataset to be used in the RIIO-GD3 modelling" (CM §100), and that repex involves "a high level of commonality, repeatability and comparability" (Response §172.4).

derived) was not robust. In any event, Mayfield confirms the errors “*did not drive our decision to normalise Tier 1 workloads at FDs*” (CM §185).

- (d) **The role of complexity:** GEMA is wrong to overwrite SGN Tier 1 repex forecasts on the basis that its approach is logically inconsistent with increasing “complexity” (Response §196.4, CM §235(v)). Throughout GD3,⁶ SGN has submitted that complexity factors primarily impact the time to deliver workloads rather than the technique or workload banding mix. GEMA therefore fundamentally misunderstands the role of complexity — it has limited impact on workload volumes or technique but a significant impact on unit costs (i.e. cost per km of main) (which is not subject to this appeal). Complexity is already factored into unit cost forecasts, and incorporating it into technique risks double-counting. GEMA’s statements that complexity drives a change in technique⁷ are not supported by evidence submitted by SGN during the GD3 process or GEMA’s own statements in the FD (e.g., FD §5.306).⁸

3.2. GEMA has not demonstrated that WWU’s methodology is a “reliable proxy”

- (12) GEMA has not established that WWU’s methodology — prepared for WWU’s own network and its own specific network characteristics — provides an appropriate basis for forecasting the Tier 1 workloads that **SGN** is required to deliver in GD3. Given the failure to provide SGN’s network with adequate capacity, it plainly cannot be considered a “reliable proxy” for forecasting SGN’s workloads.

3.2.1. Quantitative evidence cited by GEMA

- (13) GEMA has introduced two pieces of quantitative data which do not support its conclusion that WWU’s methodology is a reliable proxy for industry standards and therefore suitable for overwriting SGN’s workloads.
- (14) First, GEMA states that WWU’s RIIO-GD2 Tier 1 repex forecasts demonstrated “*strong historical accuracy*”, giving it confidence in WWU’s forecasting methods (FD §5.326, CM §243(i)). As noted in paragraph 11(a), SGN has identified an error in GEMA’s calculations. While SGN does not consider this evidence to be a sufficient basis for drawing appropriate conclusions about GD3 forecasts, once corrected, it is clear that the data does not support a finding that WWU’s forecasts are materially more robust than SGN’s.
- (15) Second, GEMA utilised the RCAV (see fn 4) at FD to identify issues with NGN and Cadent Tier 1 repex forecasts.⁹ SGN identified an error in the RCAV data, and GEMA has now accepted that its analysis was factually wrong. The corrected dataset shows that SGN’s RCAV (alone) remains “broadly stable” (+4.5% Scotland / +6% Southern) compared with WWU’s higher RCAV of +37% (an increase from +14.7% at FD) (CM Table 21). This is highly material. At FD, GEMA used this analysis to form the conclusion that

⁷ For example, see CM §192 “*elements of the repex synthetic cost driver act as partial proxies for complexity... the forecast open cut-insertion ratio*” and VT §16 “*increasingly complex workloads over time could drive higher usage of open-cut technique*”

⁸ In particular GEMA stated “We are concerned that applying an approach that only considers one source of complexity may lead to unbalanced outcomes within the benchmarking, and therefore we have not decided to adopt WWU’s proposal in our Final Determinations” and “We also think the decision to open cut is not fully outside of management control, with GDNs having some scope to choose the technique they use to deliver repex projects. Combined with the concerns we have over the robustness and comparability of some of the Tier 1 mains forecasts (which we explain in more detail below), we do not consider that open cut meets all the criteria for a good driver within the benchmark model.”

⁹ SGN also notes that it is unclear from GEMA’s response whether the RCAV was also used to consider WWU is a reliable proxy for industry standards. The Response states the “*RCAV was a separate piece of analysis*” and “*WWU’s RCAV figure was not a reason why GEMA considered WWU’s assumptions to be appropriate for adoption across the industry*” (Response §186.2). However, CM (§243(ii)) states that “*We considered WWU’s assumptions to be suitable for use as an industry standard because... WWU’s historical delivery had shown a consistent relationship between the capacity of the mains being commissioned and decommissioned. This was demonstrated by the ratio of commissioned to abandoned volumes (‘RCAV’) analysis we undertook*”.

Cadent's (c.+24-29%) and NGN's (+44%) forecasts were unacceptable and should be adjusted. However, using the same test and data, it is inconsistent for GEMA to conclude that WWU's forecast workload banding mix (with an RCAV of +37%) is a reliable proxy for SGN.

- (16) GEMA Response has obfuscated the RCAV issue, claiming that SGN's analysis is flawed and downplaying the results (Response §186.1, CM Annex 1 §18) while also confirming it is accurate (CM Annex 1). While GEMA has included the corrected RCAV figures in CM Annex 1 (see Table 21) it continues to refer to the uncorrected figures elsewhere (e.g., CM §180, §272, Figure 10). GEMA has also attempted to recast its RCAV analysis based on technique split (which is ex-post evidence not relevant to the FD decision) (CM §273-286, Response §212), but this is circular (merely showing that once normalisation is applied to technique, GDNs have similar RCAV at the technique level).

3.2.2. GEMA's claim that WWU's methodology is "highly detailed" should not lead to a conclusion that it is a "reliable proxy" for SGN

- (17) GEMA states that WWU forecasting approach was "*most granular... [and] split by technique, allowing for insertion and open cut workloads to be calculated separately*" (CM §195.3). However, it is unclear on what basis GEMA has reached this conclusion or why it considered the granularity to mean it was a reliable proxy for SGN.

3.2.3. GEMA does not adequately address detailed engineering evidence presented by SGN

- (18) GEMA fails to engage substantively with SGN's engineering evidence which demonstrates the unacceptable supply risks arising from applying WWU's methodology. GEMA raises two principal points in its Response.
- (19) First, GEMA states that the RCAV analysis "*[indicates] any implied greater reduction in network capacity than SGN had intended for RIIO-GD3 is a product of SGN's lower reported 'open cut' forecast*" (Response §212). This is without merit. SGN's network modelling was based on its historical technique split (i.e. 9.7% and 11.1% open cut for Southern and Scotland, respectively) (see JD1/1/009, Fn 5). As such, network capacity challenges are likely to be **more** acute if the lower open cut figures are utilised.
- (20) Second, GEMA states that "*the question of whether use of a proxy would ignore operational requirements within SGN's network... [is a] matter of regulatory judgement and evaluation*" (Response §184) and that SGN is conflating benchmarking with engineering design decisions (First Witness Statement of Victor Tuffen ("**VT**") §22.2). The workload banding mix assumed by GEMA directly determines funding - so the assumed mix must be operationally feasible for a given network. Assuming a workload banding mix that would (if delivered) cause a GDN to breach its licence conditions implies that GDNs are not funded to meet their licence conditions. This is irrespective of whether GDNs can change the workload banding mix they actually deliver – which is handled by other aspects of the framework (i.e. PCDs and NARM). There is also no evidence that GEMA undertook any analysis, network testing, or cross-checks to confirm whether applying WWU's workload banding mix would be compatible with SGN's network. Any suggestion that this falls within the bounds of regulatory discretion is manifestly wrong.

3.3. GEMA misrepresents or misunderstands key facts and evidence relevant to the Appeal

- (21) In its Response, GEMA misunderstands or misrepresents a number of key points raised in the NoA:
- (a) **GEMA's "mix and match" approach of applying WWU's workload banding mix with each GDN's technique assumption fails to recognise the link between technique and banding mix for SGN.** GEMA frames its approach as targeted and well-specified (Response §172.2, §192). The engineering reality is the approach bluntly overrides SGN's forecast required workloads and ignores the implications of SGN's approach to insertion. SGN is forecasting the highest levels of insertion in the sector - reflecting the fact that insertion is more efficient for its network. To achieve this high insertion rate, SGN undertakes a higher proportion of "tight-fit

insertion”¹⁰ – it is this which enables SGN to deliver the required capacity, while maximising the use of insertion. In comparison, WWU uses less ‘tight-fit’ insertion (JD1, Table 6) *and* does less insertion overall than SGN – in effect, WWU meets its capacity needs by doing more open cut rather than “tight fit” insertion. Put simply, when WWU does insertion, it lays smaller mains on average. This means that, all things being equal, there are Tier 1 repex workloads where SGN and WWU will decommission and commission the exact same diameter band of main, but use different techniques to lay the main — SGN opting for ‘tight-fit’ insertion and WWU opting for open cut. Due to these differing approaches, applying WWU’s workload banding mix to SGN’s technique split assumes that SGN will install smaller mains than is operationally required. This systematically understates the capacity SGN needs to achieve through insertion (if SGN is to deliver its high insertion ratio). Accordingly, while GEMA recognises there is a link between SGN’s technique and its banding mix (VT §20), it has failed to appreciate the true impact of its overwriting adjustment.

- (b) **SGN’s BPDT submissions adhered to the Data Assurance Guidance (“DAG”) process.** GEMA suggests that SGN’s BPDT submissions were inaccurate (Response §210, CM §231). SGN’s Tier 1 repex forecasts in the BPDT were developed using a 10.5-year dataset (see above), which embedded the 9.7% (Southern) and 11.1% (Scotland) open cut figures and were prepared in full compliance with DAG.¹¹ The 4.2% (Scotland) and 6.3% (Southern) open cut figures set out in ‘specification lines’ of the BPDT were calculated using a more recent time series (GD2 actuals from Apr 2021-Mar 2024 (DB1 Figure 1)). GEMA’s novel workload overwriting adjustment was not consulted on prior to FD, but placed central reliance on the lower open cut figure included in SGN’s ‘specification lines’. It is this adjustment that has produced unnecessary distortions to Tier 1 repex forecasts that materially underfunds SGN (DH1 §86).
- (c) **GEMA downplays the impact that its assumed repex workloads have on allowances,** which it notes will “*skew the repex synthetic cost driver in GEMA’s price control model and distort efficiency comparisons*” (Response §171). However, the more straightforward issue is that a lower repex synthetic cost driver leads directly to lower allowances, and vice versa (FE Figure 5 and Figure 10). As a result, if SGN’s post-adjustment Tier 1 repex workloads are arbitrarily too low, its allowances will be arbitrarily too low. Any impact on “*efficiency comparisons*” (i.e. efficiency scores) or regression parameters of reinstating SGN’s workloads is likely to be second-order.
- (d) **SGN consistently advocated for GEMA to resolve the overstating of Tier 1 repex forecasts and suggested a range of options, none of which were comparable to the approach taken at FD:** SGN proactively identified issues around GDN Tier 1 repex forecasts as far back as GD2 to GEMA, and suggested a range of remedies in March 2025 and DDR in the spirit of finding a pragmatic means of resolving the Tier 1 repex forecasting issues. GEMA states that SGN “*supported a normalisation in principle*” (Response §187.1) because it supported an approach to adjust GDNs’ Tier 1 repex volumes using “*a single level of design efficiency based on historical averages [...] applied consistently to all networks*” (SGN1_018 §562). This is a complete mischaracterisation of SGN’s approach, which (a) did not contemplate applying one GDN’s assumptions to another; (b) relied on historical data; and (c) did not de-link banding mix and technique, as the two elements together constitute design efficiency. In particular, SGN did not

¹⁰ “Tight fit insertion” refers to inserting mains closer in size to the decommissioned mains than their narrower alternatives (this is the large-diameter insertion indicated by the blue shaded boxes in JD1 Tables 4 and 5).

¹¹ SGN recognises the importance of providing accurate information that can be relied on within the business plan review and cost assessment. SGN considered the Impact Matrix (table 2.1 DAG guidance) and Probability Metric (table 2.2 DAG guidance) which form the impact-probability risk matrix (Figure 2.2, DAG guidance) when preparing its BPDT submission to assign risk ratings to the relevant submitted data.

support any “normalisation” that would have resulted in any GDN having a workload assumption that delivered too little capacity for its network.

4. Ground 1B: CSV weights

(22) In its Response, GEMA frames its approach to CSV weights as a matter of regulatory judgement, citing advantages and disadvantages of different approaches and asserting that SGN offers a similar alternative rather than a materially better one (Response §219, §230-233). However, the Response fails to grapple with the core issue: the inconsistency between approving workloads as part of its engineering assessment while failing to reflect those workloads in its CSV weighting, thereby underfunding SGN to deliver the work required under its licence.¹²

4.1. GEMA’s Response misunderstands or ignores the inconsistency error identified by SGN

(23) GEMA’s cost assessment approach (and price control framework for GDNs) is structured around workload volumes. GEMA collects extensive workload data, cost drivers are expressed as workloads, outputs are measured by workload delivery (and set out in the licence) and in some cases (replex Tier 1 mains), HSE requirements mandate the delivery of decommissioning workloads. GEMA also undertakes extensive engineering assessments to confirm that proposed activity levels are appropriate, i.e. as GEMA itself states (Response §237, CM §37), workloads are “approved” and “validated” prior to benchmarking.¹³ These “approved” or “validated” workloads vary across GDNs and over time. Despite this, GEMA’s approach to combining cost drivers into the CSV fails to reflect these differences.

(24) GEMA’s Response either misunderstands or ignores this inconsistency:

(a) GEMA justifies its approach on the basis that there is “*enough comparability in cost structures between GDNs*” (Response §226), but refers to the **industry** cost structure to justify this statement. In fact, there are material differences in cost structure between GDNs (NOA §6.4.2) – as demonstrated in the evidence submitted by SGN, which GEMA has not addressed.

(b) GEMA claims that the “*notional efficient licensee will not... necessarily reflect the particular characteristics or attributes of any particular given GDN*” (Response §230) – but SGN is not arguing that GEMA must capture all company-specific characteristics. Rather, because GEMA pre-assesses the workloads to be delivered (before benchmarking) and then holds companies to those workloads (after benchmarking), the design of the notional company against which GDNs are benchmarked should be consistent with the GEMA approved workloads.

(c) GEMA’s statements that regional, company specific and workload differences are captured through pre-modelling adjustments and the cost drivers themselves (Response §226) misses the point that accepted workloads (i.e. after the adjustment) are then subsequently distorted through the top-down CSV weights approach applied by GEMA to the cost drivers.

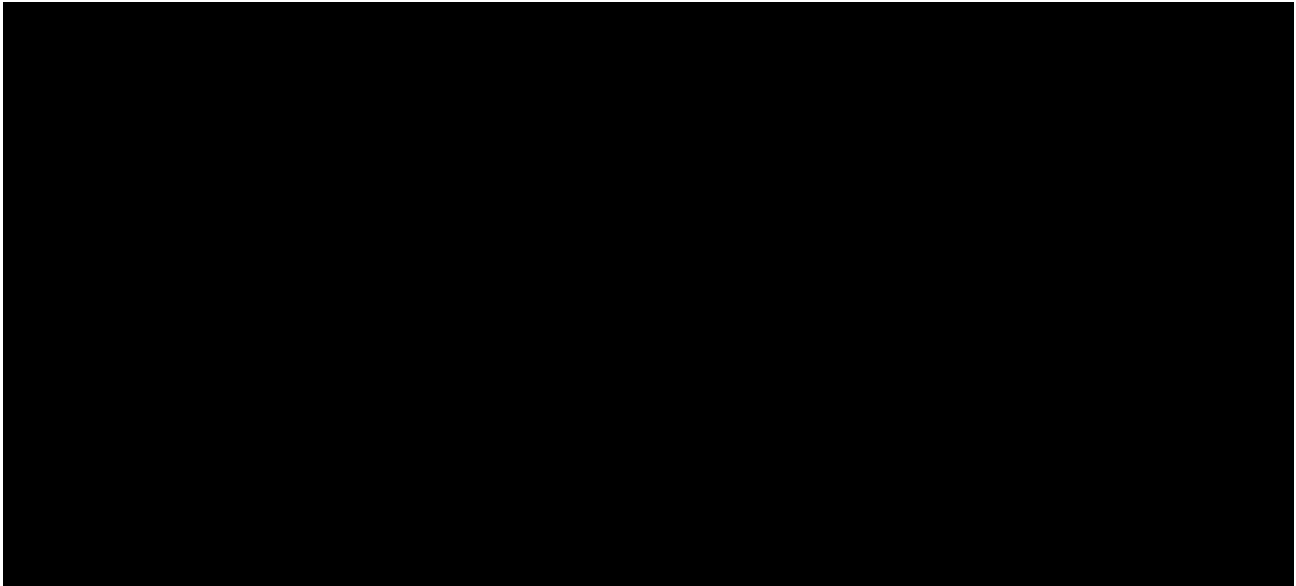
(25) Frontier’s Totex Report demonstrates the resulting distortion using a worked example, which GEMA criticises for being “theoretical” since it assumed constant unit costs across GDNs (Response §243.5). This misunderstands the purpose of the analysis: to demonstrate how GEMA’s top-down CSV leads equally efficient GDNs (on unit costs) to be deemed more or less efficient depending on their workloads necessarily required an illustration which held other factors constant.

(26) Nevertheless, the same distortion can be shown using GEMA’s actual data. Figure 2 shows how, using GEMA’s data, changes in approved workloads affect GEMA’s regression results under GEMA’s “top-

¹² For example, pursuant to Price Control Deliverables (PCDs) and the Network Asset Risk Metric mechanism. See JD1 §27.

¹³ GEMA’s response states that the costs of these workloads are not determined by GEMA as part of the engineering assessment (Response §237). SGN agrees (and indeed have not argued that the costs were pre-determined, as GEMA suggests). The key point is that the volume of work each company is expected to undertake is determined prior to the construction of the CSV cost driver for the benchmarking exercise.

down” (red line) and SGN’s “bottom-up” (green line) approaches. Results are shown in Figure 2 below for SGN Southern, but the conclusions hold (and can be provided) for all GDNs — the results reflect a structural feature of the CSV weighting methodologies and are not GDN-specific.



- (27) In Figure 2 above, (a) Movement along the x-axis shows the effect of increasing (moving to the right) or decreasing (moving to the left) the “approved” repex workloads for SGN Southern. The effect is to increase / decrease the share of repex workload within totex. For the test to be meaningful, only workloads are varied (unit costs are held constant); and (b) The y-axis shows the efficiency score for SGN Southern resulting from GEMA’s model. A higher efficiency score is ‘worse’, representing greater inefficiency (as assessed by the model), while a lower score is ‘better’, representing greater efficiency (as assessed by the model).
- (28) Figure 2 shows that GEMA’s top-down CSV weighting methodology (the red line) generates a curved relationship between efficiency scores and repex workloads. There is a single cost mix (i.e. level of workload) which generates the ‘best’ (i.e. lowest) efficiency score. If the repex workloads of the GDN vary from that minimum point (i.e. moving to the right or left on the x-axis), the efficiency score arising from GEMA’s totex model deteriorates exponentially. This happens despite the fact that the GDN’s unit costs do not change – the sole change shown is the repex workloads.
- (29) The figure demonstrates, using ‘real’ data, that GEMA’s top-down CSV approach fails to reflect its own workload-based approach. If GEMA approved one of the GDNs to do more repex workload, that GDN would automatically receive an exponentially worse efficiency score under the top-down CSV – i.e. GDNs are increasingly penalised the more their “approved” workloads drive deviations from a particular cost share. GEMA’s method therefore means that GDN-specific workload requirements — and any other drivers of legitimate GDN-specific cost shares — create arbitrary outcomes. This cannot be appropriate in a price control context (and a benchmarking modelling approach) which is heavily ‘workload based’.
- (30) By contrast, in SGN’s proposed “bottom up” approach (the green line), it is clear that the ‘u-shaped’ distortion is not present. GDNs efficiency scores still vary with workloads (due to differences in relative cost efficiency) but GDNs are not exponentially penalised since there is no U-shape. In other words, the bottom-up approach avoids disproportionately penalising GDNs for differences in workloads, while still reflecting variations in unit cost efficiency which the model is intended to capture.
- (31) This demonstrates the fundamental difference between GEMA’s top-down and SGN’s “bottom-up” CSV weighting approaches. GEMA’s Response seeks to paint the two methodologies as only trivially different (Response §230) — but, as the above figure demonstrates, the two methods have fundamentally different properties in their treatment of workload variations.

4.2. GEMA mischaracterises the similarities and differences between the two approaches

(32) GEMA's Response states it preferred the top-down CSV approach over the bottom-up approach because of its simplicity and transparency, statistical robustness, and similarities between the approaches (Response §243). SGN acknowledges there are some similarities, however, as also shown in Table 2 below, the key difference between the approaches (which GEMA fails to address) is the fundamentally different way in which they treat workloads. None of GEMA's Response engages with this fundamental error which SGN identified.

Table 2 - Comparison of the bottom-up (BU) and top-down (TD) approaches

Does the approach...	BU	TD	
...reflect a notional company for assessing efficient costs?	✓	✓	Both approaches involve defining a notionally efficient company (TD uses average workloads; BU uses GDN workloads and a notional unit cost).
...provide transparency, simplicity and ease of implementation?	✓	✓	Both approaches are transparent and easy to implement (given they rely on similar input data).
...have regulatory precedent?	✓	✓	Both approaches have precedent of use by GEMA (BU used in ED2; TD used in GD2 and ED2; both proposed for ED3)
...produce statistically robust results?	✓	✓	Both approaches pass all relevant statistical tests, including high adjusted R-squared values (TD=0.915; BU= 0.910).
... allow a fair and internally consistent assessment of workloads ?	✓	x	The TD approach does not adequately account for workloads that vary over time and by GDN; the BU approach does.

(33) GEMA's Response mischaracterises the similarities and differences between the two approaches:

- (a) GEMA states that a key difference between the approaches is that "[top-down] approach uses average industry cost shares, whereas [bottom-up] approach uses median industry unit cost" (Response §231.2). GEMA appears to recast the issue as a debate over whether a mean is preferable to a median – but that is not the issue. The relevant distinction is that the bottom-up CSV handles workloads appropriately.¹⁴ Figure 2 shows that the top-down approach distorts the treatment of workloads in a way the bottom-up approach does not.
- (b) GEMA states that SGN's remedy "implements a single cost structure across all companies" (CM §383). This is factually incorrect. The bottom-up CSV does not impose a common expenditure allocation across GDNs. It reflects each GDN's workload mix, applying a consistent set of unit costs across all GDNs and years.
- (c) GEMA defends its reliance on GD1 and GD2 data to define the notional company by stating that the bottom-up approach uses the same time period of data and that changes over time are captured by the cost drivers themselves (Response §239-240). This misses the point: as shown by the figures above, GEMA's top-down approach leads to a distortion in the treatment of workloads, which is not present under the bottom-up approach – even though both approaches draw on the same input data.¹⁵

4.3. GEMA's claimed disadvantages of the bottom-up approach are unsubstantiated or irrelevant

¹⁴ For this same reason, GEMA's statement elsewhere that the use of the median "ignores most of the information contained within the dataset" and that "the actual 'unit costs' for only two out of the eight networks are only ever being used" (Response §231.1) is beside the point.

¹⁵ GEMA also refers to the fact that company-specific or annual weights performed worse or could introduce greater endogeneity (Response §241); however these approaches are not ones that SGN is proposing.

- (34) First, GEMA states that the bottom-up approach is “*harder to interpret when different cost drivers have different units*” (Response §231.3) but this interpretation issue is an inherent feature of a CSV, not a critique of a particular methodology (top down vs bottom up) for calculating the CSV. GEMA acknowledges that the CSV in its top-down approach lacks a “clear physical interpretation” (CM §302).
- (35) Second, GEMA cites “consistency” with the Cobb-Douglas functional form as justification for its top-down approach (Response §231.3, 243.1), but it is not clear what specific advantages this alleged consistency provides or what material drawbacks the bottom-up approach creates. Moreover, GEMA did not appear concerned about any such consistency issues in its ED2 totex modelling (GEMA RIIO-ED2 FD, Table 20).
- (36) Third, GEMA states that the use of median unit costs means that the “*weights might not be representative of one that any reasonable notional company might achieve*” (Response, §231.2). This point is irrelevant since the common unit cost is not a target that any individual company is required to “achieve”, but rather serves as a benchmark against which each company’s performance is assessed on a relative basis. In any event, even if the unit cost measure was adjusted (e.g. to a mean), the fundamental difference in terms of treatment of GDN workloads would remain.
- (37) Fourth, GEMA argues that SGN’s alternative has a “*negligibly*” lower R-squared, so does not improve the explanatory power or robustness of the modelling (Response §243.4). SGN agrees that there is no meaningful difference in statistical performance of the two approaches – but the error in respect of workloads treatment remains (as set out above). The issue of interpretation of R-squared is dealt with in Frontier (FE §3.22-3.23).

4.4. Other points of clarification

- (38) GEMA argues that the use of the bottom-up approach in ED2 is not relevant given differences in sector context (Response §232, §244). However, SGN does not rely on its use in ED2 as justification for adopting it in GD3. The relevance of the ED2 precedent lies in demonstrating that the approach is (and GEMA has considered it to be) practical and transparent, implementable and statistically robust.
- (39) GEMA highlights that its approach was supported by other GDNs (Response §243.2, CM §397), however mischaracterises Cadent’s opposition to CSV weights (FD §5.346).
- (40) GEMA also states that the choice between the top-down and bottom-up CSV methodology is not material for the industry (+/-0.5%), and that its materiality for SGN “*is reflective of the fact that SGN has cherry-picked*” this appeal rather than the model distorting allowances (Response §233). To dismiss an error on the basis of it having “*no material impact on totex across the GDNs*” (i.e. an error for another licence holder) is irrelevant in the context of an appeal brought by SGN.