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RIIO-GD2: Regional and Company Specific Factors Annex

Introduction

1.1 We adjust submitted costs to ensure that we can benchmark GDNs on a comparable basis. This includes costs that are driven by factors outside of a company's control and are unique to the location in which that company operates. These regional factors can lead to higher or lower costs that are not the result of efficient or inefficient behaviour.

1.2 In RIIO-GD1 we made a number of pre-modelling adjustments to submitted cost data to account for regional factors. These regional factors included labour costs, urbanity and sparsity effects.

1.3 For RIIO-GD2, we considered the GDNs' Business Plans and undertook our own analysis and concluded that some of the differences in costs between GDNs continue to be explained by factors beyond their control. In particular, we consider that the regional factors we previously recognised in RIIO-GD1 remain relevant for RIIO-GD2. In this appendix we detail our position for these factors and our methodology for making cost adjustments.

Regional labour

1.4 In RIIO-GD1 we made regional labour cost adjustments to account for the difference in efficient labour costs between GDNs due to geographical location. These adjustments were calculated using Office for National Statistics (ONS) Annual Survey of Hours and Earnings (ASHE) wage data to construct different labour indices, and were made pre-modelling so that the cost data used in the econometric modelling was comparable across GDNs. The adjusted costs were added back post-modelling.

1.5 In developing our approach for RIIO-GD2, we considered whether labour costs continue to vary across regions, as well as how we should capture potential differences in labour costs in our modelling process. Some GDNs commented on both of these issues in their Business Plans.

Summary of GDN submissions

1.6 Both Cadent and WWU used our RIIO-GD1 methodology to re-estimate the labour indices using updated ONS ASHE data, and found that the wage differential between London and Elsewhere had slightly reduced.[1]

1.7 WWU commented that under this methodology, wage differentials between regions may not be replicated equally for every sector of the economy, as it relies on data that are occupation-specific but not industry-specific. WWU also cited Ofwat's PR19 modelling, in which it noted that wage differentials may be correlated with sparsity/density and if sparsity/density is included in a cost model, it may also capture regional wage effects.[2] In addition, WWU argued that it is subject to additional challenges in terms of labour availability and associated wages compared to other GDNs, due to regional demographics and other large projects offering above-market rates.

1.8 Other GDNs commented on particular aspects of the labour index calculation. Cadent submitted analysis that largely repeated the RIIO-GD1 approach, but used gross hourly earnings rather than gross annual earnings. Cadent also changed the local labour content of Work Management from 40% to 44%, to reflect actual RIIO-GD1 RRP data, and changed the value of repex contractor labour to reflect a recategorisation to Plant Hire, Materials and Other costs.

1.9 SGN suggested that the definition of high-cost areas has changed, and that these higher costs now extend well beyond the M25 boundary and through the South-East.

Our assessment

1.10 We consider that the wage differential between London and the rest of Great Britain still appears to be wide enough to warrant an adjustment in our benchmarking. In line with RIIO-GD1, we have decided to use regional labour indices to make pre-modelling cost adjustments.

[1] See Cadent, Appendix 09.21 Cadent's Regional Factors, December 2019 and Oxera, Regional Factors in the cost assessment for GD2 – Prepared for WWU, November 2019.
[2] Regional Factors in the cost assessment for GD2 – Prepared for WWU, November 2019.

1.11 In response to WWU's comments, we consider that since occupational earnings by sector at the regional level are not publicly available, the best and most transparent available indicator of this regional factor is occupational wage differentials between regions. In relation to Ofwat's PR19 modelling, we consider that the lack of significance of labour costs in its econometric models does not necessarily imply that a labour adjustment is not needed. Ofwat noted that the poor predictive power of labour costs might be explained by the inclusion of a density variable correlated with labour costs.[3] We consider that this merely indicates that the explanatory power of labour costs is weak under a certain model specification, however this finding does not automatically lead us to the more general conclusion that wage differentials are irrelevant. Finally, in response to WWU's argument that it faces additional labour challenges, we consider that these challenges are common to all employers in the WWU service areas which are seeking employees with similar skills as those needed by WWU. Therefore, the impact of these challenges on wages should be reflected in the ONS ASHE occupational wage data.

1.12 We have continued to use the three-region adjustment (London, South-East and Elsewhere) based on ONS ASHE wage data. We have made the following key changes to the calculation:

- Regional mean wages and indices are calculated at the 2-digit SOC code level, to reduce uncertainty and missing data in the ASHE wage estimates.
- Gross hourly mean wages (including overtime) are used rather than annual wages, as these are more robust in relation to regional differences and the number of hours worked.
- Local work proportions are activity-specific rather than an average, and we assume that 44% of Work Management activities now occur locally, based on Cadent's new analysis.
- Labour indices are not standardised. Instead, indices are scaled so that the wage index for the 'Elsewhere' region equals 1.

1.13 Calculating the proportion of expenditure that is related to labour and therefore subject to labour adjustments is not necessary to calculating the labour indices, but is required

[3] Ofwat, "Supplementary technical appendix: Econometric approach", January 2019. Available here.

to determine the size of each GDN's labour adjustments. In RIIO-GD1 we calculated the labour ratios based on GDNs' actual expenditure, then adjusted them based on the labour indices and a historical industry average ratio for direct and contract labour. For RIIO-GD2 we have adopted the approach used in RIIO-ED1, and applied industry average labour ratios to all GDNs for each cost activity. We consider this approach will ensure that we do not reward a potentially inefficient company.

1.14 Further detail on our calculation of regional labour indices is provided in the GD2 Step-by-Step Guide to Cost Assessment Annex (SBSG Annex).

Urbanity

1.15 In RIIO-GD1 we made two types of cost adjustments to account for urbanity factors. We accepted that there is reduced labour productivity associated with working in the London area, and adjusted GDNs' labour costs by 15% for repex, connections and reinforcement activities carried out within the M25. We also recognised that there are additional reinstatement costs associated with working in highly dense urban areas. We treated these costs as labour costs and adjusted them for particular opex activities based on the indices used to make regional labour adjustments.

Summary of GDN submissions

1.16 In deciding whether to account for urbanity factors, we have reviewed new information provided in the GDNs' Business Plans. Both Cadent and SGN submitted a report by NERA and Arcadis as evidence of the additional costs of operating in London. The report identifies the nature of streets and other aspects of the physical make-up of the network surroundings, such as more expensive footpath materials which increase reinstatement costs, as drivers of incremental costs in London relative to the rest of the country. SGN considered that the estimates provided by NERA and Arcadis suggest that the magnitude of the regional adjustments made for the London region in RIIO-GD2, including both urbanity and labour cost adjustments, should be similar to RIIO-GD1.

1.17 Cadent's submission also highlighted a number of apparent difficulties in carrying out its repex programme in London (e.g. lack of road space, restrictions on when and where to work, and congestion of underground assets) and proposes its own estimate for the London productivity adjustment. Cadent analysed repex productivity using Local

Authority-level data, and found there was a 14.9% productivity deficit for London, leading Cadent to the conclusion that the 15% London productivity assumption should be maintained in RIIO-GD2. Cadent also claimed that reinstatement costs are higher in London than elsewhere. It argued that, in addition to different labour and materials costs, variations in the cost of square metre reinstated are driven by other factors such as the balance of work across the footway, carriageway and verge, depth, and size of surface area. Using historical reinstatement work and expenditure data, Cadent calculated that reinstatement costs for the London network are 21% higher than the East of England network.

Our assessment

1.18 Overall, we consider that productivity and reinstatement factors, as recognised in RIIO-GD1, are still relevant drivers of additional costs for GDNs operating in urban areas. We also consider that a pre-modelling adjustment is the most appropriate method of accounting for urbanity. It is conceptually simple and the productivity differential assumption is supported by multiple sources of analyses. This approach also avoids potential interpretation and data reliability issues with adding an explanatory variable in our models.

1.19 Our approach to calculating urbanity productivity indices is similar to that adopted in RIIO-GD1. We calculate the urbanity productivity indices as the average between an assumed 1.15 urbanity factor for London and 1 for the rest of GB, weighted by each area's proportion of the GDN's work. Weights may vary across different cost activities depending on the share of work that needs to be done locally, therefore we modelled urbanity productivity indices as activity-specific. However, our assumptions on work needing to be done locally are the same for all the activities to which the urbanity adjustment applies (i.e., work is assumed to be 100% local). The only networks to receive an urbanity productivity adjustment are London, Southern and, to a small extent, East of England. We have calculated the indices between 2013/14 and 2017/18 and set the indices for later years equal to the 2013/14 - 2017/18 average.

1.20 As with the urbanity productivity adjustment, the only networks to receive an urbanity reinstatement adjustment are London, Southern and East of England. Our urbanity reinstatement adjustment applies only to reinstatement costs for emergency, repair,

maintenance and other direct activities. We treat these as labour costs and apply our regional labour indices to these costs to determine the cost adjustments.

Sparsity

1.21 In RIIO-GD1 we made cost adjustments for sparsity factors, accepting that there are differences in costs associated with working in relatively sparse areas for the emergency and repair cost activities.

1.22 In RIIO-GD1 the sparsity uplift for the sparsest network (WWU) was £2.23 million per annum (in 2009/10 prices), which was equivalent to the allowance of £2 million per annum given to WWU during GDPCR1. This equated to 13% (£2.23 million divided by WWU's Emergency and Repairs expenditure in 2011/12). In other words, WWU's emergency and repairs productivity was estimated to be 13% lower than London's (which has no sparse areas).

1.23 The GDNs commented on a number of issues relating to sparsity, including:

- Whether sparsity impacts costs and should be accounted for;
- How sparsity should be measured; and
- The value of cost adjustments required to account for sparsity impacts on their networks.[4]

Summary of GDN submissions

1.24 The GDNs were largely in favour of continuing to apply a sparsity adjustment in RIIO-GD2, and submitted reasons for these adjustments to apply to them in their Business Plans.

1.25 Cadent undertook its own analysis and submitted that overall, there is enough evidence to justify making an adjustment for Emergency, but the logic for making an adjustment for Repair is not as strong. In particular, Cadent referred to the RIIO-GD1 decision and noted that the logic for the Repair adjustment was that Repair staff needed to be placed strategically because sometimes FCOs need to hand over to Repair staff, in order to

[4] Submitted in Business Plans and in response to supplementary questions.

attain the 97% standard of performance. Cadent noted that it does not place Repair staff strategically, and the fact that it met its PREs targets without doing so suggested that it is not necessary.[5] Cadent's analysis of Emergency costs resulted in a sparsity adjustment of 5.6% for WWU.

1.26 NGN commented on the approach to making sparsity adjustments, submitting that the methodology we used to account for sparsity in RIIO-GD1 was too simplistic. It suggested using Xoserve MPRN data as a more accurate measure of customer density compared to population data.

1.27 In measuring the impact of sparsity on its network, NGN analysed the differences in the number of emergency jobs per week across 25 zones in its network. NGN did not specifically calculate the sparsity of each zone, rather it relied on its a priori views on which zones it expected to be the sparsest. It estimated that zones that were sparser were around 40% less productive than zones with more density. Using this productivity estimate, NGN estimated that it could have saved around £2 million in 2018/19 if these sparse zones had similar density to the other zones. We estimate that £2 million is 18.9% of NGN's gross emergency expenditure in 2018/19. NGN did not undertake similar analysis for Repairs as it considered that it was too difficult to disentangle repairs from its 'Totex' workforce strategy. NGN considered that its productivity will still be lower for repairs in its sparse zones. However, NGN noted that areas such as Leeds and Bradford have many more connections, service alterations and fuel poor jobs to complete, which means that overall it has more resource here and they complete fewer repairs per week". We consider this implies that the productivity differential will be lower than what it estimated for Emergency.

1.28 SGN calculated the impact of sparsity on its Emergency and Repairs activities in the Scotland network with reference to the methodology used by Deloitte in 2011. SGN based its analysis on staffing and jobs at each depot. It defined sparse depots for Emergency as those with fewer than 5,000 PREs per year or, for Repairs, fewer than 200 repair jobs per year. SGN then compared the number of staff across sparse and non-sparse depots. This provided it with an estimate of the number of additional staff needed in sparse areas. SGN then used its hourly rates for these staff to come up with

[5] Cadent, Appendix 09.21 Cadent's Regional Factors, December 2019.

an overall estimate across emergency and repairs. This estimate was £2.62 million per annum (2018/19). We estimate this to be 18.6% of SGN's Emergency and Repairs gross expenditure.

1.29 WWU submitted that sparsity impacts are likely to affect more activities, noting that other factors such as additional fuel, vehicle and depot costs also impact on capex, repex and other areas of opex. WWU also suggested there was merit in testing models using a joint sparsity/density within-model variable. It tested models of various cost activities including measures of sparsity/density in a flexible functional form, to test whether the results supported the expected u-shaped relationship between sparsity and cost, which would corroborate the hypothesis that sparsity and density are both associated with higher costs. However, the results of WWU's analysis were mixed.

1.30 In measuring the impact of sparsity on its network, WWU analysed the differences in job numbers and travel times between its Cardiff and West Wales regions. WWU found that it completed 122% more work in Cardiff than in West Wales, and required 41% more resources. WWU noted that this demonstrates the ability to utilise and mitigate unproductive time in urban areas due to availability of work yet the inability to do so in sparse areas. WWU submitted that if its sparse regions could achieve the same level of utilisation as urban areas, it would need to be funded for a regional factor of £5.5 million per annum (2018/19) across the Emergency and Repairs activities. WWU noted that this figure includes more than just labour costs.[6] We estimate this to be 30.6% of WWU's Emergency and Repairs gross expenditure.

Our assessment

1.31 We consider that there is sufficient evidence to continue applying sparsity adjustments to Emergency and Repair costs, as these particular activities incur lost productivity due to longer travel times. We do not agree with Cadent's view that sparsity adjustments should not be applied to Repair expenditure. The fact that Cadent does not need to place its staff "strategically" to meet the standards may not apply to the other networks, if their staff have more challenging geographic characteristics.

[6] WWU's estimate includes costs associated with salaries, overtime, shift allowance, national insurance, pension costs, vehicles, fuel and personal protective equipment.

1.32 We broadly agree with the points raised by WWU that there may be additional sparsity impacts, however we do not believe that WWU has demonstrated that these impacts are not already captured by existing cost drivers, such as MEAV and customer numbers.

1.33 We will continue to apply sparsity indices based on population density. We consider population density to be a good proxy of the networks' geographic characteristics and can be calculated in a relatively straightforward manner. We note that NGN's suggestion to use MPRN data may have some merit, however it could also have some drawbacks. For example, a long pipeline in a sparse area with only a few connection points may require the same level of emergency and repairs expenditure as the same length pipeline in a similarly sparse area but with more connection points.

1.34 We will continue to apply pre-modelling adjustments. We agree with WWU that, in addition to sparsity, density/urbanity can also create extra costs for the GDNs. However, WWU's analysis has produced mixed results, and adding a sparsity measure and its quadratic term to the econometric models will reduce their degrees of freedom and may affect the robustness of the estimates. We consider that our urbanity adjustments will sufficiently account for additional costs and can be attributed to specific cost activities.

1.35 Overall there is a wide range in the GDNs' estimates of sparsity impacts on these activities. In addition, there are other reasons why GDNs in urban areas may face greater costs in the Emergency and Repairs activities.[7] We have therefore decided to maintain the maximum adjustment made in RIIO-GD1, and apply a 13% adjustment to the sparsest network (WWU). Adjustments for other GDNs are based on GDN-specific sparsity indices. Detail on our methodology for calculating sparsity indices is provided in the SBSG Annex.

1.36 Tables 1 and 2 summarise the annual average regional factor adjustments for the RIIO-GD1 and RIIO-GD2 time periods respectively.

[7] For example, Cadent submitted that traffic management hire impacts on Repairs costs and locksmith costs impact on Emergency costs.

Table 1: Annual average RIIO-GD1 regional factor adjustments, £m

Adjustment factor	EoE	Lon	NW	WM	NGN	Sc	So	WWU	Industry
Labour	-1.8	-19.9	-	-	-	-	-16.9	-	-38.6
Urbanity (productivity)	-0.7	-8.3	-	-	-	-	-4.8	-	-13.8
Urbanity (reinstatement)	-0.1	-0.8	-	-	-	-	-0.4	-	-1.3
Sparsity	-2.4	-	-0.4	-1.0	-1.8	-1.2	-1.3	-2.1	-10.1
Total	-5.0	-29.0	-0.4	-1.0	-1.8	-1.2	-23.4	-2.1	-63.8

Table 2: Annual average RIIO-GD2 regional factor adjustments, £m

Adjustment factor	EoE	Lon	NW	WM	NGN	Sc	So	WWU	Industry
Labour	-1.7	-17.7	-	-	-	-	-15.1	-	-34.5
Urbanity (productivity)	-0.7	-6.7	-	-	-	-	-4.3	-	-11.7
Urbanity (reinstatement)	-	-0.7	-	-	-	-	-0.4	-	-1.2
Sparsity	-1.6	-	-0.3	-0.8	-1.7	-1.0	-1.1	-2.4	-8.8
Total	-4.1	-25.2	-0.3	-0.8	-1.7	-1.0	-20.8	-2.4	-56.2

Company-specific factors

1.37 In our 'RIIO-2 tools for cost assessment' consultation[8] we noted that we would apply a high evidential bar for company-specific factors in RIIO-GD2. We did not specify a materiality threshold for company-specific factors, but noted that companies should be able to sufficiently justify that:

- The regional or company-specific factor in question is clearly defined
- This factor, and the subsequent costs it drives, are beyond the control of an efficient company (having taken all the feasible measures to mitigate the costs)

[8] Ofgem, RIIO-2 Tools for Cost Assessment, July 2019.

- The company (or a small number of companies) are impacted by a significant amount, and in a materially different way to others.

1.38 There are two types of company-specific (or special factor) claims:

- Those that relate to adjusting historical RIIO-GD1 data to ensure comparability in the benchmarking (ie normalisations); and
- Those that relate to forecast expenditure in RIIO-GD2 that should be assessed outside of the 'standard' benchmarking model to ensure comparability.

1.39 For our assessment of the company-specific factors, we have evolved the criteria listed above into the following practical criteria:

- Is the claim material in nature? We consider that a claim that accounts for more than 0.5% of a GDN's gross unnormalised total expenditure is large enough to warrant further consideration. We note that Ofwat used this threshold to assess the materiality of cost items in its PR14 price controls, then raised the bar to 1-6% (depending on the price control) of totex in PR19. Therefore, we view our 0.5% threshold as relatively low. The issue of materiality is important given that other GDNs may also face company-specific factors but have not made claims for these given their limited materiality.[9]
- Is the claim unique in nature? The claim should be limited to a single GDN or a small number of GDNs. Only claims that reflect a material asymmetry between GDNs are justified.
- Is the claim outside the control of an efficiency company? The GDN should demonstrate that, where possible, it has mitigated the additional costs associated with a claim.
- Is the claim excluded from the cost drivers used in our econometric modelling?
- Is the claim excluded from our other adjustments, such as regional factors? If the claim is partly accounted for by other adjustments, we should consider whether the remainder passes our materiality test.

[9] For example, WWU noted it faced additional costs to produce documents in both English and Welsh as well as additional costs due to the distances required to travel to quarries, but did not submit a claim for these costs as they were not thought to be material.

1.40 We have rejected the majority of company-specific factors as they do not meet the above criteria. However, we have accepted that some costs relating to RIIO-GD2 forecasts should be assessed outside of our econometric modelling.

1.41 Our assessment of each of the company-specific factors submitted by the GDNs is summarised in Table 3 and discussed in further detail below.

Table 3: Assessment of company-specific factors

Company	Claim	Material in nature	Unique in nature	Outside company control	Excluded from cost driver(s)	Excluded from regional factor(s)
Cadent	Cathodic Protection	Partly	No	No	Yes	Yes
Cadent	Thames Tunnel & IP	Yes	Yes	Yes	Yes	Yes
Cadent	London Medium Pressure	Yes	Yes	Yes	Yes	Yes
Cadent	Parking bay suspension & TTRO	Partly	No	No	No	Yes
Cadent	Reduced depth of cover	Partly	No	No	Yes	Yes
Cadent	Repex and repair reinstatement	No	Yes	Yes	Yes	No
Cadent	Emergency job times	Yes	No	Yes	No	No
Cadent	Plant hire - repex	Yes	No	Yes	Yes	No
Cadent	Holford salt cavity	No	Yes	Yes	No	Yes

Company	Claim	Material in nature	Unique in nature	Outside company control	Excluded from cost driver(s)	Excluded from regional factor(s)
Cadent	Traffic management hire	No	No	No	Yes	No
Cadent	London depot rental costs	No	Yes	Yes	Yes	Yes
Cadent	24 hour shift patterns	No	Yes	Yes	Yes	No
Cadent	London congestion charge	No	Yes	Yes	Yes	Yes
Cadent	London Local Authority Tunnels	No	Yes	Yes	Yes	Yes
Cadent	Locksmiths	No	Yes	Yes	Yes	Yes
SGN	Isle of Wight	No	Yes	Yes	Yes	Yes

Cathodic protection

1.42 Cadent claimed that higher costs were incurred in RIIO-GD1 (2016-19) due to work required to comply with a Health and Safety Executive (HSE) order to improve cathodic protection of steel pipelines. In 2015 the HSE reviewed Cadent's compliance with standards (ECP/2) for MP and LP pipelines and found shortcomings. Consequently, HSE issued an Improvement Notice in November 2015 requiring Cadent to carry out remedial work.

1.43 Cadent estimates using data on maintenance work execution and work management costs that the impact is in the region of £10m over the last three years across the four GDNs (£6m in 2018/19 only) with EoE GDN incurring the highest costs. It argues that an adjustment to costs in 2016/17, 2017/18 and 2018/19 should be made for

benchmarking purposes because the issue is unique to Cadent GDNs and is workload related.

1.44 Considering the four Cadent GDNs in aggregate, this claim is material. It represents 6.7% of maintenance opex and 0.4% of totex in 2018/19. Although the Improvement Notice is unique to Cadent in this instance, all GDNs have this obligation under the Pipeline Safety Regulations, 1996 (Regulation 13)[10], and other GDNs noted that they were not issued with improvement notices.

1.45 We consider that the expenditure should be reflected in our totex modelling, and GDNs should only be funded for an efficient level of expenditure to maintain their pipelines. We also note that in the absence of receiving the Improvement Notice, Cadent would have incurred some additional maintenance expenditure. We have therefore rejected this company-specific factor as it is not beyond the control of an efficient company.

Thames Tunnel and IP

1.46 Cadent's London network incurred a very high level of cost in respect of reinforcement in central London at an Intermediate Pressure (IP) tier, largely due to work to dig a tunnel under the River Thames.

1.47 In order to estimate the value of the claim, Cadent calculated the expenditure per km of IP reinforcement undertaken between 2016/17 and 2018/19. Cadent then subtracted the average expenditure per km of mains greater than 180mm across all GDNs in 2014/15-2015/16 to get a 'cost per km' difference. It then multiplied this by the km of IP reinforcement completed. This results in an estimate of £17.9m of additional costs from undertaking IP reinforcement in London.

1.48 In considering this claim we noted that the GDNs report reinforcement costs according to whether mains are less than 180mm or greater than 180mm, and the Thames Tunnel requires a 630mm main. Cadent submitted that these costs should be excluded from the efficiency assessment due to the unique nature of the project, which it claims has nothing to do with efficiency.

[10] The regulation states "The operator shall ensure that a pipeline is maintained in an efficient state, in efficient working order and in good repair".

1.49 In addition to the incurred IP reinforcement costs, in its RIIO-GD2 Business Plan Cadent proposes significant levels of reinforcement cost for work to be undertaken in central London, for example, under Liverpool Street station, which is expected to have very much higher unit costs than most reinforcement. Cadent argued that we should consider these costs separately from the remainder of mains reinforcement in RIIO-2.

1.50 We consider that Cadent's proposed adjustment is material, and although the replacement of large diameter mains is not necessarily unique to Cadent, these projects in the London network are bespoke in nature. We agree that it is not appropriate to include this project in our modelling due to the significant difference in unit costs. We have removed the RIIO-GD1 costs from our totex modelling, and assessed the forecast costs separately.

London medium pressure

1.51 In addition to the previously mentioned reinforcement work, Cadent claimed that medium pressure repex in London is significant and the costs and workloads associated with the project should be removed from our modelling and should be subject to technical assessment. This claim is limited to expenditure in RIIO-GD2.

1.52 Although this claim is limited to RIIO-GD2, it is the largest put forward by Cadent both in terms of value (£12m per annum) and impact on London's expenditure (3.5% of totex and 7.7% of repex in 2021/22). We consider that, as with large diameter reinforcement activities, it makes sense to exclude large diameter repex such as this from our modelling and to assess separately.

Parking bay suspension and Temporary Traffic Restriction Order

1.53 Cadent claimed that a regional factor adjustment should be made for higher costs associated with:

- Parking bay suspensions in relation to connections and mains replacement.
- Opex-related Temporary Traffic Restriction Orders (TTROs) and parking bay suspensions, which are difficult to identify separately and therefore are reported together as a single claim.

1.54 Cadent presented evidence that the London network incurred higher costs than other Cadent networks due to the higher incidence of parking bays and local authorities charging fees. It estimated additional connections and mains replacement costs in the London network of £3.1m in 2018/19 from parking bay suspensions, and a further £0.52m in opex TTROs and parking bay suspensions. It also estimated a £0.06m adjustment for the East of England network.

1.55 At 0.7% of totex, Cadent's parking bay suspension claim for the London network is material, however the same claim for the East of England network is not material. We consider that there are four main factors that could drive differences in parking bay suspension costs between GDNs:

- Level of activity undertaken. Some GDNs may undertake relatively more open cut mains replacement than others, which is more likely to require parking bay suspensions compared to insertion. This factor, however, is likely to be captured by the synthetic unit cost driver as large diameter pipe replacement is more likely to require open cut mains replacement.
- Parking bay suspension scheme coverage. Some regions may have a greater coverage of parking bay suspension schemes than others, due to factors outside the GDNs' control.
- Parking bay suspension charges. These vary across Great Britain due to different local authority charging rates, and so are outside of company control. For example, Cadent noted that a 5-day parking suspension would cost £335 in Islington and £50 at most in Sheffield.
- Differences in risk appetite. GDNs may book longer parking bay suspensions than is necessary to ensure that the work is completed before the parking bay suspension expires, whereas other GDNs may not. This factor is within company control and could drive differences in costs between GDNs.

1.56 Overall, we have rejected this claim because we consider the issue is not unique to the London network, and cost differences between GDNs are driven by factors both inside and outside the control of the GDNs. Cadent noted that these costs are not recorded separately for its North West and West Midlands networks. If this is the case for other GDNs, it is difficult for us to make a definitive and transparent cost adjustment. Because of these factors within company control, we do not consider it suitable to

accept Cadent's claim as it is currently presented. However, if the GDNs could provide comparable data on this activity, it may be possible to assess these costs separately from our totex modelling, as we have for similar activities such as streetworks.

Reduced depth of cover

1.57 Under safety regulations buried pipelines are required to have a minimum depth of cover to withstand external forces and chemical processes to which they may be subjected. Cadent claimed that some LTS pipelines, particularly in its East of England network, have insufficient depth of soil coverage to comply with these regulations. Cadent submitted that it incurred increased maintenance costs from 2016/17 and will incur further costs in RIIO-GD2, to manage soil importation and pipeline diversions in order to maintain the required depth of cover for its pipelines. Cadent estimated that the impact will increase to around £7m p.a. across its four networks in RIIO-GD2, with around two thirds of costs incurred in the East of England network.

1.58 This claim is material for Cadent's East of England network, at approximately 0.8% of totex between 2018/19 and 2025/26. However, it is not material for Cadent's other networks. We consider that this factor is likely to affect all GDNs to some extent, and the fact that other GDNs did not raise this claim may suggest that it is simply a business as usual activity. In addition, we consider this factor is within company control. All GDNs are required to comply with the Pipeline Safety Regulations, and Cadent acknowledged that the reduced depth of cover issue was only discovered when line-walking was resumed in 2013/14. Therefore, we don't consider it appropriate to make an adjustment to Cadent's expenditure as other GDNs are continually maintaining the required depth of cover.

Repex and repair reinstatement

1.59 Cadent claimed that the cost of reinstatement is significantly higher in its London network than elsewhere and regional adjustments are required for both repex and repair reinstatement costs.

1.60 For repex reinstatement costs, Cadent estimated a £2.9m adjustment is required in 2018/19 (2.5% of repex), based on its comparison of costs in its East of England and London networks. The claim for the following years is 2.5% of repex.

1.61 For repair reinstatement costs, Cadent argued that, in addition to higher labour and potentially materials costs, variations in the cost of square metre reinstated are driven by the balance of work across the footway, carriageway and verge, as well as depth and the size of the surface area. Based on its analysis of historical reinstatement work and expenditure data, Cadent estimated a cost premium of £1.6m in 2018/19, spread across repairs, maintenance and repex.

1.62 The repex reinstatement claim as presented is 0.6% of totex in 2018/19 and is therefore material. We acknowledge that Cadent's claim has removed the labour component or repex reinstatement costs in order to avoid double counting. However, once we have adjusted costs for our urbanity productivity and reinstatement adjustments, the repex reinstatement claim is also no longer material.

1.63 The repair reinstatement claim is not material (0.3% of totex) and we have therefore rejected it.

Emergency job times

1.64 Cadent claimed that Emergency jobs take longer in more urban areas and there are longer travel times, which results in higher costs for its London network. It calculated the average additional time for internal and external PRE jobs in its London network compared to its other networks for the period 2015/16 to 2017/18. It then divided the London network's labour costs by this time premium to calculate the costs that the London network would incur if it conducted emergency work in the same time as the other GDNs. Cadent estimated its labour costs in London were around £2.6m above those that would be expected using the job times of its other networks.

1.65 The claim presented by Cadent is material, as it represents 0.6% of totex for Cadent's London network in 2018/19. Cadent's analysis of average job times across network patches found there was a broadly consistent relationship between emergency job times and population density, with more urban areas having longer job times. However, it found no meaningful relationship between population density and travel times.

1.66 We acknowledge that emergency job times may be longer in highly dense areas, however networks in dense areas will also benefit from shorter travel times and higher productivity as they will not need to have staff waiting to be deployed in order to meet

the response time standard. This will lead to lower emergency costs relative to GDNs operating in sparsely populated areas. Since Cadent has not considered the net effect of these two factors, this company-specific claim is likely to be overestimated. We consider that if the benefits of operating in a dense area were considered, any potential cost difference is likely to be immaterial, and therefore we have rejected this claim.

Plant hire - repex

1.67 Cadent claimed that plant hire costs per metre of mains replacement are higher in London than elsewhere, due to the lower level of productivity associated with mains replacement. Cadent proposed a 20% adjustment to plant hire costs for its London network, based on its analysis of plant hire unit cost data relative to its East of England network.

1.68 Cadent's proposed adjustment for its London network accounts for 0.5% of totex in 2018/19, and so we consider it is material. However, we do not consider that there is sufficient evidence that this claim meets our remaining criteria for a cost adjustment. We consider that the effect of density on plant hire costs is ambiguous, and these costs may also be higher in sparse areas due to longer driving distances. In addition, some of the cost impact may also be already captured in our regional labour cost adjustments, given Cadent's claim that higher labour costs add to plant hire expenditure. For these combined reasons we have rejected this claim.

Holford Salt Cavity

1.69 Cadent's North West network incurs costs for renting a salt cavity for gas storage at Holford. These costs make up 0.2% of totex in 2018/19. Cadent noted that if MEAV is used as a regression cost driver, the cost of Holford does not need to be included as a regional factor, because the storage it provides is included within the MEAV calculation.

1.70 Our econometric modelling includes MEAV as a cost driver. Therefore, we agree that there is no need for any cost adjustment.

Traffic management hire

1.71 Cadent submitted that its repair activity requires traffic management equipment (e.g. traffic lights) in line with the Safety at Streetworks and Road Works Code of Practice

published under the NRSWA by the Department of Transport and/or a site-specific risk assessment that is carried out internally. It noted that the level of traffic management equipment hire required can vary depending on the requirements of the individual Highway Authorities.

1.72 Cadent claimed that Traffic Management Hire costs differ across its networks according to the physical characteristics of each site including road conditions, whether Highway Authorities request manually controlled traffic lights, and regional variations in the unit costs of hire – especially labour costs.[11] It estimated that the additional repair cost was £0.3m in 2018/19 in its London network (due to high unit costs), and £0.5m in 2018/19 in its East of England network (due to a higher proportion of repair jobs requiring traffic management). Cadent also forecast these costs in the RIIO-GD2 period, although it noted that costs are expected to decrease in line with forecast mains condition reports and due to the adoption of more advanced traffic light technologies.

1.73 Cadent's claim represents only 0.1% of totex. Therefore, we have rejected the claim as it is not material in nature.

London depot rental costs

1.74 Cadent submitted that rental costs for depot space in London are higher than elsewhere in the UK, and this results in higher property management opex. Cadent noted that the additional cost is mainly experienced by its London network, although SGN's Southern network may also incur additional costs. Cadent claimed that additional costs are £0.6m p.a. for its London network and £0.06m p.a. for its East of England network.

1.75 We have rejected this claim as we consider it is not material in nature.

24-hour shift patterns

1.76 Cadent claimed that its London network has a higher proportion of publicly reported gas escapes that occur during the night, which results in longer travel distances for its engineers. This creates the need for 24-hour sift patterns instead of call-out and

[11] Cadent, Appendix 09.21 Cadent's Regional Factors, December 2019.

standby arrangements. Cadent claimed that its London network had £0.4m of additional emergency costs in 2018-19.

1.77 We have rejected this claim as we consider it is not material in nature.

London congestion charge

1.78 Cadent claimed that its London network incurs additional costs for conducting emergency, repair and replacement activities within London's congestion charging zone. Cadent noted that although SGN's Southern network operates in this zone, Cadent's costs would be significantly higher as its network covers a larger area of the zone.

1.79 We acknowledge that the London congestion charge is a company-specific, however we have rejected this claim as we consider it is not material in nature.

London Local Authority Tunnels

1.80 Cadent claimed that its London network is charged by local authorities for capital and maintenance costs and access to a series of tunnels containing gas, water, electricity and telecommunications pipes and cables. Cadent estimated additional costs of £180,000 p.a.

1.81 We acknowledge that this may be a company-specific cost, however we have rejected this claim as we consider it is not material in nature.

Locksmiths

1.82 Cadent claimed that it requires locksmiths for emergency activities in its London network. It submitted that the large number of flats, buildings in close proximity and underground ducts makes gas escapes likely to enter more properties than elsewhere. Cadent estimated additional costs of £124,000 in 2018-19.

1.83 We have rejected this claim as we consider it is not material in nature.

Isle of Wight

1.84 SGN claimed that costs in its Southern network should be adjusted by £0.6m over the RIIO-GD2 period to compensate for the additional costs of operating on the Isle of Wight. SGN noted that these costs include:

- Minimum competition at tender events;
- The requirement to maintain resources available on the island; and
- The need to ship plant, equipment and materials.

1.85 SGN submitted that these factors are not covered by the sparsity adjustment, as they are instead a consequence of the island being geographically disconnected from the mainland.

1.86 We acknowledge that operating on the Isle of Wight may involve additional costs not captured by cost drivers in our econometric modelling and other regional adjustments. However, we have rejected this claim as we consider it is not material in nature.