CEPA update for RP7 Final Determination

The Northern Ireland Utility Regulator (UR)

30 October 2024

Final report

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EXECUTIVE SUMMARY

CEPA has prepared this update for the Northern Ireland Utility Regulator (UR) on our benchmarking analysis of the historical operating expenditure (IMFT&I) of Northern Ireland Electricity Networks Ltd (NIEN) against the electricity distribution companies (DNOs) in GB. This analysis will form part of the evidence base that the UR will use to inform its Final Determination (FD) on the IMFT&I allowances for NIEN for the price control period RP7, running from 1 April 2025 to 31 March 2031.

This update addresses the points made by NIEN and its adviser, NERA, in response to the UR's Draft Determination (DD) on RP7 published in November 2023.[1] This note does not repeat the detailed analysis set out in our DD report for the UR.[2]

NIEN and NERA raised issues with three elements of the benchmarking analysis:

- treatment of connection costs;
- regional wage adjustments; and
- weighting placed on more disaggregated models covering some opex activities (Network Operating Costs; NOCs).[3] [4]

CEPA FD position on connection costs

Every year, a proportion of IMFT&I costs are allocated to connections for NIEN and the GB DNOs. The benchmarking of those costs can be carried out using either a pre-allocation approach or a post-allocation approach (i.e., before or after re-allocation of connections-related indirects). We presented the results of both pre-allocation and post-allocation models in our DD report for the UR.

NERA states that differences in connection activities between NIEN and the British DNOs mean that giving post- and pre-allocation models equal weights leads to a systematic underestimate of NIEN's efficiency. Therefore, NERA proposes that only post-allocation models should be used.

Under both approaches, NIEN outperforms the upper quartile (UQ) efficiency position of the GB DNOs. Therefore, the approach taken does not affect our assessment that there appears to be no efficiency gap for NIEN to close with regards to operating expenditure compared to the GB DNOs. In its DD, the UR used a single figure for NIEN's efficiency performance to directly feed into the calculation of NIEN's IMFT&I allowances for RP7.

NERA includes a chart in its response illustrating that NIEN incurs much higher connection costs, relative to network size, than any GB DNO.[5] NERA explains that this is driven by NIEN still carrying out around 99% of connections, while GB DNOs carry out smaller shares of connection activities.

NERA's chart shows annual connections costs of nearly £20m for NIEN compared to figures of around £6m and around £2m for the two GB DNOs which have a similar level of composite scale variable in the benchmarking. NIEN's connection costs are approximately three times larger and nine times larger than these two comparators respectively. The lower figure of around £2m sits on NERA's estimated trend line for the relationship between

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[1] Utility Regulator (November 2023), RP7 Price Control Draft Determination. URL: https://www.uregni.gov.uk/publications/rp7-price-control-draft-determination

[2] CEPA (November 2023), RP7 Efficiency Advice, prepared for the UR. URL: https://www.uregni.gov.uk/files/uregni/documents/2023-11/Annex%20B%20-%20CEPA%20RP7%20Efficiency%20Report.pdf

[3] NIE Networks (March 2024), RP7 Business Plan 2025-2031: Response to the Utility Regulator's Draft Determination. Not yet published at the time of writing this report.

[4] NERA (March 2024), Response to UR RP7 Draft Determination, Prepared for NIE. NERA's report was submitted alongside NIEN's Draft Determination Response but has not been published at the time of writing this report.

[5] Network size is captured by the composite scale variable used in the benchmarking.

connection costs and network size. However, NERA did not provide any information on the absolute scale of connection activities carried out either by NIEN or GB DNOs.

Our analysis of the GB market for contestable connections found that, between 2018 and 2021, market shares for GB DNOs ranged between 34% and 90%, with a median market share of 76%.[6] This suggests that NIEN has a market share of three times the size of the GB DNO with the lowest market share. However, the gap is much smaller between NIEN's market share (99%) and the median GB market share (76%). In summary, the difference in market shares between NIEN and the GB DNOs is much less than the scale of the difference in connection costs. Furthermore, Ofgem did not exclude connection costs from its benchmarking models for RIIO-ED2 despite the range of market shares across the GB DNOs.[7]

Our scope of work has not included an assessment of the robustness of NIEN's cost allocation processes, or the competitive pressures on NIEN's connections activities. The UR may wish to consider these issues in taking any final decision on the appropriate balance between pre-allocation and post-allocation models, if it wishes to use a single figure for NIEN's historical efficiency to inform future allowances.

CEPA FD position on regional wages

In our DD report we noted that NIEN's labour cost index is lower than that of all GB DNOs. In order to separate genuine differences in efficiency from differences in input costs outside companies' control, we applied a regional wage adjustment (RWA) to GB DNOs' and NIEN's labour costs to account for regional differences in wages.

For the DD, we assumed that both NIEN and the GB DNOs would incur 100% of their labour costs locally. At RIIO-ED1 and RIIO-ED2 Ofgem only applied regional labour adjustments to the percentage of labour costs that it assumed needs to be done locally (e.g. repairs and maintenance activities).[8] Therefore, we also tested a scenario in which we applied Ofgem's RIIO-ED2 locally incurred labour factors to the GB DNOs in our sensitivity analysis.[9]

NERA criticised the assumption that both NIEN and the GB DNOs would incur 100% of their labour costs locally. They proposed that the locally incurred labour factors used by Ofgem in RIIO-ED2 should be applied to both NIEN's costs and those of the GB DNOs.

We have identified the following two plausible scenarios for the application of Ofgem's local adjustment from ED2:

- Scenario A): GB DNOs and NIEN can carry out non-locally sourced activities within a common area – whether that is inside or outside the UK. In this scenario it would be appropriate to apply Ofgem's locally incurred labour adjustments to both GB DNOs and NIEN.
- Scenario B): GB DNOs can carry out non-locally sourced activities within GB only - and therefore do not locate their staff in the lower wage market in NI. In this case, we would apply Ofgem's local labour adjustment to all cost categories for GB companies only.

Under both scenarios, NIEN outperforms the upper quartile efficiency position of the GB DNOs. Therefore, the approach taken does not affect our assessment that there appears to be no efficiency gap for NIEN to close on operating expenditure compared to the GB DNOs.

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[6] CEPA analysis of: Ofgem (May 2022), Consultation on our review of competition in the electricity distribution connections market, Annex: summary of our review of competition in the electricity distribution connections market. URL: https://www.ofgem.gov.uk/sites/default/files/2022-03/Summary%20of%20our%20review%20of%20competition%20in%20the%20electricty%20distribution%20connections%20market.pdf

[7] Ofgem (November 2022), RIIO-ED2 Final Determinations. URL: https://www.ofgem.gov.uk/decision/riio-ed2-final-determinations

[8] Ofgem assumed that these shares are 0% for business support costs, 40% for CAI and non-op capex, and 88% for activities covered in all other cost areas.

[9] CEPA, RP7 Efficiency Advice.

We have not been able to find any explicit reference in Ofgem's ED2 documentation as to whether the locally incurred labour adjustments assume that non-locally sourced labour activities are restricted to GB only (i.e. not including NI) or can be carried out outside GB. This distinction does not matter for Ofgem as the adjustment for ED2 only considers whether the GB DNOs have access to a common labour pool. Ofgem does not need to take a view on where that common labour pool is. This means that Scenario A and Scenario B could both be consistent with Ofgem's approach in ED2.

NIEN has stated that it needs to locate some of its activities in GB (e.g., economic and legal advisers), which would be consistent with Scenario A as there would be a common labour pool with the GB DNOs. However, we have not seen evidence of the materiality of these costs as a share of total business support costs. Furthermore, it is unclear whether this would extend to having to locate all business support activities outside NI. That is what would be implied by relying on Scenario A only[10], under which NI and the GB DNOs are sourcing all business support activities from a common labour pool.

In summary, we do not have detailed evidence available to us on the constraints to the procurement of labour by NIEN inside NI. Therefore, we consider that the UR is best placed to consider how to use both approaches to regional wage adjustment (i.e. Scenarios A and B) if it wishes to use a single historical efficiency estimate to set future allowances for NIEN.

CEPA FD position on triangulation of IMFT&I and NOC models

In our DD report, we presented efficiency scores for NIEN for the nine models that we identified as being statistically robust in the benchmarking of NIEN's historical operational expenditure compared to the GB DNOs – three IMFT&I models including connection costs, three IMFT&I models excluding connection costs, and three NOCs-only models. We concluded that BSC and CAI regressions did not produce sufficiently robust results and we therefore did not recommend using bottom-up models that included these to quantitatively estimate NIEN's efficiency performance.[11]

Under all nine models NIEN outperforms the upper quartile efficiency position of the GB DNOs. Therefore, the approach to weighting the models taken does not affect our assessment that there appears to be no efficiency gap for NIEN to close on operating expenditure compared to the GB DNOs. The UR used the nine models we identified as statistically robust to produce a single estimate of NIEN's efficiency to inform its DD position on NIEN's future operating expenditure.

NERA state that this approach is erroneous, as NOCs are a subset of IMFT&I and should therefore not be given the same weight as IMFT&I models. In order to compare IMFT&I and NOCs models on a like-for-like basis, NERA proposes that NOCs models should be complemented by suitable BSC and CAI models or simply not included in the final triangulation.

We agree NOCs are only a subset of the costs covered by IMFT&I, which also includes CAI and BSC. Therefore, that putting weight on IMFT&I models and NOCs models creates the risk of a biased estimate, as it does not include efficiency scores for CAI and BSC alongside the NOCs models.

Using benchmarking approaches at different levels of disaggregation will often provide different pictures of efficiency performance. Therefore, the UR may wish to consider the evidence from standalone NOCs models in the round when setting future cost allowances, rather than directly triangulating the results from these models with those from IMFT&I models.

[10] If GB companies indeed do not incur labour costs outside GB.

[11] CEPA, RP7 Efficiency Advice.

Summary

Table 1 shows NIEN's (negative) catch-up efficiency challenge, estimated using IMFT&I models only and compared to the UQ of GB DNOs, as calculated under the different approaches we have discussed for connection costs and regional wage adjustments.[12] Each value is shown as the straight average of the three different cost models that we used in the benchmarking analysis. A negative efficiency challenge shows that NIEN is outperforming the UQ.

Table 1: NIEN's catch-up efficiency challenge (% uplift) under different approaches for IMFT&I models only

NIE Networks catch-up efficiency challenge	**Connection costs included**	**Connection costs excluded**
Locally incurred labour factors applied to GB only	-11.3%	-20.7%
Locally incurred labour factors applied to GB and NI	-15.0%	-24.4%

Source: CEPA analysis

[12] Note that we have expressed these as a percentage uplift, as opposed to our approach at DD of showing them as percentage-point differences between efficiency scores. This is to align with the UR's approach in presenting efficiency challenge, as a percentage uplift of the efficiency score.

1. INTRODUCTION

On 28 November 2023, the UR published its Draft Determination (DD) for RP7.[13] This included the results from CEPA's comparative benchmarking analysis of NIEN's historical expenditure compared to the GB distribution network operators (DNOs).[14] The benchmarking analysis assessed the efficiency of NIEN's operating expenditure (IMFT&I), which includes inspection, maintenance, faults, tree cutting and indirect costs (Business Support Costs and Closely Associated Indirects).

NIEN commissioned NERA Economic Consulting (NERA) to review the UR's DD and the accompanying papers produced for the UR by CEPA. This review focused on CEPA's DD benchmarking models prepared for the UR, and the UR's use of them to set NIEN's RP7 IMFT&I allowances at the DD stage.

CEPA has prepared this update for the Northern Ireland Utility Regulator (UR) on our benchmarking analysis. This update addresses the points raised by NIEN and NERA in relation to CEPA's comparative benchmarking analysis of NIEN's historical expenditure compared to the GB DNOs, published alongside the UR's DD documents.[15] Our analysis will form a part, but not the entirety, of the evidence base that the UR will use to inform its Final Determination (FD) on the IMFT&I allowances for NIEN for the price control period RP7, running from 1 April 2025 to 31 March 2031. For instance, NIE has also provided bottom-up evidence on its forecast costs for IMFT&I. Assessment of that evidence is outside the scope of this report.

The rest of this annex is structured as follows:

- Section 2 provides an overview of CEPA's efficiency modelling approach and results, which was presented in detail in our DD report.
- Section 3 discusses in detail our updated position on the three main issues raised by NERA: treatment of connection costs, regional wage adjustments, and use of NOCs models.

[13] Utility Regulator, RP7 Price Control Draft Determination.

[14] CEPA, RP7 Efficiency Advice.

[15] NERA, Response to UR RP7 Draft Determination.

2. SUMMARY OF CEPA'S DRAFT DETERMINATION EFFICIENCY MODELLING

This section discusses our approach to the benchmarking analysis of the efficiency of NIEN's historical operating expenditure that was set out in our DD report.

In line with the approach adopted for RP5 and RP6, we identified GB DNOs as the most suitable comparators for NIEN. Therefore, our analysis encompasses 15 companies (14 GB DNOs alongside NIEN). To ensure comparability, and address differences in scope between GB DNOs and NIEN, we conducted a comprehensive pre-modelling normalisation process.

We assessed the efficiency of NIEN's I&IMFT expenditure, using our independently developed preferred set of models. We used historical data only (2012-2021 data from Ofgem's RIIO-ED2 BPDTs and 2013-2022 data from the UR's RP7 RIGs).

We applied pre-modelling adjustments to ensure a like-for-like comparison between NIEN and GB DNOs

To ensure comparability, and address differences in scope between GB DNOs and NIEN, we conducted a comprehensive pre-modelling normalisation process. In summary, we applied the following pre-modelling adjustments to NIEN's and GB DNOs' datasets: [16]

- **Differences in scope:** for NIEN, 110kV and 275kV assets are held in the transmission business. GB DNOs operate up to 132kV, apart from the Scottish DNOs which only operate up to 66kV. To account for these differences, we allocate costs and volumes from NIEN's transmission business for 110kV assets to the distribution side of the business based on an allocation given by NIEN.
- **Cost exclusions:** to create a comparable dataset across companies, we excluded costs that are incurred by a single, or small number of DNOs, were not adequately explained by Ofgem's ED2 models, or are not comparable across DNOs. In summary, we have broadly followed Ofgem's RIIO-ED2 approach to cost exclusions.
- **Re-allocation of non-op capex:** companies can make decisions to buy or lease vehicles, and to rent or buy office spaces. These decisions have implications for the opex and capex allocations. Therefore, we have reallocated non-op capex vehicle and property costs to CAI and BSC, respectively.
- **Other regional factors**: to ensure that cost benchmarking is carried out on a comparable basis, Ofgem excluded costs where companies have provided sufficient evidence that they incur higher efficient costs due to the inherent nature of their networks. We have used Ofgem's RIIO-ED2 regional factors for our analysis in RP7. We have made no equivalent adjustments for NIEN, matching our approach in RP6.
- **Wayleaves:** NIEN and their advisers argue that wayleaves costs are not comparable between GB and NIEN, and therefore should be excluded from the comparative benchmarking analysis.[17] However, we consider that wayleave payments can be captured within the models by including percentage of overhead line length (OHL) as a cost driver for each company. Additionally, wayleaves are partially captured by network length, as companies with a large network length are usually associated with a high percentage of OHL. Therefore, we did not carry out any pre-modelling adjustment for wayleaves.

[16] For more detail, see: CEPA, RP7 Efficiency Advice.

[17] Wayleave payments are associated with the cost of rent payments to landowners to cover the financial impact of having equipment on the landowners' land, or having to access it so that the network company can reach its equipment.

- **Connection costs:** every year a proportion of IMFT&I costs are allocated to connections for NIEN and the GB DNOs. Connection costs are treated outside of the price control as connection costs are funded through customer connection charges. In RP6, the UR triangulated between pre- and post-allocation modelling; i.e. it placed equal weight on both approaches. Therefore, we presented both pre-allocation and post-allocation models in our DD report.
- **Regional labour adjustments:** in order to separate genuine differences in efficiency from changes in input costs outside companies' control, we applied a regional wage adjustment (RWA) to GB DNOs' and NIEN's labour costs to account for regional differences in the wage costs companies incur. However, some activities do not necessarily need to be carried out within the region in which the DNO operates. At RIIO-ED1 and RIIO-ED2 Ofgem only applied regional labour adjustments to the percentage of labour costs that it assumed needs to be carried out locally (e.g., repairs and maintenance activities).[18] Overall, we considered that it would be difficult to pinpoint the total proportion of labour that can realistically be procured outside of the operating area by DNOs. The extent to which companies are incentivised to procure labour outside of their region is likely to be asymmetric. As the DNO operating in the UK's lowest-wage region, NIEN has more limited incentives to source their labour outside of its own region. We aimed to replicate the work Ofgem undertook to develop its data adjustments at RIIO-ED1 and RIIO-ED2. However, we were unable to find the exact source of Ofgem's assumptions with regards to its local labour adjustment. Therefore, instead of adjusting only a share of labour costs that is incurred locally based on Ofgem's locally incurred labour assumptions, we applied regional labour adjustments to 100% of labour costs for GB DNOs and NIEN, assuming that companies incur all their labour locally.

The latter two adjustments, on connection costs and regional labour adjustments, were challenged by NIEN and its advisers in reports submitted in response to the UR's DD on RP7.

CEPA's Draft Determination benchmarking approach

Conducting benchmarking analysis between different jurisdictions is a complex process, due to differences in regulatory framework and assumptions underpinning forecast costs. Hence, on balance, we decided to use historical data only for our benchmarking analysis. We considered that using forecast data would add additional complexity, which could result in benchmarks that are not calculated on a sufficiently comparable basis. We used 2012-2021 data from Ofgem's RIIO-ED2 BPDTs and 2013-2022 data from UR's RP7 RIGs.

We started by rerunning the RP6 final determination models, using updated data. As part of the process, we sought to improve these models by testing various options for cost aggregations, relevant drivers and the functional form. We tested three different levels of aggregation:

- **Top-down models:** we considered the use of total expenditure (totex) modelling for the RP7 price control, and explored models closely aligned with Ofgem's totex models used in RIIO-ED1 and RIIO-ED2. Overall, due to the lack of robust models, we considered that it would not be appropriate to use our totex modelling results to estimate a catch-up efficiency challenge for NIEN's totex.
- **Middle up models:** we benchmarked companies at the level of total operating expenditure (IMFT&I), which includes inspection, maintenance, faults, tree cutting and indirects (Business Support Costs and Closely Associated Indirects).
- **Disaggregated models:** we explored benchmarking individual elements of IMFT&I costs (e.g., NOCs, BSC, CAI). However, while we obtained statistically robust results for NOCs-only models, results from standalone BSC and CAI models did not prove to be robust. As a result, we did not recommend using the BSC and CAI models for quantifying the difference in historical efficiency between NIEN and the GB DNOs.

[18] Ofgem assumed that these shares are 0% for business support costs, 40% for CAI and non-op capex, and 88% for activities covered in all other cost areas.

Overall, we concluded that the RP6 models still performed broadly similarly as evidenced by the UR's modelling results in the RP6 final determination. However, the RESET test failed in various models, and not all variables were statistically significant. Therefore, we sought to improve UR's RP6 models, focusing on alternative drivers, including squared terms and different levels of aggregation. We performed a targeted model improvement process based upon our findings in the RP6 re-runs, and from our experience in applying econometric analysis to RIIO-ED2.

As a result of our model improvement process, we made some changes to the RP6 final determination models to make our quantitative assessment of the comparative efficiency of IMFT&I expenditure by NIEN and the GB DNOs. These changes are summarised in Figure 2.1.

Figure 2.1: RP6 final determination models (left), and CEPA's RP7 recommended models (right)

Model 1.1	Model 1.2	Model 1.3	Model 1.4	Model 1.5	Model 1.6
Cost					
IMFT&I	IMFT&I	IMFT&I per customer	NOCs	CAI	BSC
Cost drivers					
Network length	MU CSV	OHL%	Network length	MU CSV	MU CSV
Network density	OHL%	Inverse network density	Network density	OHL%	
OHL%	Time dummies		OHL%		

Model 2.1	Model 2.2	Model 2.3	Model 2.4	Model 2.5	Model 2.6
Cost					
IMFT&I	IMFT&I	IMFT&I	NOCs	NOCs	NOCs
Cost drivers					
Network length	MU CSV	Network length	Network length	MU CSV	Network length
Network density	Network density	Network density	Network density	Network density	Network density
OHL%	OHL%		OHL%	OHL%	

Source: CEPA analysis. Note: middle up CSV (MU CSV) = 50% weight on network length, 25% weight on customer numbers, 25% weight on units distributed.

We made the following changes to the RP6 final determination models:

- Model 2.2 was created by adding network density to model 1.2, as we consider this an important driver of costs. Additionally, we removed the time dummies for model 1.2, as the coefficients on the year dummies were mostly statistically insignificant and there is no clear rationale to include the time dummies.
- We removed Model 1.3 as this model performed less well in terms of statistical robustness (e.g., the inverse density driver was statistically insignificant). We replaced this model with Model 2.3, a version of Model 1.1 without OHL%, as this model now passes the RESET test.
- We dropped the models for CAI and BSC as they performed much worse than when tested in the RP6 determination process. In particular the R squared is significantly lower compared to the RP6 final determination and the RP7 middle up models.
- We ran the same models for NOCs as for IMFT&I, as we found similar conclusions for NOCs as in the IMFT&I models.

Error! Reference source not found. summarises NIEN's efficiency scores according to the set of models we presented for the RP7 DD, alongside the upper quartile benchmark (UQ, 75th percentile efficiency score of the industry) and the catch-up challenge (i.e., the difference between the upper quartile and NIEN's efficiency score). The score above 1 indicates inefficiency (i.e. lower efficiency than the industry UQ), and a score below 1 indicates performance more efficient than the UQ.

NIEN's catch-up efficiency challenge can be calculated as the percentage-point difference between NIEN's efficiency score and the UQ in each model. Triangulating the results for each different model (with equal weights on

each model) for middle-up and bottom-up results respectively produces estimated efficiency gaps of -14% for IMFT&I, and -5% for NOCs. A negative value indicates that NIEN is more efficient than the UQ).[19]

Table 2.1: The benchmarking results presented in CEPA's DD report

	IMFT & I (inc. connection costs)			IMFT & I (exc. connection costs)			NOCs		
	Model 2.1	Model 2.2	Model 2.3	Model 2.1	Model 2.2	Model 2.3	Model 2.4	Model 2.5	Model 2.6
NIE Networks efficiency score	0.865	0.881	0.820	0.814	0.830	0.754	0.875	0.896	0.773
UQ	0.970	0.998	0.942	0.974	0.992	0.949	0.889	0.906	0.889
Catch-up challenge	-10%	-12%	-12%	-16%	-16%	-19%	-1%	-1%	-12%

Source: CEPA analysis

The UR triangulated across all nine models (six IMFT&I and three NOCs models) with equal weights to calculate an overall catch-up efficiency challenge to inform its DD position on future IMFT&I allowances.

The UR expressed NIEN's (negative) catch-up efficiency challenge as a percentage uplift of its efficiency score. Expressed in this way, the triangulated catch-up efficiency challenge is -14%. To ensure consistency with the UR's approach, we have expressed all newly calculated efficiency catch-up challenges in this update as a percentage of NIEN's efficiency score.

The approach to triangulation set out here is the third main area of challenge from NIEN and its advisers in their responses to the DD reports.

[19] For consistency with the DD report, these figures are presented as percentage-point differences between efficiency scores. In Section 3 of this report and in the Executive Summary we have aligned with the UR's approach in presenting efficiency challenge as a percentage uplift of the efficiency score.

3. CEPA UPDATE FOR RP7 FINAL DETERMINATION

This section sets out the main points raised by NERA on behalf of NIEN in response to the UR's RP7 Draft Determination. NERA's review focused on CEPA's DD benchmarking models prepared for the UR, and the UR's application of them to set NIEN's RP7 IMFT&I allowances. NERA's report focused particularly on three methodological choices proposed by CEPA regarding pre-modelling adjustments and econometric benchmarking of IMFT&I costs:

- **Connection costs:** We presented both pre-allocation and post-allocation models for the DD (i.e. models including and excluding connection costs). The UR triangulated between the two approaches with equal weights to determine its DD position on NIEN's future IMFT&I allowances.
- **Regional labour adjustments:** We applied regional labour adjustments to 100% of labour costs for GB DNOs and NIEN, assuming that NIEN and GB DNOs incur all their labour locally.
- **Triangulation:** To inform its DD position on NIEN's future IMFT&I allowances, the UR triangulated across CEPA's six IMFT&I (three models including connection costs and three models excluding connection costs) and three NOCs models, weighting each model equally.

Below, we summarise NERA's arguments and our updated position on each point in turn.

3.1. CONNECTION COSTS

Every year a proportion of IMFT&I costs are allocated to connections for NIEN and the GB DNOs. The benchmarking can be carried out using pre-allocation approach or a post-allocation approach (i.e., before or after re-allocation of connections-related indirects).

In RP6, the UR triangulated between pre- and post-allocation modelling (50% weight on both approaches), acknowledging both approaches have advantages and disadvantages. On the one hand, if connection costs are excluded from the benchmarking models, a gaming opportunity arises, where NIEN could choose to allocate more costs to connections in order to make the remaining costs appear more efficient. Additionally, excluding connection costs from the benchmarking models may eliminate valuable information on NIEN's efficiency in relation to connection costs. On the other hand, comparing different connection markets might be challenging and could have the potential to bias the results.

In our DD report, we considered that the strengths and weaknesses of both approaches meant that the RP6 approach of triangulating between both approaches remained appropriate[20]. We therefore provided benchmarking results to the UR for both pre-allocation and post-allocation models.

NERA states that CEPA's DD approach does not control for important differences between NIEN and the British DNOs related to connections

The market for connections has been contestable in Northern Ireland since 2018, with Independent Connections Providers (ICPs) able to compete with NIEN to offer connections to customers. In its response to the UR's DD, NERA states NIEN still carries out around 99% of connections because of low interest from ICPs.[21] NERA contrasts this to GB, where ICPs play a much more significant role in the connections market, with DNOs having smaller market shares.

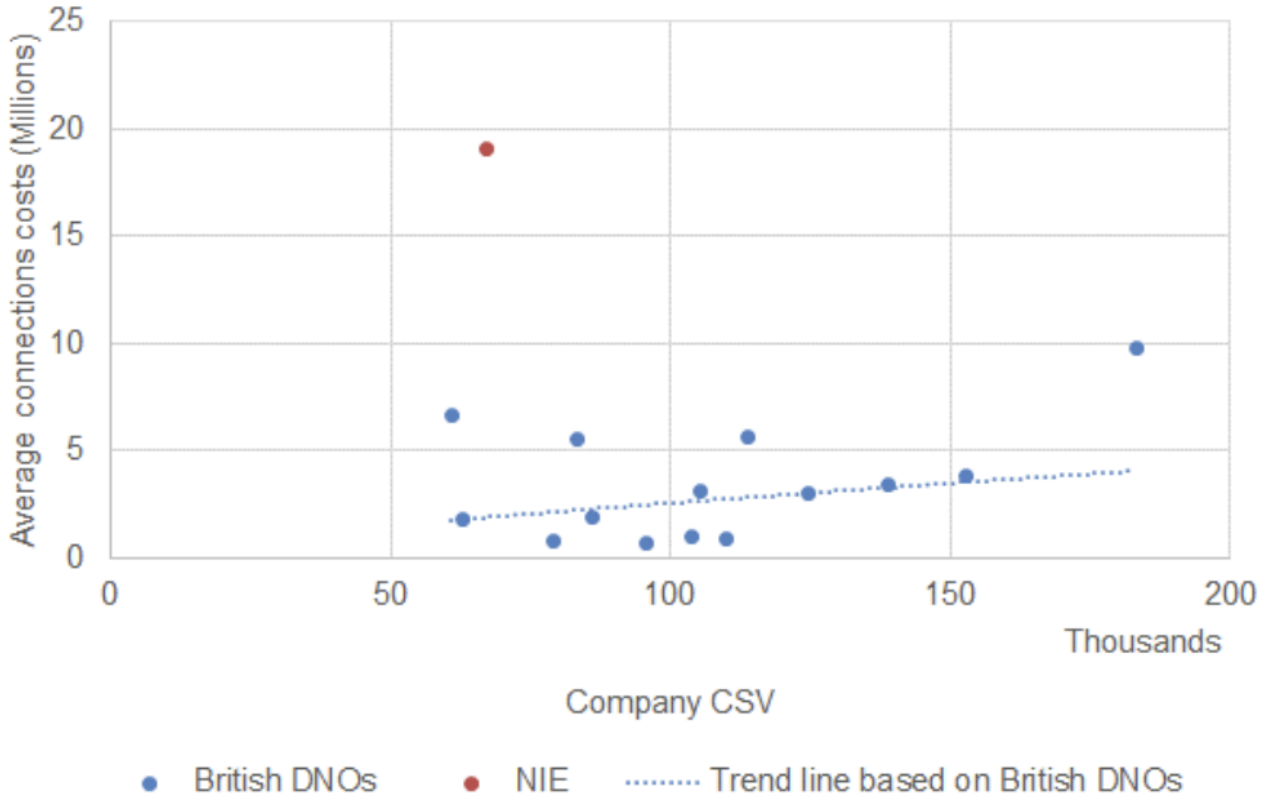
Therefore, NERA conclude that connection costs between NIEN and the British DNOs are not directly comparable. In support of this conclusion, NERA present a chart in their report (reproduced here as **Error! Reference source not found.**) which shows that NIEN's annual connection costs are the higher than any GB DNO. The chart presents

[20] CEPA, RP7 Efficiency Advice, section 2.2.7.

[21] NERA, Response to UR's Draft Determination, page i.

NIEN as even more of an outlier when comparing connection costs to network size, as proxied by the composite scale variable (CSV) used in the benchmarking analysis.[22]

Figure 3.1 - Average annual connection costs over RP6 against network CSV



Source: NERA, Response to UR RP7 Draft Determination, page 9.

Therefore, NERA states that as the cost drivers used in the modelling do not control for the higher volumes of connections carried out by NIEN, the company will appear to be relatively less efficient. Therefore, including connection costs in the IMTF&I modelling would introduce a directional bias against NIEN in any efficiency assessment.

NERA notes the UR's concern that relying solely on post-allocation models could create scope for NIEN to game the allocation of costs to connections – i.e. attribute more indirect costs to connections in order to improve its comparative performance regarding the efficiency of IMFT&I costs. However, NERA states that in practice, the scope for gaming by NIEN is mitigated by the fact that NIEN have followed the UR's Regulatory Instruction and Guidance (RIGs) in developing their estimates for direct and indirect connection costs.

NERA also notes that at RP5, the Competition Commission (CC) tested models that included and excluded indirect costs related to connections. However, it ultimately decided to rely solely on models that excluded all indirect costs allocated to connections (i.e. post-allocation only).[23] NERA reports that the CC reached this decision because the scale drivers included in the models did not capture differences in the amount of new connection activity.

As a result, NERA argues that the UR's approach of giving post- and pre-allocation models equal weights leads to a systematic underestimate of NIEN's efficiency, and that only post-allocation models should be used instead.

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[22] The middle-up CSV is constructed with 50% weight on network length, 25% weight on customer numbers, 25% weight on units distributed.

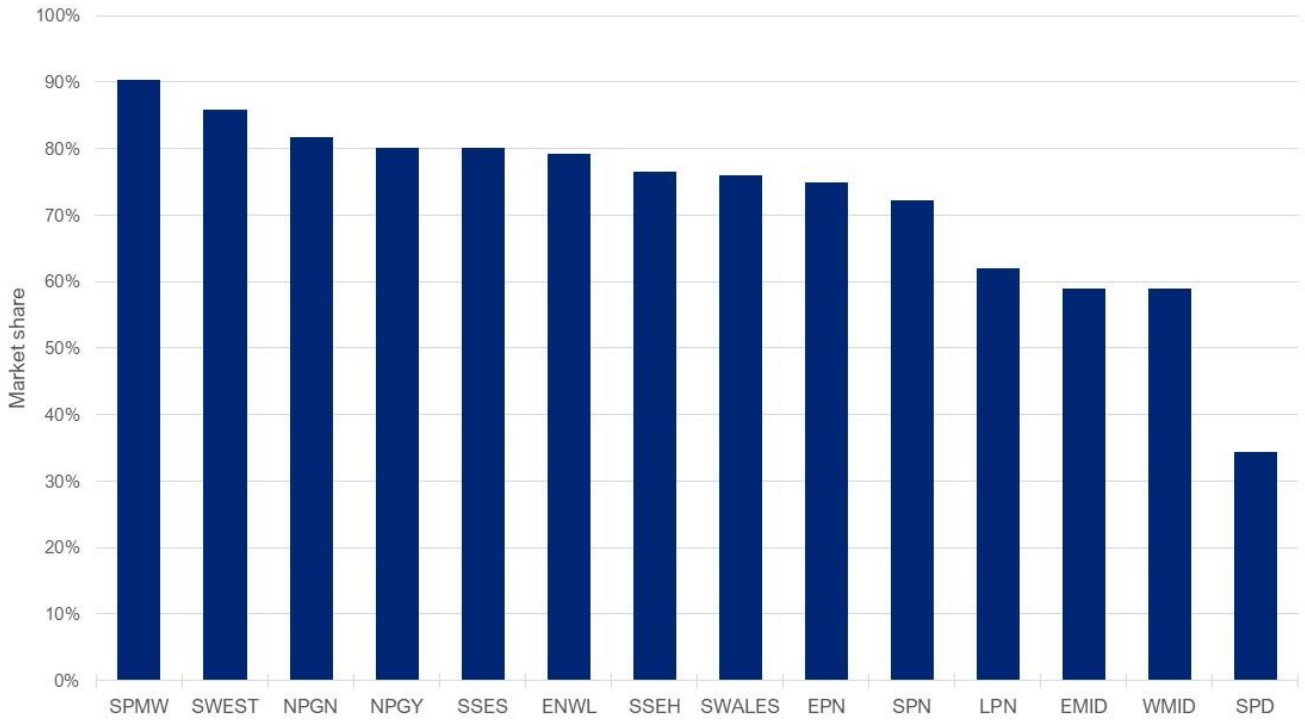
[23] NERA, Response to UT RP7 Draft Determination, pages 9-10.

CEPA's Final Determination view

We have investigated the publicly available evidence on the impact on different levels of connections activity in GB. We have not been able to obtain publicly available data that would allow direct comparability of the absolute level of connection activities between NIEN and GB DNOs. We also note that neither NIEN nor NERA have provided any details on the absolute scale of these activities.

Error! Reference source not found. shows the variation in market shares across GB DNOs. Between 2018 and 2021, market shares for GB DNOs ranged between 34% and 90%, with a median market share of 76%.[24] This illustrates that while it is true that all GB DNOs have a smaller connections market share than NIEN, there is a wide range of market shares across GB DNOs. Despite this, during RIIO-ED2 Ofgem did not exclude connection costs from its benchmarking models.[25] While Ofgem uses some additional cost drivers in its benchmarking (e.g., capacity released, number of low carbon technology uptake), none of these explicitly control for connection costs either.

Figure 3.2: Market shares for contestable connections (Relevant Market Segments, 2018-2021 average), variation across GB DNOs



CEPA analysis of Ofgem (May 2022), Consultation on our review of competition in the electricity distribution connections market.

Finally, we note that while our analysis does conclude that on average market shares in GB are lower than 99%, the difference does not seem to fully explain the much larger connection costs reported by NIEN. For context, the NERA chart shows connection costs of nearly £20m/a for NIEN compared to figures of around £6m and around £2m for the two GB DNOs with a similar composite scale variable in the benchmarking. NIEN's connection costs are approximately three times larger and nine times larger than these two comparators respectively. The lower figure of around £2m sits on NERA's estimated trend line for the relationship between connection costs and network scale.

Our scope of work has not included a detailed assessment of the robustness of NIEN's cost allocation processes. However, we agree with the UR that there is always some degree of judgement in the allocation to different

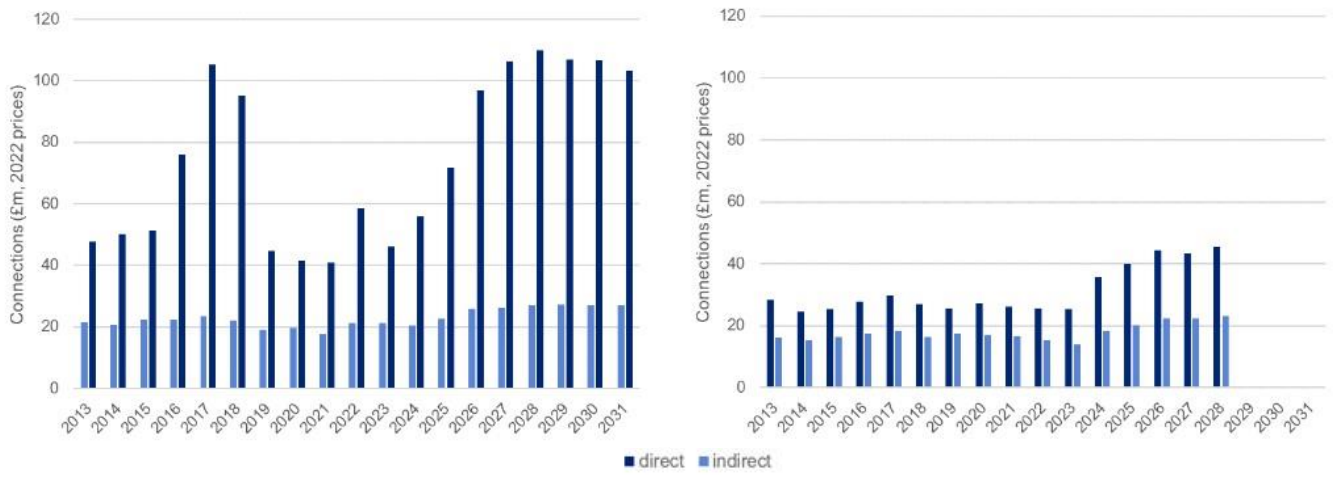
[24] CEPA analysis of: Ofgem, Consultation on our review of competition in the electricity distribution connections market, Annex: summary of our review of competition in the electricity distribution connections market.

[25] See: Ofgem, RIIO-ED2 Final Determinations.

activities of indirect costs, such as network design and engineering, IT and telecoms, and call centres.[26] We do not agree with NERA's assessment that there could not be, at least hypothetically, directional bias in reporting indirect costs, given the gaming incentives companies face under a price control framework.

Figure 2.4 in our DD report showed that there was much more variation over time in NIEN's connection costs than for GB DNOs. To try to better understand the drivers of variation in these costs, we have compared NIEN's direct and indirect connection costs against the GB average. Figure 3.3**Error! Reference source not found.** shows that the variation over time in NIEN's connections costs is driven by direct connection costs, with indirect costs being broadly stable over time and following a similar pattern to the GB average. This suggests that the variation in NIEN's connection costs cannot be seen as evidence of potential allocation issues for connection costs.

Figure 3.3: Composition of connection costs (£m, 2022 prices), NIEN (left) and GB average (right)



The scope of our work does not include an assessment of (and we have not seen any evidence presented of) whether NIEN's high market share for connections activities implies anything about the efficiency of these costs - i.e. whether NIEN is very efficient, which allows it to out-compete ICPs, or whether there is a lack of competitive pressure from ICPs. If the latter is the case, then comparative benchmarking may play an important role in identifying cost efficiencies that would otherwise be revealed by effective competitive pressures.

Summary of CEPA FD position:

Under both approaches to the treatment of connection costs, NIEN outperforms the upper quartile efficiency position of the GB DNOs. Therefore, the approach taken does not affect our assessment that there appears to be no efficiency gap for NIEN to close on operating expenditure compared to the GB DNOs.

In its DD, the UR used a single figure for NIEN's efficiency performance to directly feed into the calculation of NIEN's IMFT&I allowances for RP7.

Our scope of work has not included an assessment of the robustness of NIEN's cost allocation processes, and the competitive pressures on NIEN's connections activities. The UR may wish to consider these issues in a final decision on the balance between pre-allocation and post-allocation models if it wishes to set future allowances informed by a single estimate of NIEN's historical efficiency.

[26] Ofgem (December 2020), RIIO-ED2 Business Plan Data Template – Glossary. URL: https://www.ofgem.gov.uk/sites/default/files/2021-10/RIIO%20-%20ED2%20BPDTs%20-%20Glossary.pdf

3.2. REGIONAL WAGE ADJUSTMENTS

In our DD report we noted that NIEN's labour cost index is the lowest across all DNOs in the UK. Therefore, in order to separate genuine differences in efficiency from differences in input costs outside companies' control, we applied a regional wage adjustment (RWA) to GB DNOs' and NIEN's labour costs. A RWA normally consists of three different elements:

- **Regional labour index**: using Annual Survey of Hours and Earnings (ASHE) data from the Office of National Statistics (ONS), indices are constructed for each network company to reflect the relative regional wage in its region.
- **Proportion of labour costs:** for each cost category, the regional labour index is only applied to the notional average labour share of the industry.
- **Proportion of labour incurred locally:** some labour costs do not necessarily have to be sourced within the region the DNO operates in, as companies can improve efficiency by locating activities such as call centres in lower wage areas. In RIIO-ED1 and RIIO-ED2 Ofgem only applied the regional labour adjustment to the percentage of labour costs that it assumed needs to be incurred locally (e.g. for repairs and maintenance activities).

Table 3.1: Ofgem's RIIO-ED2 locally incurred labour assumptions

Cost category	Locally incurred (%)
Statutory Independent Undertakings (SIU)	0%
IT & Telecoms	0%
Property Management	0%
HR & Non-operational training	0%
Audit, Finance & Regulation	0%
Insurance	0%
Procurement	0%
CEO & Group Management	0%
Stores & Logistics	0%
Total Work Management	44%
Training & Apprentices	85%
Emergency	100%
Repairs	100%
Maintenance	100%
Other Direct Activities (ODA)	100%
Capex	100%
Repex	100%

Source: Ofgem RIIO-2 modelling suite.

In our DD report, we considered three approaches to the application of locally incurred labour adjustments:

- 1) Apply no local labour adjustment to NIEN's and GB DNOs' labour costs (assuming 100% of labour is sourced locally).
- 2) Apply Ofgem's RIIO-ED1 and RIIO-ED2 local labour adjustment to all cost categories for GB companies only (i.e., assuming GB companies source a portion of their labour outside of their region). Apply no local labour adjustment to NIEN's labour costs (assuming 100% of labour is sourced locally).

- 3) Apply Ofgem's RIIO-ED1 and RIIO-ED2 local labour adjustment to all cost categories (i.e., assuming all companies source a portion of their labour from a common labour market). [27]

In the DD, we considered that it is difficult to pinpoint the total proportion of labour that can realistically be procured outside of the operating area by DNOs. The extent to which companies are incentivised to procure labour outside of its region is also likely to be asymmetric, as NIEN operates in the lowest wage region in the UK. Therefore, instead of adjusting only a share of labour costs that is incurred locally based on Ofgem's locally incurred labour assumptions, we recommended the UR apply regional labour adjustments to 100% of labour costs for GB DNOs and NIEN (i.e. Option 1), assuming that companies incur all their labour costs locally.

NERA states that an error is caused by assuming that all DNOs co-locate all labour costs with network operations

NERA explains Ofgem's approach in RIIO-ED2, which assumed that only a proportion of activities needs to be carried out locally. Ofgem assumes that this proportion varies by cost activity (see Table 3.1) and applies it to all GB DNOs.

NERA states that this demonstrates a regulatory precedent and that the adjustment for proportion of labour incurred locally is necessary to "reflect the fact that some work does not need to be carried out locally to ensure a like-for-like comparison of DNOs' costs".[28] It therefore follows that the DD approach to regional wage adjustments results in an underestimation of NIEN's efficiency by failing to adjust for the proportion of locally incurred labour when applying regional wage adjustments.

There are four main points set out by NERA in support of this view:[29]

- Whether NIEN locates its staff in Northern Ireland does not affect the rationale for a local labour cost adjustment: some staff can be located anywhere in the country or even abroad (e.g. in lower wage countries compared to the UK). Hence, DNOs in low-wage areas do not necessarily enjoy cost savings relative to other DNOs in respect of their whole labour force. Similarly, DNOs in high wage areas appear more efficient than they really are, as a result of CEPA's assumption that all their labour costs are incurred locally. Hence, where such DNOs influence the upper quartile efficiency target, our approach of not applying a local labour adjustment penalises other DNOs – including NIEN – by setting an unrealistically low cost upper quartile target for the industry.
- Some of NIEN's labour costs need to be sourced outside of NI. NERA states that historically NIEN has been demonstrably sourcing labour from a national or international labour markets for certain activities. NIEN has provided several examples of labour that needs to be outsourced from other regions in the UK, such as economic advisers, legal advisers, IT providers and outsourced contractors working on the network when additional help with urgent work is needed.
- CEPA's sensitivity of applying the locally incurred labour adjustment to only GB DNOs, and not NIEN, is inconsistent and does not bring costs to a comparable level. The CEPA DD report included a sensitivity that applied Ofgem's assumptions for local labour shares to the British DNOs, but not to NIEN. However, NERA sets out that this approach is mistaken as it does not ensure consistent modelling treatment for DNOs across GB and NI. Consistency of treatment is a crucial aspect of benchmarking across DNOs, as the goal is to bring the costs to a comparable level and to obtain the "cleanest" possible comparison of efficiency across companies. Therefore, NERA concludes that applying the local labour adjustment only on a subset of the DNOs fails to provide consistency, and is discriminatory to the detriment of NIEN.

[27] CEPA, RP7 Efficiency Advice, page 18.

[28] NERA, Response to UR's Draft Determination, page 19.

[29] NERA, Response to UR's Draft Determination, pages 20-23.

- Uncertainty on the share of labour that needs to be co-located with the network does not obviate the need to control for this factor. In other words, uncertainty over the true share of locally incurred labour costs does not justify failing to adjust for it at all, as the assumption that 100% of labour can be co-located with the network is demonstrably incorrect. NERA argues that if the UR cannot replicate Ofgem's analysis on locally incurred labour shares, it needs to undertake its own independent analysis.

CEPA's Final Determination view

Table 3.2 shows the regional wage indices we have used to adjust DNOs' labour costs.

Table 3.2: DNOs and NIE Networks' Regional Wage index

Company	Wage index
LPN	1.19
SPN	1.06
SSES	1.03
EPN	1.03
SPD	1.00
SSEH	1.00
ENWL	0.96
SPMW	0.95
WMID	0.95
EMID	0.95
SWales	0.94
SWest	0.94
NPGY	0.94
NPGN	0.93
NIEN	**0.89**

Source: CEPA analysis

Ofgem's local labour adjustment assumes that all companies are able (or indeed need) to source a portion of their labour from the same pool, independently of their region. Therefore, for this adjustment to be applicable to NIEN on the same basis as GB DNOs, it would need to be the case that GB DNOs and NIEN have equal scope to locate non-locally sourced activities in the same areas – whether that is within or outside of the UK. We call this Scenario A.

However, there is another plausible scenario consistent with Ofgem's local labour adjustment in ED2 – namely that GB DNOs have equal scope to carry out non-locally sourced activities within GB only. In this case, the GB DNOs would not have access to the lower wage market in Northern Ireland. This would be consistent with applying Ofgem's local labour adjustment to all cost categories for GB companies only. In this scenario, we normalise all NIEN's labour costs to the UK average, and follow Ofgem's ED2 assumptions for GB DNOs – assuming that GB DNO's locate part of their labour outside their local area (but not in NI). We call this Scenario B.

We have not been able to find any explicit reference in Ofgem's ED2 documentation as to whether the locally incurred labour adjustments for ED2 assume that non-locally sourced labour activities can be carried out outside GB. This distinction does not matter for Ofgem as the adjustment for ED2 only considers whether the GB DNOs have access to a common labour pool – not where that labour pool is located. We have not seen any evidence that GB DNOs actually incur labour outside of the GB. In research reported by the UR for RP6, none of the GB call centres appeared to be located outside of GB.[30]

Therefore, we consider that both Scenario A and Scenario B could be consistent with the regional wage adjustment approach taken by Ofgem for ED2. NIEN has stated that it needs to locate some of its activities in GB (e.g.,

[30] The Utility Regulator (30 June 2017), Transmission & Distribution 6th Price Control (RP6), Final determination, p.116. We have not been able to find updated information on the latest situation regarding the locations of customer service and new connection centres of the GB DNOs.

economic and legal advisers), which would be consistent with Scenario A as there would be a common labour pool with the GB DNOs. However, we have not seen evidence of the materiality of these costs as a share of total business support costs. Furthermore, it is unclear whether this would extend to having to locate all business support activities outside NI. That is what would be implied by relying on Scenario A only[31], under which NI and the GB DNOs are sourcing all business support activities from a common labour pool.

Summary of CEPA's FD position:

Under both of our RWA scenarios, NIEN outperforms the upper quartile efficiency position of the GB DNOs. Therefore, the approach taken does not affect our assessment that there appears to be no efficiency gap for NIEN to close on operating expenditure compared to the GB DNOs. However, in its DD, the UR used a single figure for NIEN's efficiency performance to directly feed into the calculation of NIE Networks' IMFT&I allowances for RP7.

We do not have detailed evidence available to us on the constraints on NIEN's procurement of labour inside and outside NI. Therefore, we consider that the UR is best placed to consider how to use both approaches to regional wage adjustment (i.e. Scenarios A and B) if it uses a single estimate of NIEN's historical efficiency to inform the setting of future allowances.

3.3. Triangulation of IMFT&I and NOCs models

In our DD report, we presented efficiency scores for NIEN for the nine models that we identified as being statistically robust in the benchmarking of NIEN's historical operational expenditure compared to the GB DNOs – three IMFT&I models including connection costs, three IMFT&I models excluding connection costs, and three NOCs models.

Table 3.3 lists the cost drivers included in the models. We reported that the gap between the NIEN's efficiency performance and the upper quartile is -14% for the IMFT&I models and -5% for the NOCs models (where a negative value signifies costs more efficient than the upper quartile).

Table 3.3: CEPA's DD models

Model 1 IMFT&I	Model 2 IMFT&I	Model 3 IMFT&I	Model 4 NOCs	Model 5 NOCs	Model 6 NOCs
Network length	MU CSV	Network length	Network length	MU CSV	Network length
Network density	Network density	Network density	Network density	Network density	Network density
OHL%	OHL%		OHL%	OHL%	

Source: CEPA analysis. Note: middle up CSV (MU CSV) = 50% weight on network length, 25% weight on customer numbers, 25% weight on units distributed.

However, we concluded in our DD report that BSC and CAI regressions did not produce sufficiently robust results. We therefore did not recommend using these bottom-up models to quantitatively estimate NIEN's efficiency performance.[32]

The UR placed equal weight (triangulated) on the nine models we identified as statistically robust to produce a single estimate of NIEN's efficiency to inform its DD position on NIEN's future operating expenditure.

NERA argues that the UR has weighted modelling results incorrectly when calculating NIEN's overall efficiency score

NERA states that triangulating across all nine models is erroneous because NOCs are a subset of IMFT&I and should therefore not be given the same weight. In order to compare IMFT&I and NOCs models on a like-for-like

[31] If GB companies indeed do not incur labour costs outside GB.

[32] CEPA, RP7 Efficiency Advice.

basis, NERA suggests that NOCs models should be complemented by suitable BSC and CAI models, or simply not included in the final triangulation.

CEPA's Final Determination view

We agree that triangulating between IMFT&I and NOCs model outputs using equal weights on both approaches creates the risk of a biased estimate, as it does not include efficiency scores for CAI and BSC alongside the NOCs models. To address this issue, we have considered the following three approaches:

- **Including BSC and CAI models in the triangulation:** When taking into account results from the RP6 BSC and CAI model re-runs alongside the NOCs model, NIEN's historical performance appears to become less efficient compared to the IMFT&I aggregate models – though these results are very sensitive to decisions on the exclusion of connection costs. However, we found that these models are not statistically robust.
- **Relying on IMFT&I models only:** Relying on IMFT&I models only would entirely avoid the bias introduced by weighting IMFT&I and NOCs models equally.
- **Using lower weights on NOCs models:** For example, weighting according to the proportion of NOCs to total IMFT&I costs (i.e. assigning a weight of just under 34% of that of IMFT&I models). However, this would not remove the bias as the NOCs model still represents an assessment of only a part of the costs covered by the IMFT&I models.

Summary of CEPA's FD position

Under all nine models NIEN outperforms the upper quartile efficiency position of the GB DNOs. Therefore, the approach to weighting the models taken does not affect our assessment that there appears to be no efficiency gap for NIEN to close on IMFT&I expenditure compared to the GB DNOs.

We recommend that the UR accept NERA's proposal and use only aggregate IMFT&I models to estimate a single figure for NIEN's efficiency score. This is because of the lack of robust evidence of efficiency scores on CAI and BSC which would be required for a full disaggregated model.

Using benchmarking approaches at different levels of disaggregation will often provide different pictures of efficiency performance. Therefore, the results of the NOCs models could still provide some valuable information regarding the efficiency of NIEN's IMFT&I costs using a different benchmarking approach.

As such, the UR may wish to consider the evidence from standalone NOCs models in the round when setting future cost allowances, rather than directly triangulating the results from these models with those from IMFT&I models.

Appendix A DETAILED MODEL RESULTS UNDER BOTH REGIONAL WAGE ADJUSTMENT OPTIONS

Locally incurred labour factors applied to GB DNOs only						
	IMFT&I including connection costs			IMFT&I excluding connection costs		
	Model 2.1	Model 2.2	Model 2.3	Model 2.1	Model 2.2	Model 2.3
Log of network length	0.814***		0.807***	0.833***		0.820***
Log of middle-up CSV		0.829***			0.847***	
Log of network density	0.679***	0.281*	0.460***	0.846***	0.439**	0.483***
Length of overhead lines as a % of network length	0.508*	0.573**		0.844**	0.910**	
Constant	-6.391***	-5.666***	-5.349***	-7.419***	-6.670***	-5.689***
Model robustness tests						
Adjusted R2	0.879	0.881	0.865	0.854	0.855	0.817
RESET test	0.003	0.000	0.345	0.000	0.000	0.352
Normality of model residuals	0.037	0.009	0.850	0.008	0.025	0.54
Heteroskedasticity	0.008	0.032	0.096	0.000	0.002	0.005
Chow test	0.997	0.536	0.984	0.696	0.147	0.929
NIEN efficiency score	**0.871**	**0.888**	**0.839**	**0.820**	**0.836**	**0.770**
UQ	**0.961**	**0.974**	**0.957**	**0.982**	**1.000**	**0.945**
Catch-up challenge	**-10%**	**-10%**	**-14%**	**-20%**	**-20%**	**-23%**

* p < 0.1, ** p < 0.05, *** p<0.001

NB: We have expressed the catch-up efficiency challenge as a percentage uplift, as opposed to our approach at DD of showing them as percentage-point differences between efficiency scores. This is to align with the UR's approach in presenting efficiency challenge, as a percentage uplift of the efficiency score.

Locally incurred labour factors applied to both NIEN and GB DNOs						
	IMFT&I including connection costs			IMFT&I excluding connection costs		
	Model 2.1	Model 2.2	Model 2.3	Model 2.1	Model 2.2	Model 2.3
Log of network length	0.816***		0.808***	0.835***		0.821***
Log of middle-up CSV		0.831***			0.850***	
Log of network density	0.724***	0.325*	0.485***	0.888***	0.480*	0.505***
Length of overhead lines as a % of network length	0.556*	0.622**		0.888**	0.955**	
Constant	-6.595***	-5.875***	-5.454***	-7.608***	-6.864***	-5.786***
Model robustness tests						
Adjusted R2	0.875	0.878	0.859	0.847	0.849	0.809
RESET test	0.000	0.000	0.333	0.000	0.000	0.318
Normality of model residuals	0.007	0.004	0.764	0.003	0.009	0.853
Heteroskedasticity	0.000	0.002	0.010	0.000	0.000	0.000
Chow test	0.996	0.509	0.980	0.694	0.158	0.925
NIEN efficiency score	**0.846**	**0.862**	**0.811**	**0.798**	**0.813**	**0.746**
UQ	**0.962**	**0.9765**	**0.957**	**0.983**	**1.000**	**0.948**
Catch-up challenge	**-14%**	**-13%**	**-18%**	**-23%**	**-23%**	**-27%**

* p < 0.1, ** p < 0.05, *** p<0.001

NB: We have expressed the catch-up efficiency challenge as a percentage uplift, as opposed to our approach at DD of showing them as percentage-point differences between efficiency scores. This is to align with the UR's approach in presenting efficiency challenge, as a percentage uplift of the efficiency score.

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