

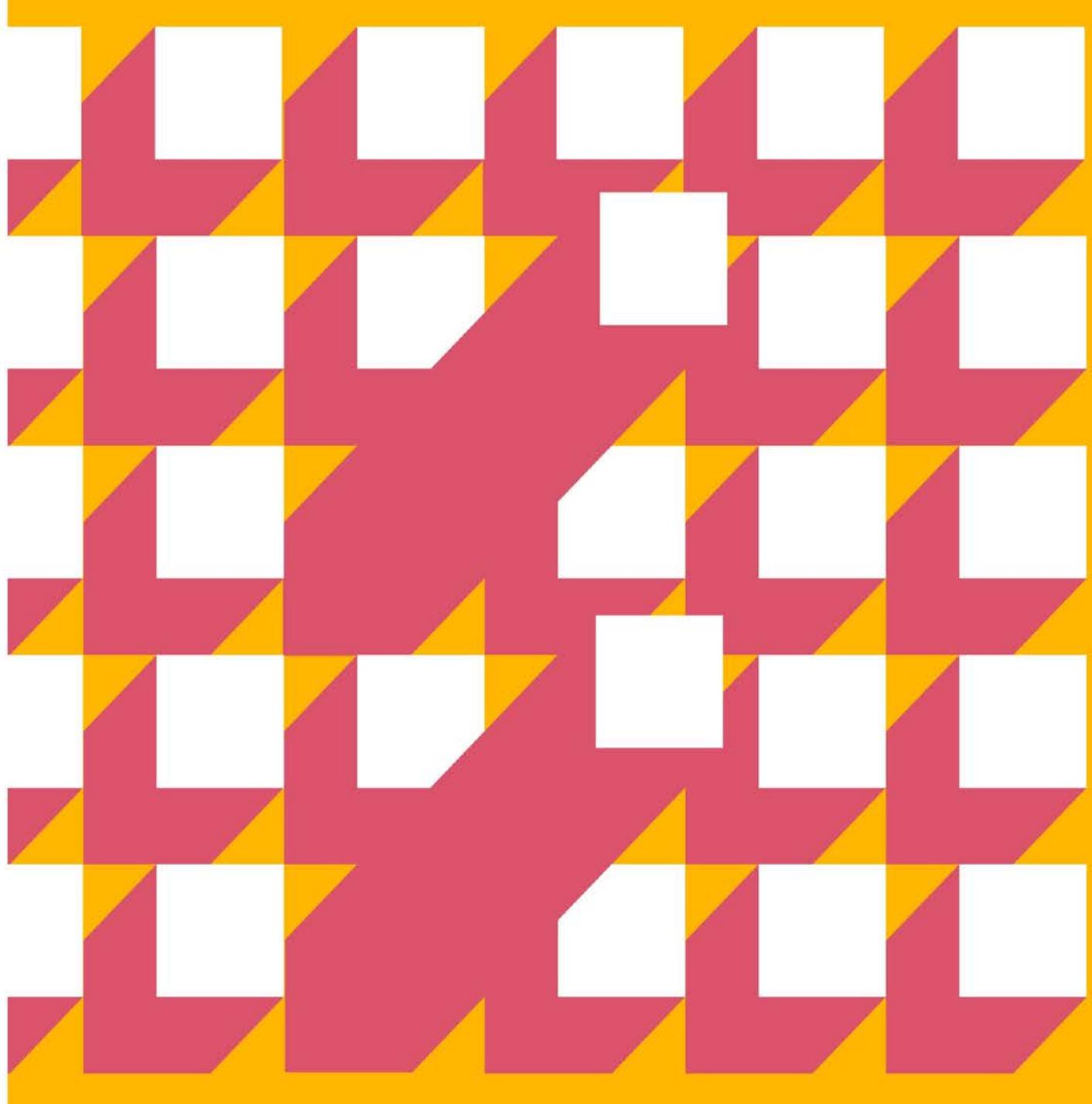
Aurora Energy - CPP Draft Decision

SONS and People Cost Allowances

*An assessment of Strata Energy Consulting's Opex
Briefing Report 6*

17 December 2020

Final Report





Richard Fletcher
Chief Executive Officer
Aurora Energy Limited
PO Box 5140
Dunedin 9054

17 December 2020

CPP Draft Decision - SONS and People Costs

Dear Richard,

We are pleased to present our assessment of the analysis and recommendations set out in Strata Energy Consulting's Opex Briefing Report 6. Strata's analysis has been incorporated into the Commerce Commission's Draft Decision on the System Operations and Network Support (SONS) and People Cost opex allowances for Aurora Energy Limited's (Aurora's) Customised Price Quality Path (CPP).

This report is provided in accordance with the terms of our letter of engagement dated 13 December 2017, the subsequent scope of work document dated 1 February 2019 and your instructions of 16 November 2020. This report is subject to the restrictions set out in Appendix A.

If you require any clarification or further information, please do not hesitate to contact us.

Yours sincerely

A handwritten signature in black ink, appearing to read 'Lynne Taylor'.

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1. Executive summary

Introduction

We have reviewed the report prepared by Strata Energy Consulting 'Opex Briefing Report 6 – Opex issue 7 (Report 6) and the accompanying spreadsheets:

- OBR6 3795792_Aurora opex base year efficiency analysis rev 2 – SEC.xlsx (Model 1)
- OBR6 - Forecast Tracker - 12 June Submission - Post SEC adjustment.xlsx (Model 2).

Report 6 provides recommendations for Aurora's forecast opex allowances during the CPP period for Aurora's System Operations and Network Support (SONS) and People Cost portfolios. We understand that the CPP Draft Decision relies on the analysis presented in Report 6.¹

The purpose of our review is to assist Aurora Energy to understand the approach and supporting analysis underlying the recommended opex allowances, and to assess whether the approach and the resulting SONS and People Cost opex allowances are consistent with the regulatory framework. We have also considered whether Report 6, Models 1 and 2 are fit for purpose.

We have focussed on the benchmarking adjustments to SONS and People Costs, which is the scope of Report 6. We have not considered other recommended adjustments to the opex allowances which fall outside the Report 6 recommendations.

Strata recommendations

The upper bound estimate reflects a reduction in Aurora's:

- SONS opex by \$23.2m (29%) during the five year CPP period; and
- People Cost opex by \$12.5m (31%) during the five year CPP period proposed (all \$ figures in this report are presented in RY20 terms, consistent with Report 6)¹.

The main driver for the proposed opex reduction purports to be staffing levels. Report 6 suggests that the upper bound scenario which has been adopted for the Draft Decision, is consistent with a reduction in Aurora's headcount from 158 FTEs to 140 FTEs from the start of regulatory year 2022 (RY22) and 132 FTEs from the middle of RY24 (refer Table 4 and Table 9 of Report 6).

¹We note that there are minor differences in the values presented in Report 6, Model 2, and the Draft Decision. We understand that the Commerce Commission is aware of the discrepancies.

Strata's approach

Strata's approach to deriving the recommended opex levels has been to:

- adjust Aurora's forecast SONS and People Cost opex to the long term average of a benchmark cohort of electricity distributors
- increase the benchmark opex by a ratio derived from Powerco data, to reflect additional SONS and People Cost opex expected to be incurred during a CPP
- cross check the analysis using a 'senior management' challenge approach to headcount, calculating alternative opex allowances derived from these FTE estimates.

Our findings

Our overarching finding is that the benchmarking approach adopted by Strata has not adequately recognised the unique circumstances facing Aurora during the CPP period. A CPP is intended to be the regulatory option where business specific requirements are reflected in the regulatory settings. Each CPP is unique. As we demonstrate in this report, the approach adopted by Strata to benchmark Aurora to a cohort average, and apply a step change based on the Powerco CPP does not derive SONS and People Cost opex outcomes which are consistent with Aurora's planned asset management and network investment programme during the CPP period.

The approach adopted also ignores the significant investment Aurora has made in the network prior to the CPP period. This has been well above historical levels of investment, and Aurora's regulatory allowances. This prolonged elevated period of investment distinguishes Aurora from the cohort group, and Powerco.

In addition, Strata's senior management upper bound FTE and opex analysis relies on unsupported judgements about FTE reductions, and assumptions about Aurora's average salaries and staff and non-staff costs which are materially incorrect. Accordingly we have concluded that the analysis and recommendations presented in Report 6, and relied on in the CPP Draft Decision, are not fit for purpose.

1. Executive summary

Our findings (continued)

Cohort benchmarking

We have examined the cohort benchmarking reflected in Model 1 and Report 6 and have concluded that it does not deliver outcomes which are consistent with the CPP expenditure objective because:

- it uses benchmark metrics which are inconsistent with the drivers of Non-Network costs
- there is no benchmark data for the People Cost portfolio and therefore the benchmarks are inferred from other cost categories
- it includes Powerco within the cohort group and Powerco's scale (approximately 4x Aurora) means it is not a good comparator for Aurora
- it fails to consider the impact of different organisation structures and operating models on the balance between SONS and Business Support costs
- it fails to consider the scale of Aurora's network expenditure programme, and the obligations on Aurora to meet network performance standards and delivery requirements within the CPP regulatory period.

We conclude that Aurora's proposed Non-Network opex is not out of line with the cohort. The proposed network programme to be undertaken by Aurora during the CPP period is considerably larger than the cohort group average. It follows that the Non-Network opex is also higher.

Aurora's ratio of Non-Network opex to Network expenditure during the CPP period is in line with the average of the cohort. This outcome appears to be consistent with the regulatory expenditure objective, which is an Input Methodology requirement of a CPP, and requires the CPP expenditure allowances to:

- reflect the efficient costs of a prudent non-exempt EDB;
- meet the expected demand for electricity services;
- manage appropriate service standards; and
- comply with applicable regulatory obligations.

Powerco CPP benchmarks

Strata's approach to deriving the CPP step change adjustment is subject to the same benchmark metric limitations we have identified for the cohort benchmarking. This includes differences in organisation structures, reliance on \$/km and \$/ICP metrics, the economies of scale available to Powerco and the lack of People Cost benchmarks. It also ignores the differences between the CPPs for Powerco and Aurora.

Aurora has undertaken significant investment in its network since the new operating model was established post 2017. Aurora's CPP proposal is a continuation of the elevated levels of investment already being made. This is matched by elevated levels of non-network opex.

In comparison, Powerco's network investment per ICP is much lower - for network capex, network opex and non-network support opex. This difference applies both before and during Powerco's CPP period.

Aurora is already investing more, on a per connection basis, than Powerco is under its CPP. Unfortunately the benchmarking assessment has ignored this fact, and has scaled Aurora's business to the cohort benchmark, and then adjusted for Powerco's CPP step.

CPPs are unique. The Part 4 regulatory regime includes the CPP option specifically to address business specific circumstances. There is no reason why the step changes experienced under Powerco's CPP are relevant for Aurora, or any other EDB. In addition, the scaling factor has not been applied to Aurora's actual costs, it has been applied to a cohort average.

We therefore conclude that Strata's benchmarking approach is flawed in the context of Aurora's CPP, because it does not reflect a reasonable assessment of Aurora's prudent and efficient costs, necessary to meet Aurora's expected demand, service standards and regulatory obligations.

1. Executive summary

Our findings (continued)

Staffing levels

We have identified that the FTE benchmark cross checks presented in Report 6 are inconsistent with the recommended opex allowances, because there are errors and incorrect assumptions in the modelling. This inconsistency is illustrated by the proposed reduction in SONS and People Cost opex of 30% over the CPP period, which is significantly greater than the average FTE reduction of 13% (to 136 FTEs) presented in Report 6 and adopted in the Draft Decision.

If the recommended opex reductions were to be implemented by Aurora, and Aurora's current cost structure and average salary costs are maintained, we have estimated that the inferred FTE reduction would be 27% (to 113.5 FTEs) on average over the CPP period.

The inferred staffing levels are the same as the cohort average (on a per ICP basis) and similar to the original Delta operating model staffing levels (of 108 FTEs), which existed prior to the accelerated investment in the network and asset management capability. They are also significantly lower than the cohort when assessed against the average value of the work to be delivered during the CPP period.

This suggests that Aurora's organisation structure is not unreasonable given the network programme. Our finding that Aurora's proposed staffing levels are lower than the cohort average when the value of the network work programme is taken into account highlights the weakness in the benchmarking approach adopted, which only considers network scale (ICPs and kms) in assessing how much opex (and by implication staffing) should be approved for Aurora.

We also derive a corrected opex allowance based on the recommended management challenge upper bound FTE estimates from Report 6. We apply the correct assumptions for Aurora's salary costs and non-staff costs. We estimate a total SONS and People Cost opex allowance over the CPP period which is \$24m higher than the upper bound estimate in Report 6. The reason these outcomes differ to Report 6 is that Model 2 contains key assumptions which are materially incorrect, and as a result materially underestimate Aurora's SONS and People Cost opex allowances for the CPP period.

Model errors

The models which support Report 6 contain input and logic errors, and introduce inconsistencies in the benchmark data used to derive the scaling ratios applied to Aurora's SONS and People Cost opex. For example, the benchmark data for Aurora's Business Support costs is overstated. It is inconsistent with Aurora's AMP and the CPP proposal, and is not comparable with the cohort data used for the opex benchmarks and scaling factors. It is also inconsistent with the regulatory definitions of opex and capex.

In addition, the models include adjustments to input data and formula, many of which are hard coded values within calculation cells. This is not consistent with spreadsheet best practice. Matching these adjustments to the commentary in the report and verifiable source data is extremely difficult, and we have not been able to fully reconcile the models to Report 6, or underlying data sources. We note that the commentary in Report 6 is confusing and the approach adopted is not transparent. Data input and modelling and labelling errors contribute to the confusion. It was only once we had access to the models that we were able to review the analysis supporting the forecast opex allowances. We have not completed a full model review.

The consequences of the modelling errors and incorrect assumptions we have identified are that:

- the benchmark data used for Aurora is not consistent with the CPP proposal or the benchmark data used for the cohort
- the denominators used for the key benchmark metrics are inaccurate
- the FTE estimates are inaccurate
- the recommended opex allowance is insufficient to support the recommended FTE levels.

This means that the scaling factors applied to Aurora's SONS and People Cost opex reflect model errors, and the FTE estimates and associated opex estimates presented in Report 6 reflect incorrect modelling assumptions. Accordingly, in our view Strata's recommendations are not fit for purpose, particularly given the material impact these recommendations have on the CPP opex allowances for the SONS and People Cost portfolios.

2. Cohort benchmarking

We have identified a number of weaknesses with the cohort benchmarking undertaken to derive SONS and People Cost opex allowances for Aurora's CPP. We consider that the overall approach is flawed and not consistent with the requirements of the CPP expenditure objective.

Cohort group

The cohort benchmarking presented in Report 6, and calculated in Model 1 uses a benchmark group comprising Counties Power, Orion New Zealand, Powerco, Unison Networks and WEL Networks. Historical and forecast expenditure sourced from information disclosure data, including AMPs, is compared, using \$ per connection (ICP) and \$ per line length (km) metrics. The focus is on SONS, Business Support and Non-Network (SONS + Business Support) opex benchmarks.

The cohort group has been chosen on the basis of networks with similar customer density and similar sized networks. We challenge the inclusion of Powerco in the benchmark cohort given they have approximately 4x as many ICPs as Aurora, and over 4.5x circuit kms². We would not expect a much smaller network to achieve the same cost benchmarks as Powerco due to the scale economies available to Powerco.

Benchmark metrics

We also question the focus on the \$/ICP and \$/km metrics. These metrics provide no insights into the relative maturity of the organisation, including asset management maturity and the programme of work being undertaken on the network.

The analysis of ICPs and circuit kms as explanatory factors for opex included in the DPP Decision³, indicates that there is a stronger relationship between ICPs and Non-Network opex than between circuit length and Non-Network opex. In addition, the paper concluded that Business Support opex is principally driven by customer numbers, not circuit length.

However, Model 1 places equal weight on \$/ICP and \$/km metrics, contrary to the Commission's findings. In Model 1, the \$/ICP and \$/km benchmarks for each of SONS, Business Support and Non-Network opex are combined to derive the adjustment ratios used to scale Aurora's proposed SONS and People Cost opex. Each adjustment ratio is the average of the ratios derived from the \$/ICP and \$/km benchmarks.⁴

We note that there are no People Cost benchmarks available for the cohort. Strata apply the adjustment ratios derived from the Non-Network and Business Support cohort benchmarks to Aurora's People Cost portfolio.

The benchmarking also places equal weight on disaggregated (SONS + Business Support) opex benchmarks and combined (Non-Network) benchmarks. We consider it is misleading to assess Aurora's SONS and People Cost opex using the disaggregated benchmarks.

Our analysis of the organisation structures, functional mapping and cost allocations of the cohort group, which we discuss in more detail in section 4, highlights significant divergences in the allocation of people and costs between SONS and Business Support. For this reason, we consider that disaggregated benchmarks should not be relied on without further investigation into the organisation and cost structures of EDBs.

The adjustment ratios are derived from forecast opex data which extends to RY30 for Aurora, but is limited to RY21 data for the cohort group. It is not clear why time series data beyond the CPP period should be used for this purpose, as the adjustments are applied for the CPP period only. It is also not clear why there is a disjoint between the time series of data applied in the numerator and denominator of the adjustment ratios.

There has been criticism of the verifier using single year metrics when assessing relative expenditure performance⁵. The benchmarking approach in Model 1 also relies on a single year of benchmark data to derive the recommended adjustment ratios. There is no analysis presented which confirms that RY21 is a steady state year for the cohort group.

Report 6 challenges totex benchmarking, because Aurora is undertaking a major capex programme, and there will be variability in capex across distributors in any one year. We agree that totex is more appropriate over the longer term, but we do not agree that it is only Powerco and Aurora within the cohort who are undertaking major capex programmes.

² Based on the RY19 ICP and circuit km data included in Model 1

³ Commerce Commission, DPP Draft Decision, November 2019, paragraphs A107, A108 and Table A7

⁴ Refer Tables 5, 7 and 8 of Report 6

⁵ Report 6, pages 13 and 14

2. Cohort benchmarking

Alternative benchmarks

The benchmarking approach adopted for Report 6 has failed to consider the relative activity levels of Aurora and the cohort group. This can be demonstrated by a comparison of the value of network capex and opex, and network totex. Comparisons using multiple years of data help to mitigate the impact of year on year variances in the amount of cost which is capitalised. Longer term AMP expenditure data is generally extrapolated from the initial five year period. This is consistent with the information disclosure guidance for AMPs, and Aurora's approach from RY27.

Our analysis uses the same data as Model 1, corrected for the model input errors associated with Aurora's expenditure data, and the logic errors in the ICP forecasts (as documented in section 5). The corrections to the input data ensure we are comparing Aurora and the cohort on a like for like basis, the data is consistent with the regulatory definitions of opex and capex, and it is consistent with the non-network opex component of the CPP proposal.

Figure 1

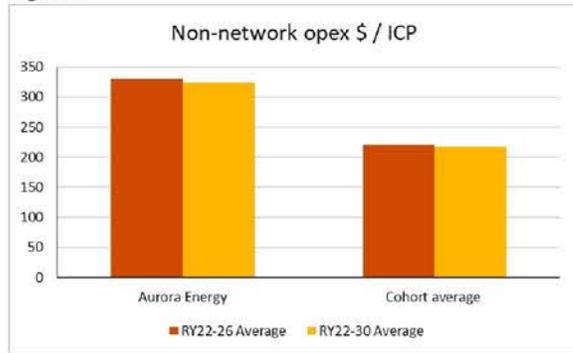
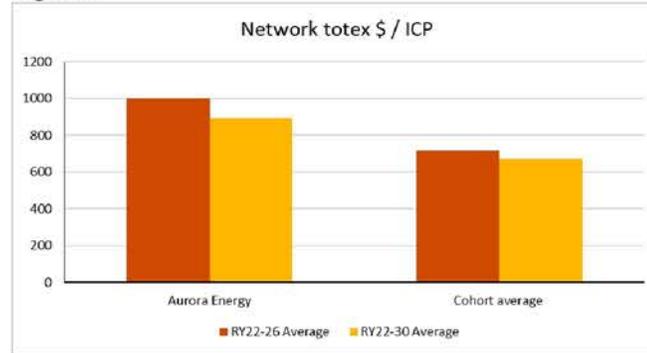


Figure 2



As demonstrated above, Aurora's non-network opex per ICP is higher than the average of the cohort group over the CPP period and in the longer term. Network totex per ICP is also higher. As demonstrated in Table 1, Aurora's ratio of non-network opex to network opex, network capex and network totex is consistent with the average of the cohort group.

RY22-RY26 Non-Network opex (%)	Aurora	Cohort
Network opex	171%	175%
Network capex	41%	41%
Network totex	33%	33%

One of the reasons that Aurora's situation differs from the cohort group is that during the CPP period both network capex and network opex are above the group averages, as illustrated below. Appendix B includes supporting data for Figures 1-4.

Figure 3

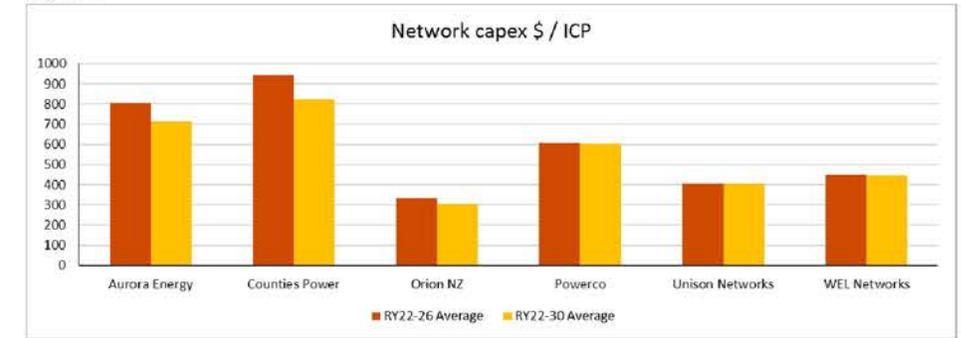
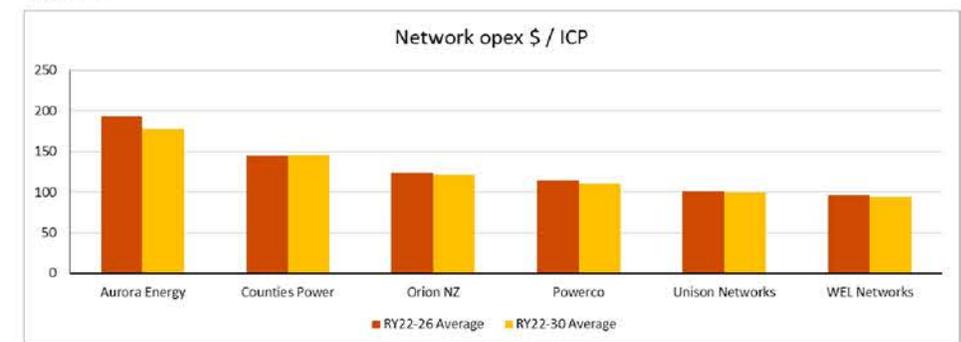


Figure 4



2. Cohort benchmarking

Alternative benchmarks (continued)

In Report 6 there is little consideration of network opex. However network opex, along with SONS expenditure is a critical part of the CPP because it is directly relevant to achieving the network reliability standards which have been proposed, and which Aurora will be held accountable for. As shown in Figure 4, Aurora's network opex per connection exceeds each of the cohort EDBs within the CPP period, and also over the longer term.

We also note that the Powerco data demonstrates an elevated level of network capex, but not network opex over this period when compared to the other EDBs in the cohort. Powerco's expenditure is addressed further in section 3.

The cohort benchmarking is not suitable for Aurora's CPP

We have concluded that the cohort benchmarking approach adopted is not suitable and does not deliver outcomes which are consistent with the CPP expenditure objective because:

- it uses benchmark metrics which are inconsistent with the drivers of Non-Network costs
- there is no benchmark data for the People Cost portfolio and the benchmarks are inferred from other cost categories
- it includes Powerco within the cohort group and Powerco's scale (approximately 4x Aurora) means it is not a good comparator for Aurora
- it fails to consider the impact of different organisation structures and operating models on SONS and Business Support costs
- it fails to consider the scale of Aurora's network expenditure programme, and the obligations on Aurora to meet network performance standards and delivery requirements within the CPP regulatory period.

As a CPP is business specific, the benchmarking approach adopted cannot be expected to derive outcomes that will be consistent with the CPP expenditure objective, as follows:

that capital expenditure and operating expenditure reflect the efficient costs that a prudent non-exempt EDB would require to-

- (a) meet or manage the expected demand for electricity distribution services, at appropriate service standards, during the CPP regulatory period and over the longer term; and*
- (b) comply with applicable regulatory obligations associated with those services.⁶*

As demonstrated on the previous page, Aurora's Non-Network opex is not out of line with the cohort. The network programme to be undertaken by Aurora during the CPP period is considerably higher than the cohort group average. It follows that the Non-Network opex is also higher. The ratio of Non-Network to Network expenditure is in line with the cohort.

This outcome appears to be consistent with the regulatory expenditure objective, which is an Input Methodology requirement of a CPP, and as stated above requires the CPP expenditure allowances to:

- reflect the efficient costs of a prudent non-exempt EDB;
- meet the expected demand for electricity services;
- manage appropriate service standards; and
- comply with applicable regulatory obligations.

⁶ Commerce Commission, EDB Input Methodologies, Clause 1.14

3. Powerco CPP benchmarks

Introduction

In Report 6 and Model 2, the cohort benchmarks derived using the approach and modelling described in section 2 are adjusted for a CPP step change. This is calculated in Model 1, and is derived from Powerco data prior to their CPP (RY13-RY15 and RY18) and during their CPP (RY19-RY23). RY16 and RY17 are excluded because they are CPP preparation years.

In Model 1, the same metrics are used for the CPP step as for the cohort benchmarking (\$/ICP and \$/km) for SONS, Business Support and Non-Network opex. These ratios are averaged and combined to derive the CPP adjustments to the SONS and People Cost opex allowances. The Powerco CPP ratios are presented in Table 3 of Report 7.

This approach is subject to the same benchmark metric limitations identified in Section 2. This includes differences in organisation structures, reliance on \$/km and \$/ICP metrics, the economies of scale available to Powerco, the lack of People Cost benchmarks. It also ignores the differences between the CPPs of Powerco and Aurora.

The resulting opex allowances for SONS and People Costs are not calculated in Model 2, as the model fails to fully gross up the allowances for non-staff related costs. For this reason, Table 7 in Report 6 is misleading because it only includes the proportion of the SONS and People Cost portfolios designated as staff costs after the application of the cohort benchmark and Powerco adjustment factors.

Expenditure comparisons

Figures 5-8 (overleaf) show the difference in the scale of expenditure and the expenditure profiles prior to and during the CPPs for Aurora and Powerco (shown as average \$ p.a). We show three periods for Aurora and two periods for Powerco, which illustrate the differences between the EDBs. These illustrate that Powerco's CPP reflects very different circumstances to Aurora's CPP which invalidates the CPP step benchmark approach adopted to assess Aurora's SONS and People Cost opex allowances. The difference between the two EDBs is also illustrated in the step changes in network and Non-Network expenditure in Table 2.

Table 2

CPP Step from Pre CPP	Aurora	Aurora	Powerco
	Step 1 to Advance CPP	Step 2 to CPP	
Network totex	102%	7%	46%
Non network opex	122%	11%	17%

For Aurora, the Pre CPP period (RY13-RY17) reflects the Delta operating model. The Advance CPP period (RY18-RY21) reflects the establishment of the new Aurora Energy operating model. During this period, Aurora has invested above the DPP regulatory allowances to build asset management capability, meet demand for additional capacity and improve network performance. Aurora's CPP period is RY22-RY26. For Powerco, the pre CPP Period is RY13-RY18 and the CPP Period is RY19-RY23. Powerco has maintained a consistent operating model during these periods.

The figures overleaf illustrate the magnitude of Aurora's investment in the network (on a per ICP basis) since the new operating model was established. The CPP proposal is a continuation of the elevated levels of investment already being made. This is matched by elevated levels of Non-Network opex, as shown in Figure 7. In comparison, Powerco's investment per ICP is much lower, for network capex, network opex and non-network support costs. This applies before and during Powerco's CPP period.

Aurora's ratio of non network opex to network totex has increased during the Advance CPP period and is projected to continue to increase during the CPP. Powerco's Non-Network opex has decreased as a proportion of network totex. We expect that this may reflect the differences in maturity of the two organisations, particularly in respect of asset management capability, as acknowledged in Report 6.

Aurora appears to have acted responsibly to pre-invest in improving its asset management capability and asset renewal programme prior to the CPP. The scale of this investment is much greater than the uplift managed by Powerco during its CPP.

3. Powerco CPP benchmarks

Figure 5

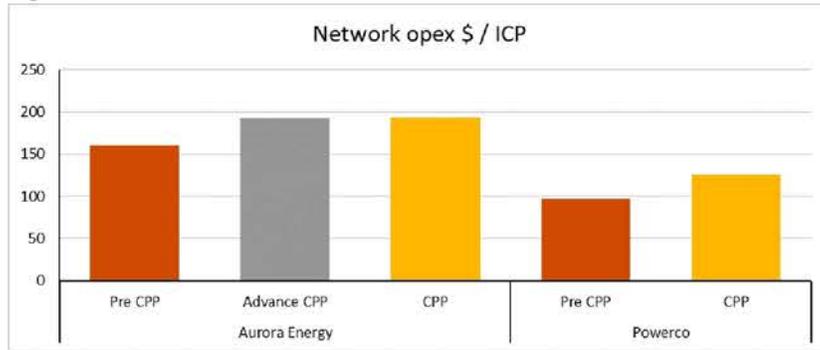


Figure 7

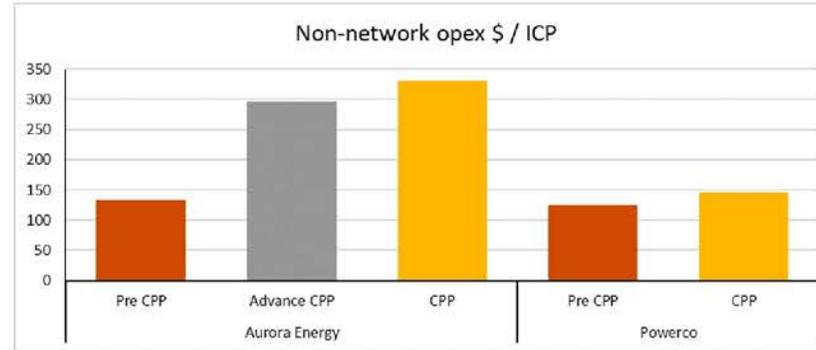


Figure 6

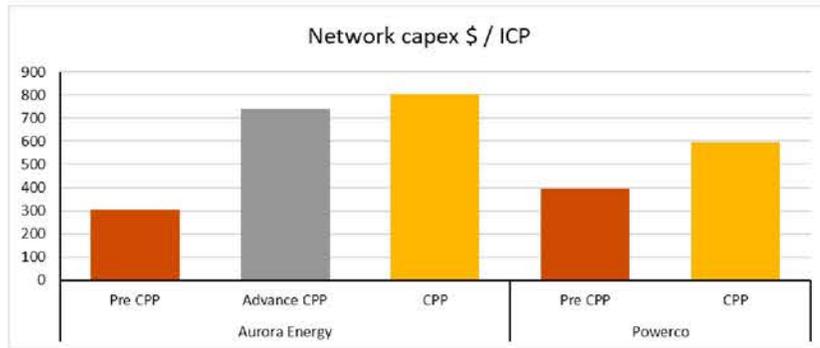
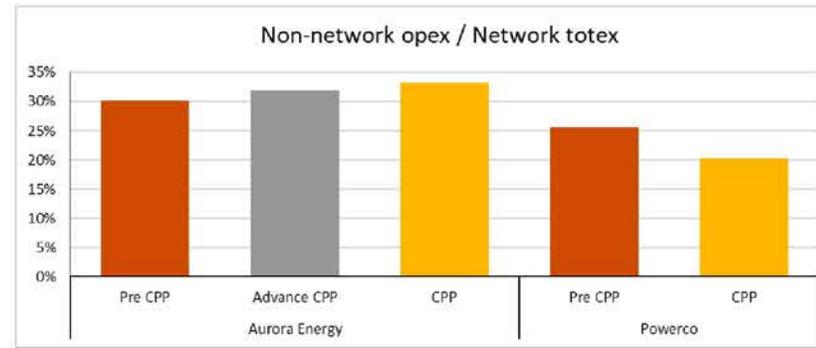


Figure 8



CPP adjustments

Aurora is already investing more per ICP in its network than Powerco is under its CPP. Unfortunately the cohort benchmarking assessment has ignored this fact, and has scaled Aurora's business to a level which is not consistent with the status of the network or the maturity of the organisation. This anomaly is exacerbated by then scaling the cohort benchmark applied to Aurora with a Powerco CPP adjustment factor.

CPPs are unique. The regulatory regime established the CPP option to address business specific circumstances. There is no reason why the step changes experienced under Powerco's CPP would be relevant for Aurora, or any other EDB.

The data presented in the figures opposite is included in Appendix B.

4. Staffing levels

Introduction

Report 6 presents an assessment of the efficient level of staffing for a distribution network like Aurora. This is derived from:

- a senior management challenge undertaken by Strata
- benchmarking of SONS, Business Support and Non-Network opex
- a comparison of Aurora's proposed SONS opex with Powerco's SONS opex for Powerco's CPP.

Report 6 presents the FTE conclusions shown in Table 3.

Table 3

Number of roles	Period	FTEs	FTEs	Reference/Notes
Delta	2017	108		<i>Report 6, Page 5</i>
Aurora	Current	156		
Benchmark assessment		Option 1	Option 2	<i>Note 1</i>
Cohort average opex	RY21-RY30 average	82.5	90	<i>Report 6, Table 6</i>
<i>Implied reduction (%)</i>		-47%	-42%	
Cohort average adjusted	RY22-RY26 average	119	131	<i>Report 6, Table 8</i>
<i>Implied reduction (%)</i>		-24%	-16%	
Management challenge		Lower	Upper	
Senior management	From start of RY22	127	140	<i>Report 6, Table 9</i>
<i>Implied reduction (%)</i>		-19%	-10%	
Senior management	From mid RY24	124	132	<i>Report 6, Table 9</i>
<i>Implied reduction (%)</i>		-20%	-15%	

¹ Option 1 is derived from SONS and Business Support opex benchmarks

Option 2 is derived from Non Network opex benchmarks

Inconsistency between opex allowances and FTE outcomes

In section 5 we describe the modelling errors and incorrect assumptions we have identified in the Models which support Report 6. The consequence of these errors is that the FTE cross checks in Report 6 are inconsistent with the opex recommendations. This inconsistency is illustrated by the proposed reduction in SONS and People Cost opex of 30% over the CPP period, which is significantly greater than the average FTE reduction of 13% (to 136 FTEs) presented as the upper bound estimate in Report 6 and adopted in the Draft Decision.

If Aurora were to implement the opex recommendations for the SONS and People Cost portfolios, the number of roles would be significantly lower than the FTE numbers presented in Report 6 (shown in Table 3). Conversely, if Aurora were to implement the recommended upper bound management challenge FTE numbers presented in Report 6, the opex allowances would be considerably higher than those included in the report, and adopted for the Draft Decision.

We acknowledge that the Draft Decision is not imposing staff reductions on Aurora, as the business is free to allocate its expenditure within its total allowance. However, if Aurora were to meet the SONS and People Cost benchmarks proposed, and allocate the efficiency reductions on a proportionate basis within these portfolios, the staffing levels would be much lower than those suggested in Report 6. This is illustrated in Table 4 overleaf.

We have calculated the FTE numbers inferred by the proposed opex reductions for the SONS and People Cost portfolios, using Aurora's average salary costs for each portfolio. We scale equally the direct staff costs (those represented by the salary components) and the remaining non-staff costs. We do this because it is consistent with the cohort opex benchmarks which have been used to establish the adjustment ratios.

We also derive a corrected opex allowance based on the 'senior management' upper bound FTE estimates from Report 6, applying the correct assumptions for Aurora's salary costs and non-staff costs.

4. Staffing levels

Inconsistency between opex allowances and FTE outcomes (continued)

Table 4

Number of roles inferred	Period	FTEs	FTEs
Delta	2017	108	
Aurora	Current	156	
Benchmark assessment		Option 1	Option 2
Cohort average opex	RY21-RY30 average	69	73
<i>Implied reduction (%)</i>		-56%	-53%
Cohort average adjusted	RY22-RY26 average	97	105
<i>Implied reduction (%)</i>		-38%	-33%
Management challenge		Lower	Upper
Senior management	From start of RY22	105	115
<i>Implied reduction (%)</i>		-33%	-26%
Senior management	From mid RY24	104	112
<i>Implied reduction (%)</i>		-33%	-28%

We have concluded that the headcount would need to be 115 FTEs (26% lower) in RY22 and 112 FTEs (28% lower) in RY24 for Aurora to meet the opex allowances proposed in Report 6 for SONS and People Costs, while maintaining average salaries and the current mix of staff costs and non-staff costs. This is shown as the Upper bound senior management challenge estimates in Table 4. Our supporting calculations are presented in Appendix C.

Our corrected opex allowance based on the recommended upper bound FTE estimates is \$24m higher than the upper bound estimate presented in Table 12 of Report 6. This reflects correct assumptions for Aurora's salary costs and non-staff costs. Our supporting calculations are presented in Appendix D.

There are two key reasons for these differences. Firstly, Model 2 under-estimates the non-staff costs for each portfolio. Strata's assumptions are documented on page 22 of Report 6 and hard coded in Model 2.

Secondly, the average salary assumption ignores capitalised labour and differs to the actual salary allowances in the CPP portfolios. As the SONS opex portfolio excludes capitalised labour costs, Aurora's average salary cost is considerably lower than the benchmark applied in Model 2. Accordingly, the opex proposals in Report 6 do not support the staffing recommendations.

Cohort organisation structures

We have obtained current organisation charts and FTE data for the cohort of EDBs which were adopted by Strata for Report 6. This data has been provided to us on a confidential basis, and accordingly our analysis is presented in aggregate for the cohort group.

We undertook a functional mapping exercise across the organisation structures of the cohort group and Aurora, which is summarised in Appendix E. This revealed that there are differences in the organisation structures of EDBs which are reflected in the allocation of people and costs to SONS and Business Support. Field service contracting arrangements also contribute to differences in the allocation of costs and activities between network and Non-Network categories.

Our analysis indicates that SONS and Business Support staffing levels differ between EDBs for a number of reasons, including the following:

- activities may be performed internally, contracted out or by internal contracting units
- the contracting model influences the functions included within SONS
- functional allocations between SONS and Business Support differ
- EDBs place more or less weight on certain functions
- shared service models influence Business Support functions and staffing
- the customer interface model influences both SONS and Business Support
- the level of capitalisation of SONS costs differs, and it will vary over time.

The functional activities which show the most divergence between the cohort are procurement, health & safety, programme management, scheduling and design, first response/call centre/customer services, metering, communication, IT support, systems and data.

4. Staffing levels

Cohort organisation structures (continued)

Figures 9 and 10 show the divergences within the cohort group in the allocation of people and opex to the SONS and Business Support categories. The data reflects the current FTE and opex allocations between SONS and Business Support categories for Aurora and the cohort. The cost data is from RY20 information disclosures. The FTE data is from the functional mapping exercise undertaken by PwC, using the current organisation charts of each EDB and Aurora. Supporting information is presented in Appendix E.

Opex is weighted towards SONS for Aurora and two other EDBs and towards Business Support for three EDBs. FTE weightings are similar, but not the same. The proportion of non staff related costs in SONS and Business Support, and the proportion of SONS which is capitalised will influence this outcome.

This analysis supports our conclusion that analysing SONS costs separately from Business Support costs will be unduly influenced by the organisation structures and the cost allocations of the benchmark companies. It is not appropriate to benchmark Aurora to the average of the cohort group at the disaggregated level, because the averaging obscures the underlying variation. Using Non-Network cost benchmarks avoids the issue of the inconsistencies in the boundaries between the sub-categories of opex.

Figure 9

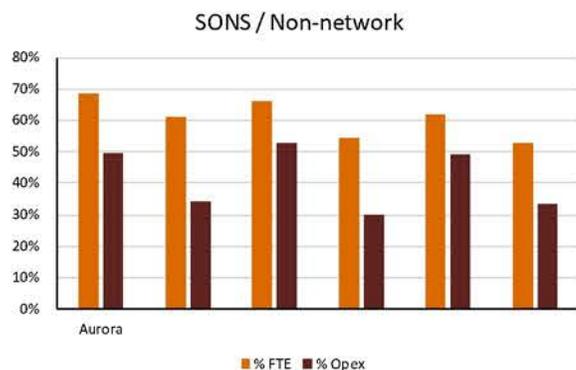
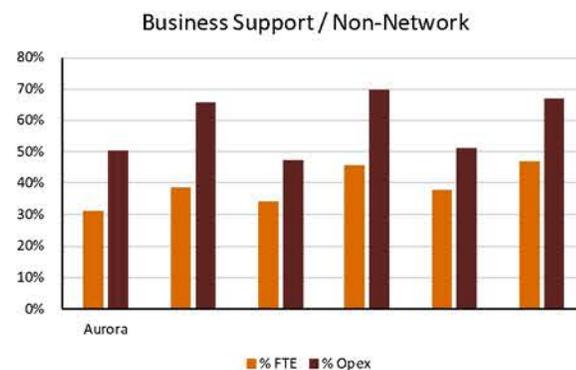


Figure 10



We note that there are residual issues with the boundaries between network and Non-Network costs. We would expect an assessment of the contracting arrangements of the cohort to be undertaken before expenditure benchmarks could be used to assess expenditure allowances for SONS activities.

Cohort FTE benchmarks

We have benchmarked the FTE counts of the cohort group against Aurora's current FTEs, the FTEs presented in Report 6 the first year of the CPP, and the inferred FTE numbers we have derived consistent with the proposed opex allowances, for the first year of the CPP. The benchmark data is included in Appendix E.

The purpose of this analysis is to assess whether Aurora is an outlier with its current staffing levels. It also illustrates how the recommended reductions to SONS and People Cost opex impact Aurora's FTEs relative to the FTE levels of the cohort. This provides a cross check on the proposed Non-Network opex reductions for Aurora set out in Report 6.

Senior management challenge

We also note that the senior management challenge headcount in Table 4 of Report 6 presents recommendations which are inconsistent with our observations of the cohort organisation structures.

For example, Strata recommend combining the Regulatory and Commercial team with the Accounting/Finance/Risk Assurance team to reduce the Executive Leadership Team (ELT) by one. This is not consistent with the cohort. Each of the EDBs in the cohort have separate Finance and Commercial teams, and associated General Managers who are part of the ELT.

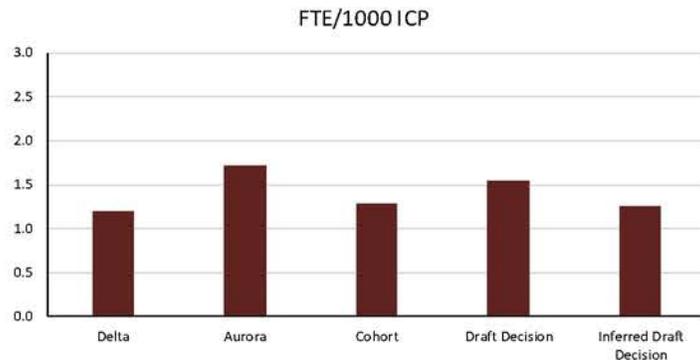
4. Staffing levels

FTE benchmarks

The figures on this page present RY20 staffing level ratios using total FTE numbers associated with Non-Network opex (ie: SONS and Business Support). This ignores the differences in organisation structures which lead to different weightings between SONS and Business Support activities, as discussed on the previous page.

Figure 11 indicates that the Delta staffing level referred to in Report 6 is below the cohort average on a per ICP basis. Aurora currently has higher staffing levels than the cohort. The Draft Decision estimate is also above the cohort average. However, the corrected inferred draft decision estimate (from Table 4) is the same as the cohort average and similar to the Delta operating model benchmark per ICP. This outcome is inconsistent with our expectations of an EDB about to start a CPP. In earlier sections of this report we note that ICP benchmark ratios don't adequately reflect Aurora's CPP circumstances.

Figure 11

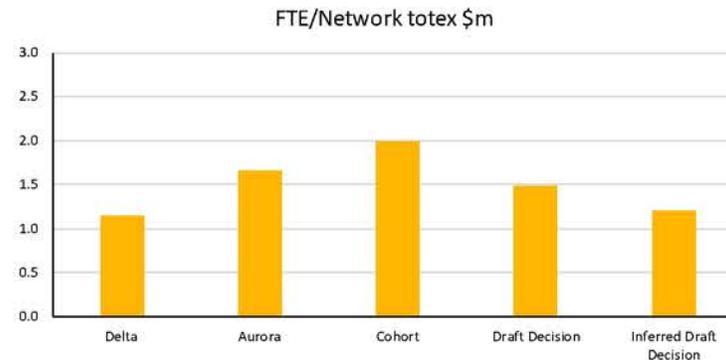


Aurora's actual staffing levels are lower than the cohort when assessed against the average value of the work to be delivered during the CPP period as shown in Figure 12. This suggests that Aurora's organisation structure is not unreasonable given the network programme. The Draft Decision benchmarks are considerably lower than the cohort average on this measure, which suggests they are too low.

This highlights the weakness in the benchmarking approach adopted, which only considers network scale (ICPs and kms) in assessing how much opex (and by implication staffing) should be approved for Aurora.

The proposed adjustments to opex would require Aurora to manage its network programme with a considerably lower level of staffing than the cohort. The inferred staffing levels are only marginally higher than the original Delta benchmark, which was prior to the elevated investment in the network and asset management capability.

Figure 12



Figures 13 and 14 show the same FTE ratios against network capex and network opex. They reflect current FTEs and average RY22-RY26 \$m p.a. (in RY20 terms). Supporting data is presented in Appendix E.

Figure 13

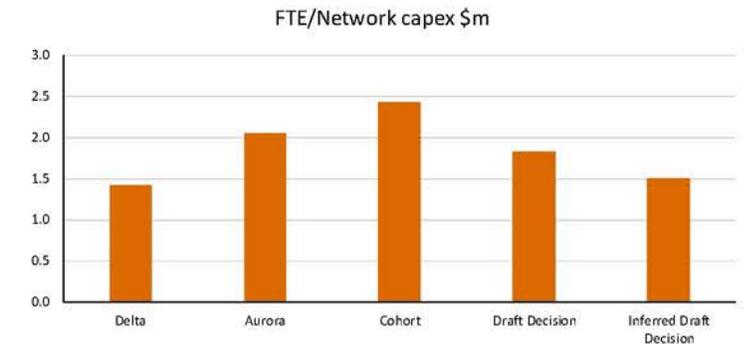
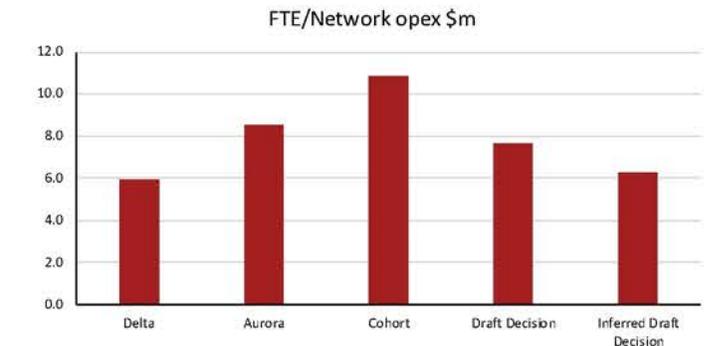


Figure 14



5. Modelling errors and assumptions

Model 1

Model 1 is the cohort benchmark model which derives the adjustment ratios which are applied (in Model 2) to derive the recommended opex allowances. Model 1 contains historical and forecast EDB expenditure data, and historical ICP and circuit length data, sourced from information disclosures. The time series of expenditure data is converted to RY20 terms. We have discovered the following errors and inconsistencies in Model 1.

Table 5

Forecast ICP denominator	Forecast ICP growth for the cohort and Aurora is derived from Alpine Energy data Forecast ICP growth is applied to all forecast years except RY22 and RY30, where no ICP growth is applied
Forecast circuit km denominator	Forecast circuit km data assumes no growth, which is inconsistent with the approach to ICP growth However, the forecast \$/ICP and \$/km benchmarks are combined to derive the adjustment ratios
RY20 data sources are inconsistent	Actual RY20 disclosure data is used for SONS and Business Support opex for Aurora Energy The remaining RY20 data, including the benchmark cohort opex and capex, and ICP and km data is forecast data
SONS and Business Support opex sources are inconsistent	SONS and Business Support opex for Aurora Energy are sourced from intermediate Forecast Tracker models. These contain data which is inconsistent with the benchmark cohort, and inconsistent with the CPP proposal. Specifically: <ul style="list-style-type: none"> • Aurora’s forecast opex is overstated because it includes operating leases which are capitalised in accordance with the IMs • the forecast opex efficiencies included in the CPP proposal have been removed • a portion of Aurora’s SONS opex is transferred to Business Support opex

Model 2

Model 2 is the expenditure adjustment model, which applies the adjustment ratios from Model 1, to determine the SONS and People Cost opex allowances. It also derives the FTE estimates and opex allowances consistent with the Strata management challenge FTE scenarios presented in Report 6. We have discovered the following errors and inconsistencies in Model 2.

Table 6

Average salary at 1 July 2020	Model 2 assumes the average salary for ex-Delta roles in RY21 is \$107.8k/FTE. This rate is applied to the assumed staffing cost component of Aurora’s SONS and People Costs to derive the FTE estimates. Aurora’s actual average staffing costs in the CPP opex proposal are \$95.9k/FTE. There is also a notable difference between SONS (\$89.6k/FTE) and the People Cost (\$109.9k/FTE) portfolios.
The FTE estimates reflect inaccurate estimates of costs that are staff related	When calculating the FTE cross checks, the staff related portion of the SONS and People Cost portfolios are overstated. This overstates the FTEs used in the cross checks. Staff related costs are only about two thirds of the portfolios. For example, in RY22, staff related costs are 62% of SONS and 69% of People Costs.
Multiple cells include hard coded data embedded within the formulae	This appears to be the process of backing out non staff related costs, and adding them back later (as described in Report 6). However, other than a manual review of each cell and reconciling them to other sources, there is no way to verify that the correct adjustments have been made. This also introduces a high level of risk of modelling errors.

More detail about the model errors we have discovered is included in Appendix F. Note, we have not completed a full model review of Model 1 or Model 2.

5. Modelling errors and assumptions

We note that the models include manual adjustments to input data and formula, many of which are hard coded values within calculation cells. This is not consistent with spreadsheet best practice. Matching these adjustments to the commentary in the report and verifiable source data is also extremely difficult, and we have not been able to fully reconcile the models to Report 6, or underlying data sources.

We note that the commentary in Report 6 is confusing and therefore the actual approach adopted is not transparent. Data input, modelling and labelling errors contribute to the confusion. It was only once we had access to the models that we were able to review the analysis supporting the forecast opex allowances.

We also note an inconsistency in Report 6 between Table 5 and Table 7. Table 5 includes non-staff costs whereas Table 7 excludes them.

Consequences of modelling errors and incorrect assumptions

The consequences of the modelling errors and incorrect assumptions we have identified¹ are as follows:

- the benchmark data used for Aurora is not consistent with the CPP proposal
- the benchmark data used for Aurora is not consistent with the benchmark data used for the cohort
- the denominators used for the key benchmark metrics are inaccurate
- the FTE estimates are inaccurate
- the recommended opex allowance is insufficient to support the recommended FTE levels.

This means that the scaling factors applied to Aurora's SONS and People Cost opex reflect model errors, and the FTE estimates and associated opex estimates presented in Report 6 reflect incorrect modelling assumptions. Accordingly, in our view Strata's recommendations are not fit for purpose, particularly given the material impact these recommendations have on the CPP opex allowances for the SONS and People Cost portfolios.

Appendix A: Important notice

This report has been prepared for Aurora Energy Limited to present our analysis of the recommendations set out in Strata Energy Consulting's Opex Briefing Report 6 and accompanying spreadsheet models which support the CPP Draft Decision.

This report has been prepared solely for this purpose and should not be relied upon for any other purpose. We accept no liability to any party should it be used for any purpose other than that for which it was prepared.

To the fullest extent permitted by law, PwC accepts no duty of care to any third party in connection with the provision of this report and/or any related information or explanation (together, the "Information"). Accordingly, regardless of the form of action, whether in contract, tort (including without limitation, negligence) or otherwise, and to the extent permitted by applicable law, PwC accepts no liability of any kind to any third party and disclaims all responsibility for the consequences of any third party acting or refraining to act in reliance on the Information.

We have not independently verified the accuracy of information contained in Strata's Report or the supporting models. Accordingly, we express no opinion on the reliability of information provided to us.

The statements and opinions expressed herein have been made in good faith, and on the basis that all information relied upon is true and accurate in all material respects, and not misleading by reason of omission or otherwise. The statements and opinions expressed in this report are based on information available as at the date of the report. We reserve the right, but will be under no obligation, to review or amend our report, if any additional information, which was in existence on the date of this report, was not brought to our attention, or subsequently comes to light.

This report is issued pursuant to the terms and conditions set out in our letter of engagement dated 13 December 2017, the subsequent scope of work document dated 1 February 2019 and your instructions of 16 November 2020.

Appendix B: Benchmark data

Supporting information

The data below supports the alternative benchmarks presented in Figures 1-4 in section 2.

Non-network opex \$ / ICP

RY22-26 Average	
Aurora Energy	330
Cohort average	221
RY22-30 Average	
Aurora Energy	324
Cohort average	218

Network capex \$ / ICP

EDB	RY22-26 Average	RY22-30 Average
Aurora Energy	806	714
Counties Power	941	824
Orion NZ	332	303
Powerco	608	602
Unison Networks	403	403
WEL Networks	451	446

Network totex \$ / ICP

RY22-26 Average	
Aurora Energy	1,000
Cohort average	719
RY22-30 Average	
Aurora Energy	892
Cohort average	673

Network opex \$ / ICP

EDB	RY22-26 Average	RY22-30 Average
Aurora Energy	194	177
Counties Power	145	146
Orion NZ	124	121
Powerco	115	111
Unison Networks	101	100
WEL Networks	96	95

Appendix B: Benchmark data

Supporting information

The data below supports the Aurora and Powerco CPP benchmarks presented in Figures 5-8 in section 3.

Network opex \$ / ICP

Aurora Energy	
Pre CPP (RY13-17)	160
Advance CPP (RY18-21)	193
CPP (RY22-26)	194
Powerco	
Pre CPP (RY13-18)	97
CPP (RY19-23)	125

Non-network opex \$ / ICP

Aurora Energy	
Pre CPP (RY13-17)	133
Advance CPP (RY18-21)	296
CPP (RY22-26)	330
Powerco	
Pre CPP (RY13-18)	124
CPP (RY19-23)	145

Network capex \$ / ICP

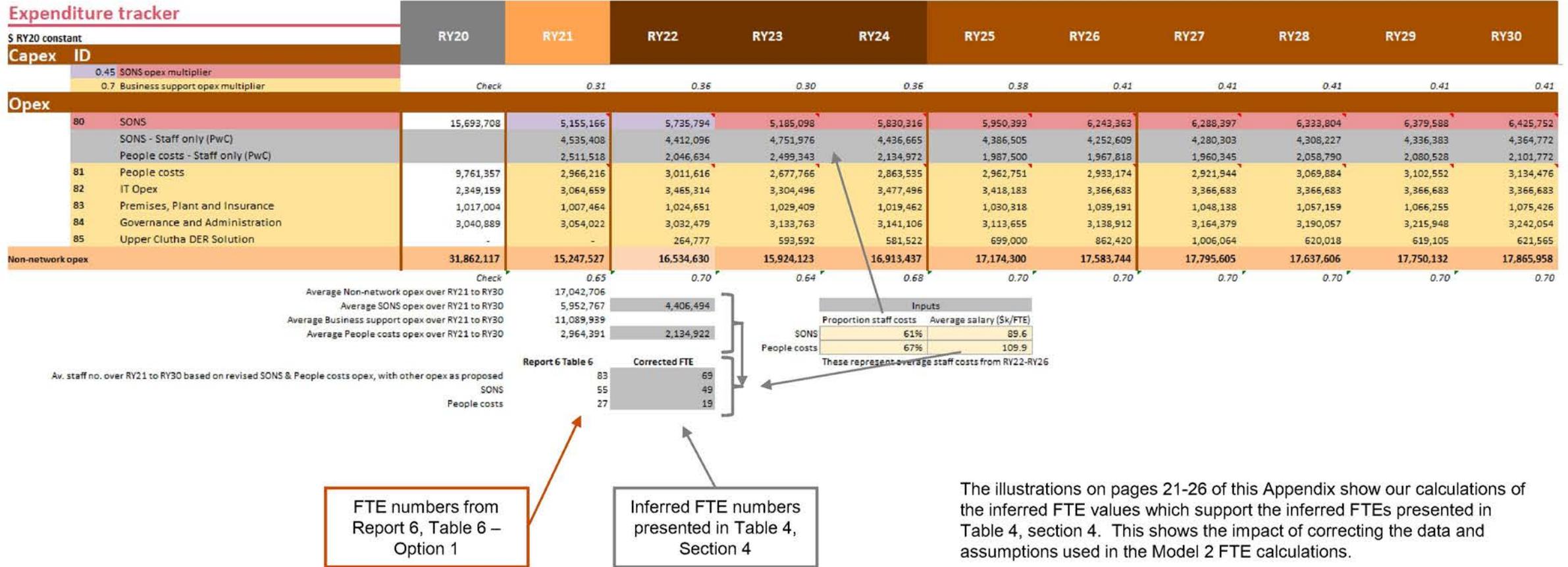
Aurora Energy	
Pre CPP (RY13-17)	304
Advance CPP (RY18-21)	743
CPP (RY22-26)	806
Powerco	
Pre CPP (RY13-18)	394
CPP (RY19-23)	593

Non-network opex / Network totex

Aurora Energy	
Pre CPP (RY13-17)	30%
Advance CPP (RY18-21)	32%
CPP (RY22-26)	33%
Powerco	
Pre CPP (RY13-18)	26%
CPP (RY19-23)	20%

Appendix C: FTE estimates

Screenshot of Model 2 showing FTE calculations from cohort average SONS and Business Support opex scenario: Option 1



The illustrations on pages 21-26 of this Appendix show our calculations of the inferred FTE values which support the inferred FTEs presented in Table 4, section 4. This shows the impact of correcting the data and assumptions used in the Model 2 FTE calculations.

Appendix C: FTE estimates

Screenshot of Model 2 showing FTE calculations from cohort average Non-Network opex scenario: Option 2

Expenditure tracker		RY20	RY21	RY22	RY23	RY24	RY25	RY26	RY27	RY28	RY29	RY30
5 RY20 constant												
Capex	ID											
	0.6 Non-network opex multiplier											
Opex												
80	SONS	15,693,708	5,732,443	6,029,612	5,630,576	6,051,426	6,114,055	6,320,433	6,334,196	6,488,676	6,541,560	6,593,985
	SONS - Staff only (PwC)		4,890,413	4,592,784	5,025,930	4,572,640	4,487,152	4,300,004	4,308,468	4,403,468	4,435,990	4,468,229
	People costs - Staff only (PwC)		2,727,040	2,409,871	2,793,528	2,501,732	2,391,512	2,370,085	2,377,550	2,432,823	2,453,647	2,474,342
81	People costs	9,761,357	3,290,096	3,557,478	3,119,859	3,414,691	3,569,888	3,537,688	3,548,907	3,631,969	3,663,263	3,694,363
82	IT Opex	2,349,159	3,064,659	3,465,314	3,304,496	3,477,496	3,418,183	3,366,683	3,366,683	3,366,683	3,366,683	3,366,683
83	Premises, Plant and Insurance	1,017,004	1,007,464	1,024,651	1,029,409	1,019,462	1,030,318	1,039,191	1,048,138	1,057,159	1,066,255	1,075,426
84	Governance and Administration	3,040,889	3,054,022	3,032,479	3,133,763	3,141,106	3,113,655	3,138,912	3,164,379	3,190,057	3,215,948	3,242,054
85	Upper Clutha DER Solution	-	-	264,777	593,592	581,522	699,000	862,420	1,006,064	620,018	619,105	621,565
Non-network opex		31,862,117	19,176,591	18,877,058	20,431,987	19,414,714	19,151,635	18,961,164	19,164,203	19,050,398	19,168,650	19,289,913
	Check 1		0.51	0.55	0.49	0.55	0.56	0.58	0.58	0.58	0.58	0.58
	Check 2		0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60
	Average Non-network opex over RY21 to RY30		19,268,631									
	Average SONS opex over RY21 to RY30 over RY21 to RY30		6,183,696	4,548,508								
	Average Business support opex over RY21 to RY30		13,084,935									
	Average People costs opex over RY21 to RY30		3,502,820	2,493,213								
	Report 6 Table 6											
	Av. staff no. based on revised Non-network opex, changing only SONS & People costs opex											
	SONS		90	73								
	People costs		57	51								
			32	23								

Inputs	
Proportion staff costs	Average salary (\$k/FTE)
SONS	61%
People costs	67%
	89.6
	109.9

These represent average staff costs from RY22-RY26

FTE numbers from Report 6, Table 6 – Option 2	Inferred FTE numbers, presented in Table 4, Section 4
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Appendix C: FTE estimates

Screenshot of Model 2 showing FTE calculations using cohort average SONS and Business Support opex after CPP adjustment: Option 1

Expenditure tracker

S RY20 constant		RY20	RY21	RY22	RY23	RY24	RY25	RY26	RY27	RY28	RY29	RY30
Capex ID												
1.515	SONS opex multiplier											
1.13	Business support opex multiplier	Check	0.45	0.59	0.53	0.60	0.61	0.64	0.45	0.45	0.45	0.45
Opex												
80	SONS	15,693,708	7,375,060	9,430,682	9,164,618	9,545,780	9,623,851	9,804,691	6,960,233	7,005,640	7,051,424	7,097,588
	SONS - Staff only (PwC)		4,535,408	6,684,325	7,199,244	6,721,547	6,645,555	6,442,703				
	People costs - Staff only (PwC)		2,821,021	2,312,696	2,824,257	2,412,518	2,245,875	2,223,634				
81	People costs	9,761,357	3,774,229	3,411,446	3,166,037	3,280,623	3,351,029	3,317,607	2,945,944	3,093,884	3,126,552	3,158,476
82	IT Opex	2,349,159	3,064,659	3,465,314	3,304,496	3,477,496	3,418,183	3,366,683	3,366,683	3,366,683	3,366,683	3,366,683
83	Premises, Plant and Insurance	1,017,004	1,007,464	1,024,651	1,029,409	1,019,462	1,030,318	1,039,191	1,048,138	1,057,159	1,066,255	1,075,426
84	Governance and Administration	3,040,889	3,054,022	3,032,479	3,133,763	3,141,106	3,113,655	3,138,912	3,164,379	3,190,057	3,215,948	3,242,054
85	Upper Clutha DER Solution	-	-	264,777	593,592	581,522	699,000	862,420	1,006,064	620,018	619,105	621,565
Non-network opex		31,862,117	18,275,434	20,629,349	20,391,915	21,045,989	21,236,036	21,529,504	18,491,441	18,333,442	18,445,968	18,561,794
	Check 1		0.57	0.66	0.60	0.65	0.67	0.68	0.58	0.58	0.58	0.58
	Check 2		0.70	0.72	0.67	0.70	0.72	0.72	0.70	0.70	0.70	0.70
	Average Non-network opex over 5 year review period		20,966,559									
	Average SONS opex over 5 year review period		9,513,924	6,738,675								
	Average Business support opex over 5 year review period		11,452,634									
	Average People costs opex over 5 year review period		3,305,348	2,403,796								
	Report 6 Table 8											
	Av. staff no. over 5-yr review period based on revised SONS & People costs opex, with other opex as proposed		119	97								
	SONS		88	75								
	People costs		31	22								

Inputs	
Proportion staff costs	Average salary (\$k/FTE)
SONS	61%
People costs	67%
	89.6
	109.9

These represent average staff costs from RY22-RY26

FTE numbers from Report 6, Table 8 – Option 1

Inferred FTE numbers, presented in Table 4, Section 4

Appendix C: FTE estimates

Screenshot of Model 2 showing FTE calculations using cohort average Non-Network opex after CPP adjustment: Option 2

Expenditure tracker

5 RY20 constant		RY20	RY21	RY22	RY23	RY24	RY25	RY26	RY27	RY28	RY29	RY30
Capex	ID											
	1.24 Non-network opex multiplier											
Opex												
80	SONS	15,693,708	7,952,337	9,080,635	8,870,182	9,146,203	9,193,625	9,335,375	7,006,032	7,160,512	7,213,396	7,265,821
	SONS - Staff only (PwC)			6,469,058	7,018,176	6,475,822	6,380,981	6,154,090				
	People costs - Staff only (PwC)			3,394,368	3,900,865	3,542,980	3,400,864	3,392,023				
81	People costs	9,761,357	4,098,109	5,036,948	4,783,929	4,979,445	5,086,710	5,073,425	3,572,907	3,655,969	3,687,263	3,718,363
82	IT Opex	2,349,159	3,064,659	3,465,314	3,304,496	3,477,496	3,418,183	3,366,683	3,366,683	3,366,683	3,366,683	3,366,683
83	Premises, Plant and Insurance	1,017,004	1,007,464	1,024,651	1,029,409	1,019,462	1,030,318	1,039,191	1,048,138	1,057,159	1,066,255	1,075,426
84	Governance and Administration	3,040,889	3,054,022	3,032,479	3,133,763	3,141,106	3,113,655	3,138,912	3,164,379	3,190,057	3,215,948	3,242,054
85	Upper Clutha DER Solution	-	-	264,777	593,592	581,522	699,000	862,420	1,006,064	620,018	619,105	621,565
Non-network opex		31,862,117	19,176,591	23,407,552	25,335,664	24,074,246	23,748,028	23,511,843	19,164,203	19,050,398	19,168,650	19,289,913

Check	0.72	0.83	0.76	0.81	0.83	0.83	0.74	0.73	0.73	0.73	0.73	
Average Non-network opex over 5 year review period	24,015,466											
Average SONS opex over 5 year review period	9,125,204	6,499,625										
Average Business support opex over 5 year review period	14,890,262											
Average People costs opex over 5 year review period	4,992,091	3,526,220										
Report 6 Table 8		Corrected FTE										
Av. staff no. over 5-yr review period based on revised Non-network opex, changing only SONS & People costs opex	131	105										
SONS	85	73										
People costs	46	32										

Inputs		
Proportion staff costs	Average salary (\$k/FTE)	
SONS	61%	89.6
People costs	67%	109.9

These represent average staff costs from RY22-RY26

FTE numbers from Report 6, Table 8 – Option 2

Inferred FTE numbers, presented in Table 4, Section 4

Appendix C: FTE estimates

Note: This analysis is not included in Model 2. This block has been created using the same logic for the Upper Bound estimates in Model 2

Screenshot of Model 2 showing FTE calculations using senior management challenge opex: Lower Bound

	SONS	People costs	Total		CPP Year 1	CPP Year 2	CPP Year 3	CPP Year 4	CPP Year 5
CPP Year 1 av. Headcount	85	42	127	SONS	9,162,772.54	9,162,772.54	9,001,076.55	8,839,380.56	9,162,772.54
CPP Year 3 av. Headcount	82	42	124	People costs	4,527,487.61	4,527,487.61	4,527,487.61	4,527,487.61	4,527,487.61
				Total	15,091,625.35	15,091,625.35	14,660,436.06	14,229,246.76	14,229,246.76

Lower bound	CPP Year 1	CPP Year 2	CPP Year 3	CPP Year 4	CPP Year 5	Total
SONS	10,812,080	12,022,409	10,774,574	10,478,164	10,371,572	54,458,799
People costs	4,701,345	5,771,312	5,077,916	4,795,527	4,838,701	25,184,801
Total	15,513,425	17,793,721	15,852,490	15,273,691	15,210,273	79,643,600
IT Opex	3,465,314	3,304,496	3,477,496	3,418,183	3,366,683	17,032,173
Premises, Plant and Insurance	1,024,651	1,029,409	1,019,462	1,030,318	1,039,191	5,143,031
Governance and Administration	3,032,479	3,133,763	3,141,106	3,113,655	3,138,912	15,559,915
Upper Clutha DER Solution	264,777	593,592	581,522	699,000	862,420	3,001,310
Business support opex	12,488,565.34	13,832,571.66	13,297,502.60	13,056,683.64	13,245,907.81	65,921,231
Total non-network opex	23,300,645.68	25,854,980.44	24,072,076.24	23,534,847.92	23,617,480.10	120,380,030

FTE numbers from Report 6, Table 9

PwC workings	CPP Year 1	CPP Year 3
SONS submission opex (\$)	15,324,031	15,663,624
People Costs submission opex (\$)	7,731,117	8,106,063
SONS opex difference (\$)	(4,511,950)	(4,889,051)
People Costs opex difference (\$)	(3,029,772)	(3,028,146)
SONS difference (staff) (\$)	(2,790,768)	(3,000,307)
People Costs difference (staff) (\$)	(2,081,462)	(2,000,917)
SONS inferred FTE reduction	(32)	(33)
People Cost inferred FTE reduction	(19)	(18)
SONS total FTE	75	74
People Costs total FTE	30	31
Total	105	104

Inferred FTE numbers, presented in Table 4, Section 4

Corrected salaries (RY22)		
	Proportion staff costs	Average salary (\$k/FTE)
SONS	62%	88.4
People costs	69%	109.1

Corrected salaries (RY24)		
	Proportion staff costs	Average salary (\$k/FTE)
SONS	61%	89.6
People costs	66%	110.0

Starting FTE	
SONS	107
People costs	49

Appendix C: FTE estimates

Screenshot of Model 2 showing FTE calculations using senior management challenge opex: Upper Bound

	SONS	People costs	Total	SONS	CPP Year 1	CPP Year 2	CPP Year 3	CPP Year 4	CPP Year 5
CPP Year 1 av. Headcount	92	48	140	SONS	9,917,353.80	9,917,353.80	9,593,961.83	9,270,569.86	9,270,569.86
CPP Year 3 av. Headcount	86	46	132	People costs	5,174,271.55	5,174,271.55	5,066,474.23	4,958,676.90	4,958,676.90
				Total	15,091,625.35	15,091,625.35	14,660,436.06	14,229,246.76	14,229,246.76

Upper bound	SONS	CPP Year 1	CPP Year 2	CPP Year 3	CPP Year 4	CPP Year 5	Total
SONS		11,566,662	12,776,990	11,367,459	10,909,354	10,479,370	57,099,834
People costs		5,348,129	6,418,096	5,616,903	5,226,716	5,269,890	27,879,734
Total		16,914,790	19,195,086	16,984,362	16,136,070	15,749,260	84,979,568
Check		-	-	-	-	-	-
IT Opex		3,465,314	3,304,496	3,477,496	3,418,183	3,366,683	17,032,173
Premises, Plant and Insurance		1,024,651	1,029,409	1,019,462	1,030,318	1,039,191	5,143,031
Governance and Administration		3,032,479	3,133,763	3,141,106	3,113,655	3,138,912	15,559,915
Upper Clutha DER Solution		264,777	593,592	581,522	699,000	862,420	3,001,310
Business support opex		13,135,349.29	14,479,355.60	13,836,489.22	13,487,872.93	13,677,097.11	68,616,164
Total non-network opex		24,702,010.89	27,256,345.65	25,203,948.14	24,397,226.51	24,156,466.71	125,715,998

FTE numbers from Report 6, Table 9

Corrected workings	CPP Year 1	CPP Year 3	Corrected salaries (RY22)
SONS submission opex (\$)	15,324,031	15,663,624	Proportion staff costs
People Costs submission opex (\$)	7,731,117	8,106,063	Average salary (\$k/FTE)
SONS opex difference (\$)	(3,757,369)	(4,296,165)	SONS
People Costs opex difference (\$)	(2,382,988)	(2,489,160)	62%
SONS difference (staff) (\$)	(2,324,038)	(2,636,469)	109.1
People Costs difference (staff) (\$)	(1,637,120)	(1,644,769)	69%
SONS inferred FTE reduction	(26)	(29)	Corrected salaries (RY24)
People Cost inferred FTE reduction	(15)	(15)	Proportion staff costs
SONS total FTE	81	78	Average salary (\$k/FTE)
People Costs total FTE	34	34	SONS
Total	115	112	61%
			110.0
			Starting FTE
			SONS
			107
			People costs
			49

Inferred FTE numbers, presented in Table 4, Section 4

Appendix C: FTE estimates

Supporting information

The data below supports our inferred FTE calculations presented in Table 4, section 4 and illustrated on pages 21-26 of this Appendix.

Total SONS and People Costs are consistent with Aurora's CPP proposal schedule E, Table 7.

The staff and non-staff components have been provided by Aurora.

The lower average salary in SONS is because a portion of SONS staff costs are capitalised.

Number of FTEs assumed in CPP proposal

Name	CPP Year 1	CPP Year 2	CPP Year 3	CPP Year 4	CPP Year 5
SONS FTE	107	107	107	107	107
People Costs FTE	49	49	49	49	49
Total	156	156	156	156	156

Opex (RY20 \$ 000) from CPP proposal

Name	CPP Year 1	CPP Year 2	CPP Year 3	CPP Year 4	CPP Year 5
SONS					
Staff	9,478	9,538	9,612	9,676	9,751
Non-staff	5,846	7,026	6,051	5,902	5,352
Total	15,324	16,564	15,664	15,578	15,103
Staff %	61.9%	57.6%	61.4%	62.1%	64.6%
Average salary (per FTE)	88.4	88.9	89.6	90.2	90.9
People Costs					
Staff	5,311	5,345	5,356	5,368	5,369
Non-staff	2,420	3,476	2,750	2,440	2,458
Total	7,731	8,820	8,106	7,807	7,828
Staff %	68.7%	60.6%	66.1%	68.8%	68.6%
Average salary (per FTE)	109.1	109.8	110.0	110.2	110.3

Appendix D: Opex allowance

Supporting information

The data in this appendix supports our corrected opex allowance consistent with the upper bound FTE estimate, presented in section 4. Note: The data in these tables is consistent with Model 2, which differs slightly to the data presented in Report 6, Table 12.

Corrected opex allowances consistent with the senior management challenge Upper Bound FTEs (Report 6, Table 12) – SONS

Opex allowance SONS (RY20 \$ 000)

	CPP Year 1	CPP Year 2	CPP Year 3	CPP Year 4	CPP Year 5	Total
SONS (Report 6 Table 12)						
Staff	9,917	9,917	9,594	9,271	9,271	47,970
Non-staff	1,439	2,542	1,384	1,183	672	7,219
Network scale factor	211	318	389	456	537	1,911
Total	11,567	12,777	11,367	10,909	10,479	57,100
SONS (Corrected)						
Staff	8,186	8,186	7,919	7,652	7,652	39,595
Non-staff	5,846	7,026	6,051	5,902	5,352	30,177
Total	14,032	15,212	13,970	13,554	13,004	69,772
Increase	2,465	2,435	2,603	2,644	2,525	12,672

Appendix D: Opex allowance

Corrected opex allowances consistent with the senior management challenge Upper Bound FTEs (Report 6, Table 12) – People Costs

Opex allowance People Costs (RY20 \$ 000)

	CPP Year 1	CPP Year 2	CPP Year 3	CPP Year 4	CPP Year 5	Total
People Costs (Report 6 Table 12)						
Staff	5,174	5,174	5,066	4,959	4,959	25,332
Non-staff	64	1,078	345	24	24	1,535
Network scale factor	110	166	206	244	287	1,012
Total	5,348	6,418	5,617	5,227	5,270	27,880
People Costs (Corrected)						
Staff	5,261	5,261	5,151	5,042	5,042	25,757
Non-staff	2,420	3,476	2,750	2,440	2,458	13,543
Total	7,681	8,736	7,901	7,481	7,500	39,300
Increase	2,333	2,318	2,284	2,255	2,230	11,420

Corrected opex allowances consistent with the senior management challenge Upper Bound FTEs (Report 6, Table 12) – SONS and People Costs

Opex allowance SONS and People Costs (RY20 \$ 000)

	CPP Year 1	CPP Year 2	CPP Year 3	CPP Year 4	CPP Year 5	Total
SONS + People Costs (Report 6 Table 12)	16,915	19,195	16,984	16,136	15,749	84,980
SONS + People Costs (Corrected)	21,712	23,949	21,871	21,035	20,504	109,072
Increase	4,798	4,754	4,887	4,899	4,755	24,092

Appendix E: Cohort staffing

Functional mapping

The EDB cohort has shared their current organisation charts with us on a confidential basis. We have mapped the staffing data to the following functions using job titles and team structure information. These functions are consistent with the ID expenditure category definitions for SONS and Business Support.

Business Support

- Chief executive, corporate and human resources
- Finance and risk
- Commercial, regulatory and communications
- IT (corporate)

SONS

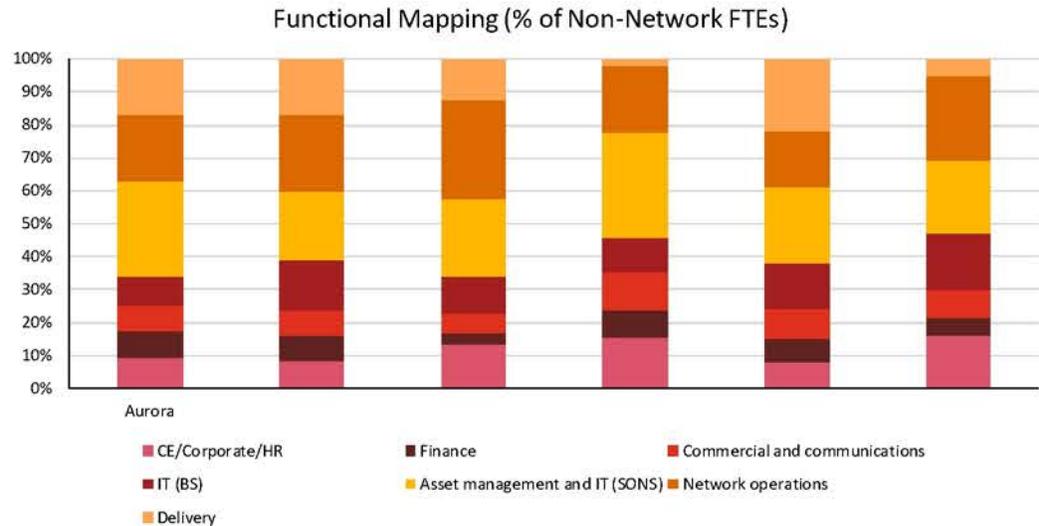
- Asset Management, IT (asset)
- Network operations
- Delivery

FTEs associated with other functions (such as field contracting or non regulated services) are excluded.

We sought additional clarification from each EDB where necessary.

Where Business Support services also support non EDB functions, we prorated the Business Support FTEs using the cost allocation percentages reported in each EDB's RY20 information disclosures.

The results of the functional mapping exercise are illustrated below. This shows the differences in the organisation structures and staffing levels between Aurora and the cohort EDBs for Business Support and SONS activities.



Appendix E: Cohort staffing

Supporting information

The data in this appendix supports Figures 11-14, presented in section 4, and the figure on the previous page.

FTE connection (ICPs) benchmarks (RY20)

	Delta	Aurora	Cohort	Draft Decision	Inferred Draft Decision
FTE/1000 ICP	1.2	1.7	1.3	1.5	1.3

FTE expenditure benchmarks (RY20)

	Delta	Aurora	Cohort	Draft Decision	Inferred Draft Decision
FTE/Network opex \$m	5.9	8.5	10.8	7.6	6.3
FTE/Network capex \$m	1.4	2.0	2.4	1.8	1.5
FTE/Network totex \$m	1.1	1.7	2.0	1.5	1.2

SONS (% of Non-Network)

	% FTE	% Opex
Aurora Energy	69%	50%
Cohort EDB	61%	34%
Cohort EDB	66%	53%
Cohort EDB	54%	30%
Cohort EDB	62%	49%
Cohort EDB	53%	33%

Business Support (% of Non-Network)

	% FTE	% Opex
Aurora Energy	31%	50%
Cohort EDB	39%	66%
Cohort EDB	34%	47%
Cohort EDB	46%	70%
Cohort EDB	38%	51%
Cohort EDB	47%	67%

The FTE data represents current data for Aurora and the cohort, the benchmarks stated in Report 6 which support the Draft Decision, and the inferred draft decision benchmarks from our analysis. The expenditure data is for RY20. The Aurora expenditure is used in the Delta, Aurora, Draft Decision and Inferred Draft Decision benchmarks. The average cohort data is used for the cohort benchmarks.

Appendix F: Model error log

The issues log below documents the most material modelling issues we discovered in our examination of Models 1 and 2, as noted in section 5. We have not completed a full review of either model.

Model 1				
#	Sheet Name	Cell Ref	Calculation	Description
Issues				
1	Opex - Bus Supp (SEC) Opex - Bus Supp (x0.7) (SEC)	Y120:AN120 Y124:AN124	Aurora's revised People costs BST model	The People Cost data is inconsistent with the data submitted in Aurora's CPP application.
2	Opex - SONS (SEC)	C77:T77	Aurora SONS opex	Aurora SONS opex is inconsistent with the benchmark cohort and the CPP proposal as it is not sourced from the RY20 AMP.
3	Opex - Bus Supp (SEC)	C77:I77	Aurora Business Support Opex	Aurora Business Support opex from RY21 is inconsistent with the benchmark cohort and the CPP proposal as it is not sourced from the RY20 AMP. It is overstated as lease opex is included.
4	Opex - SONS (SEC) Opex - SONS (x0.45) (SEC) Opex - Bus Supp (SEC) Opex - Bus Supp (x0.7) (SEC) Opex - Non-Network (SEC) Opex - Non-Network (x0.6) (SEC)	AN76:AN81	SONS, BS, NN opex/ICP	The RY30 'SONS opex/ICP', 'Business support opex/ICP', and 'Non-network opex/ICP' ratios use RY29 ICP data.
5	Opex - SONS (SEC) Opex - SONS (x0.45) (SEC) Opex - Bus Supp (SEC) Opex - Bus Supp (x0.7) (SEC) Opex - Non-Network (SEC) Opex - Non-Network (x0.6) (SEC)	AN76:AN81	SONS, BS, NN opex/ICP	Actual RY20 SONS & BS opex is being used for Aurora, but the ICP number is a forecast. Actual RY20 opex data is not included for the cohort.

Appendix F: Model error log

Model 1				
#	Sheet Name	Cell Ref	Calculation	Description
Issues				
6	Opex - SONS (SEC) Opex - SONS (x0.45) (SEC) Opex - Bus Supp (SEC) Opex - Bus Supp (x0.7) (SEC) Opex - Non-Network (SEC) Opex - Non-Network (x0.6) (SEC)	AD95:AN104	SONS, BS, NN opex/total line length km	The 'SONS opex/total line length km', 'Business support/total line length km', and 'Non-network opex/total line length km' ratios for RY20-RY30 use circuit length data from RY19.
7	Opex - SONS (SEC) Opex - SONS (x0.45) (SEC) Opex - Bus Supp (SEC) Opex - Bus Supp (x0.7) (SEC) Opex - Non-Network (SEC) Opex - Non-Network (x0.6) (SEC)	AD95:AN104	SONS, BS, NN opex/total line length km	Actual RY20 SONS and BS data is being used, but RY19 lines length data is being used.
8	Opex - SONS (SEC) Opex - Bus Supp (SEC) Opex - Non-Network (SEC)	AE88:AN88, AE107:AN107	Aurora SONS, BS, NN opex/cohort average/ICP and /km	The cohort average is derived from RY21, Aurora is an average for RY21-RY30
9	ICP numbers	K6:T33	ICP total	RY20-RY29 ICP data is incorrectly forecast for Aurora and the cohort as Alpine Energy's average growth rate is applied.
10	ICP numbers	M5:T33	ICP total	From RY22-RY29 the ICP value is being extrapolated using an incorrect formula, which skips RY22.

Appendix F: Model error log

Model 2				
#	Sheet Name	Cell Ref	Area	Description
Issues				
1	Submission w eff Op A (SEC)	D176	Salary calculation	Model 2 assumes the average salary for ex-Delta roles in RY21 is \$107.8k/FTE. This rate is applied to the assumed staffing cost component of Aurora's SONS and People Costs to derive the FTE estimates. Aurora's actual average staffing costs in the CPP opex proposal are \$95.9k/FTE. There is also a notable difference between SONS (\$89.6k/FTE) and the People Cost (\$109.9k/FTE) portfolios.
2	Submission w eff Op A (SEC)	Rows 139, 140, 159, 160 etc	Staff costs	When calculating the FTE cross checks, the staff related portion of the SONS and People Cost portfolios are overstated. This overstates the FTEs used in the cross checks. Staff related costs are only about two thirds of the portfolios. For example, in RY22, staff related costs are 62% of SONS and 69% of People Costs.
3	Submission w eff Op A (SEC)	Rows 139, 140, 159, 160 etc	Hard coding	The SONS and People Costs staff only calculation rows back out hard coded staff related costs, and add them back in later. However, other than a manual review of each cell and reconciling them to other sources, there is no way to verify that the correct adjustments have been made. This also introduces a high level of risk of modelling errors.
4	Submission w eff Op A (SEC)	Rows 260, 261, 295, 296, 319, 320	Hard coding	We note there are instances in Model 2 where hardcoded numbers that represent 'Aurora's proposed network scale factor' differ between cells and it is difficult to know if this was intended or is a modelling error.
5	Submission w eff Op A (SEC)	Row 165, 216	Sum calculation	These rows showing totals are incorrect. The data in the block above does not sum to these values.