



Vector Limited
110 Carlton Gore Road
PO Box 99882
Newmarket
Auckland 1149
+64 9 978 7788 / vector.co.nz

24 April 2024

Ben Woodham
Electricity Distribution Manager
Commerce Commission
44 The Terrace
Wellington 6140
By email: infrastructure.regulation@comcom.govt.nz

Vector submission on CEPA's EDB Productivity Study

1. This is Vector's ('our,' 'we,' 'us') submission on the Cambridge Economic Policy Associates' (CEPA) report entitled EDBs Productivity Study commissioned by the Commerce Commission's (Commission). The study is part of Phase 1 of the Commission's productivity and efficiency review to analyse total factor and partial productivity of the EDB sector. No part of this submission is confidential, and it can be published on the Commission's website.
2. The Commission has stated (on its website) that it may use the phase 1 findings as context for the draft decision on the default price-quality (DPP4) reset, but it has not outlined how. This is a concern for non-exempt EDBs given the limitations of the analysis.
3. In this submission we set out how the CEPA productivity analysis is limited and therefore must only be consider in consideration regards to the specific outputs and inputs used in the modelling. To have a complete view on EDB productivity the Commission must consider other drivers of EDB expenditure that have not been considered in the CEPA analysis.
4. We note our disappointment that the Commission has only chosen to tweak its productivity study from that which it has used for the past two resets. It is our view that productivity studies used when the sector was in a steadier state and applying that now to a sector in transition is bound to lead to spurious results.

Unmeasured outputs

5. The modelling undertaken by CEPA and the Commission uses a combination of eight outputs:
 - a. Connections (#): This is the number of installation control points (ICPs) or customers. The number of connections should proxy spending that scales with connections e.g., customer service activities;
 - b. Circuit length (km): The sum of overhead and underground circuit kilometres;
 - c. Energy Throughput (GWh): The quantity of electricity distribution throughput is measured by the number of kilowatt hours of electricity supplied;
 - d. Overall system capacity (kVA*kms): transformer capacity multiplied by circuit length; and
 - e. Ratcheted maximum demand (GW): The highest maximum demand observed in the sample period up to that point;
 - f. Reliability (minutes lost): Total customer interruption durations (planned and unplanned) in minutes for the year;
 - g. Overhead line capacity (MVA-kms): The apparent power in the overhead circuit in MVA (current multiplied by voltage), multiplied by the length of the overhead circuit; and
 - h. Underground line capacity (MVA-kms): The apparent power in the underground circuit in MVA (current multiplied by voltage), multiplied by the length of the underground circuit.
6. If EDBs efficiently increase their opex on anything that is not directly driven by changes in line-length, customer numbers, peak demand/system capacity or energy throughput, then this will reduce measured productivity. Actual productivity, however, exceeds measured productivity if EDBs are spending opex on generating unmeasured outputs. These unmeasured outputs could be driven by customers (e.g., demands for improved or new services) or external factor (e.g., legislative or regulatory changes).
7. Vector argues that EDBs are delivering a number of outputs over the last two decades that are not factored into CEPA's productivity analysis. In fact, the number of outputs have and will actually increase with the drive to electrification to achieve net zero 2050. CEPA has recognised this is the case in their list of 'potential explanations' on why their analysis shows declining productivity.
8. Vector along with the other largest non-exempt EDBs (Big Six) commissioned NERA to review CEPA's productivity study and analyse the implications of its findings for the Commission's task of setting a partial productivity factor for opex over DPP4. NERA's report "*Implications of CEPA's draft findings for the NZCC's decisions on opex productivity for DPP4*" suggests that EDBs are delivering uncompensated outputs that consumers value. We have extracted NERA's list of outputs below, by category, with some additional explanations.

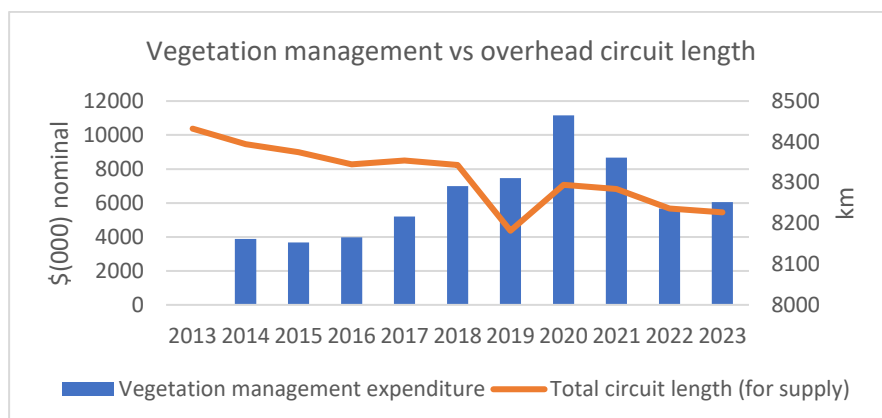
Output category 1: Consents, regulation, and compliance

9. Our first category of unmeasured outputs covers consents, regulation, and compliance. EDBs are facing increased regulations (or other pressures) to deliver additional unmeasured compliance or legal outputs which are missing from CEPA's review.

Category 1	Output	Period
Consents, regulation, and compliance	Traffic Management Compliance: Increasingly stringent safety regulations require crews to set up and manage traffic for project works adding a significant cost to the works undertaken. Traffic management also adds costs by extending the time taken to complete a job.	Historical
	Public, EDB staff and Service provider safety (distinct from traffic management compliance): For example, <i>Electricity (Hazard from Trees) Regulations 2003</i> require EDBs to remove trees sufficiently near to electricity lines. Tree removal can only occur via negotiation with tree owners. This can deliver uncertain timeframes and outcomes all leading to increased cost. Another example is the <i>Health and Safety and Work Act 2015</i> , which increased costs to work on or around electrified (live) lines and required a lot of live line work to be carried out deenergised, leading to longer timeframes and hence increased costs.	Historical
	Regulatory/ financial compliance: In general, more complex disclosures (IDs & AMP), more complex Accounting Standards (e.g., IAS 16) and share market disclosures (e.g., ESG), code changes and pricing requirements.	Historical
	Resource Consents: Examples include council signoffs such as approval of works impacting parking and footpaths, district plan reviews (including submission, hearings, mediations etc.)	Historical

10. One of the expenditure categories impacted by some of the compliance outputs above is Vegetation Management. The Tree Regulations, the Health and Safety requirements and the increased need to gain ecological and land consents for cutting trees have meant that costs have increased.
11. The graph¹ below shows Vector's Vegetation Management expenditure since 2013 in relation to the length of overhead lines on our network. The productivity model attempts to factor in vegetation management through the circuit length output, but the model is flawed because first of all vegetation management is only concerned with our overhead network. Secondly there is nowhere in the CEPA model which accounts for legislative changes.
12. It is clear from the graph that even with our overhead network decreasing in length, expenditure on vegetation management has increased considerably. One of the reasons as explained above is the compliance burden imposed on EDBs which is not factored into the study.

¹ Graph derived from Vector's Electricity Information Disclosures: <https://www.vector.co.nz/about-us/regulatory/disclosures-electricity/financial-and-network-information>



Output category 2: New products/ services

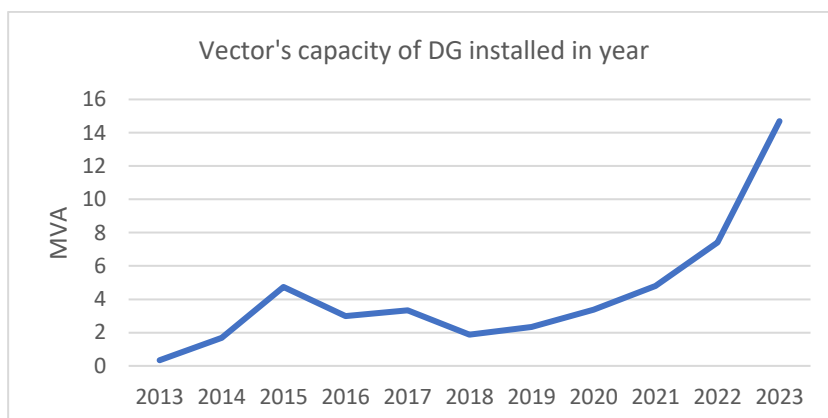
13. The second category of outputs not captured by the productivity study surrounds new products and services that EDBs are increasingly providing which were not provided historically. These are mostly related to decarbonisation activities which are crucial for the energy transition.

Category 2	Output	Period
New products/ services	Non-network solutions/flex services: EDBs are increasingly (or will in the future) be finding opex solutions to what were traditionally capex problems. An example is non-network solutions, which reduce the size of the grid.	Forward
	Environmental, social, and governance (ESG) factors and carbon footprint: expenses that reduce an EDBs ESG impact. For example, by reducing carbon emissions.	Forward
	Stakeholder engagement and communications: Increasing expectations of improved engagement and communications from consumers, communities, iwi and other stakeholders	Recent/Forward
	Connecting/Integrating DER: This includes connecting solar panels to the grid; batteries, and network planning for large new loads.	Forward

14. Although most of these outputs are more recent and will grow further as EDBs begin to integrate more distributed energy resources (DERs) onto their networks, some activities have developed strongly over DPP3 and are worth pointing out for this analysis.

15. The graph² below shows Vector’s capacity of distributed generation (DG) installed in MVA since 2013. Whilst the amounts were smaller from 2013 to 2018, since 2019 the amount of DG has accelerated reaching almost 15 MVA installed in 2023. The Commission must not ignore the legal and compliance aspects of connecting DG.

² Graph derived from Vector’s Electricity Information Disclosures: <https://www.vector.co.nz/about-us/regulatory/disclosures-electricity/financial-and-network-information>



16. On sustainability, Vector has published its Taskforce on Climate-related Financial Disclosure (TCFD) annually since 2021, and its Greenhouse Gas (GHG) Emissions Inventory Report since 2022. Reducing emissions and reporting the results has become one of Vector’s key business strategies with Board level oversight including an integrated approach to climate change-related governance. This ensures that climate change considerations are built into daily operations across Vector.

Output category 3: Digitisation and information technology (IT)

17. The third category of outputs concerns digitisation and IT. EDBs are investing in digital technologies to provide new or improved services.

Category 3	Output	Period
Digitisation & IT	Smart meters: greater opex required to access smart meter data to monitor the network. Also, costs involved in turning this data into insights.	Historical/ Forward
	General digitisation: For instance, maintaining a website (or app) to provide information to customers on the grid including data on repair times and planned and unplanned outages.	Historical/ Forward
	Cyber resilience: Cyber security already extremely important but likely to become increasingly complex as household defer more to smart technologies such as time of day charging for EVs.	Historical/ Forward
	LV visibility/ monitoring /Data acquisition: Understanding the impact on the grid of emerging technologies such as batteries and solar panels requires increased information and understanding about the LV networks. Collecting and using this data, however, is costly.	Historical/ Forward

18. The financial impact of this category of outputs on Vector’s non-network operational expenditure has been significant.

19. The main driver of the increase in non-network costs is due to computer expenses caused by the change in accounting standards where system costs that were previously considered capex are now opex and Vector’s focus on digitalisation and cloud first strategy (see callout box for more details).

Vector's cloud first vision:

Vector has adopted a cloud first policy to accelerate our journey to native cloud services. This enables scalable and elastic computing and storage power at the right economics. Vector has adopted the cloud-first policy as our default and consuming cloud-based services as our primary enabler for IT modernisation. The policy has been in place for the last 6 years and considers cloud-based solutions before alternatives. Our vision is based on the following guiding principles:

1. **PARTNERSHIPS** – leveraging expertise of suppliers and partners
2. **FLEXIBILITY** – Platforms must rapidly adapt to changing business needs
3. **SECURITY BY DESIGN** – systems must be designed from the foundation to be secure
4. **STABLE TEAMS** – Powered by in-house DevOps model with Continuous Improvements
5. **RELIABLE** – Provide a high-available, scalable and secure platform
6. **CLOUD FIRST** – Boost productivity, promote agility in operations and improve scalability
7. **FIT FOR PURPOSE** – the cloud is a model, not a location or a particular infrastructure so new workloads should be assessed first, but cloud-first is desirable

20. During DPP3 Vector migrated virtual servers from their office locations in Carlton Gore Road and Orbit data centres to public cloud environments, thereby enabling:
 - a. Reduction of operational and cyber security risk due to the cost of running infrastructure that is end of life or out of support;
 - b. Faster turnaround of infrastructure requests without reliance on globally constrained supply chains and the related long lead times which happens with hardware support;
 - c. The avoidance of the risk and expense associated with physically moving hardware;
 - d. Decommissioning of redundant servers.
21. While the opex expenditure increased to deliver this cloud migration project, at the same time it avoided capex otherwise required to refresh the on-premises infrastructure hardware.
22. Meanwhile the main drivers of Vector's System Operations and Network Support opex expenditure are related to the acquisition of smart meter data and payments to our digital provider.
23. With the acquisition of smart meter data, Vector has already started to get better data insights leading to better informed decision-making on the locations and capacity for new connections

and the impact on distribution transformers, especially concerning commercial customers installing EV chargers. By proactively managing demand and optimising network design based on years of data, Vector aims to provide immediate feedback on potential capacity constraints and network upgrades. We will also use these insights to reduce infrastructure costs, increase network reliability and the quality of electricity service, and ultimately help lower costs for consumers.

Vector's cyber journey:

As Vector continues its **digital transformation journey**, continuing to maintain an effective and mature security posture is a key priority and an area in which we continue to invest sufficiently to ensure we appropriately manage these cyber security risks. We have continued to improve our ability to detect and prevent potential cyber security threats via our **Security Operations Centre (SOC)**, which provides **24/7/365 monitoring** of our Information Technology (IT) and Operational Technology (OT) environments, and our preventative and detective controls through ongoing initiatives such as network modernisation, user awareness and education, identity and access management as well as external assurance. Execution of the Vector cyber security strategy and roadmap has resulted in advances such as the continuous development of security orchestration, while automation has resulted in reduction of manual effort and time required to remediate security incidents as well as streamlined identification, assessment, and remediation of vulnerabilities. The network modernisation initiative has progressed and will move Vector towards a **zero-trust architecture** with strong foundations in privileged access and service management with identity lifecycle automation for security risk mitigation, operational efficiency and visibility.

24. The Vector cyber security team continues to work with key global tier-1 security providers to apply a global perspective to cyber security assurance and technology, as part of an integrated Cyber Security Operating Model. This had led to higher-than-expected opex cyber expenditure during DPP3, accentuated by the non-provision by the Commission of a cyber security opex step change for the DPP reset back in 2019.
25. Unfortunately, the EDB Productivity Study fails to recognise the huge steps made by EDBs to digitalise and become more resilient in the face of cyber threats.

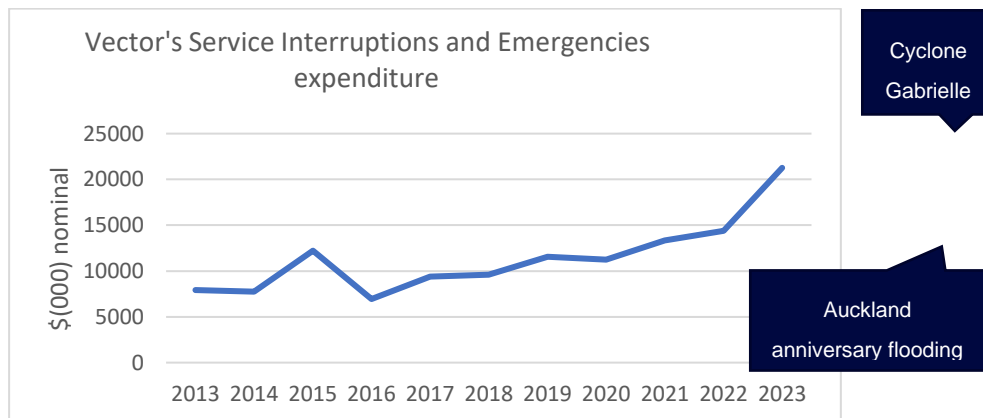
Output category 4: Network resilience

26. The fourth output category is network resilience. EDBs are incurring costs to make their networks more resilient to climate change, severe weather, and natural disasters.

Category 4	Output	Period
Network resilience	Climate and natural disaster resilience: Responding to more frequent severe weather events.	Historical/Forward
	Insurance: Protects customers from paying more after a major event (e.g., cyclone, flooding).	Historical/Forward

27. Although the majority of resilience expenditure will be captured by capital expenditure, EDBs have witnessed more severe weather events over the last decade which has meant responding to outages under extremely difficult circumstances. We need look no further than the Auckland flooding and Cyclone Gabrielle events which hit the region in early 2023.

28. The graph³ below shows Vector’s Service Interruptions and Emergencies expenditure which points out that year where the expenditure is well above average is caused by severe weather events: the Auckland Anniversary flooding and Cyclone Gabrielle impacted the Auckland region in January and February 2023.

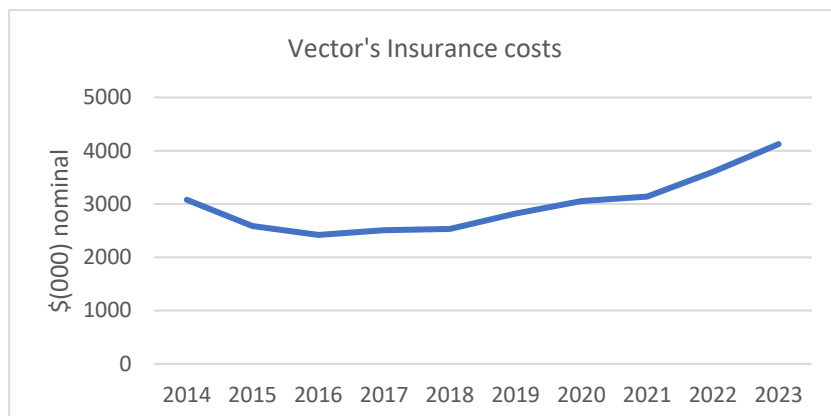


29. Insurance premiums are increasing at an alarming rate across the globe but in our sector in particular given the effects of climate change and natural disasters on infrastructure. It is important that the Commission recognises the benefit consumers get from suppliers procuring efficient levels of insurance. Insurance proceeds reduce the cost of rebuilding after an event and therefore reduced cover would likely translate to reduced insurance proceeds and greater rebuild costs. Costs that, at the end of the day, would be borne by consumers.

30. The graph⁴ below represents Vector’s insurance costs from 2013 to 2023. In 2023 insurance costs were 70% higher than they were in 2016. A trend which is not unique to Vector.

³ Graph derived from Vector’s Electricity Information Disclosures: <https://www.vector.co.nz/about-us/regulatory/disclosures-electricity/financial-and-network-information>

⁴ Graph derived from Vector’s Electricity Information Disclosures: <https://www.vector.co.nz/about-us/regulatory/disclosures-electricity/financial-and-network-information>



31. NERA concludes on the topic of unmeasured outputs that:

“In practice, to deliver unmeasured outputs that require opex, an EDB must either:

- A. find productivity gains on its measured outputs; or*
- B. overspend its opex allowance and face IRIS penalties.*

This disincentivises EDBs from allocating opex to unmeasured outputs, which is likely to be inefficient if those outputs are valued by consumers. As we set out in our December 2022 report, this is essentially a barrier to innovation since many of the unmeasured outputs require innovation to deliver. Or it will cause EDBs to systematically incur losses, which will likely damage investment incentives.”⁵

Other factors that have led to increased operational expenditure

Supply chain costs

- 32. It has become increasingly apparent that cost increases for materials in the EDB sector, in New Zealand and we understand internationally, have been significantly greater than general inflation indicators over the last few years.
- 33. The impact of EDB cost increases being above economy-wide indexed inflation means costs actually incurred by EDBs in recent years have been far greater than what they and regulators had historically forecast and provided for in allowable revenue.
- 34. There are several possible reasons for high EDB cost increases. Significant contributors are likely to have been Covid-19 and supply issues in general, unfavourable changes in commodity prices, unfavourable changes in exchange rates, and greater demand from the electricity sector for materials and labour given the growing rate of decarbonisation and electrification.

⁵ NERA 24th April 2024, *Implications of CEPA’s draft findings for the NZCC’s decisions on opex productivity for DPP4*, p.16

35. Over the last four years Vector has worked with suppliers and field service providers to reduce risk and complexity in our supply chain. The Covid-19 pandemic presented significant operational challenges including constrained supply, increased freight costs and longer delivery times. Vector has overcome these challenges by building deeper, more transparent relationships with trusted suppliers, forecasting demand for long lead-time items, rationalising the range of “standard” items purchased and introducing new suppliers to mitigate the impact of bottlenecks.
36. Conflict in the Middle East and drought in Central America have reduced freight capacity on the Suez and Panama routes, lengthening freight lead times which had started to improve after Covid. The impact of this disruption has been mitigated by the relationships we have built with manufacturers in-region, delivering shorter and less complex supply routes and diversifying sourcing within asset classes. We have also strengthened relationships with peer electricity distributors to drive alignment on equipment specifications, which has reduced portfolio complexity and risk. Our focus on optimising inventory holdings is enabling more efficient and timely fulfilment. We have partnered with logistics expert Rohlig to manage physical inventory, improving the quality and consistency of our warehousing function and enabling more dynamic inventory management.

Cost pressures

37. There has been a significant increase in inflation levels, compared to recent history. Vector has advocated strongly during the Input Methodology review for the Commission to cease forecasting inflation for the purpose of setting DPP revenues. The impacts of inflation are set to be significant for Vector’s customers, owing to the way the Commission’s model treats inflation.
38. Cost pressures have also driven a lift in operational and capital expenditure, due to an increase in costs from suppliers, partly due to competition for resources as the amount of wider infrastructure work needing to be done.

Related DPP features

39. With the DPP4 reset in mind, the Commission must bear in mind how it uses this report (if at all) in relation to other factors within the process.
 - a. Step changes and IRIS: The criteria adopted by the Commission are unnecessarily restrictive for dealing with the issue of unanticipated step-changes to opex. This is especially relevant given the inclusion of the opex IRIS within the regulatory tool kit for expenditure efficiency. The opex IRIS operates on the presumption of the sufficiency of the opex allowance set for a regulatory control period. Accordingly, the inclusion of new prescribed responsibilities for EDBs to invest in during a DPP will create the impression of sudden inefficiencies that are penalised under the opex IRIS. Such penalties will be incurred not because of sudden inefficiency but due to the need to execute new responsibilities. EDBs were not given opex step changes for a number of activities that

they have had to invest in during DPP3. These include cyber security, LV monitoring including data costs, and health and safety. Another issue with the approach adopted in the productivity analysis is that some of the periods used were when there was no IRIS and other periods when there were. The analysis also includes expenditure as reported in information disclosure (ID). This is not the same as expenditures effectively funded for by consumers i.e., not all expenditure reported will have been allowed for in the Commission's building block model.

- b. Innovation: The Commission has admitted that the innovation project allowance scheme for DPP3 has not worked. Innovation is a key source of efficiency and with very little incentive to innovate during DPP3, EDBs have been disadvantaged by this mechanism.
- c. Whole system costs: We note that EDB costs could be increasing, but EDBs are facilitating a reduction in other costs, which potentially reduces net costs for consumers. Vector has long advocated that the Commission take a whole of energy system cost view of the sector to ensure consumers benefit overall from cost impacts across the sector.
- d. Non-exempts vs exempt EDBs: We note that the CEPA report covers all EDBs whether they are exempt or not from price-quality regulation. For that reason, it would prove inconsistent that the Commission uses the report to cull opex allowances to drive the efficiency of non-exempt EDBs, while it has no remit to do so for the exempts.
- e. Prohibition on comparative benchmarking: We note s53P of the Commerce Act prohibits the Commission from using comparative benchmarking on efficiency in order to set starting prices, rates of change, quality standards, or incentives to improve quality of supply. Accordingly, the Commission should be cautious how it uses productivity and efficiency studies in the DPP process. We consider there is a risk this could lead to, in effect, comparative benchmarking.

Conclusions and recommendations

40. There is no denying the results of the CEPA EDB Productivity Study - using the Commission's method for assessing productivity, shows an EDB productivity decline. But as we have outlined in this submission, the analysis is limited as admitted by CEPA themselves. The biggest factor which distorts the results are the many unmeasured outputs which are simply not factored into the efficiency equation. EDBs are spending more on opex related activities for reasons that are either outside of the EDBs control (compliance to legislation), to avoid capex investment or due to accounting changes (cloud migration), to withstand the impact of climate change and protect our network (network and cyber resilience, insurance).

41. NERA explains in their report:

"The combination of, declining measured productivity, returns below the regulatory WACC and expenditure in excess of allowances suggests that the most likely explanation for declining

measured productivity is that EDBs have been delivering uncompensated outputs, which they would only do if they were valued by consumers.

If this is the case, then EDBs need to achieve efficiency gains to deliver all the outputs valued by consumers without being financially penalised for doing so. Put another way, the presence of uncompensated outputs in the allowance-setting process is essentially a form of productivity target.

Therefore, applying a further productivity target on top of this in the form of a positive opex PPF would essentially be a double counting and imposing a punitive productivity target.”⁶

42. For these reasons, Vector recommends that:

- a. The Commission does not use this productivity report beyond learning from its failings in order to improve its efficacy and robustness in future studies of this nature;
- b. The Commission improves future productivity studies by:
 - Normalising for opex costs outside of the control of the EDB; and/ or
 - Incorporating those outputs that are not currently factored into the productivity modelling.
- c. The Commission provides a summary of responses to the CEPA report to ensure that the reports results are heavily caveated when/ if published more widely.

Yours sincerely

Richard Sharp

GM Economic Regulation & Pricing

⁶ NERA 24th April 2024, *Implications of CEPA’s draft findings for the NZCC’s decisions on opex productivity for DPP4*, p.25