



Bream Bay sand mining: assessment of purported economic effects

A report for the Bream Bay Guardians Society

23 February 2026



Project Team

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1. Introduction

My name is Hayden Matthew Green. I am a founding Director of Axiom Economics Limited. For more than twenty years, I have worked as an economist across the Asia-Pacific, advising on competition and regulatory matters.¹ Over that period, I have prepared numerous expert reports, provided sworn testimony in commercial mediations and arbitrations, and reviewed hundreds of economic assessments, including cost-benefit analyses.

I have been asked by the Bream Bay Guardians Society to review the economic analysis prepared for McCallum Brothers Limited (MBL) by ME Consulting (the 'MEC report').² That report was lodged in support of MBL's fast-tracked application for resource consent to extract between 8.45 and 9 million cubic metres of sand from the seabed at Bream Bay. I should disclose two matters at the outset:

- Although I live in Bream Bay, I have no objection in principle to mining ventures being granted resource consents, and I harbour no animus towards mining businesses.³ However, resource consents should only be granted where the benefits clearly outweigh the adverse impacts and I am concerned that this threshold has not been met in this case.
- I have limited experience advising specifically on sand or concrete markets and I do not claim otherwise. However, I am widely regarded as one of New Zealand's leading practitioners of applied microeconomics and am well placed to assess the robustness of the economic analysis advanced in support of MBL's proposed sand-mining operation.

The MEC report contends that granting consent would generate **\$383.1m** in economic benefits. In my opinion, the analysis presented does not support that conclusion. Key methodologies are opaque and irreproducible, and the report contains several material errors. As a result, MEC has not provided a robust indication of the proposal's likely net economic impact. I explain why in the remainder of this report, which is structured as follows:

- **Section 2** reviews MEC's assessment of future sand supply and demand, including its treatment of consented capacity, consent expiry and market entry. It explains why the supply shortages identified in the MEC report are not supported by a realistic assessment of market conditions.
- **Section 3** examines MEC's claimed transport cost savings. It sets out what a robust transport cost assessment would require, reviews the way MEC has presented its analysis and explains why the resulting estimates cannot be relied upon as evidence of a net economic benefit.

¹ More detail of my relevant experience is provided in **Appendix A**.

² ME Consulting, *Te Akau Bream Bay Sand Extraction: Economic Assessment*, December 2025 (hereafter: 'MEC report (2025)').

³ Indeed, I have previously advised one of the world's largest mining companies.



- **Section 4** considers MEC's claims regarding environmental cost savings. It explains why reductions in transport emissions do not translate into net national environmental benefits in the presence of New Zealand's Emissions Trading Scheme (ETS), and why MEC's benefit estimates are conceptually flawed.
- **Section 5** reviews MEC's claimed social cost savings from avoided road deaths and injuries. It explains why MEC's methodology appears ill-suited for a project-level assessment and why accident risk depends critically on transport environments rather than distance alone.
- **Section 6** identifies other relevant economic costs not considered in the MEC report, including externality costs associated with offshore sand mining and the opportunity cost of land use. It explains why these matters are central to a proper net benefit assessment, even if they fell outside MEC's terms of reference.
- **Section 7** sets out my overall conclusions, drawing together the implications of the preceding analysis for whether the proposal can be said to deliver a significant national or regional public benefit.

In preparing this statement, I have read the Code of Conduct for Expert Witnesses in the Environment Court Practice Note 2023 and complied with it. This evidence is within my area of expertise. To the best of my knowledge, I have not omitted to consider any material facts known to me that might alter or detract from the opinions expressed in this report. The analysis set out in this report is high-level and largely qualitative. Where aspects of the MEC report are not explicitly addressed, that should not be taken as an implicit endorsement of those elements.



2. Demand and supply outlook

A central plank of the MEC report is its depiction of future sand demand and supply in the Auckland region. On MEC's analysis, the absence of extraction from Bream Bay would result in material and persistent supply deficits, or at least in shortages that are materially worse than necessary. The presentation of these forecasts gives the impression that Auckland is fast approaching a critical shortage of sand, with associated risks for concrete supply, construction activity and infrastructure delivery. However, that is not supported by the analysis.

The sand sufficiency concern described in the MEC report appears to arise largely from the methodology used to forecast future supply. The way MEC has constructed its supply projections means it is inevitable that shortages will eventually be projected. Under that approach, deficits become a matter of timing rather than possibility – they are effectively built in. This stands in contrast to a recent study by Beca,⁴ which concludes that Auckland is not on the brink of running out of sand and that multiple alternative sources remain available.

2.1 Demand forecast

I have not had time to examine MEC's approach to forecasting demand in detail, but a few brief observations can be made. MEC forecasts future sand demand using a simple rule of thumb. It observes that, historically, Auckland has used a broadly similar amount of sand per person over long periods of time, and it assumes that future sand demand can be estimated by multiplying this historic "per-person" figure by projected population growth.

This relationship is not tested in any formal way. MEC does not demonstrate that population growth causes sand demand to rise, and it does not test how closely the two have moved together over time. Instead, it assumes that the historical pattern will continue. That assumption is not obviously unreasonable. Over long periods, total construction activity may well tend to scale with population once cyclical booms and downturns are averaged out.⁵

However, this is ultimately an empirical question, and one that could easily have been tested. There are straightforward statistical techniques that could have been applied to historical data to assess whether the relationship between population growth and sand (or concrete) demand is statistically significant, whether per-capita demand has been stable over time and how much of the variation in demand population growth ultimately explains.⁶ No such analysis is presented.

⁴ Beca Ltd, *Review of Alternative Sand Sources*, Prepared for Bream Bay Guardians, 14 July 2025 (hereafter: 'Beca report (2025)').

⁵ In any given year, sand demand can vary substantially from this long-term trend. It rises and falls with construction cycles, financing conditions and the timing of major projects.

⁶ There is no regression, no correlation coefficient, no R^2 , no hypothesis tests, no tests for stationarity and no attempt to estimate population as an explanatory variable for sand (or concrete) demand. The report relies on descriptive averages and ratios only.



It is also not possible to replicate or independently test MEC's assumptions using the information provided in the report. While MEC refers at a high level to population data and ready-mix concrete data, the underlying datasets are not presented in tabular form and the constructed per-capita demand series is not disclosed. The report provides a cursory explanation of some of the methodological choices required to derive that series, but it does not set out:

- the specific data series used for concrete or sand demand and whether/how those data were allocated to the Auckland market;
- whether any smoothing, averaging or exclusions were applied and the basis for any such adjustments; and
- whether unusually high or low years were included, excluded, or smoothed when calculating per-capita demand.

The approach also assumes that future construction practices will remain broadly consistent with those observed historically – in effect, that the past is prologue. However, those practices could change over time, including in response to environmental considerations. Comparable shifts have occurred in other sectors, where activities that were once commonplace have become harder to finance or pursue as environmental expectations have changed.⁷ If similar dynamics were to influence construction practices, the historical relationship between population and sand demand may prove to be an unreliable guide to future demand.

In summary, the central relationship underpinning MEC's demand forecast is assumed rather than demonstrated and cannot be independently tested on the basis of the relatively sparse material provided. As we shall see, this lack of transparency is a recurring feature throughout the MEC report that, in my view, limits the weight that can be placed upon its conclusions.⁸ The demand forecast is also vulnerable to substantial error over a 35-year horizon if underlying construction practices change. These uncertainties are compounded by more fundamental problems with MEC's assessment of future supply, discussed below.

2.2 Supply forecast

The MEC report compares projected demand (discussed above) with consented volumes. From an economic perspective, MEC's approach to forecasting supply is problematic. The fundamental flaw is the assumption that consented volumes are synonymous with supply, particularly over extended time horizons. That assumption is plainly incorrect for two reasons.

⁷ For example, new coal-fired power generation has become increasingly difficult to finance in Australia and New Zealand, as major banks, insurers and institutional investors have adopted policies restricting or excluding lending to thermal coal projects on environmental grounds. This has occurred despite continued electricity demand growth, illustrating how shifts in environmental expectations and financing conditions can materially alter investment and production patterns in established sectors.

⁸ Sections 3.1 and 3.2 address the importance of disclosure and transparency in more detail and explains the evidential standards ordinarily expected in regulatory or adjudicative contexts.



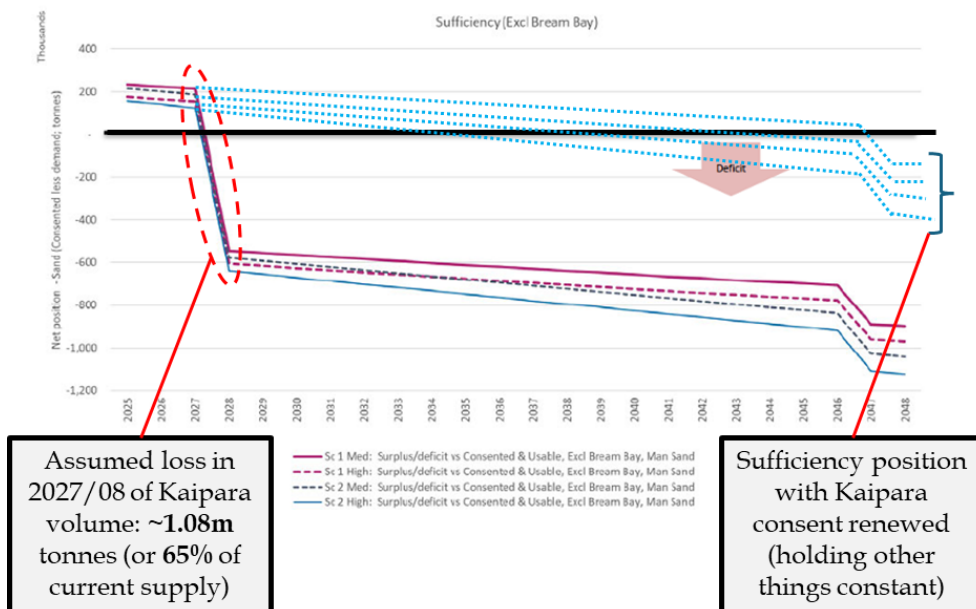
- **Expiry of existing consents.** MEC assumes that once a consent expires, supply from the relevant site immediately falls to zero. Supply is therefore assumed not to extend beyond the formal life of current consents.
- **No new market entry.** MEC assumes that no new consents will be granted at sites other than Bream Bay, thereby limiting future supply to existing suppliers (until their current consent expiration dates) and MBL’s proposed project.

Neither assumption is reasonable. It is likely that at least some existing suppliers have additional reserves that can continue to be extracted, whether at current or reduced rates. It is reasonable to expect that some of them will seek to renew their consents as expiry approaches. Where genuine shortages are anticipated, new sources of supply can also be expected to enter the market. MEC’s treatment of the Kaipara resource provides a clear illustration of the flaws in its approach.

2.2.1 The Kaipara resource

The Kaipara resource has a consented volume of approximately 1.08m tonnes (around 700,000m³) per year, with the current consent expiring in 2027. The MEC report acknowledges that Kaipara is “one of the most important (largest) sources for the Auckland region”, but notes that renewal of the consent is “not guaranteed”.⁹ Consistent with its forecasting approach, MEC therefore assumes that supply from Kaipara falls to zero from 2027/28 onwards, as illustrated in Figure 2.1.

Figure 2.1: Impact of loss of Kaipara resource



Source: MEC report (2025), Figure 3-4, p.26 (modified).

This assumption has a decisive effect on MEC’s projected supply–demand balance. From 2027 onwards, the Auckland market is shown to move into a substantial and persistent deficit. Even with the addition of Bream Bay volumes, the projected

⁹ MEC report (2025), p.20.



shortfall remains large – initially in the order of 200,000 tonnes per year and increasing thereafter. By contrast, if the Kaipara consent were renewed, the market would remain adequately supplied for many years, even under MEC’s otherwise restrictive assumptions.

This naturally prompts the question: if failure to renew the Kaipara consent would result in shortages of the magnitude projected by MEC, how likely is it that the consent holder would choose not to seek renewal, or that a renewal application would be declined? In my opinion, the probability of either outcome is very low.

At the time of writing, the Kaipara consent holders had publicly indicated their intention to seek renewal.¹⁰ From an economic perspective, that response is unsurprising. If the supply–demand outlook was genuinely as severe as implied by the MEC report, suppliers would have strong commercial incentives to renew existing consents where possible and to bring additional sources of supply through the regulatory process.

Furthermore, if renewal of the Kaipara consent were declined, it would almost certainly be for reasons relating to unacceptable environmental effects or adverse cultural impacts. That is not a hypothetical concern. The Pakiri seabed sand-mining proposal was declined on precisely those grounds. It is difficult to conceive of a plausible scenario in which renewal of a strategically important resource such as Kaipara would be refused because the sand is no longer required; rather, refusal would presumably reflect a judgment that the environmental and cultural costs outweigh the benefits.

This points to a circularity in MEC’s analysis. If sand extraction at Kaipara was stopped because its environmental or cultural effects were found to be unacceptable, it is difficult to see how that outcome could then be relied upon to justify the need for *another* seabed sand-mining operation at Bream Bay. The Bream Bay proposal would give rise to the same broad categories of adverse environmental and cultural effects. To argue that sand mining at Kaipara may need to cease for those reasons, and that this therefore necessitates sand mining at Bream Bay, is internally inconsistent. Figure 2.2 summarises the problems with MEC’s approach.

¹⁰ See the announcements [here](#) and [here](#).



Figure 2.2: Inconsistencies in forecasting approach

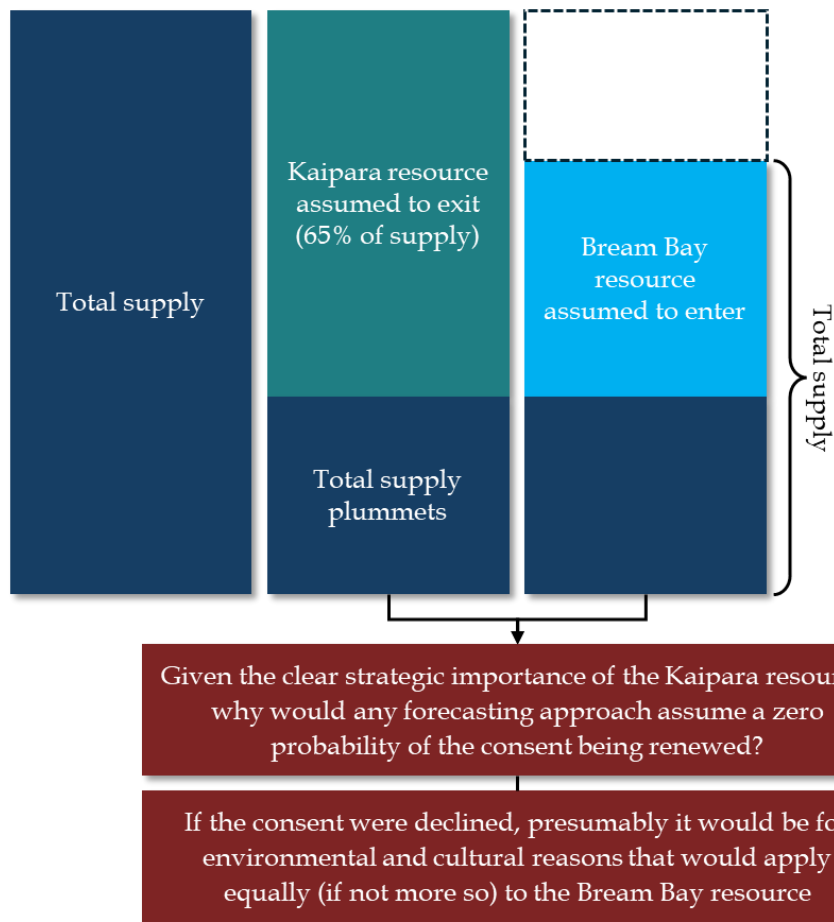



Figure 2.2 highlights the apparent contradiction in MEC’s reasoning. Either the strategic importance of the Kaipara resource means that its consent will be renewed, in which case the Auckland market does not face an imminent or persistent supply deficit – even on MEC’s own restrictive assumptions – and the claimed need for the Bream Bay volumes falls away. Or, if the Kaipara consent was declined, it would almost certainly be for environmental or cultural reasons that *would be likely to apply with equal force* to MBL’s proposal. Either way, the analysis does not establish that the proposed Bream Bay volumes are necessary.

2.2.2 Exit of Pākiri – what happened?

The cessation of sand extraction at Pākiri following MBL’s exit provides a useful, recent real-world point of reference for how the Auckland sand market responds to changes in supply. During the consenting and litigation process, proponents of continued extraction emphasised that Pākiri was a major source of high-quality sand for Auckland and warned that its loss would place significant pressure on supply and costs. Mr Patrick Bridgeman, Managing Director of Bridgeman Concrete Limited (BCL), went so far as to state:¹¹

¹¹ See: *Supporting statement of Patrick John Bridgeman in support of McCallum Bros Limited application to fast track a sand extraction consent from a site in the Mangawhai Pakiri embayment*, paragraph 9, available: [here](#).



'BCL are wholly reliant on sand from MBL for its three Auckland plants. If MBL were unable to provide us with sand, the three Auckland plants would have to close and the cement plant would reduce to half its productivity (as it would not be providing the cement for our Auckland plants).'

It is now six months since supply from Pākiri ceased entirely, during which time MBL has not supplied any sand to the Auckland market.¹² Yet BCL's three Auckland plants appear to still be operating.¹³ More generally, I have seen no reports that the exit of Pākiri has resulted in acute sand shortages, widespread delivery failures, sharp price increases or an inability of the Auckland construction sector to source sand. Instead, sand appears to have been supplied from alternative sources and there has been no reported collapse in market activity.

This does not mean that the loss of Pākiri had no effect or that it was unimportant to the market. Supply chains will have adjusted, costs may have changed at the margin and reliance on other sources will have increased. However, the experience does suggest that the Auckland sand market has been capable of adapting to the loss of a major coastal source without the kind of systemic failure that was sometimes implied during the consenting process.

The experience following MBL's exit from Pākiri also provides a useful indication of what might happen if MBL were to re-enter the market by supplying sand from Bream Bay – a geologically and geographically similar coastal resource. The market appears to have adjusted to MBL's exit without material price increases or sustained supply disruption – at least none that I have seen reported publicly. Against that background, it is not obvious why the reintroduction of comparable volumes would have a materially different effect in the opposite direction, or why prices would be expected to fall sharply. This is relevant when assessing claimed economic benefits.

The experience following the exit of Pākiri illustrates why it is unrealistic to assume that the market would remain static as a supply deficit emerged or persisted. In practice, suppliers and customers adjust through substitution and changes in logistics. A supply-forecasting approach that assumes supply declines mechanically over time, without allowing for such adjustment, risks overstating the likelihood and persistence of supply shortfalls. The MEC approach adopts that assumption and is consequently not analytically sound.

2.2.3 Forecasting should not ignore obvious market responses

A supply-forecasting approach that ignores consent renewal and does not allow for the possibility of new market entry seems neither robust nor well-grounded from an economic perspective. As the experience following the exit of Pākiri illustrates, the market can – and does – adjust in response to changes in supply conditions. MEC's approach also gives rise to a circularity problem. By adopting assumptions that

¹² Prior to August 2025, MBL had also been extracting a substantially reduced volume from Pākiri.

¹³ The company's website continues to state: "We have three plants in the Auckland region which enables us to cover most areas" (see: [here](#)).



force supply to decline mechanically over time, MEC effectively generates the very deficits the Bream Bay volumes are then presented as necessary to alleviate.

To be clear, I am not for a moment suggesting that all existing suppliers will continue operating indefinitely, or that all potential new sources of supply will ultimately proceed. An assumption of universal continuation would be just as unrealistic as assuming that supply collapses once consents expire (the MEC approach). The relevant issue is not whether supply uniformly persists or disappears, but how supply is likely to evolve in response to economic incentives and regulatory processes.

It is beyond the scope of this report to develop or implement a comprehensive supply-forecasting model. However, at a minimum, I expect a more reasonable approach would:

- make explicit, evidence-based assumptions about the likelihood of consent renewal, informed by factors such as historical renewal outcomes, remaining resource quality and the strategic importance of the resource;¹⁴ and
- allow for the possibility of market entry by assigning probabilities to prospective new sources, rather than assuming either universal failure or universal success.

By contrast, MEC's approach embeds a single, highly restrictive set of assumptions that cause supply to decline mechanically over time, irrespective of market conditions or observed behaviour. The resulting deficits are therefore not a neutral forecasting outcome. They are a direct consequence of the modelling choices that have been made. From an economic perspective, this forecasting approach is not easy to justify.

Indeed, applied elsewhere, the same methodology could produce conclusions that are obviously unsound. For example, one might conclude that a second airport is needed in Whangārei on the assumption that the existing Onerahi facility could cease providing services once its current landing agreements expire. That conclusion would clearly not be well founded – but it would be an inevitable result of the same unreliable forecasting logic.¹⁵

2.3 Alternative approach

In July 2025, Beca prepared a review of alternative sand sources for the Bream Bay Guardians Society. The report updated an earlier assessment and was based on

¹⁴ For example, as explained earlier, the probability of the Kaipara consent being renewed would presumably be very high – and a robust forecasting methodology would recognise and account for that obvious economic reality.

¹⁵ In a similar vein, New Zealand Rugby might conclude that the All Blacks will cease to exist once current player contracts expire, on the assumption – plainly unrealistic – that all players would depart or retire and that no replacements would be recruited. Or, a municipality might determine that a city will face a severe shortage of supermarkets in twenty years, based on the equally implausible assumption that no existing leases will be renewed and no new stores will open.



publicly available information regarding, among other things, key sand sources and current Auckland ready-mix concrete demand.

Unlike MEC, Beca did not equate future supply with currently consented volumes. Instead, it identified and assessed a range of potential supply sources and ranked them by plausibility, using criteria such as sand characteristics, consent status, available volumes and transport options. Sources were categorised as “probable”, “possible”, “unlikely” or “not a viable option”.

This framing is fundamentally different from MEC’s. Rather than assuming away consent renewal and market entry, Beca explicitly considers alternative supply pathways and distinguishes those that appear more or less feasible. It concludes that multiple alternatives exist in addition to any proposed Bream Bay extraction, including both marine and land-based options and manufactured sand. For example:

- Kaipara Harbour (Taporapora Banks) is identified as the “most probable” alternative, noting that 2024 extraction was approximately 308,000m³ against a consented 600,000m³/year, leaving around 290,000m³/year of unused consented capacity.¹⁶
- Manufactured sand from Brookby Quarry is also identified as an existing Auckland-based source with reported capacity of 170,000m³/year, and potential to increase to 280,000m³/year depending on demand.¹⁷
- Beca also identifies the Marsden Point navigation channel as a further marine source, noting that maintenance dredging generates substantial sand volumes that could be made available to the Auckland market, subject to logistics and commercial arrangements.¹⁸

Beca does not present its analysis as evidence of an impending regional sand crisis. Instead, it juxtaposes the scale of plausible alternative supply with current estimated demand. Excluding Bream Bay extraction, it estimates potential annual supply in excess of 1,000,000m³/year, compared with Auckland ready-mix concrete demand of approximately 310,000–610,000m³/year.

Importantly, Beca does not assume that all potential sources will proceed, or that Auckland will face persistent oversupply. Rather, it recognises that supply evolves through a combination of renewal, substitution and selective market entry in response to economic conditions.

2.4 Summary

The MEC report presents the Auckland sand market as facing a looming and persistent supply crisis. There is no way to assess whether MEC’s demand forecast is robust, since it rests on an assumed relationship between population growth and

¹⁶ Beca report (2025), p.5.

¹⁷ *Op cit.*, pp.1 and 7.

¹⁸ *Op cit.*, pp.16-18.



sand demand that is not tested statistically and cannot be independently verified using the information provided. While this introduces material uncertainty on the demand side, the scale and persistence of the projected shortfall depend most critically on the *supply* assumptions adopted in the modelling.

MEC assumes that existing sources – most notably the Kaipara resource – will exit the market entirely once current consents expire, and that no new supply will enter (aside from Bream Bay). From an economic perspective, that assumption is difficult to sustain. Shortages of the magnitude projected by MEC would be expected to trigger consent renewals, expansion by existing suppliers and new entry. A supply-forecasting approach that excludes these responses does not reflect observed market behaviour, including the experience following the exit of Pākiri.

The Beca report adopts a materially different and ostensibly more economically coherent framing. Rather than assuming supply collapses when consents expire and that no new sources enter the market, it identifies a range of alternative supply pathways and distinguishes those that appear more or less feasible. In doing so, it recognises that supply is likely to evolve over time through a combination of renewal, substitution and selective market entry.

Accordingly, the supply deficits depicted in the MEC report should not be interpreted as evidence of an impending or unavoidable shortage. They are the mechanical consequence of restrictive modelling assumptions – most importantly, the assumed exit of the Kaipara resource. The report therefore materially overstates the risk of future supply shortfalls and correspondingly inflates the apparent need for the Bream Bay volumes. Once its restrictive assumptions are relaxed, it is far from clear that sand supply will be insufficient.



3. Transport cost savings

All three categories of economic benefit estimated in the MEC report are driven by assumed reductions in transport distances. Under the proposal, MBL would transport sand from Bream Bay to its Ports of Auckland depot by barge, before distributing it by truck to concrete plants across Auckland. MEC assumes that, in the counterfactual scenario where consent is not granted, an equivalent volume of sand would instead be shipped from the Kaipara Harbour to the Winstone/Atlas yards in Helensville, then trucked to concrete plants throughout the region.

On that basis, the report assumes that sourcing sand from Bream Bay would result in lower transport costs than the alternative. Much of the total estimated economic benefit – \$258.2m out of \$383.1m, or more than 67% – is attributed to this supposed saving. In my view, this element of the analysis is not robust. The issue is not that a transport cost saving is inconceivable in principle. Rather, the problem is that MEC has not demonstrated, quantified or substantiated such a saving in a manner that meets basic standards of economic analysis.

3.1 What should be done

Before getting into MEC's numbers, it is worth being clear about what a transport cost saving calculation of this kind should look like if it is to carry evidential weight. A robust assessment requires more than a high-level exercise. It is a complex, multi-layered calculation. The final output might be a single headline figure, but it should sit on top of a large amount of structured, auditable work. At a minimum, a robust analysis should:

- **Define the full logistics chain** in both the factual and counterfactual scenarios, including all relevant legs (e.g. extraction, barge transport, port handling, storage and road distribution), treated consistently across scenarios.
- **Identify destinations and volume allocation.** Transport costs depend critically on where the sand is delivered and in what quantities. Unless the proponent has firm offtake arrangements,¹⁹ this requires explicit assumptions about how volumes are distributed across plants.²⁰ Those assumptions should be stated, justified, and tested – particularly over long time horizons where end-use patterns are inherently uncertain.
- **Construct an origin-destination matrix**, rather than relying on a single average distance. This involves specifying routes, distances, modes and any intermodal transfers for each source-destination pair.

¹⁹ If the proponent has firm offtake arrangements (or other credible evidence) showing that particular plants will take defined volumes over defined periods, then it becomes feasible to estimate transport costs with reasonable accuracy, at least over the life of those arrangements. That is because the proponent will have a very good idea where all its sand will be going.

²⁰ If the sand will be sold more generally into the market – especially if it is blended or mixed with other sands at the depot – then its final destinations cannot be observed directly and must be assumed. In that case, the analyst must set out an allocation rule (e.g., “pro rata to existing purchasing shares”, “least-cost allocation subject to capacity limits”, or similar) and explain why that approach is reasonable in the circumstances.



- **Apply transparent unit cost assumptions** for each leg of the transport task, including how loading, unloading, storage, utilisation and other operational factors are treated. The cost basis and price year should be clear.
- **Deal explicitly with time and variability.** Where results are expressed over decades, the analysis should explain how unit costs and delivery patterns are assumed to evolve, and whether results are sensitive to plausible changes in demand geography, operating conditions or technology (e.g., potential shifts to electric vehicles).
- **Disclose workings and sensitivities.** The calculations should be transparent and replicable, typically through a technical appendix or supporting spreadsheets.

The final point about disclosure and transparency is particularly important. If a very large number is doing heavy lifting in the narrative, it should be supported by analysis that an independent reviewer can follow, reproduce and interrogate. If it is not, that is not a presentational issue – it goes directly to the weight that can properly be placed on the claimed saving.

This concern is not merely theoretical. For example, around a decade ago, the Electricity Authority commissioned a quantitative cost-benefit analysis (CBA) from an Australian economic consultancy to support proposed reforms to electricity transmission pricing. The report presented a headline finding of over \$200m in net benefits, and that figure was used as a central part of the Authority's case for change. Yet the CBA was released without the underlying assumptions, data or calculations needed for independent scrutiny.

Only after external analysts²¹ pressed for, and ultimately obtained, access to the underlying material did fundamental modelling errors become apparent. Those errors were not visible from the published report and proved sufficiently serious that the analysis could not be repaired. The Authority was ultimately forced to withdraw the CBA and stop relying on it – a retraction that made the national news.²² As explained below, if anything, the MEC report provides even less of the detail required to scrutinise, test or replicate its claimed savings.

3.2 Presentation of MEC's analysis

MEC's transport cost analysis is presented at a level of abstraction that materially limits its evidential value. The assessment is confined to a small number of paragraphs describing the approach said to have been taken, without disclosing the calculations, assumptions or data on which the results depend. As presented, the analysis consists of a high-level methodological outline and a set of headline results, with no transparent link between the two.

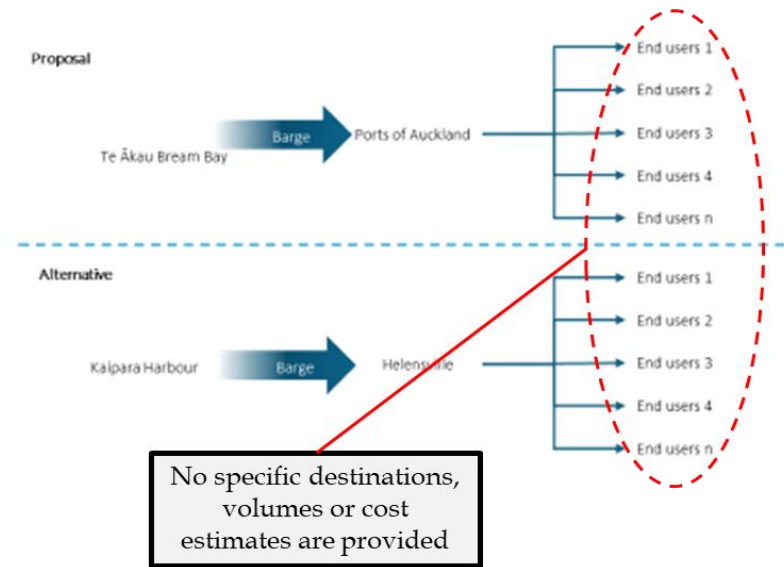
²¹ Axiom Economics was engaged by Transpower to independently review the CBA, we are therefore familiar with the issues that led to its withdrawal.

²² See for example: Radio New Zealand, *Flaws found in electricity pricing report*, 26 April 2017.



MEC does not identify the destinations to which sand is assumed to be delivered in either the factual or counterfactual scenarios. The only indication of distribution patterns is a schematic diagram, Figure 3.1, which uses generic labels such as “end user 1” and “end user 2”. The schematic provides almost no germane detail. It does not identify any specific plants, depots or geographic locations, assign volumes to destinations, or explain how sand is allocated between end users or how transport costs vary between them.

Figure 3.1: Level of specificity provided by MEC



Source: MEC report (2025), Figure 4-1, p.32 (modified).

Similarly, while MEC lists a range of sources from which data are said to have been drawn – such as industry information, handbooks and official guidance – the data themselves are not disclosed. More generally, the report does not set out:

- **Volumes by destination:** the volumes assumed to be transported to each destination from Bream Bay and from alternative sources over the life of the consent, including how they are expected to vary from year to year.
- **The distances or routes used for each transport leg:** the distances sand is assumed to be transported to deliver those assumed volumes of sand to those assumed destinations.
- **Treatment of ‘back-haul’ options:** why MEC assumes that all volumes would be supplied from the Kaipara, without considering the potential for lower-cost back-haul transport from Northland suppliers on return trips to Auckland.²³

²³ Some Northland sand suppliers also operate bulk transport businesses and service Auckland-bound freight routes. For example, Semenoff Group combines sand extraction with heavy transport operations between Northland and Auckland. Where a truck is already travelling to Auckland to deliver other freight, loading sand for the return trip can involve only the additional cost of loading, unloading and minor additional fuel use. In those circumstances, the marginal cost of transporting sand by truck may be substantially lower than the cost of transporting the same material by dedicated coastal shipping. MEC’s counterfactual does not appear to consider this possibility. It instead assumes that all displaced volumes would be supplied from the Kaipara resource by barge.



- **The time profile of volumes or costs:** whether unit costs and delivery patterns are assumed to evolve over time, or whether they are held constant in real terms – and the basis for any such assumptions.
- **Dynamic considerations:** whether, and to what extent, changes in transport infrastructure, traffic conditions and fuel costs have been examined over the relevant period, if at all.
- **Sensitivity testing:** any analysis showing how results change under plausible alternative assumptions, e.g., potential for increased adoption of electric trucks, for example, appears to be a particularly relevant consideration.

The report also contains no technical appendix, worked examples or spreadsheets explaining how the inputs were combined. If these exist elsewhere, I have been unable to find them. As a result, the transport cost analysis cannot be independently reproduced, even in outline. In the context of an economic assessment advancing large, quantified claims, that lack of transparency is not mere semantics; it limits the assessment's reliability.

In my experience, an analysis presented in this form falls short of the evidential rigour typically expected in regulatory or adjudicative contexts. I do not consider that a regulator such as the Commerce Commission would accept a large claimed efficiency or cost saving based on a brief description, a simple schematic diagram, a list of sources and an undisclosed calculation. I see no reason for the Panel to apply a more relaxed approach here.

Accordingly, in my opinion, the manner in which MEC presents its transport cost analysis materially undermines its probative value. On the information provided, there is no reliable basis on which to assess whether the claimed cost savings are reasonable, exaggerated or simply incorrect.

3.3 Avoided costs are not the same as economic benefits

Even if the transport cost saving claimed by MEC were correctly calculated – which has not been demonstrated – it does not follow that it represents an economic benefit of a kind relevant to the statutory test. A reduction in transport costs is, in the first instance, simply a cost saving to the supplier. Whether that saving becomes a wider economic benefit depends on what happens to it once it arises.

The critical issue is whether the saving is passed on. If lower transport costs lead to lower delivered sand prices, and those price reductions flow through to concrete producers and end users, then there may be significant resulting economic benefits. Those benefits would arise because others are made better off – for example, through lower construction costs or improved supply conditions.

However, there is no automatic reason why this must occur. Cost savings are often retained by suppliers as higher margins. In that case, prices do not fall, output does not change and end users are no better off. The saving simply increases the profitability of the business making the saving. Which outcome occurs depends on



market conditions, including how competitive the market is, how prices are set, whether there are capacity constraints, and how contracts are structured.

MEC does not analyse any of these matters. Instead, it simply asserts that avoided transport costs “accrue to Auckland’s economy and ultimately households”,²⁴ without explaining how that outcome would arise or why it should be expected. This is not something that can be assumed or asserted; it must be demonstrated. Indeed, it is entirely possible for a transport cost saving to benefit *only the applicant*, with little or no wider effect.

This distinction is critical. A project being privately profitable is not the same thing as it delivering a significant national or regional public benefit. If the principal effect of a claimed transport cost saving is to increase the profits of the applicant, that is, in my opinion, a weak basis on which to characterise it as generating an economic benefit for consenting purposes. I doubt this is the kind of “economic benefit” Parliament intended to promote when it enacted the Fast Track legislation.²⁵

This omission is particularly relevant when the recent experience following MBL’s exit from Pākiri is considered. As discussed in section 2.2.2, I have been unable to find any publicly available reports of acute sand shortages, delivery failures or sharp price increases following the complete cessation of supply from Pākiri. If that observation is correct, it tends to suggest that the volumes previously supplied by MBL were not setting market prices at the margin. In those circumstances, there is no obvious reason to assume that changes in MBL’s costs or volumes would translate into materially lower market prices in reverse.

It follows that even if MBL were able to achieve a transport cost saving – which, as noted above, has not been transparently demonstrated – there is a real possibility that such a saving would have little or no effect on delivered sand prices and would instead be retained largely or wholly as increased profit. MEC does not explore this possibility at all. It simply asserts that any transport cost savings achieved by MBL will ultimately benefit Auckland’s households, without demonstrating why or how.

For these reasons, a transport cost saving does not represent an economic benefit in its own right. Even if MEC’s avoided cost estimate were accepted at face value, it would still be of strictly limited relevance to the central question at issue – namely, whether granting consent would result in a genuine net public benefit. Significant additional work would be required to establish whether any such cost saving

²⁴ MEC report (2025), p.37.

²⁵ Economists often adopt a deliberately dispassionate approach to distributional effects, treating a dollar in the hands of a large corporation as equivalent to a dollar in the hands of a consumer. Even on that basis, however, it is difficult to see how a private company’s cost savings – retained entirely as profit would, without more, satisfy the relevant criteria. A firm seeking a resource consent can be presumed to expect that the activity will be profitable; otherwise, there would be little reason to pursue consent in the first place. If the mere existence of private profit were sufficient to constitute an economic benefit, the criteria would be effectively redundant, as any application could be said to meet them *by definition*. Plainly, something more must be demonstrated to meet the statutory requirement.



translated into anything more than increased *private* benefits in the form of profits for MBL.

3.4 Summary

It is entirely plausible that sourcing sand from different locations could give rise to differences in transport costs. In that limited sense, it is possible that the proposal could result in some transport cost saving relative to alternatives. MEC presents a quantified estimate of avoided transport costs and treats that figure as a material component of its claimed economic benefits.

However, the analysis underpinning that estimate is not disclosed in a way that allows it to be scrutinised, replicated or tested. Key assumptions are unstated, critical elements of the methodology are unexplained, and the underlying calculations are not provided. As a result, although the transport cost saving is presented numerically, it cannot be independently verified and, in my opinion, should carry no more weight than a qualitative assertion.

More fundamentally, even if some transport cost saving were assumed to exist, MEC has not established that it would translate into a genuine public economic benefit rather than a private gain. The report does not analyse whether any avoided costs would be passed through to others or retained by MBL, and it does not examine the market conditions that would determine that outcome.

Consequently, at best, this aspect of the MEC report suggests that transport costs may differ between supply options under certain assumptions. It does not provide a sound or reliable basis for concluding that the proposal would deliver a transport cost saving that results in a significant national or regional economic benefit.



4. Environmental costs

The MEC report also asserts that mining sand in Bream Bay would reduce New Zealand's environmental costs.²⁶ It contends that transporting sand from Bream Bay would involve fewer kilometres of road travel than moving it from the Kaipara, resulting in lower vehicle emissions. MEC claims that these reduced emissions give rise to two additional categories of cost savings:²⁷

- it estimates emissions cost savings of \$34.4m, calculated using a *shadow price of carbon* drawn from Waka Kotahi's manual for assessing the benefits and costs of proposed land transport investments;²⁸ and
- it estimates health-related cost savings of \$78.2m, representing additional health externalities associated with local air pollutants from vehicle emissions. These health impacts are treated as additional to the carbon valuation.

There are two overarching problems with this analysis. First, as the previous section explained, MEC does not disclose how it has calculated the reduction in transport distances on which these estimates depend. The assumed reduction in vehicle kilometres travelled is therefore not transparent and cannot be verified. It is unclear whether it is accurate.

Second, and more fundamentally, New Zealand operates an economy-wide Emissions Trading Scheme (ETS). The existence of the ETS means that a reduction in greenhouse gas emissions from one activity does not necessarily result in a reduction in environmental harm at the *national* level. The implications of this are critical to assessing MEC's claimed emissions and health-related cost savings.

4.1 How MEC estimates environmental costs

MEC's emissions cost saving is calculated by taking a per-kilometre emissions cost and multiplying it by the assumed reduction in truck travel. The per-kilometre cost is derived by combining standard emissions factors for heavy vehicles with Waka Kotahi's shadow price of carbon. The result is a dollar estimate of the emissions cost said to be associated with each kilometre of truck travel, which MEC then treats as wholly avoided when travel distances are reduced.

MEC applies an analogous approach to health-related environmental costs. It assumes that each kilometre of truck travel imposes a health cost through exposure to local air pollutants. It applies standard appraisal values to estimate that cost on a

²⁶ For the avoidance of doubt, this claim relates solely to greenhouse gas emissions. MEC does not consider other ostensibly relevant environmental impacts, including effects on marine ecosystems, fisheries, tourism or related values. I discuss these issues in section 6.

²⁷ In its summary of total avoided costs, MEC states that the total avoided environmental cost is \$104m. However, the two components said to make up that total are listed as \$34.4m and \$78.2m, which sum to \$112.6m. On its face, the \$104m figure therefore appears to be an error. However, in the absence of any explanation or supporting detail it is not possible to determine whether this reflects a simple arithmetic mistake or some undisclosed adjustment.

²⁸ NZ Transport Agency Waka Kotahi, *Monetised benefits and costs manual – volume 1: procedures, Version 1.7.4*, 1 August 2025 (available: [here](#)).



per-kilometre basis. The assumed reduction in kilometres travelled is then treated as generating a corresponding reduction in health costs. The two avoided costs are added together to produce MEC's estimated environmental cost savings.²⁹

This per-kilometre valuation approach is used in the Waka Kotahi investment evaluation framework to compare alternative transport projects. It allows differences in travel distances between, for example, 'Project A' and 'Project B' to be expressed as differences in monetised emissions and health impacts, so they can be weighed alongside other project costs and benefits. However, for reasons I explain below, that approach is not directly applicable in the present context.

Finally, a brief word on transparency. As with its transport cost saving methodology, MEC does not provide the detailed calculations underlying these estimates. No spreadsheets or equivalent supporting material are included, and only a broad outline of the approach is described. This significantly limits the extent to which the methodology can be replicated or scrutinised. The reader is, once again, expected to take the headline results largely at face value.

Consequently, for the same reasons set out in my review of MEC's transport cost saving estimates, this analysis does not meet the standard commonly expected in comparable regulatory or adjudicative contexts. In any event, as I explain below, MEC's conclusions do not ultimately turn on the precise numerical inputs to these calculations. In this case, they can be set aside on first principles alone, without the need for a detailed review of the underlying modelling.

4.2 The role of the ETS

New Zealand operates a binding ETS with a cap-and-trade mechanism. The transport sector is a mandatory participant in this nationwide regime. Under the ETS, businesses must purchase and surrender 'New Zealand Units' (NZUs) before emitting greenhouse gases, with one NZU corresponding to one tonne of emissions. NZUs can be traded at a market price, which fluctuates in response to changes in supply and demand.

The ETS plays a central role in determining the level of greenhouse gas emissions from the sectors it covers. In principle, aggregate emissions are constrained by the supply of NZUs set under the scheme. As a result, a reduction in emissions within one ETS-covered sector does not necessarily translate into a reduction in New Zealand's overall emissions. Where an emitter reduces its emissions, it will require fewer NZUs, potentially leaving additional units available to be purchased and used by other emitters, either immediately or over time.

An analogy may be helpful. Imagine an All Blacks supporter purchased 20 tickets to the 2011 Rugby World Cup final at Eden Park. Shortly before the match, five friends advise they can no longer attend. That does not imply five empty seats on game

²⁹ As footnote 27 explains, the two figures do not, in fact, sum to the total avoided environmental cost reported by MEC. It is unclear whether this reflects a calculation error, an omission or an undocumented adjustment.



day. Demand for tickets far exceeded supply, and the tickets would simply be resold to other supporters. The binding constraint was the stadium's fixed number of seats. The ETS's emissions cap plays the role of the stadium's capacity. A reduction in emissions from one activity does not necessarily reduce total emissions under the scheme; it simply frees up units that can be used elsewhere within the capped system. Emissions may simply be *reallocated*, rather than reduced.

Waka Kotahi's investment evaluation framework does not take this reallocation effect into account. That is perhaps an acceptable simplification when comparing transport investments within a single sector. However, the implications are critical when the framework is used to assert net national environmental benefits.

Returning to the earlier example, if transport Project A results in fewer emissions than Project B, the immediate effect under the ETS is not a reduction in total emissions, but the release of NZUs that can be used *elsewhere in the economy*. Those units may be taken up by activities with similar emissions profiles, or by activities with higher emissions and greater associated harm. For example, emissions avoided through reduced truck travel may enable additional emissions from an industrial heat plant, a fertiliser factor or other high-emitting activities.

Whether New Zealand is better off *overall* therefore depends entirely on where the displaced emissions occur and what costs they impose. To reiterate: the ETS means that emissions may be reallocated, rather than eliminated. Any analysis that treats lower emissions from Project A as an unambiguous national benefit, without considering the use of freed NZUs elsewhere, is consequently incomplete. MEC has not accounted for this in its approach.

4.3 Implications for MEC's approach

The application of the ETS has direct implications for MEC's assessment of MBL's proposal. MEC's analysis proceeds on the basis that sourcing sand from Bream Bay, rather than from the Kaipara, would reduce truck travel distances and therefore reduce greenhouse gas emissions. That reduction is then treated as giving rise to a corresponding reduction in New Zealand's environmental costs. However, that conclusion no longer follows once the ETS is considered.

Even if it were accepted that transporting sand from Bream Bay involves fewer kilometres of truck travel than moving the same volume from the Kaipara, the most that can be said is that emissions associated with transport would be lower *in that part of the supply chain*. Under the ETS, this would reduce demand for NZUs associated with transport activity. It would not, of itself, establish that total emissions across the economy are lower.

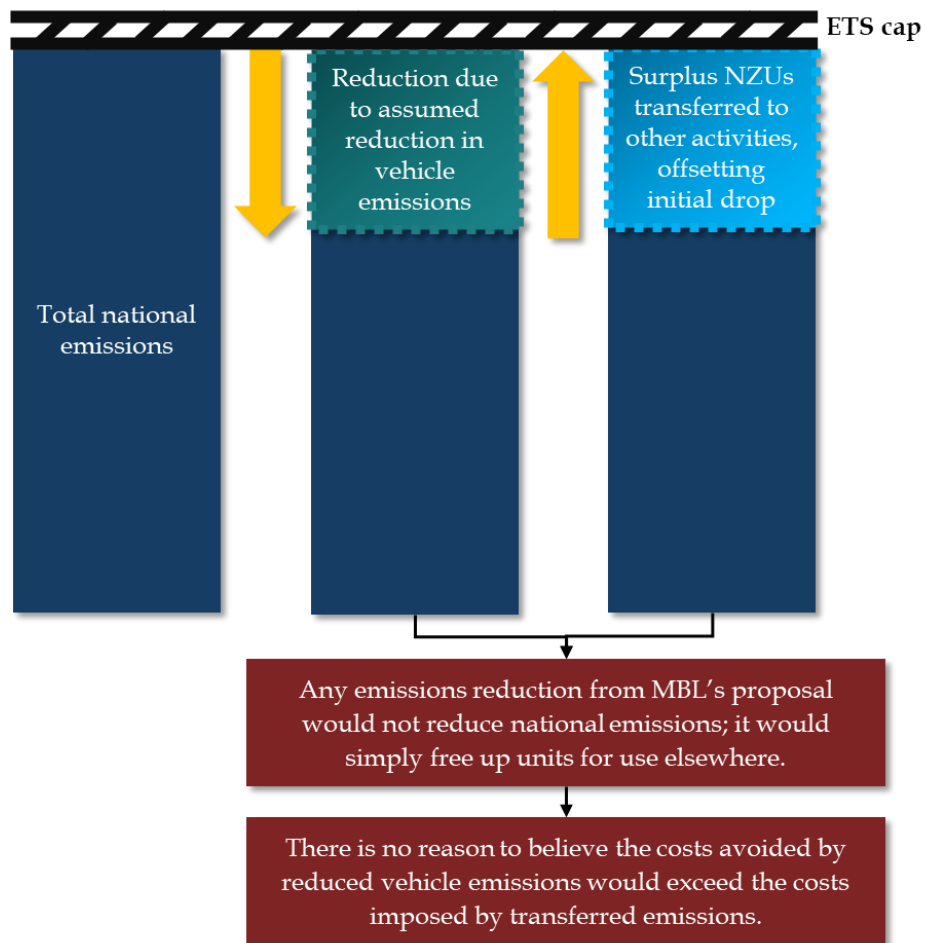
The freed NZUs could be taken up by other emitters covered by the ETS, either immediately or over time. Those emissions could arise in the form of increased emissions by other trucks, or via activities with very different characteristics from truck transport, including activities with higher emissions intensity or greater associated environmental and health impacts. Whether overall environmental costs



rise, fall or remain unchanged consequently depends on where those emissions ultimately occur. MEC does not consider this question.

The same issue arises in relation to MEC's claimed health-related cost savings. MEC counts the reduction in local air pollution but does not consider whether emissions enabled elsewhere through the ETS may give rise to comparable or greater health impacts. Again, the net national outcome depends on the characteristics and location of the activities that make use of any freed NZUs, not solely on what happens along the Bream Bay and Kaipara transport routes. Figure 4.1 summarises.

Figure 4.1: Effect of ETS on claimed environmental benefits



Finally, I am not a public health expert, but I would expect the adverse health effects of vehicle emissions to depend just as much (if not more) on *where* trucks are driving than on how far. For example, if granting the consent were to result in more trucks travelling through central Auckland – one of the most densely populated parts of New Zealand – I would expect that to have greater health implications than an equivalent number of truck kilometres travelled on roads more removed from local populaces. MEC does not engage with this issue either.



4.4 Summary

MEC's assessment of environmental costs rests on the assumption that transporting sand over shorter distances by truck would result in reduced vehicle emissions. Those lower emissions are then treated as a reduction in New Zealand's environmental costs and counted as economic benefits of the proposal. That reasoning does not hold once New Zealand's ETS is considered.

Under the ETS, a reduction in emissions from a particular activity does not, by itself, reduce total national emissions. Instead, it reduces the demand for NZUs associated with that activity. Those units can then be used by other emitters elsewhere in the economy. Emissions may therefore be reallocated, rather than eliminated.

Whether overall environmental costs fall, rise or remain unchanged depends on where and how those freed units are ultimately used. MEC does not address this issue. It treats reduced transport emissions as a national benefit without considering emissions that may occur elsewhere under the ETS.

The same issue arises in relation to MEC's claimed health-related cost savings. Under the ETS, health externalities may simply be displaced to other activities. Even aside from this, MEC relies on average per-kilometre health costs that do not distinguish between transport environments, despite emissions in densely populated areas being likely to have greater public health impacts.

Once the ETS is properly understood, the link between reduced transport emissions and net national environmental benefit breaks down. MEC's claimed environmental cost savings therefore do not constitute a valid net economic benefit. In the absence of analysis demonstrating otherwise, there is no basis for concluding that the proposal delivers a net environmental benefit.



5. Social costs

The MEC report contends that granting the Bream Bay consent would avoid \$12.2m in “social costs” associated with road deaths and injuries.³⁰ As with the other benefit categories, this estimate is driven by assumed reductions in transport distances. MEC assumes that a reduction in kilometres travelled would result in fewer accidents and treats that drop as an economic benefit. In my view, this claim – and the resulting estimate – is tenuous for two reasons.

First, as explained in section 3.2, MEC has not clearly demonstrated that granting consent would in fact reduce the distances over which sand would be transported. That premise remains unsubstantiated. Second, the methodology appears to overlook the transport environment in which those kilometres would be travelled. In my opinion, the location and conditions under which truck movements occur are likely to be at least as relevant to accident risk as the distance travelled.

5.1 Presentation of MEC’s analysis

When one reads MEC’s analysis of social costs, the same issue of limited methodological detail is encountered again. MEC’s analysis of this issue is extremely brief.³¹ It provides very little detail as to how the calculations were performed or how the final estimate was derived. As presented, neither an expert nor a lay reader could meaningfully scrutinise or replicate the analysis. For the reasons set out previously, this falls short of the basic standards normally expected of an analysis of this kind.

MEC states that it has applied the Ministry of Transport’s metrics to translate travel distances into social costs associated with road deaths and injuries. Beyond that statement, however, the report does not identify which specific metrics were used, how they were parameterised, or how they were applied to the assumed vehicle movements to produce the final estimate. It also does not disclose any intermediate calculations or supporting material.

In the absence of that information, it is necessary to infer how MEC has arrived at its estimate. The most plausible interpretation is that MEC has relied on standard relationships between vehicle kilometres travelled (VKT) and road safety outcomes. Under this approach, historical data are typically used to estimate average rates of fatalities and injuries per kilometre travelled. Reductions in total VKT are then converted into proportional reductions in expected deaths and injuries, which are monetised using standard valuation parameters.

That interpretation is necessarily speculative, given the lack of methodological detail provided. But, if that is indeed how MEC has performed its assessment, it is problematic in this context. VKT-based approaches are designed for highly aggregated analysis, such as assessing how broad changes in total driving affect

³⁰ MEC report (2025), pp.36-37.

³¹ *Op cit.*, paragraphs 148-150.



road safety outcomes at a national or regional level. They are poorly suited to a project-specific assessment of the kind undertaken here. That is because accidents are not simply a function of distance travelled.

5.2 Factors not considered

What MEC appears not to capture in its analysis is that the risk of road deaths and injuries per kilometre travelled varies significantly depending on the transport environment. Factors such as road type, traffic density, speed limits, intersection frequency and the presence of pedestrians and cyclists all materially affect accident risk. These factors are often more closely associated with accident risk than distance travelled alone.

For example, a kilometre driven by a heavy truck through a dense urban environment with frequent intersections presents a very different risk profile from a kilometre driven on a well-designed, low-traffic arterial road. In short, *where* trucks travel matters at least as much as *how far* they travel. By (seemingly) using national averages that mask these more granular effects, MEC's analysis does not engage with this distinction, despite its obvious relevance to the estimation of social costs in this instance.

In this case, the routes that trucks would be required to take if the Bream Bay consent were granted appear materially less favourable from a road-safety perspective than those associated with alternative sources of supply. Trucks departing MBL's depot would presumably be required to travel through Auckland's busy downtown district. That area is characterised by high traffic volumes, large numbers of pedestrians and complex intersections.

It is reasonable to expect that this environment would present a higher accident risk than routes through less congested areas, even if those routes involve longer distances. For these reasons, it has not been established that the costs associated with road accidents, injuries, and fatalities would fall if consent were granted. The likely transport routes could instead increase accident risk and associated harm, in which case granting consent would impose an additional social cost – not a saving.

5.3 Summary

MEC's claimed reduction in social costs rests on an approach that treats accident risk as a simple function of distance travelled. That approach is not appropriate for a project-specific assessment of this kind. The risk of road deaths and injuries varies materially depending on the transport environment. Factors such as road type, traffic density, intersection frequency and pedestrian activity can matter more for accident risk than distance travelled alone. MEC does not engage with these factors.

In this case, the transport routes associated with the Bream Bay proposal would likely require heavy trucks to travel through downtown Auckland, a complex and heavily trafficked urban environment. The analysis does not provide a sufficient basis for concluding that accident risk in these conditions would be lower than on



longer routes through less congested areas. For these reasons, the \$12.2m social cost saving claimed by MEC should be treated with caution. The net effect could plausibly be neutral or negative.



6. Other relevant costs

The limitations of the MEC report do not arise solely from the matters it has attempted to quantify. They also reflect the fact that the report is confined to a relatively narrow set of effects and does not address many other costs that are relevant to an assessment of overall net economic impact. It may be that consideration of those matters fell outside MEC's terms of reference. Even so, their omission means the report should not be read as providing a comprehensive assessment of the proposal's net economic impact.

6.1 Externalities not considered

A central limitation of MEC's analysis is that it focuses almost exclusively on private costs and benefits. It concentrates particularly on changes in private transport costs arising from assumed reductions in travel distances. In that narrow sense, it is conceivable that extracting sand from the Bream Bay seabed and transporting it to market could be cheaper than some alternative supply arrangements – although, the MEC report does not substantiate this for the reasons set out hitherto.

But even if that were true – and even if it resulted in a positive *private* benefit – it would not be sufficient to demonstrate a net *public* benefit. Externalities must still be considered. These are costs or benefits imposed on third parties that are not reflected in market prices. In this context, the relevant externality costs potentially associated with offshore sand mining include, among other things:

- **Disturbance of the seabed and marine ecosystems:** Offshore sand extraction involves direct physical disturbance of the seabed and the organisms that live on and within it. I understand this can alter habitat structure, disrupt ecological processes and affect the ability of marine ecosystems to recover over time.
- **Impacts on fisheries and customary fishing:** Changes to seabed conditions and marine habitats can affect fish and shellfish species. These effects may have economic consequences for commercial fisheries and social and cultural consequences for recreational and customary fishing activities.
- **Effects on coastal processes and sediment dynamics:** Removing sand from the seabed can alter sediment movement and coastal processes. In some circumstances, this may affect shoreline stability, beach profiles or natural coastal protection functions.
- **Impacts on recreational use of the marine environment:** Offshore mining activity and associated changes in water quality or seabed conditions may affect recreational activities such as swimming, boating, diving and surf-related uses, particularly if water clarity or coastal conditions are altered.
- **Effects on visual amenity and natural character:** Mining operations, vessel movements and associated infrastructure can affect the visual qualities and perceived naturalness of the coastal environment. These effects may be relevant to residents, visitors, and users of the coastal area.



- **Impacts on cultural values:** The marine environment may hold cultural significance for iwi and hapū, including connections to customary practices and the exercise of kaitiakitanga. Disturbance of coastal and seabed areas may therefore give rise to cultural impacts that are not reflected in market prices.

These effects are not peripheral. They go directly to the external cost side of the economic welfare assessment. Although they may not be reflected in private extraction costs or the market price of sand, they represent real economic costs borne by other members of the public. Even if MEC's private economic benefit estimates were accepted at face value, they could still be outweighed by the negative externalities associated with the proposal.

It is possible that MEC has proceeded on the implicit assumption that externality costs do not differ materially between extraction from Bream Bay and extraction from the Kaipara, which it treats as the counterfactual.³² If so, it is not clear what economic basis there would be for that supposition. The physical environments of Bream Bay and Kaipara differ, surrounding uses differ, and the nature and distribution of impacts on third parties are unlikely to be identical.

This also has implications for the choice of counterfactual. It is conceivable that alternative sources of supply – including land-based options – would involve higher private costs but lower total costs once externalities are considered. By excluding externality costs from its assessment and confining the counterfactual to the Kaipara resource, MEC's methodology precludes that comparison from taking place. In doing so, it risks missing the option that delivers the highest overall public benefit, which is the central question a proper net benefit assessment is meant to address.³³

6.2 Opportunity cost of land

MEC also overlooks differences in opportunity costs associated with land use. Most notably, it does not consider the opportunity cost of locating MBL's sand depot on prime waterfront land in central Auckland. That site occupies highly valuable land within the Port of Auckland that could support a wide range of alternative uses. Waterfront land in downtown Auckland is among the most valuable in the country and dedicating it to bulk sand handling entails a substantial opportunity cost.

From an economic perspective, the relevant cost of using land for a particular purpose is the value of the best alternative use forgone. In this case, the foregone alternatives would be likely to generate significant economic returns and wide public benefits – perhaps greater still than a bulk sand handling facility. Those forgone benefits represent a real economic cost of the proposal.

³² As noted earlier, it is also possible that MEC was not asked to examine externalities.

³³ I have consciously refrained from making any other comments about MEC's choice of counterfactual throughout this report. As I noted at the outset, I am not an expert in sand sourcing economics, and I will therefore leave it to others more qualified to offer an informed view of likely alternative supply options.



By contrast, depot facilities in locations such as Helensville are likely to involve a much lower opportunity cost, reflecting lower land values and fewer competing uses. The difference is not marginal. It reflects the fundamental scarcity and productivity of waterfront land in Auckland's central city relative to outlying locations where demand for land is lower.

6.3 Summary

MEC's analysis considers only a narrow subset of the costs and benefits relevant to an assessment of net economic impact. It focuses on private cost changes while excluding material externality costs and opportunity costs that are directly relevant to the consent decision. Offshore sand mining is likely to give rise to a broad range of negative externalities that could impose substantial costs on the people and communities of Bream Bay, none of which are reflected in MEC's analysis.

Once those excluded factors are recognised, there is no basis for confidence that the proposal would deliver a net public benefit. Even if MEC was not asked to consider these matters, they remain highly germane to the assessment of benefits. MEC's narrow framing creates a material risk that adverse effects have been understated or not fully captured. As a result, the report does not provide complete framework for assessing the overall economic merits of granting consent.



7. Conclusion

The MEC report claims that granting consent for the proposed sand-mining operation would deliver substantial economic benefits. I have undertaken a high-level economic review of the analysis in the MEC report to assess whether its conclusions are supported by a sound assessment of market conditions and a robust evaluation of net economic impacts. In doing so, I have examined both the way MEC characterises future supply and demand conditions and the robustness of the benefit estimates it presents.

That review has identified material shortcomings. In my opinion, the MEC report does not demonstrate that the supply shortages it posits would arise if consent were declined. The projected deficits are instead the product of a restrictive and unrealistic forecasting methodology. MEC equates future supply with currently consented volumes, assumes that supply ceases when consents expire and ignores the prospect of new market entry. Once those assumptions are relaxed and plausible alternative sources of supply are considered, there is no sound basis for concluding that demand could not be met in the absence of the proposal.

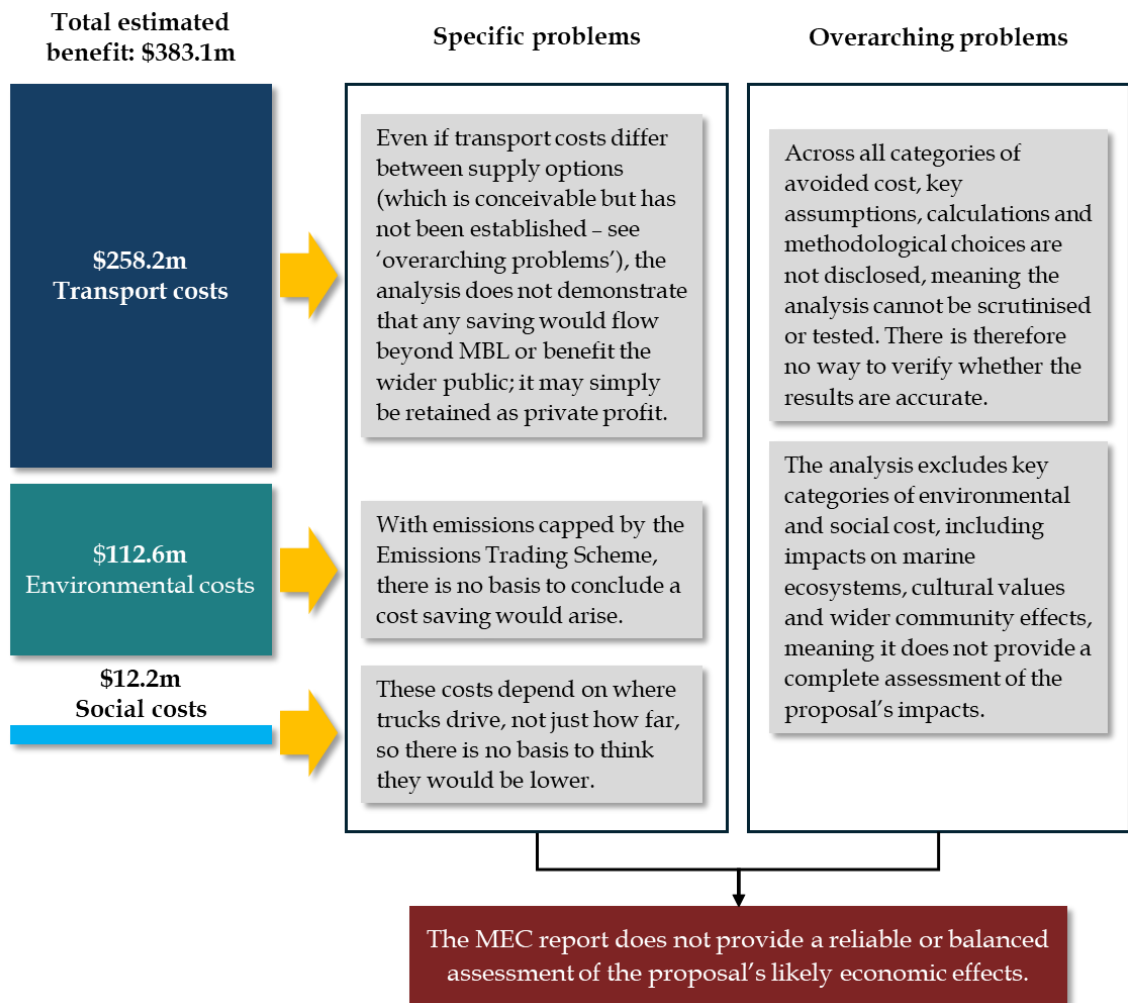
The MEC report also fails to provide any reliable indication of the magnitude of any national or regional public benefits. The methodologies employed are opaque, cannot be independently reproduced and appear to contain material errors. Key assumptions relating to transport costs, emissions impacts and social cost impacts are either unsupported or open to challenge. In several instances, claimed benefits also reflect private cost savings that are not shown to be passed through to consumers or otherwise giving rise to a net public benefit.

More fundamentally, the report examines only a narrow subset of the economic effects relevant to an assessment of net benefit. It does not address a range of externality costs associated with offshore sand extraction, which are typically relevant to a comprehensive welfare assessment. It also does not consider other potentially material costs, including differences in opportunity costs associated with alternative locations and land uses. While some of these matters may have fallen outside MEC's terms of reference, their exclusion limits the extent to which the report can be relied upon as an assessment of overall net economic impact.

Taken together, these deficiencies mean that the MEC report does not provide a reliable or balanced assessment of the proposal's likely economic effects. It therefore does not provide a sufficiently reliable basis for concluding the Bream Bay extraction project would result in significant economic benefits that exceed the associated social costs. In my opinion, the material presently available does not meet the evidential threshold that should be required to justify granting consent. Figure 7.1 summarises the shortcomings in the MEC report and illustrates why it cannot reasonably be relied upon.



Figure 7.1: Summary of shortcomings





Appendix A Relevant experience

For over twenty years, I have worked as an economist across the Asia-Pacific, advising on competition and regulatory matters. Throughout my career, I have prepared numerous expert reports, provided sworn testimony in high-stakes commercial mediations and arbitrations, and reviewed hundreds of economic assessments – including cost-benefit analyses.

I am one of only a handful of New Zealand-based economists recommended by Lexology (formerly Who's Who Legal) in its annual publications of the world's leading practitioners (compiled based on votes by clients and peers) and have been listed for many years. I have been involved in numerous matters in natural resources sectors, including:

- Last year, I assisted Mr Rhys Powell in responding to RS Sand's application for consent to mine up to 400,000 tonnes of sand per year from a proposed quarry at 77 Newcombe Road, Cambridge. I prepared an expert report and gave oral evidence on the applicant's economic assessment before an adjudicative panel.
- In 2011, I provided an expert report and modelling of the economic impact of two severe wet weather events on the benchmark price of hard coking coal and the resulting damage to mining operations, for an insurance claim exceeding A\$1 billion. I later gave expert evidence before Ian Callinan KC, AC at a mediation in Singapore
- In 2008 and 2010, I was part of a team that advised BlueScope Steel on the potential competitive effects of the proposed merger – then joint venture – between BHP Billiton and Rio Tinto. This included empirical analyses of the potential for the combined entities to increase iron ore prices by strategically withholding supply.
- In 2009, I was part of a team assisting Fortescue Metals Group with its application to access BHP Billiton's and Rio Tinto's iron ore railway lines in Western Australia. This involved detailed assessments of the above- and below-rail markets, as well as the upstream and downstream markets for the acquisition and sale of iron ore.

I have been involved in numerous market studies, merger clearances and investigations into allegedly anticompetitive practices throughout the Asia-Pacific. For example, I have advised on:

- Proceedings brought by the Commerce Commission against Winstone Wallboards, alleging anticompetitive conduct and misuse of market power – including through the structure of rebates provided to customers. This will involve the provision of expert reports and oral testimony at a trial scheduled for mid-2027.
- FOXTEL's acquisition of Austar and its merger with Fox Sports Australia; Vector's takeover of Meridian Energy's smart metering business, Arc Innovations; Sky's proposed merger with Vodafone; Fletcher Distribution's successful acquisition of several ITM retail stores; and Westpac's acquisition of Lloyd's motor vehicle financing business.



- Wide-ranging reviews of competitive conditions in particular markets, including retail energy markets in New Zealand and Australia; auto-fuel supply in Hong Kong and Australia; bus routes in metropolitan Auckland; gas and electricity metering in New Zealand; and retail payments and personal banking in both New Zealand and Australia.
- eBay's proposal to tie the provision of its online marketplace with its online payment service, PayPal; the design of economic tests to screen for potential anticompetitive foreclosure (including price squeezes); and numerous other matters involving allegations of collusion, predatory pricing, misuse of market power and other exclusionary practices – some of which remain ongoing.
- The Board of Airline Representatives' application to access a jet fuel pipeline serving Sydney airport; the design of a decision rule to help the Australian Competition and Consumer Commission identify enduring bottlenecks in the supply of fibre backhaul services; and assessments of the effectiveness of various regulatory access regimes (e.g., grain storage and handling, and electricity transmission).

I have also advised on a broad suite of matters across the energy, airport and shipping port, communications, water, payments systems, rail, fuel and road sectors. For instance, I have:

- Recently been part of an expert panel advising the Ministry of Business, Innovation and Employment on various issues arising out of the Government's review of energy market performance, including whether the current arrangements provide sufficient incentives for firms to invest in adequate dry-year generation firming capacity.
- Been a key advisor to numerous clients on myriad regulatory and economic aspects of the design and implementation of the regulatory regimes for electricity distribution and transmission businesses and gas pipelines. These clients have included TransGrid, Orion, Vector, Wellington Electricity, Meridian, Mercury, Northpower, Energy Networks Aotearoa, the Commerce Commission and the Ministry for Business, Innovation and Employment.
- Provided expert reports to Spark in relation to various aspects of the Commission's proposed approach to implementing the new regulatory framework for fibre. This included advice on initial asset values, cost allocation and pricing principles for anchor products and others.
- Assisted Auckland Airport and NZ Airports during the design and implementation of the initial input methodologies for airports and subsequent price negotiations. I also advised Wellington Airport throughout the Commission's subsequent review of those regulatory arrangements (the 'section 56G' investigations).
- Worked on a plethora of leading-edge topics throughout the Asia-Pacific, including the removal of price controls, forms of regulation, asset valuation, network pricing, investment tests, cost allocation, treatment of related party transactions, the cost of capital, depreciation, auction design and efficiency incentive schemes.