

IN THE HIGH COURT OF NEW ZEALAND
WELLINGTON REGISTRY

I TE KŌTI MATUA O AOTEAROA
TE WHANGANUI-Ā-TARA

CIV-2021-485-000341

UNDER Judicial Review Procedure Act 2016 and part 30 of the
High Court Rules 2016

IN THE MATTER OF an application for judicial review

BETWEEN **LAWYERS FOR CLIMATE ACTION NZ INCORPORATED**
Applicant

AND **THE CLIMATE CHANGE COMMISSION**
First Respondent

AND **MINISTER FOR CLIMATE CHANGE**
Second Respondent

AFFIDAVIT OF PAUL ALLEN YOUNG

**(Climate Change Commission – modified activity-based accounting, response to
Drs Taylor and Bertram)**

Affirmed: 10 December 2021

I, Paul Allen Young, Senior Analyst, of Wellington, affirm–

INTRODUCTION

1. My full name is Paul Allen Young. I am a Senior Analyst in the Budgets, Adaptation and Markets Team at He Pou a Rangi Climate Change Commission.
2. I am providing this affidavit as part of the Climate Change Commission's response to judicial review proceedings brought by Lawyers for Climate Action New Zealand Inc (LCANZ).

PLACE AND THE SCOPE OF MY EVIDENCE

3. Stephen Walter for the Commission is providing an affidavit setting out an overview of the international emissions reporting and accounting framework.
4. Renee (Eva) Murray's affidavit then describes the general issues in accounting for land emissions and removals, the international and domestic framework and the evolution of the modified activity-based approach for assessing progress towards targets. She also addresses the gross-net approach for setting targets required under the Kyoto Protocol and then continued by New Zealand in its first nationally determined contribution (NDC) under the Paris Agreement.
5. My evidence follows from this, and specifically responds to the criticisms made by LCANZ and its witnesses about the Commission's recommendation of the modified activity-based approach as one of the rules that will apply to measure progress towards the first three emissions budgets and the 2050 target, under section 5ZA(1)(b) of the Climate Change Response Act 2002.
6. In this affidavit, I will:
 - 6.1 Address the factual basis for what I understand is a claim by LCANZ that the national inventory reporting approach (LCANZ refer to this as GHGI net emissions accounting) is the only approach that meets the definitions of 'gross' and 'net' emissions under the Climate Change Response Act.
 - 6.2 Address the merits of LCANZ' claims that its preferred approach is better than the approach recommended by the Commission.

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- 6.3 Respond to other specific points raised by the LCANZ witnesses Dr Bertram and Dr Taylor (these are the only witnesses for LCANZ who address this issue in their evidence).
7. In this affidavit I refer to a number of documents. I understand that a bundle of the Commission's Advice and Supplementary Volumes has already been prepared, and other documents will be collated with material referred to by other witnesses for the Commission into a paginated supplementary bundle. I will refer to these documents by reference to those bundles. References in this affidavit will accordingly be to:
- 7.1 the Commission's Advice and Support Volumes, which have been combined together as a single paginated "Advice Bundle". The page references I will give will be to the page number at the top of each page (not the original page numbers, as these were not continuous in the original volumes); and
- 7.2 the Commission's supplementary bundle of documents, referred to as "CBD" with the relevant page reference.
8. I am authorised to provide this evidence on behalf of the Commission.
9. To the extent that my evidence includes matters of expert opinion, I confirm that I have read and agree to comply with the Code of Conduct for expert witnesses in Schedule 4 of the High Court Rules, and I confirm that the evidence I give is within the area of my expertise.

QUALIFICATIONS AND EXPERIENCE

10. I hold a Masters in Physics from the University of Otago. I have more than a decade's experience working in climate change mitigation issues in New Zealand as an analyst and consultant with expertise in modelling. I was also a co-founder of Generation Zero in 2011, remaining involved in the organisation until 2017. Generation Zero is a youth-led climate action organisation that initiated the campaign for the Zero Carbon Act, in which I was heavily involved.
11. I have been in my role as a Senior Analyst at the Commission since August 2019.
12. Prior to taking up my role at the Commission, I held the following positions:

- 12.1 From 2018 – 2019, I was a Senior Analyst at the Ministry for the Environment’s Transition Hub. In this role I led a major project to develop economy-wide marginal abatement cost curves for New Zealand, worked on the economic impact analysis and other details of the Zero Carbon Act, and worked on the development of the Government’s provisional emissions budget for the 2021-2025 period. My work on the Zero Carbon Bill included steering and analysis of the economic modelling of 2050 target options, drafting of the economic impacts analysis in the Bill’s regulatory impact statement, presenting on the economic modelling and analysis to the Select Committee, and attending submission hearings.
- 12.2 In 2018 I worked as an Advisor on the Low-emissions Economy Inquiry at the New Zealand Productivity Commission. In my work there I provided research, analytical and drafting support for the inquiry. I oversaw the modelling of economy-wide mitigation pathways and helped lead the analysis and synthesis of the modelling results. I also contributed to chapters on transport, heat and industrial processes, and transitions.
- 12.3 Between 2015 – 2017 I was a Researcher at the Morgan Foundation, a non-profit organisation dedicated to providing research and advancing discussion on important public policy issues in New Zealand. In this role I researched and produced several reports on New Zealand climate change policy issues and communicated about environmental policy issues to a broad audience through articles, presentations, interviews, and submissions to central and local government. One of my reports for the Morgan Foundation in 2016 focused on the introduction of the ‘averaging’ approach for production forests in New Zealand’s Intended Nationally Determined Contribution. For this I undertook considerable research on accounting for land emissions and removals and built a forestry emissions model from scratch to investigate the impacts of the move to the averaging approach.
13. Throughout the period 2011-2017 I also worked as a contractor and in a voluntary capacity with Generation Zero.
14. I have particular expertise in climate change techno-economic analysis, low-emissions pathways and scenario analysis, and New Zealand and international climate policy. My work at the Commission and previously has included modelling and

analysis of the land sector, and I am very familiar with the approaches to accounting for land emissions and removals and how these have evolved.

15. My CV is at [•] of the CBD.

LCANZ CHALLENGE TO THE COMMISSION'S ADVICE ON THE RULES FOR MEASURING PROGRESS

16. I understand that LCANZ challenge the Commission's advice on the rules for measuring progress, in particular the Commission's advice that New Zealand should use a modified activity-based approach to account for emissions and removals from the land sector (LULUCF) in measuring progress towards the first three emissions budgets and the 2050 target.¹

17. I understand that LCANZ says instead, that the Commission should have advised government to use the national inventory reporting approach (LCANZ refer to this as GHGI net emissions accounting) for LULUCF. It appears that LCANZ consider that:

17.1 the use of modified activity-based accounting does not comply with the requirements of the Climate Change Response Act; and

17.2 the modified activity-based approach is not truly reflective of "what the atmosphere sees" and provides a misleading impression of New Zealand's historic emissions profile. While it is unclear (LCANZ witnesses present conflicting views) it appears that LCANZ suggests that this will facilitate the adoption of less stringent emissions reduction targets than LCANZ considers appropriate.

18. I note that LCANZ submitted on the Commission's draft Advice during the consultation process, and also engaged in significant correspondence and meetings with the Commission prior to the Commission finalising its Advice. This engagement is detailed in the affidavit of Joanna Hendy. The Commission was well aware that LCANZ preferred the national inventory reporting approach to the modified activity-based

¹ This advice is set out in Chapter 10 of the Commission's Advice, and Chapter 3 of the Supporting Volumes: Climate Change Commission *Ināia tonu nei: a low emissions future for Aotearoa* (June 2021), Advice Bundle at 211 – 223 and 470 – 506.

approach. The Commission carefully considered LCANZ' views but ultimately did not agree with them.

LCANZ' claim that the Climate Change Response Act required the Commission to adopt the national inventory reporting approach

19. In its third ground of review in the second amended statement of claim, LCANZ claim at paragraphs 101 and 102 that:

The Act mandates use of the GHGI net emissions accounting approach for setting emissions budgets and measuring performance under s 5Q(1)(a) and s 5X(4)

The Commission has erred in law by adopting the modified activity-based approach rather than the mandated GHGI approach

20. I understand from this that LCANZ claim that the Climate Change Response Act required the Commission to recommend the national inventory reporting approach, and that the Commission actually had no choice in the matter, despite section 5ZA(1)(b) which directs the Commission to advise the Minister on "the rules that will apply to measure progress towards meeting emissions budgets and the 2050 target."

21. It is not within the scope of my evidence to express a view on whether LCANZ correctly understand the Act, but its conclusion appears to be based on a basic misunderstanding of the facts.

22. I understand that LCANZ position starts with sections 5Q(1)(a) and s 5X(4), which they refer to in their statement of claim at paragraph 101. These sections refer to the 2050 target and the budgets set by the Minister reflecting 'net accounting emissions'. I understand that LCANZ then take this to the definition in section 4 of "net accounting emissions", being:

means the total of gross emissions and emissions from land use, land-use change, and forestry (as reported in the New Zealand Greenhouse Gas Inventory); less

(a) removals, including from land use, land-use change, and forestry (as reported in the New Zealand Greenhouse Gas Inventory); and

(b) offshore mitigation.

23. The modified activity-based approach is just one way of accounting for emissions and removals from land use, land-use change, and forestry (LULUCF), as the definition requires. As I understand it, LCANZ consider that it nonetheless falls outside this

definition because it is not “as reported in the New Zealand Greenhouse Gas Inventory”. Dr Bertram’s evidence for LCA NZ addresses this at paragraphs 34 to 42.

24. Dr Bertram appears to acknowledge that the activity-based approach of net emissions is in fact reported in the Greenhouse Gas Inventory, as part of the reporting under the Kyoto Protocol, and the modified version used in the NDC under the Paris Agreement will be reported in the Greenhouse Gas Inventory (given the provisions in the Act defining the Inventory, he could hardly do otherwise). That is the correct position in fact: both the activity-based approach under the Kyoto Protocol and the modified activity-based approach that New Zealand has adopted for its NDC are already or will be reported in the Greenhouse Gas Inventory.²
25. Dr Bertram however then mounts an argument based around the CRF (Common Framework Reporting) tables used by the UNFCCC secretariat, and claims that while the Greenhouse Gas Inventory reports land emissions under the Kyoto Protocol accounting approach, this is not included in the CRF tables. I agree with Matthew Smith’s evidence at paragraphs 147 and 150 of his affidavit where he discusses the errors in Dr Bertram’s understanding of the CRF tables.
26. Dr Bertram, at paragraph 42 of his affidavit, says that the Common Reporting Framework tables submitted to the UNFCCC include only the datasets for the national inventory reporting approach (used for reporting under the UNFCCC), and do not include the datasets for New Zealand’s target accounting reporting under the Kyoto Protocol. This is incorrect. There are specific Common Reporting Framework tables for the Kyoto Protocol data. These are available on the websites of the Ministry for the Environment and the UNFCCC.³ Further, from 2023 this will also be true of the datasets for New Zealand’s target accounting reporting under the Paris Agreement. A similar misunderstanding is evident at paragraph 44 of Dr Bertram’s evidence.

² The NDC reporting data is currently being collected for the Greenhouse Gas Inventory, and will be reported from 2023.

³ See: Ministry for the Environment *New Zealand’s Greenhouse Gas Inventory 1990 – 2019* (11 October 2021) <<https://environment.govt.nz/publications/new-zealands-greenhouse-gas-inventory-1990-2019/>>; and UNFCCC *National Inventory Submissions 2014* <<https://unfccc.int/process/transparency-and-reporting/reporting-and-review-under-the-convention/greenhouse-gas-inventories/submissions-of-annual-greenhouse-gas-inventories-for-2017/submissions-of-annual-ghg-inventories-2014>>.

Why the modified activity-based approach is better for setting budgets and measuring progress to the 2050 target

27. I now turn to address LCANZ's contentions on the merits of the national inventory reporting approach over the modified activity-based approach.
28. As I understand it, LCANZ argue that the Commission was wrong to adopt the modified activity-based approach to accounting for net emissions in its advice on the rules for measuring progress for the first three emissions budgets and 2050 target. Their claim appears to be that the use of the modified activity-based approach reflects or allows a reduced ambition and will lead to worse outcomes for the climate (although as I have noted, their witnesses actually give conflicting evidence on this point).
29. I disagree with this framing. Ambition is about real-world actions taken and is not inherent in a choice of accounting approach. Rather, the question of which accounting approach is appropriate is one of suitability in terms of what is being accounted and for what purpose. It would be possible to reflect exactly the same level of ambition in budgets set using the modified activity-based approach, or the national inventory reporting approach. The numbers would look different, because they are accounting for land emissions and removals differently, but the actual level of ambition, in terms of action required to meet the budgets, would be the same.
30. Further, LCANZ' assessment of what it sees are the 'benefits' of the national inventory reporting approach are not correct.
31. LCANZ's claim seems to be that the use of the modified activity-based approach (coupled with gross-net accounting) makes it "appear" that New Zealand has achieved (or is budgeted to achieve) a greater percentage reduction in emissions compared to national inventory reporting (coupled with net-net accounting). In other words, LCANZ appear to take the position that national inventory reporting is more stringent or more transparent about government action. However, this is not the case for a number of reasons, as I explain below.

First, using national inventory reporting credits more CO₂ removals over the long term

32. On LCANZ' approach, over the period to 2050 the national inventory reporting approach proposed by LCANZ would in fact credit *more* CO₂ removals than under the modified activity-based approach. Unless this were properly adjusted for by changing

the level of the 2050 target (which LCANZ does not seem to propose), LCANZ' approach would in fact make the legislated 2050 net zero target easier to meet. This would support a policy setting that was *lower* in ambition than the Commission's recommend approach, as well raising as a host of other complications that I discuss more in the next section of my evidence.

33. In Figure 10.1 of the Commission's Advice (reproduced below) it can be seen that over the long term, national inventory reporting credits significantly more CO₂ removals by forests than the modified activity-based approach (noting that Figure 10.1 uses different terminology: NDC accounting refers to the modified activity-based approach and GHG Inventory accounting means the national inventory reporting approach (that LCANZ refer to as the GHGI net emissions accounting)).⁴
34. Note that in the Figure, removals are shown as negative emissions, as is common practice.

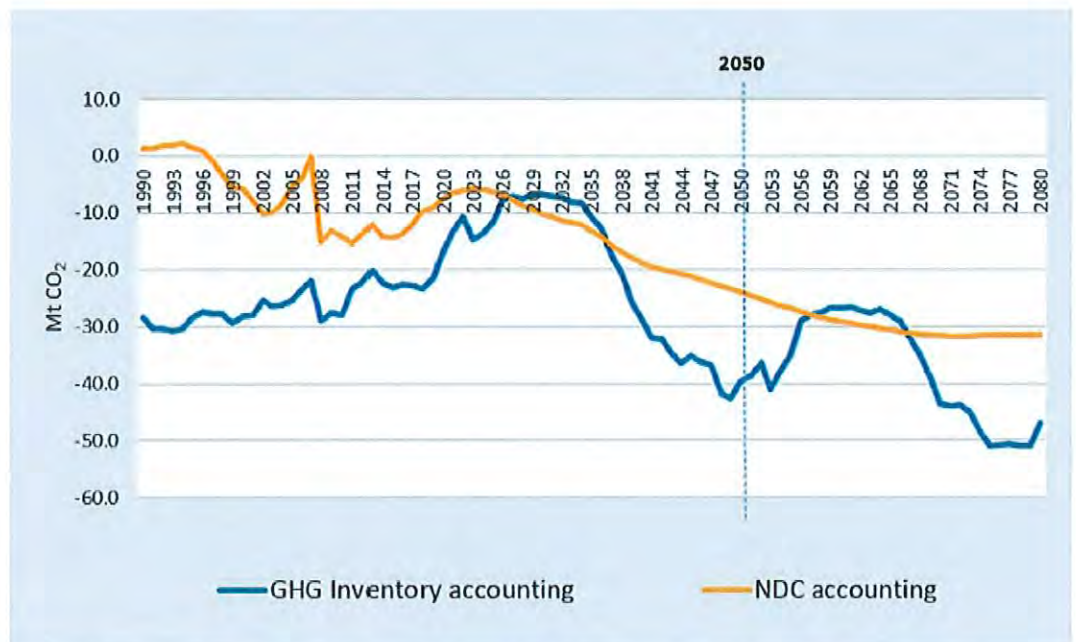


Figure 10.1: Comparison of national forest net emissions using New Zealand's Greenhouse Gas Inventory (stock change) and NDC (averaging) accounting.

Source: MPI October 2020 updated 'with existing measures' projection, \$35 emissions price

35. In the scenario shown, from the exact same actions, (that is, no actual difference in New Zealand's greenhouse gas emissions and removals) the total net removals from

⁴ Figure 10.1 is in the Advice Bundle at 218.

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2020 to 2050 recognised under national inventory reporting are 631 MtCO₂, but under the modified activity-based approach only 439 MtCO₂ in removals are taken into account.

36. This point is observed in the affidavit of LCA NZ witness Dr Taylor, who notes that using the modified activity-based approach will require *more* abatement than the national inventory reporting approach to reach net zero long-lived greenhouse gas emissions. Dr Taylor notes that:⁵

Given [national inventory reporting] is a measure of what the atmosphere actually sees, this means using [modified activity-based accounting] will require Aotearoa to abate more emissions than is actually necessary to meet its targets.

37. He goes on to say:⁶

Thus, while the use of MAB essentially makes it easier for Aotearoa to stay below its budget early on, in the later part of the period through to 2050 it requires Aotearoa to abate significantly more emissions than necessary.

38. One reason for this difference, which Dr Taylor describes as “systematically [overstating] actual emissions”,⁷ is that the national inventory reporting includes some additional categories of CO₂ removals that are excluded from the modified activity-based approach on the basis that these are not the result of any climate change mitigation efforts (that is, the principle of additionality – only *additional* efforts should be recognised and credited).

39. For example, national inventory reporting includes an estimated annual rate of CO₂ removals from regenerating pre-1990 natural forest (native and other ‘unplanted’ forest that existed prior to 1990). This is currently estimated at approximately 2.7 MtCO₂ per year (though subject to considerable uncertainty). This quantity is larger than the total direct emissions from New Zealand’s entire steel and aluminium production industries and equates to around 7 percent of gross CO₂ emissions in 2019. Using the national inventory reporting approach for emissions budgets would enable this to offset the same quantity of gross emissions indefinitely, despite the fact these CO₂ removals are happening regardless of any climate mitigation efforts.

⁵ Affidavit of Dr William Taylor at [124].

⁶ Affidavit of Dr William Taylor at [127].

⁷ Affidavit of Dr William Taylor, appended report at [126].

40. Counting these removals makes sense for the national inventory report ('what the atmosphere sees') but, in my opinion, is not useful for accounting for emissions targets, where the objective is to hold governments to account for *their actions* going forward, and to inform domestic policy decisions on changes required to improve our emissions and removals. Hence the modified activity-based approach excludes these removals (but will count the emissions from any deforestation of such land). This makes the net zero target more stringent than if the national inventory reporting approach were used.

Second: national inventory reporting is dominated by cyclical forest emissions and removals which obscure genuine long-term changes

41. Eva Murray in her affidavit explains that the "swing" in land emissions and removals due to the forest harvest cycle can "drown out" changes in other emissions activity in New Zealand. Below, I set out three Figures – Figures 1, 2 and 3 – to further demonstrate this point. Each of them shows the same scenario under different sets of emissions data: gross emissions, net emissions according to the modified activity-based approach, and net emissions according to the national inventory reporting approach.

42. Noting that:

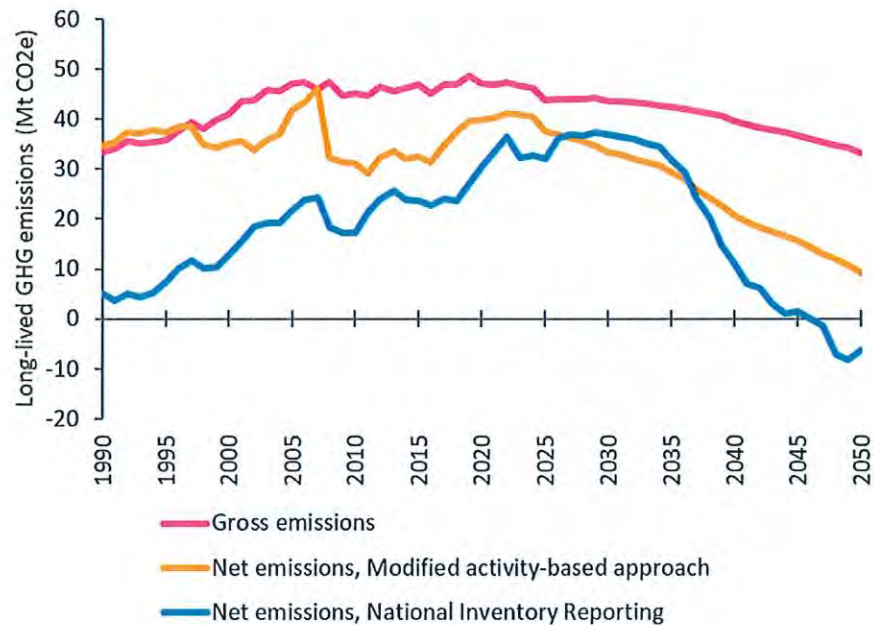
42.1 Gross emissions mean emissions from all sectors, but excluding LULUCF emissions and removals (that is, gross emissions exclude forestry);

42.2 Net emissions mean emissions from all sectors including LULUCF (that is, net emissions account for the emissions and removals of carbon dioxide by the forests); and

42.3 The "Current Policy Reference scenario" is a scenario in which nothing changes in terms of government policy or action affecting emissions or removals – in other words that New Zealand continues in its current policy settings. This is the 'reference scenario' which the Commission used to compare against scenarios with further mitigation action to meet the legislated targets.

43. Figure 1 shows gross and net emissions of long-lived greenhouse gases in the Current Policy Reference scenario under both the modified activity-based and national inventory reporting approaches.⁸ The figure is constructed by adding the net forest emissions series under the two approaches (published in Figure 10.1 of the Advice, reproduced above at paragraph 34) to the gross emissions series in the Commission’s published scenarios data set.

Figure 1: Gross and net emissions of long-lived greenhouse gases in the Current Policy Reference case under the two different accounting approaches



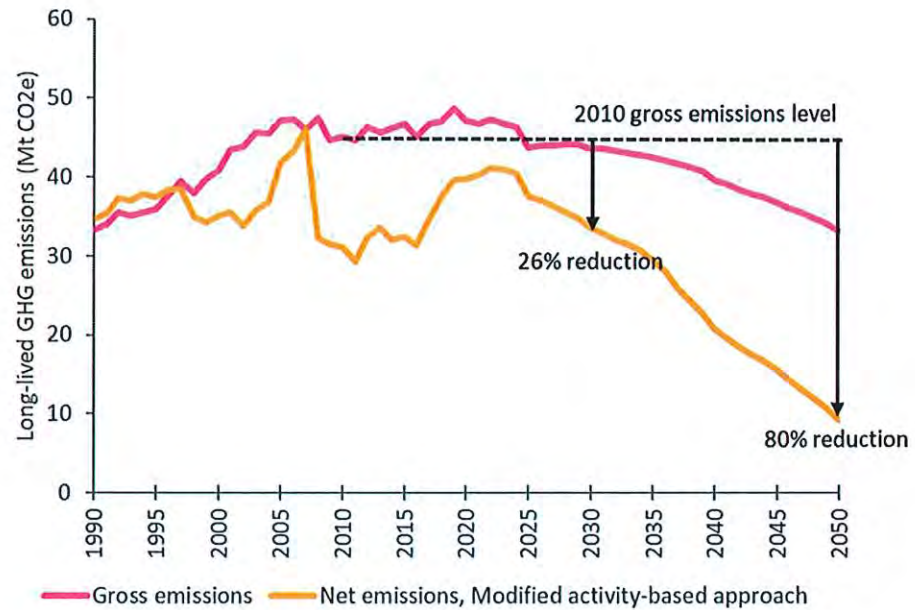
44. The figure shows that, under current policy settings, future gross emissions (the pink line) are projected to gradually decline over time. In addition, this scenario features a sustained, slowly increasing rate of new forest planting (afforestation), which is also projected to occur in response to the assumption of a constant price incentive through the Emissions Trading Scheme. This is affecting the slope of both the orange line and the blue line (both of which take into account the removals from forests).

⁸ Note that I show emissions of long-lived greenhouse gases, excluding biogenic methane, in these and subsequent figures. This is because under the legislated split gas 2050 target, these gases are subject to the net zero target in 2050 while biogenic methane has a separate target.

45. In this Figure net emissions under the modified activity-based approach (the orange line) are currently (in 2021) *higher* than net emissions under LCANZ' preferred approach (the blue line), but that is about to change – somewhere around 2027 the blue line (net emissions calculated under the national inventory approach) will go higher than the net emissions resulting from using the modified activity-based approach. That is because of the approaching forestry harvesting peak that Eva Murray describes in her affidavit at paragraph 25.2(b). New Zealand is about to cut down a lot of forests through the 2020s, at which point they temporarily become an emissions source before returning to being an emissions sink as trees are replanted and start growing again. New Zealand's land sector will still not become an overall source of emissions, but it will be temporarily removing less carbon dioxide from the atmosphere during this period of peak harvesting.
46. This is the same reason for the major dip in the blue line we see starting around 2035 – as harvest levels fall from their peak and more forests are in their sink phase rather than source phase, total removals from the land sector increase. The large cohort of forests harvested and replanted in the 2020s (as well as the new forests established in the 2020s) will be growing and sequestering carbon through to 2050, around which time removals would peak. As can be seen in Figure 10.1 of the Advice (reproduced above at paragraph 34) this pattern will repeat after 2050, where this cohort of forests reach harvest age again, and net emissions would rise before falling once again.
47. Figures 2 and 3 shows what this can mean in terms of comparing 'headline' emissions reductions under the two accounting approaches. Figure 2 illustrates the percentage reduction in long-lived greenhouse gas emissions in 2030 and 2050 relative to 2010 when calculated on a gross-net basis under the modified activity-based approach.⁹ Here, net emissions in 2030 and 2050 are evaluated against the 2010 gross emissions level. For this scenario, this gives reductions of 26 percent in 2030 and 80 percent in 2050.

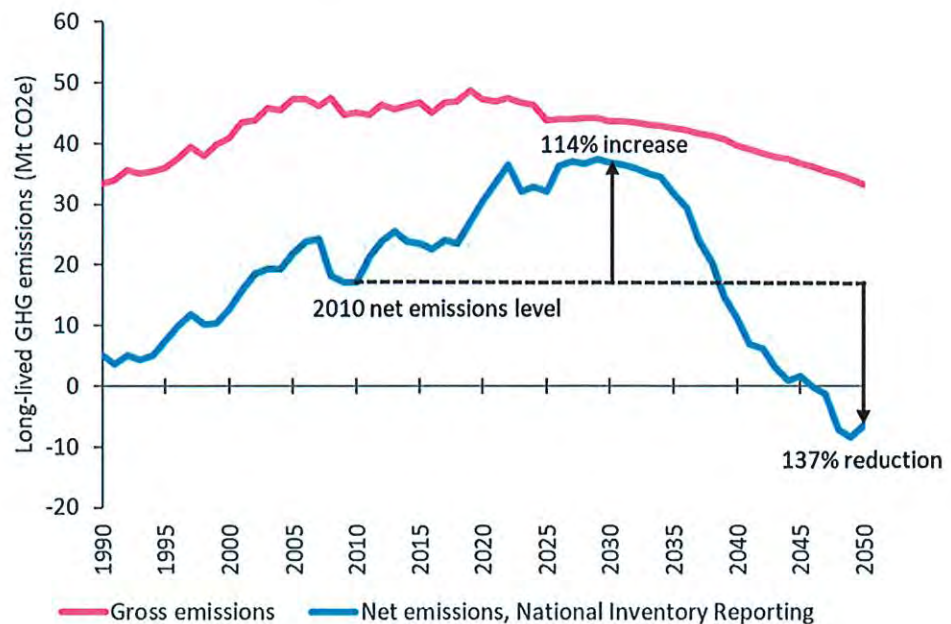
⁹ I have used a 2010 reference year in this illustration, given this is the same time period being used in the comparison to the IPCC's global 1.5°C pathways. The same qualitative point would hold if a different reference year were used.

Figure 2: Percentage change in long-lived greenhouse gas emissions in 2030 and 2050 relative to 2010 in the Current Policy Reference case under the gross-net modified activity-based approach



48. Figure 3 illustrates the identical scenario when using a net-net approach under national inventory reporting (LCANZ' preferred approach). Under this approach, net emissions are shown to *increase* by 114 percent by 2030 relative to 2010, but *reduce* by 137 percent (to net negative levels) by 2050.

Figure 3: Percentage change in long-lived greenhouse gas emissions in 2030 and 2050 relative to 2010 in the Current Policy Reference Case under net-net national inventory reporting



49. In other words, under LCANZ preferred accounting approach *with no change at all* in the current policy settings and no new emissions reduction initiatives, New Zealand would not just meet the 2050 net zero target for long-lived gases, but exceed it. And a major contributor to this would be the impact of forestry planting decisions made decades ago.¹⁰
50. These Figures demonstrate which accounting approach is better suited to track progress and inform New Zealand's policy decisions on climate action. These divergent pictures arise almost entirely from the cyclical forestry harvest emissions included in the national inventory reporting approach. The large peak in harvesting expected in the 2020s drives an increase in projected net emissions out to 2030 – *despite* actual gross emissions reducing alongside a significant increase in total forest area. The genuine long-term reduction in emissions is drowned out by the temporary swing of the forestry cycle.
51. The replanting and subsequent regrowth of these forests then drives a rapid decrease in net emissions between 2030 and 2050, again obscuring the level of genuine long-term reductions in emissions, which are nowhere near that level.
52. These cyclical forest harvest dynamics balance out over time and result in no improvement to New Zealand's emissions profile over the long run: what is removed is eventually re-emitted over and over again. They are of no relevance to New Zealand's current and future actions to reduce greenhouse gas emissions or to genuinely increase the amount of carbon sequestered by forests over the long run (by planting new forests). By contrast, the modified activity-based accounting approach excludes these cyclical production forest dynamics to provide a better measure of the sustained long-term impact of New Zealand's actions on atmospheric greenhouse gas concentrations.

¹⁰ This is a serious issue in terms of informing policy. The Climate Change Response Act requires that net long-lived greenhouse gas emissions are to no more than zero in 2050 "and for each subsequent calendar year" (s 5Q(1)(a)). While using national inventory reporting would make it easy to achieve this in 2050, net emissions would continue to rise and fall due to ongoing harvest cycles and fluctuations. This would elevate the risk of policy responses that allow for the target to be met in 2050 in a narrow accounting sense but require significant further emissions reductions after 2050, pushing a burden onto future generations.

53. What these Figures also show is that the 'headline' emissions reductions are also dependent on the (arbitrarily) nominated start and end dates. In 2030, net-net national inventory reporting indicates a significant *increase* in emissions from 2010, compared with a 26 percent reduction under the gross-net modified activity-based approach. However, in 2050, net-net national inventory reporting indicates a much larger percentage *reduction* than the modified activity-based approach. That is, for the exact same underlying action, under LCANZ's preferred accounting approach the resulting emissions curve "appears" less ambitious when looking at one date but more ambitious when looking at another.
54. This illustrates the basic principle that I have already referred to. Accounting for emission reduction targets is meant to track progress, and the better approaches will assist in measuring progress in a way that is useful for that purpose. But different accounting approaches do not provide any sort of comparison of ambition: the 'headline' percentage emissions reduction – for the very same level of action – will simply be different under different approaches because it is being calculated differently.
55. To put this in another way, if the Commission had recommended budgets using the approach preferred by LCANZ (net-net targets using national inventory reporting) the new budgets would not be any more or less ambitious than the budgets the Commission did recommend. They would just 'look' different, because they are being calculated differently. Governments and the community would still need to take the very same level of action to meet them.
56. These Figures also show that the 'headline' picture can vary hugely depending on the selection of the start and end dates. This is simply how this works and should be well understood: for example, New Zealand's NDC as first communicated in of its NDC was often described as 30 percent below 2005 levels equating to 11 percent below 1990 levels. The 30 percent did not represent a greater level of ambition than the 11 percent - they were the same

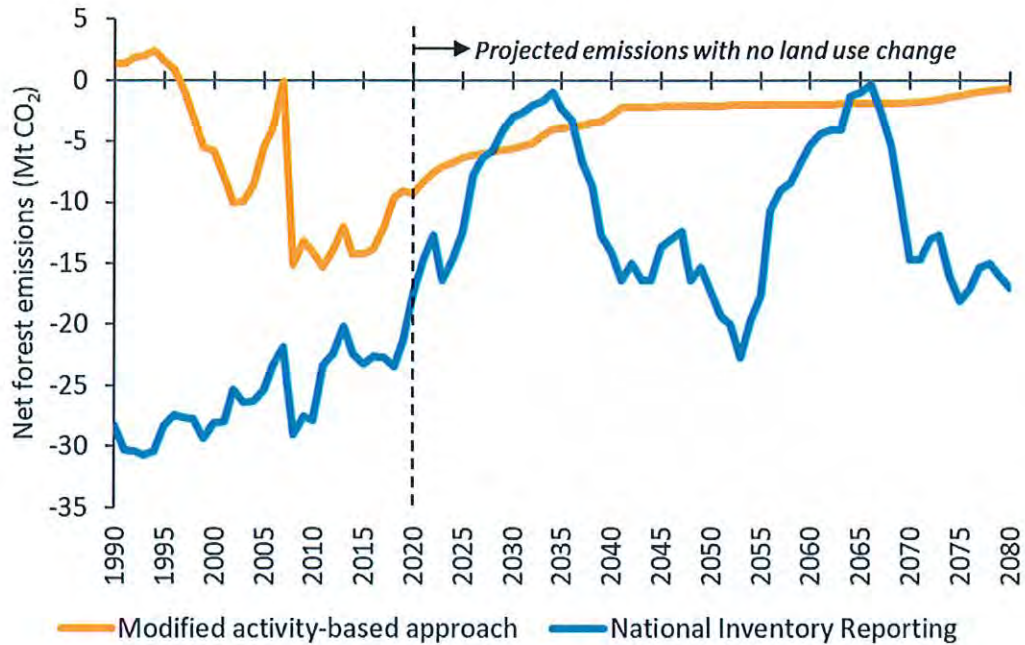
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“What the atmosphere sees” from year to year is a poor approach for informing policy and future action

57. LKANZ witnesses argue that national inventory reporting is a better approach to use because it represents an estimate of “what the atmosphere sees”. Eva Murray’s affidavit touches on this at paragraph 68, and I agree with her comments.
58. Returning to Figure 1 and the discussion above, a key point that this illustrates is that, for New Zealand, “what the atmosphere sees” from year to year is fundamentally a poor measure of genuine action being taken to *reduce* greenhouse gas emissions or *increase* CO₂ removals by forests. In the scenario shown in Figure 1, both gross emissions reductions and new forest planting are occurring at a reasonably steady rate from 2020 to 2050.¹¹ This is reflected in both the gross emissions (pink line) and the net emissions under the modified activity-based approach (orange line) showing close-to-linear reductions. However, net emissions under national inventory reporting show a substantial increase from 2019 to 2030, giving the appearance of weak or non-existent action, before falling rapidly after 2035 giving the appearance of very strong action, *despite there being no change in the level of action*.
59. Below, I introduce a new hypothetical scenario to attempt to illustrate this point even more clearly. I will assume in this scenario that there is no future land use change (that is, no afforestation and no deforestation), unlike in the Current Policy Reference scenario shown previously, in order to isolate the impact of the harvest cycle of existing forests from the effects of future changes in forest area.
60. Figure 4 below is a comparable graph to Figure 10.1 from the Commission’s advice (reproduced earlier at paragraph 34). As I’ve just described however, Figure 4, shows a scenario with no future land use change – no new land is put into forests, and no forest land is converted to other land uses. All that is occurring in this figure is that existing forests continue to be harvested and replanted. This is the same scenario that Eva Murray presents at paragraph 27 of her affidavit, but in Figure 4 here I also show the net forest removals under modified activity-based accounting.

¹¹ New forest planting here refers to afforestation – turning land not previously used for forestry into forest. This is projected to happen at a sustained, gradually increasing rate under current policy settings.

Figure 4: Projected net forest emissions under a scenario with no land use change occurring from 2020, under the two accounting approaches



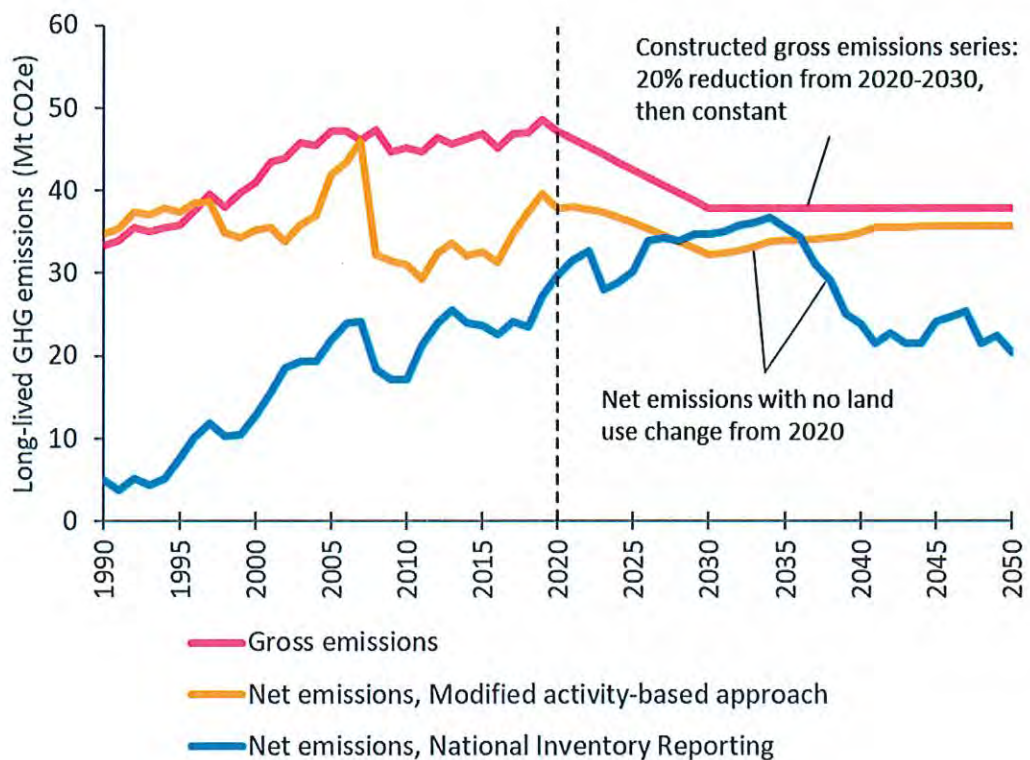
61. Figure 4 shows that with no further change in land use, net forest removals under the modified activity-based approach (orange line) move steadily from negative emissions (removals) towards zero.¹² This is a good reflection of the absence of any actual change on the ground. Maintaining the current level of removals under modified activity-based accounting would require continued planting of new forests.
62. In contrast, net removals under the national inventory reporting approach exhibit large cyclical variations over decades due to the harvesting and replanting of existing forests. This again demonstrates the problems with using national inventory reporting as a measure of progress – the removals by forests swing by more than 40 percent of New Zealand’s long-lived greenhouse gas emissions when no mitigation action or change in behaviour has occurred.
63. I now combine this fixed land use projection with a hypothetical gross emissions scenario, purely for illustrative purposes. In this I assume that actions are taken that

¹² Net removals under modified activity-based accounting do not go all the way to zero due to post-1989 native forests and the small percentage of post-1989 exotic forest land that is expected to be uneconomic to harvest. These both continue to contribute removals out to 2080.

reduce New Zealand's gross long-lived gas emissions by 20 percent from 2020 to 2030, but action then ceases and emissions remain constant from 2030 to 2050. This is shown in Figure 5 below (the pink line). Figure 5 also shows the resulting net long-lived gas emissions under both accounting approaches, when this gross emission path is combined with the fixed land use projection shown in Figure 4.

64. A useful accounting approach for tracking towards a target would clearly show the impact of actions that have been taken to reduce emissions, so that we can see the effects of government and society's actions (and inactions), and be better informed about what we need to do next.

Figure 5: Gross and net emissions of long-lived greenhouse gases in a hypothetical scenario under the two different accounting approaches



65. Figure 5 shows how:
- 65.1 Under the modified activity-based approach, net emissions would fall 15 percent from 2020 to 2030 and then increase out to 2050, reflecting the assumed gross emissions trends combined with the steady decline in removals without new forest planting. In other words, it would show the benefit of the

actions up to 2030, and it would also show that no new action was taken after 2030.

65.2 Under national inventory reporting, net emissions would *increase* 17 percent from 2020 to 2030, counter to the 20 percent *decrease* in gross emissions. They would then fall by more than 40 percent by 2050, despite no reduction in gross emissions and no new forest planting. In other words, it would fail to show the positive impact of the actions taken before 2030, and equally hide the lack of any action between 2030 and 2050.

66. Accordingly, Figure 5 clearly demonstrates how, due to New Zealand's production forest harvest cycles, national inventory reporting can give a highly distorted picture of the actual efforts to reduce greenhouse gas emissions in a given time period. As a result, the Commission's position and my own view are that basing New Zealand's emissions reduction target accounting system on "what the atmosphere sees" year to year is not a suitable accounting approach for New Zealand's budgets to achieve the 2050 targets set under the Act.

Further responses to LCANZ witnesses, Dr Taylor and Dr Bertram

67. I have set out above my general response to the position of LCANZ and its two witnesses who address the issue of the modified activity based approach, Dr Taylor and Dr Bertram. I now turn to respond to some of the additional points raised by Dr Taylor and Dr Bertram in their evidence.

68. I also note that Professor Forster for LCANZ, who has significantly more experience in climate matters than these two witnesses, says that he considers that the Commission's use of the modified activity-based approach is well-justified by the Commission, and that he considers that the approach is reasonable.¹³ Neither Dr Taylor nor Dr Bertram address Professor Forster's contrary view in their evidence.

¹³ Affidavit of Professor Piers Forster at [6] – [7].

Dr Taylor

69. There are a number of inaccuracies and over-simplifications in the way that Dr Taylor describes the modified activity-based approach in his report. For example, he is incorrect to say it 'ignores' pre-1990 forests,¹⁴ nor does it 'assume that Aotearoa had no forests before 1990'.¹⁵ Rather, it represents an explicit choice that only emissions and removals resulting from land activities undertaken from 1990 should be counted towards targets (for well-founded reasons such as avoiding problems arising from legacy effects). Deforestation of pre-1990 forests is accounted for in full.¹⁶
70. Dr Taylor's key proposition however appears to be that the Commission's budgets are somehow misleading, because comparing the Commission's accounting approach to LCANZ' preferred approach, the historic level of removals is lower (that is, the historic emissions are higher), and the trend of removals is improving (that is, emissions are reducing).
71. At paragraphs 100 – 118 of his report, Dr Taylor compares the annual historic net emissions by decade using both the national inventory reporting approach (which he refers to as 'GHGI net') and the modified activity-based approach. He sets out his view that using the modified activity-based approach appears to show that the Commission's proposed budgets "are the continuation of a downward trend in emissions whereas in fact net emissions measured by the [national inventory reporting approach] (being what the atmosphere actually sees) will be trending upwards over the same period". My main response to this is as set out above: net emissions under national inventory reporting are trending upwards at the moment mainly because New Zealand is approaching a peak in its production forest harvest cycle, and will trend down again for the same reasons after the period Dr Taylor is describing. Dr Taylor stops his analysis at 2030 but I assume from other parts of his report that he must be aware of what is due to happen with removals by forests in the decades that follow.

¹⁴ Affidavit of Dr William Taylor, appended report at [18], [21] and [106].

¹⁵ Affidavit of Dr William Taylor, appended report at [111].

¹⁶ Note, for the NDC the accounting will also count the effects of forest management activities on emissions and removals from pre-1990 forests. For emissions budgets, that will not be the case because the Commission recommended that it be excluded, at least initially, due to the forest management reference level not having been set yet, meaning the Commission was unable to assess how it manages accuracy and uncertainty risks.

72. After 2030 (where this analysis by Dr Taylor ends) the national inventory reporting approach will show a dramatic decline in New Zealand's emissions profile. It will show lower levels of net emissions and a strong trend downwards, far in excess of the trend projected with modified activity-based accounting, and without reflecting any additional action to reduce emissions or increase removals. Dr Taylor does not acknowledge this, but it reverses the position (and thus negates his criticism).
73. The Commission's figures are not misleading, nor are they overstating the ambition of the Commission's proposed budgets. Instead:
- 73.1 The decrease in net emissions under the modified activity-based approach is a reliable indicator of long-term trends, because it is only recording enduring removals from the additional planting of new forests, rather than including harvest and growth cycles where removals simply turn back into emissions at harvesting and average out over time.
- 73.2 By contrast, the current increase in emissions under the national inventory reporting approach and the inevitable decrease in emissions after 2030 is not a reliable indicator of long-term trends or a measure of real change. This is because a large proportion of the emissions evident under the national inventory reporting approach will in time be removed (and then subsequently re-emitted), without any change in policy settings or action.
74. I also note that Dr Taylor compares the proposed emissions budgets set using a modified activity-based approach, to budgets that he has "calculated" on the basis of national inventory reporting, in an attempt to make a point about the level of ambition under either accounting approach. However, as I have already explained, it is simply not meaningful to compare budgets set on the basis of modified activity-based accounting and "comparator" budgets using national inventory reporting figures. If the Commission had been using national inventory reporting, the Commission would have recommended that the budgets be set at different levels, because the basis for the budgets would be entirely different. Ambition is not inherent in an accounting approach, and cannot be meaningfully compared in this way. Regardless of the accounting approach adopted and however the budget was expressed, it would reflect the same level of ambition that the Commission had assessed was appropriate for its recommendation to the Minister.

75. Dr Taylor sets out his opinion of the impact of using the modified-activity based approach “going forward” to measure progress at paragraphs 119 – 28 of his report. Dr Taylor outlines his view that using the modified activity-based approach going forward will result in a significant additional burden on New Zealand, because of what he understands to be the effect of the modified activity-based approach: overstating emissions and understating removals. Dr Taylor considers that this will result in “additional ambition” in emissions budgets in the period to 2050, and that this will not be durable or politically feasible. I have responded to the key points in my general response set out above. However, I set out some additional responses below
76. First, Dr Taylor’s view that in the future, the modified activity-based approach will result in more “ambitious” budgets that are harder to meet, seems to be inconsistent with earlier parts of his report, and contrary to the position put forward by LCA NZ and Dr Bertram (that is, that the modified activity-based approach would make New Zealand’s emissions budgets easier to meet). In my view, this inconsistency helps to demonstrate that an accounting system is neither inherently ambitious nor unambitious. An accounting system is simply more or less suitable for tracking progress towards the level of ambition that has already been decided on. In the Commission’s view, the national inventory reporting approach was unsuitable because it introduces such significant fluctuations that obscure genuine long-term changes, not because it is inherently ambitious or unambitious.
77. Second, Dr Taylor says that he considers that his perceived “overstating” of emissions would not be a particular issue if the “over and understatement was symmetric”, which it is not. In response, I note that the lack of “symmetry” that Dr Taylor refers to is a result of the fact that the modified activity-based approach and the national inventory approach are calculated on a different basis. Also, it appears to me that Dr Taylor has misunderstood the specifics of how the averaging under the modified activity-based approach works:
- 77.1 At paragraph 119 Dr Taylor says that “[a]fter 2020, averaging will apply, which is why the [modified activity-based] line in Figure 4.2 is smooth and the [national inventory reporting] line fluctuates around it”.¹⁷ It is important to

¹⁷ Figure 4.2 appears at: Advice Bundle at 67.

note that the national inventory reporting line fluctuates, but not directly around the averaging line. This is because averaging isn't taking the average of the national inventory reporting "line". Instead, averaging stops crediting forests once they reach their long-term average carbon stock.

- 77.2 The framing of Dr Taylor's discussion of averaging in paragraph 121 is wholly incorrect. The purpose of the averaging under the modified activity-based approach is to credit real and additional removals that will be effectively maintained over the long-term, but not credit those that are only cyclical. It is not a matter of abating more or less emissions than are "strictly necessary", or targets being "easier" or "harder" to meet in particular years (though, this latter description is certainly the effect of the national inventory reporting approach).
78. Finally, Dr Taylor then concludes that the modified activity-based accounting approach should not be adopted because it will not be durable or politically feasible. In terms of durability, the activity-based approach has been applied to New Zealand's and many other countries' target accounting since the first commitment period under the Kyoto Protocol. It has been applied by Cabinet in setting New Zealand's first NDC and the net zero 2050 target in the Climate Change Response Act, and the Commission has endorsed it as fit for purpose in measuring progress against the first three budgets towards meeting the 2050 targets. For the reasons already outlined the Commission considers that the modified activity-based approach is more appropriate (and thus durable) than the national inventory reporting approach, because it focusses on real additional action to reduce emissions, rather than counting large fluctuations that obscure genuine progress and will simply be balanced out over time.
79. In terms of political feasibility, I cannot comment on what governments may consider feasible. From the Commission's perspective however, while this accounting approach may not suit short-term political objectives, that is largely the point: it does not allow governments to take credit for removals that are temporary and that will be cancelled out by equal and opposite emissions in 20 – 30 years' time. LCANZ' approach on the other hand would permit governments to borrow abatement from the future with no accountability, contrary to the objectives of providing a framework for clear and stable climate change policies.

H.K

Dr Bertram

80. It appears that Dr Bertram and Dr Taylor have opposing views on the impact of modified activity-based accounting, as I have noted: while Dr Taylor considers that it will require more stringent cuts in emissions than are strictly necessary, Dr Bertram seems to think it will have the opposite effect. As I have mentioned, neither address Professor Forster's view that the Commission's approach is well-justified and reasonable.
81. The two main additional issues that I wish to respond to are Dr Bertram's approach to 'comparing' data under modified activity-based accounting and the national inventory reporting approach (which he refers to as GHGI net emissions), and his view that the Commission ought to have adopted the latter so that 'lay readers' would not be misled by the Advice.
82. In general (see, for example, paragraphs 45 and 49 - 56) Dr Bertram has an unusual opinion of the relevance and significance of the activity-based accounting approach which New Zealand (along with the many other countries) was required to adopt under the Kyoto Protocol. He sees activity-based accounting as being "solely for the purpose" of "compliance with the letter of commitments made under the Protocol", and that this approach to accounting for target emissions is "appropriate for that purpose, but for no other". I disagree. What was developed under the Kyoto Protocol was a detailed framework and guidance on accounting for emissions reduction targets. This continues to be of significant relevance, and can (and does) inform New Zealand's approach to tracking progress against all of its emissions reductions targets, not just those set under the Kyoto Protocol. Many other countries have followed a similar approach.
83. Dr Bertram's opinion at paragraph 56 that "it is the reduction of [emissions assessed under the national inventory reporting] that matters for the real world outcomes of climate policy", is again an unusual view. Dr Bertram refers here to the modified activity-based approach as a "construct" which gives an "incomplete picture of human impacts on global climate". However, both national inventory reporting and modified activity-based accounting are in that sense 'constructs' as they are different forms of tracking emissions following different rules. But the Parties subject to emissions reduction commitments under Kyoto adopted activity-based accounting as a means of focussing attention on current and future actions that result in reductions that are

enduring and represent real progress, rather than penalising or rewarding countries based on the legacy effects of actions that occurred in the past. Averaging, the “modification” introduced by New Zealand for the accounting for its first NDC, is an evolution of this approach to address the particularly pronounced cyclical effects of our production forests.

84. Dr Bertram clearly has strong views about activity-based accounting. It is clear from his evidence and from his submission to the Commission on the draft Advice (discussed by Matthew Smith in his affidavit at paragraphs 142 - 144) that in Dr Bertram’s opinion, New Zealand should not be adopting that approach in any of its domestic or international target commitments.¹⁸ That is quite an extreme position when activity-based accounting is accepted as a legitimate accounting choice under the Paris Agreement and is used by many other countries.
85. At paragraph 59, Dr Bertram claims that “the move” to modified activity-based approach “changes” the “historical record” of New Zealand’s emissions, with reference to Figure 10.1 of the Commission’s Advice (reproduced above at paragraph 34). He says that this shows a “radical upward revision” in the 1990 – 2025 level of “forestry net emissions”, which he considers “can be expected in due course to feed through to a reduction in the stringency of the NDC when measured using modified activity-based target accounting”.
86. With regard to the second part of this claim, that the modified activity-based approach “can be expected in due course to feed through to a reduction in the stringency of the NDC when measured using modified activity-based target accounting”, this is simply illogical. The NDC was set on this basis. The level of ‘stringency’ is already set and progress towards meeting it will be measured in the way that matches the way it was set. It is not meaningful to compare the emissions reductions required under the NDC, which was set by government on the basis that it would use the modified activity-based approach, to figures developed using a national inventory accounting approach. If the NDC had been set on the basis of the national inventory accounting approach, then the target itself would have been expressed differently. The same applies to the budgets recommended by the Commission.

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Dr Ivo Bertram *Submission to the Climate Change Commission*, CBD at [•].

87. With regard to the first part of this claim, that “the move” to modified activity-based approach “changes” the “historical record” and gives rise to a “radical upward revision” in the 1990-2025 level of “forestry net emissions”, I understand that Dr Bertram and LCANZ consider this ‘upwards revision’ to be misleading. Dr Bertram takes the point further at paragraphs 67 – 72, where he compares New Zealand’s historic emissions calculated on the basis of the national inventory reporting approach with the re-calculated figures the Commission produced on the basis of the adoption of the modified activity-based approach. He says that the consequence of this is to make future reductions (under the proposed budgets) look “more dramatic and ambitious than in fact they are”.
88. In response I note:
- 88.1 If the “historical record” were presented on the basis of the activity-based approach used under the Kyoto Protocol, rather than the national inventory reporting, there would be no “radical upwards revision”: this is simply a matter of which accounting approach is being looked at.
- 88.2 The “revision upwards” is nothing more than a difference in how emissions have been accounted for. The modified activity-based approach excludes a large quantity of temporary removals from pre-1990 forests that did not reflect enduring emissions reductions. The national reporting inventory includes them. Differences in how something is calculated and recorded of course gives a different number, and trying to compare one directly against the other is meaningless. Numbers *within* each series can be compared, but not *between* the series, unless you first convert the data to a comparable accounting basis.
- 88.3 The Commission presented the historic emissions on a modified activity-based approach to provide a transparent and fully comparable time series to show how its proposed emissions budgets would affect net emissions.¹⁹ The consequence of this is not to make future emissions reductions under the proposed budgets look more “dramatic and ambitious”. It merely allows the budgets to be compared to what had gone before, *when tracked on the same*

¹⁹ See in particular Figure 5.3 in the Commission’s Advice: Advice Bundle at 97.

basis. The difference in 'trend' simply reflects that in the short-term, New Zealand's net emissions as recorded under national inventory reporting will be on the rise because of where New Zealand is in the forestry cycle. This cyclical upswing will drown out the enduring effects of emissions reductions resulting from the additional action that represents real progress. The choice to put that aside is not a question of drama or ambition, but instead suitability of the accounting approach for what it is we are trying to measure here.

89. At paragraph 60 Dr Bertram says that it is his argument that it "would have been helpful" for the Commission to have presented its proposed budgets in terms of proposed national inventory accounting net emissions. As I have already outlined, if the Commission had adopted the national inventory reporting approach for its recommended budgets, then the recommended budgets themselves would have been different as they would have been set on a different basis.
90. For the same reasons, I do not agree with Dr Bertram's criticism at paragraphs 73 and 74, that the presentation of historic emissions expressed on the same basis as the budgets (that is, under modified activity-based accounting) is misleading. I note that Dr Bertram accepts that it is not *actually* misleading (contrary to LCANZ' allegation in its statement of claim), as he says "for specialist insiders this problem does not arise". However, Dr Bertram considers that "most lay readers (including many policy makers) are highly likely to be misled". This is a strong claim and I do not agree with it: policy makers in the area of climate change are highly unlikely to be misled, given familiarity with the accounting principles followed by New Zealand since its first commitment under the Kyoto Protocol.
91. For lay readers, the Commission's approach and what it is measuring and why are explained in the Advice and Supporting Volumes in considerable detail. A reader who works through all that extensive material but wishes to know more can access a range of other sources of guidance. I note also that national inventory reporting is in fact no simpler to understand than modified activity-based accounting, and Dr Bertram's suggested approach of trying to directly compare figures derived under these two different accounting approaches when they are not comparable would make matters even more confusing.
92. I agree with Matthew Smith's evidence on this point, set out in his affidavit at paragraph 163: these are complex matters and in my view it would have been

inappropriate for the Commission to advise the government to adopt an accounting approach that it thought was not fit for purpose, simply on the basis that it would (in LCANZ' view) be easier for a casual reader to understand.

Affirmed

Paul Allen Young



At Wellington this 10th day of December 2021

before me:

Hana Khan
Solicitor, Wellington



A Solicitor of the High Court of New Zealand