



The Climate Commission's Report and the 2019 Act: Implications for Governance and Policy-making

Kennedy Graham

Working Paper 21/13



Institute for Governance
and Policy Studies
A research institute of the School of Government

INSTITUTE FOR GOVERNANCE
AND POLICY STUDIES
WORKING PAPER
21/13

MONTH/YEAR

July 2021

AUTHOR

Kennedy
Graham

INSTITUTE FOR GOVERNANCE
AND POLICY STUDIES

School of Government
Victoria University of Wellington
PO Box 600
Wellington 6140
New Zealand

For any queries relating to this working paper, please
contact igps@vuw.ac.nz

DISCLAIMER

The views, opinions, findings, and conclusions or
recommendations expressed in this paper are strictly
those of the author. They do not necessarily reflect
the views of the Institute for Governance and Policy
Studies, the School of Government or Victoria
University of Wellington. The paper is presented not
as policy, but with a view to inform and stimulate
wider debate

Abstract

Climate change has been described by the NZ Government as ‘the greatest challenge of our time’. Thirty years after the UN IPCC’s 1st Assessment Report, there is increasing concern that the global action is insufficient to achieve the ‘ultimate objective’ of climate stabilisation, and that the remaining time to reverse this is now short. The UNFCCC Paris Agreement (2015) established a universal plan for emissions to meet the temperature goal of ‘well below 2°C’, with a global effort to stay under 1.5°C. The IPCC’s Special 1.5°C Report (2018) has provided global scenarios and pathways for countries to determine their national contributions to that end. In New Zealand, domestic legislation (2019) set a 2050 Emissions Reduction Target for this country to make its contribution to the ‘1.5°C global effort’. It also established a Climate Commission to provide the Government with independent and expert advice on budgets, implementation plans, measurement rules and target reviews. The Commission has recently released its first Advisory Report, for government decisions by the end of 2021. This Working Paper assesses the Report and the 2019 legislation in the context of New Zealand’s ‘contribution’ to the 1.5°C global effort and, more broadly, the implications for national governance and policy on the ‘existential threat’ that is climate change.

Author

Kennedy Graham is Senior Associate in the Institute for Governance & Policy Studies, Victoria University of Wellington (VUW), member of the Global Studies Council at the University of Auckland, and Director of the NZ Centre for Global Studies. Dr Graham has a BCom and a BA (Hons), MA and PhD in Political Science/International Relations. He studied at Auckland and VUW, Fletcher School of Law & Diplomacy (Boston) and the University of Cambridge, and taught at the College of Europe (Bruges), VUW, and the University of Canterbury. He is the author or editor of five books, including *The Planetary Interest: A New Concept for the Global Age* (UCL/Rutgers/Routledge; 1999). Dr Graham participated in the UN Earth Summit (Rio de Janeiro, 1992), the UN Population Conference (Cairo, 1994), ‘Rio Plus 20’ Summit (2012), and six climate conferences including COP-15 (Copenhagen, 2009) and COP-21 (Paris, 2015). He was Chair of GLOBE-NZ, the cross-party parliamentary group on climate change, from 2015 to 2017, and a consultant to the Productivity Commission for its Low Emissions Economy Inquiry (2017–18).

Executive Summary

The Climate Commission's Advisory Report (31 May 2021) represents a step forward in New Zealand's climate governance. It answers to the terms of reference, is comprehensive, and has been positively reviewed.

This Working Paper explores the Report in a broader context – the implications of the Commission's work for national governance and policy on climate change – in particular, New Zealand's international legal obligations and domestic institutional capacity to meet them, including the interaction between governance and policy. The focus therefore extends beyond the Report itself, to cover the relationship between the Commission and the 2019 amending legislation that established it as a Crown entity to convey independent and expert advice.

Section 1 provides the broad thirty-year global context within which every country's national effort is placed. It reviews the two formative decades in which the ultimate objective, and associated principles and methodology of climate policy were established. It notes the distinction between climate neutrality, long-lived gas neutrality and carbon neutrality, and the confusion that a lack of clarity over these can generate. It then focuses on the past decade, during which the global effort has strengthened and the pace quickened – with three developments in particular:

- a move from a centralised ('top-down') to decentralised ('bottom-up') governance framework (2012–15);
- a strengthening of the temperature goal from 2°C (2010) to effectively 1.5°C, (2015–2018), a tightening of the remaining global emissions budget, and a growing 'global emissions gap'; and
- a global call for climate emergency declarations (2020), with several major climate neutrality targets announced (April 2021), and a heightened concern over extreme and widespread weather events (July 2021).

Section 2 explores New Zealand's climate governance and policy within the global context. It first reviews New Zealand's emissions history and projections from 1990 to 2050, and then summarises the Commission's Report with a particular focus on its emissions budgets (2022–35) and review of New Zealand's 2030 Target – its 'nationally determined contribution' (NDC). The Commission is required by statute to produce 'realistic' budgets and plans, and unavoidably has to deal with the past three decades in its future planning. New Zealand's early climate governance was relatively weak, with the Government relying on traditional economic frameworks for policy formulation that excluded the counter-factual scenario of potential economic impacts from inadequate mitigation. The targets (2008–20) not only lacked ambition, they were then met through excessive reliance on forestry removals inherited from commercial planting in the 1990s, plus international credits, many without environmental integrity. The decision to carry over surplus credits to meet the 2020 Target met minimum standards of legality but failed the principle of equity. The absence of a capped Emissions Trading Scheme (with agriculture deferred) and a long-term afforestation programme have left New Zealand with a domestic mitigation problem over the coming decades, forcing a continuing reliance on the controversial option of offshore mitigation.

Section 3 analyses the NZ legislation and the Commission's Report in the context of the Paris principles of enhanced transparency and highest possible ambition. The 1.5°C goal can be accepted as a constant for policy purposes. The associated mitigation goal, however, is continually changing as the global emissions budget shrinks faster than the prescribed '1.5°C Budget' for as long as the Paris Agreement's NDCs remain inadequate. This presents a daunting challenge for national climate policy, to cope with continuous global change.

Enhanced transparency

While New Zealand's identification of biogenic methane as a separate 'mitigation basket' for policy purposes reflects its 'respective capabilities and national circumstances', this does not absolve it from its responsibility to meet the global principle of transparency. Certain problems derive from the wording of the 2019 amending legislation, and these become manifest in the Commission's Report which contains features likely to fall short of the standards required in the Paris Agreement's Enhanced Transparency Framework. There is no valid reason to avoid identifying New Zealand's 2050 Target in terms of carbon dioxide equivalent. There is an associated lack of clarity over the 2050 Target, discernible in the media and even in official statements by government leaders. A 'transparency gap' is developing between the domestic presentation of climate policy (the 2019 legislation and the 2021 Commission Report) and the international requirements of New Zealand's reporting of the Target and progress towards it.

Highest possible ambition

Section 3 then considers whether New Zealand is meeting the Paris principle of ‘highest possible ambition’ with its 2030 and 2050 responsibility targets in the ‘climate emergency era’. It notes that the original targets for 2030 and for 2050 were decided when the recognised temperature goal was 2°C, whereas the current 2050 Target set in 2019, and the required review of the 2030 NDC in 2021, adopt the more stringent 1.5° goal as the criterion for required ambition.

The 2050 Target

The overarching question explored in the Paper is whether New Zealand’s 2050 Target and thus the Commission’s budgets are compatible with the 1.5°C global effort, and whether ‘2050 climate neutrality’ as opposed to ‘2050 carbon neutrality’ is necessary to that end. While the Government identified climate neutrality (net-zero GHG) by 2050 as a policy option, the acceptance of official advice in favour of ‘carbon neutrality’ has meant that New Zealand’s 2050 Target is calculated to be 23 Mt CO₂-e (range: 19–28 Mt), and the ‘climate neutrality’ year to be around 2065. The Commission’s demonstration path is estimated to arrive at 13 Mt CO₂-e by 2050. The official advice in 2018 to reject 2050 climate neutrality on grounds that the option was ‘viable but not preferred’ was a conscious and explicit rejection of New Zealand’s ‘highest possible ambition’. Both precursor reports (Vivid Report, 2017, and Productivity Report, 2018) had shown that 2050 net-GHG neutrality was viable, whether preferred or not.

The Commission’s affirmation that the 2050 Target is compatible with the 1.5°C goal is based primarily on scenarios and pathways from the IPCC’s Special Report, and as such is simply an affirmation of official reasoning of 2018–19. Subsequent scientific findings and global action indicate that circumstantial change has already occurred since then.

The 2030 Target

In its Report, the Commission advises the Government that, in the case of the 2030 NDC, New Zealand’s target should be much higher than the IPCC’s interquartile mid-point (36%), yet it leaves the judgement to the elected representatives as to how close to the upper quartile boundary (45%) this should be. There was perhaps a statutory requirement for a recommendation, to assist the elected representatives in exercising their final judgement. In this respect, as the UNEP Methane Assessment Report (May 2021) has pointed out, the urgency for immediate global action places greater importance on rapid mitigation of short-lived gases.

Section 4 draws conclusions from the analysis and advances recommendations. While New Zealand’s climate governance has improved in recent years, its policy in terms of target-setting has again fallen behind legitimate global expectations of a developed country. Making biogenic methane a separate component of the 2050 Target, while consistent with climate science, rests on national policy interest, to the detriment of the international principles of transparency and ambition. In 2021, with COP-26 approaching, global calls for climate emergency declarations, together with recently upgraded 2050 net-zero GHG targets from major countries, challenge New Zealand to undertake an urgent policy reformulation. In light of New Zealand’s own Climate Emergency Declaration, the 2050 net-zero GHG option from the Government’s Regulatory Impact Statement of 2018 should be reconsidered, and accepted as viable, necessary and preferred.

Two recommendations are advanced:

Enhanced transparency

- All NZ Responsibility Targets (the 2030 NDC and the 2050 Target), and their associated emissions budgets and demonstration pathways, should be expressed in terms of carbon-dioxide equivalence, using GWP₁₀₀ (AR5 values), including all component baskets of the 2050 Target.

Highest possible ambition

- In light of significant circumstantial change since 2019 in recent scientific findings regarding climate change and in recent global action regarding national target ambition as well as declarations of climate emergency, a review of New Zealand’s 2050 Target should be undertaken by the Commission by 31 October, through a request from the Minister under section 5K(1) of the Act. The Government should defer communication to UNFCCC of its upgraded NDC for the 2021–30 period until it is satisfied that it will be consistent with a revised 2050 Target that ensures New Zealand is fully contributing to the 1.5°C global effort.

Contents

Abstract	3
Executive Summary	4
1. Global Climate Governance and Policy	7
1.1 Review: 1990–2020	7
(a) The meaning of ‘neutrality’	7
(b) Global movement from the 2.0°C to 1.5°C goal	8
1.2 Global principles and methodology	8
(a) Principles	8
(b) Global methodology	11
1.3 The ‘global effort’	12
(a) The global emissions gap	12
(b) Circumstantial change: Scientific findings and global action	13
2. National Climate Governance and Policy	17
2.1 NZ emissions: Historical and projected (1990–2050)	17
2.2 The Climate Commission’s report	19
(a) The emissions budgets	21
(b) The 2050 Target	21
(c) The 2030 NDC Target	22
3. Analysis: The Legislation and the Report	26
(a) Transparency	26
(b) Ambition	28
4. Conclusions and Recommendations	40
(a) Conclusions	40
(b) Recommendations: Governance and policy in the ‘climate emergency’ era	41
Appendices	42
Appendix 1: Climate metrics and values	42
Appendix 2: Precursor reports on ‘low emission’ and ‘net-zero’ economies	44
Appendix 3: The pathway to New Zealand’s Zero Carbon Bill	47
Glossary	52

List of Tables	
1. The global emissions gap (Gt CO ₂ -e)	13
2. Circumstantial change: Enhanced ambition in the climate emergency	16
3. The Commission’s budget recommendations	20
4. The Commission’s 2030 NDC recommendation	22
5. NZ 2050 National Responsibility Target: Compatibility with the 1.5°C global effort	29
6. UK and NZ Net GHG emission targets (CO ₂ -e) off 1990	34
7. NZ GHG emissions in 2019 (Mt CO ₂ -e) based on GWP ₂₀ and GWP ₁₀₀ (AR5 values)	36
8. NZ 2030 National Responsibility Target: Domestic/offshore mitigation	38
List of Figures	
1. NZ GHG emissions: Actual and projected (1990–2050)	18
2. NZ GHG emissions: Target accounting (1990–2050)	18
3. Short-term and long-term impact of greenhouse gases (2000–2200)	36

1. Global Climate Governance and Policy

1.1 Review: 1990–2020

The history, to date, of global climate governance is less than ideal. Notwithstanding early scientific conclusions that the global economy potentially threatened the stable Holocene climate,¹ it took almost a century more for the international community to address the issue with the first scientific symposia organised by WMO, UNEP and ICSU (Villach, 1980 and 1985).² The Brundtland Report (1987), which identified climate change as a global threat with little time available for corrective action,³ laid the foundation for the establishment of the IPCC in 1988, its 1st Assessment Report in 1990, and the 1992 UN Framework Convention on Climate Change (UNFCCC), on which global climate governance continues to be based. This includes the statement of global objective, the establishment of global targets, the legal principles for guiding global policy, and the scientific and statistical metrics for policy planning, performance measurement and reporting.

The political goal of global action over climate change is ‘climate stabilisation’. This is described, rather than defined, in the 1992 UN Framework Convention on Climate Change as the prevention of ‘dangerous anthropogenic interference with the climate system’.⁴ The ‘ultimate objective’ of the Framework Convention is stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. Climate stabilisation is thus the avoidance of climate system interference, and is achieved through a particular GHG atmospheric concentration at a stable level.

(a) *The meaning of ‘neutrality’*

The terms ‘climate neutrality’ and ‘carbon neutrality’ are not defined in the UNFCCC or any of its related legal instruments. They are therefore political, not legal, concepts, but clarity over their usage is just as important, for reasons advanced in this Paper. The two terms are often used interchangeably, to the detriment of sound climate governance and policy.

The distinction between climate neutrality, long-lived gas neutrality and carbon neutrality is critical to global and national climate policy. The extent to which this is clearly understood by a domestic public, and transparently conveyed by its government, is a measure of how sound a country’s climate governance is.

- climate neutrality is net-zero emissions of all GHGs;
- long-lived gas neutrality is net-zero of the LLGs (carbon dioxide and nitrous oxide);
- carbon neutrality is net-zero of carbon dioxide emissions.⁵

¹ Svante Arrhenius (1896) XXXI. ‘On the influence of carbonic acid in the air upon the temperature of the ground’, *The London, Edinburgh, and Dublin Philosophical Magazine and Journal of Science*, 41: 251, 237–76, DOI: [10.1080/14786449608620846](https://doi.org/10.1080/14786449608620846)

² Bolin, B., *A History of the Science and Politics of Climate Change: The Role of the IPCC* (Cambridge: CUP, 2007)

³ ‘Little time is available for corrective action. In some cases we may already be close to transgressing critical thresholds. While scientists continue to research and debate causes and effects, in many cases we already know enough to warrant action. This is true locally and regionally in the cases of such threats as desertification, deforestation, toxic wastes, and acidification; it is true globally for such threats as climate change, ozone depletion, and species loss. The risks increase faster than do our abilities to manage them.’ *Report of the World Commission on Environment and Development: Our Common Future*, para. 32, <https://sustainabledevelopment.un.org/content/documents/5987our-common-future.pdf>

⁴ UN Framework Convention on Climate Change, Art. 2 Objective. The term ‘climate stabilisation’ does not figure in the Convention’s definitions (Art. 1).

⁵ <https://www.wri.org/insights/cop21-qa-what-ghg-emissions-neutrality-context-paris-agreement>

This has been clearly laid out by the World Resources Institute, among others: ‘What is GHG emissions neutrality? Greenhouse gas (GHG) emissions neutrality should be interpreted to mean net zero anthropogenic GHG emissions from all sectors. It is achieved first and foremost by reducing total GHG emissions to as close to zero as possible. Any remaining GHGs would be balanced with an equivalent amount of removals (such as enhanced sequestration in the land sector) or negative emissions (possibly using future technologies like bioenergy combined with carbon capture and sequestration, although these remain unproven at scale). How is that different from carbon neutrality? GHG neutrality covers all greenhouse gas emissions, which means emissions from carbon dioxide as well as other greenhouse gases like methane. All of these gases would reach net zero in a GHG neutral scenario. In contrast, carbon neutrality deals only with carbon dioxide emissions. In

(b) Global movement from the 2°C to 1.5°C goal

The 1992 Convention did not specify temperature goals, but the UNFCCC process has done so in two stages:

- 2007–10: Limiting the temperature increase to 2°C, or ‘below 2°C’, for the avoidance of dangerous climate change was first prescribed in the IPCC AR4 of 2007, and as a global policy goal in COP-15’s Copenhagen Accord in 2009,⁶ formalised in 2010 at COP-16 (Cancun). The Cancun Agreements also recognised a need for a review (initially by 2013; finalised by 2015) of the adequacy of the 2°C limit, specifically referring to 1.5° as a possible global goal.⁷
- 2015–18: On the basis of the IPCC’s 2015 review, COP-21 (Paris) reflected an increasing concern and sense of urgency over climate change, and intent on ‘enhancing the implementation of the Convention, including its objective’, decided ‘to strengthen the global response to the threat of climate change ... by holding the increase in the global average temperature to well below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5°C above pre-industrial levels’.⁸ To achieve this ‘long-term temperature goal’, Parties aim to reach ‘global peaking’ of GHG emissions ‘as soon as possible’, and to undertake rapid reductions thereafter to achieve net-zero GHG emissions ‘in the second half of this century’.⁹

In the decision adopting the Agreement, the Parties invited IPCC to provide a Special Report in 2018 on the impacts of 1.5°C and related global greenhouse gas emission pathways for 1.5°C.¹⁰

Since the 2018 Special Report, the focus of global policy has been on the 1.5°C goal, in full recognition of the challenge. As a result of this refocus, the global emissions budget has become tighter, and consequently each country’s share thereof.

1.2 Global principles and methodology

The scientific understanding of climate change is under continuous advance, while global action, in pursuit of climate stabilisation, is subject to continuous change – through refinement of the shared obligations and agreed principles by which countries can meet them.

The international legal documents reflecting that evolution (Framework Convention, 1992; Kyoto Protocol, 1997; Paris Agreement, 2015) impose legally binding obligations on States Parties which, given the universality of membership status, can be regarded today as peremptory norms.¹¹ The Framework Convention has broad commitments, including the central objective of climate stabilisation. The Kyoto Protocol contained binding commitments on certain (Annex I) countries for specific quantitative emission targets. The Paris Agreement contains a binding commitment on all countries to develop ‘nationally-determined contributions’. All three texts contain, in inter-related manner, legally binding principles for countries to fulfil their obligations.

(a) Principles

Such principles are, purposefully, broad in terminology and thus open to interpretation – but not to repudiation or disregard. If they are wilfully violated, cynically construed or excessively subjective, not only does a country diminish its international reputation but its action in response to an existential threat such as climate change will run counter to its legitimate national interest. This applies to all Parties, and New Zealand

2012, 23% of emissions were non-CO₂ greenhouse gases.’ See also UNFCCC: <https://unfccc.int/climate-action/climate-neutral-now>

⁶ *Proposal by the President: Copenhagen Accord*. FCCC/CP/2009/L.7, para. 1

⁷ *The Cancun Agreements: Outcome of the Work of the Ad Hoc Working Group on Long-term Cooperative Action under the Convention*. Dec. 1/CP.16 (paras 4, 138-9), FCCC/CP/2010/7/Add.1 (15 March 2011)

⁸ Paris, Art. 2.1 (a)

⁹ Paris, Art. 4.1

¹⁰ 1/CP.21, para. 21

¹¹ The climate change instruments are essentially universal: the UNFCCC has 197 States Parties, the Kyoto Protocol has 192, and the Paris Agreement has 191 (with four more signatories yet to ratify). With the Kyoto targets (2008–20) having essentially terminated, the primary texts for the 2020s are the 1992 Framework Convention and the 2015 Paris Agreement (although the Kyoto rules remain relevant).

is no exception.¹² Some principles are designed to facilitate international negotiations for a global goal. Some are designed to guide national policy-making. These mutually interact and, when successfully applied, will have a synergistic effect on the achievement of global goals through national governance and policy.

Framework Convention: The ‘ultimate objective’ of the Convention is to achieve net-zero GHG emissions. This is to be achieved within a timeframe sufficient to allow ecosystems to adapt naturally, ensure that food production is not threatened, and enable economic development to proceed in a sustainable manner. These three elements are more than principles; they are conditions of the central objective. To achieve climate stabilization, the Convention instituted five guiding principles. These are: equity and the common but differentiated responsibilities of Parties; the specific needs of the developing world; precaution in situations of scientific uncertainty; sustainable development; and an open international economy.¹³ These principles remain the overarching contextual framework for global and national governance and policy-making in climate change to this day.

Paris Agreement: The Paris Agreement exists within the legal context of the UNFCCC, being ‘in pursuit of the objective of the Convention’ and ‘guided by its principles’.¹⁴ While the Agreement has ensured voluntary contributions from all Parties, it explicitly cites two of the 1992 principles: the distinction between developed and developing countries; and shared national responsibility for the global goal.¹⁵ The Agreement, plus the COP decision adopting it, have thus fashioned the contemporary framework of principles, as follows:

- Ambition: Each NDC will represent progression in the ‘highest possible ambition’ of each contribution.¹⁶
- Transparency: Parties shall observe environmental integrity through promoting accuracy, completeness, comparability and consistency in their accounting for their NDC.¹⁷
- Compliance: In reporting on their NDCs, each Party may convey an explanation of how its contribution is ‘fair and ambitious in light of its national circumstances’.¹⁸

The Enhanced Transparency Framework

The move away from internationally agreed targets with penalty for non-compliance (Kyoto) to nationally determined contributions without penalty (Paris) simply requires a higher level of volitional commitment if the global effort is to succeed. The Paris Agreement accordingly established the Enhanced Transparency Framework to ‘build on and enhance the transparency arrangements under the Convention’.¹⁹ Each Party will

¹² In a report in advance of the critical COP-21 (Paris, 2015), the global parliamentarian cross-party group GLOBE-International noted that ‘national interest, or to be more accurate, perceived national interest’ is the overriding factor influencing a country’s negotiation position. Relevant factors include perceived climate risk, public and parliamentary opinion, carbon intensity of the economy, political influence of high-carbon industries, trade competitiveness, and mitigation opportunities. On the basis of its third *GLOBE Climate Legislation Study*, it made the following observation: “Traditionally, the international climate change negotiations have been characterised by a debate around sharing a global burden (cost) to reduce greenhouse gas emissions. Under this characterisation, it is in political leaders’ interest to minimise the burden placed on their own country, relative to others. The temptation is to plead that one’s country is a special case and therefore deserves less of a burden, or to characterise commitments in a way that maximise positive publicity but minimise real effort (e.g. by using a favourable baseline, using carbon intensity instead of absolute numbers).” In ‘National Climate Change Legislation: The Key to More Ambitious International Agreements’, *Globe-International and Climate Development Knowledge Network* (July 2013) [Section: ‘An evolving dynamic: Historical responsibility versus self-interest’, p. 3].

¹³ UNFCCC, Art. 3. Principles. Note: ‘common but differentiated responsibilities’, henceforth CBDR.

¹⁴ Paris Agreement (2015), Preamble, 3rd para. [hereafter ‘Paris’]

¹⁵ Paris, Art. 4.1 and 4.4

¹⁶ Paris, Art. 4.3: ‘Each Party’s successive nationally determined contribution will represent a progression beyond the Party’s then current nationally determined contribution and reflect its highest possible ambition, reflecting its common but differentiated responsibilities and respective capabilities, in the light of different national circumstances.’

¹⁷ Paris, Art. 4.13

¹⁸ UNFCCC-COP 21, Decision 1/CP.21, para. 27: ‘The Conference of the Parties agrees that the information to be provided ... may include, as appropriate, ... information ... on how the Party considers that its national-determined contribution is fair and ambitious in light of its national circumstances.’

¹⁹ Paris, Art. 13.1 and 13.3

regularly provide a national inventory report of its net emissions, using good practice methodologies accepted by the IPCC and agreed upon by the relevant UNFCCC meetings of the Parties. It will also provide 'the information necessary to track progress made in implementing and achieving' its NDC.²⁰

In 2018 the UNFCCC (COP 24), as part of the transition to the Enhanced Transparency Framework, adopted a detailed set of modalities, procedures and guidelines (MPGs).²¹ The ETF requirements carry implications for NZ climate governance and policy, which is explored in section 3.

The principle of 'highest possible ambition'

Neither the Framework Convention nor the Kyoto Protocol explicitly incorporates the term 'ambition', although the conceptual aspiration was present in the earliest efforts at global and national policy.²² But after a quarter-century of failure to curb global emissions growth, the need for ambition was explicitly introduced into the Paris Agreement. And the concept is not vaguely expressed. It requires the 'highest possible ambition, reflecting its common but differentiated responsibilities and respective capabilities, in the light of its different national circumstances'.²³ Two other principles, however, are closely related: equity and feasibility. Their interaction carries significance for governance and policy-making.

'Ambition' and equity

The relationship between highest ambition and equity is complex. Equity has three dimensions: temporal (inter-generational justice)²⁴; economic (poverty alleviation); and communal (a just inter-sectoral and

²⁰ Paris, Art. 13.7

²¹ 'Modalities, Procedures and Guidelines for the Transparency Framework for Action and Support Referred to in Article 13 of the Paris Agreement', Dec. 18/CMA.1, Doc. FCCC/PA/CMA/2018/3/Add 2 (19 March 2019). The ETF contains provisions for both action (under Paris Art. 13.5) and support (Art. 13.6). The MPGs are:

- The purpose of the framework is to provide a 'clear understanding of climate action ... including clarity and tracking of progress' towards achieving a Party's NDC (para. 1);
- Two of the eight guiding principles are (i) promoting transparency, accuracy, completeness, consistency and comparability (each is defined in detail); and (ii) avoiding duplication of work and undue burden on the UNFCCC secretariat (para. 3);
- Each Party shall use the 2006 IPCC Guidelines (para. 20);
- Each Party may use nationally appropriate methodologies if they better reflect its national circumstances and are consistent with the IPCC guidelines, but must 'transparently explain' such methods, data or parameters (para. 22);
- Each Party shall use GWP₁₀₀ (from IPCC's AR5 or subsequent IPCC document) to report all net GHG emissions expressed in CO₂-e; it may additionally use another metric, e.g. GTP provided it reports on the 'value of the metrics used and the IPCC assessment report they were sourced from' (para. 37);
- Each Party shall report estimates of emissions for 'all categories, gases and carbon pools' on a 'gas-by-gas basis in units of mass at the most disaggregated level' (para. 48);
- Each Party shall report seven gases: carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, sulphur hexafluoride, and nitrogen trifluoride (para. 48);
- Each Party shall describe each methodology and/or accounting approach used, as applicable for targets, baselines and indicators; such information shall include key parameters, IPCC guidelines used, and metrics used (paras 74, 75);
- Each Party shall include projections 'on a sectoral basis and by gas' as well as for the national total, using a common metric consistent with that in its national inventory report (para. 98).

²² By way of examples:

- In 1990, the first global parliamentary workshop on climate change policy, involving MPs from 13 major emitting countries (US, Canada, Italy, Netherlands, Australia, Japan, India, Pakistan, Indonesia, Brazil, Mexico, Egypt, Zimbabwe), issued a call for global net-emissions to be reduced 50% by 2010 off 1988. *Global Warming: North-South and the Planetary Partnership: The Bellagio Communique*, Parliamentarians for Global Action Workshop (June 1990).
- In 1992, the Framework Convention envisaged climate stabilisation through a return to 1990 GHG emissions levels by 2000, with Annex I Parties 'taking the lead' in the 'global effort' (UNFCCC Art. 4.2(a)).

²³ Art. 4(3)

²⁴ 'Temporal' equity reaches into the past as well as the future, in the sense of historical responsibility of developed countries for past emissions. The main debate on this turns on the 'base year' (1850, 1950, 1990)

employment transition). Ambition has only one dimension: achievement of the temperature target goal for climate stabilisation.

Ambition and feasibility

States Parties to the climate texts uniformly affirm that their national mitigation plans are ambitious but achievable (feasible). In this perception, ambition is an aspirational concept on which feasibility acts as a real-world constraint. A country's 'highest possible ambition' is reached at an emissions level where ambition and feasibility meet. Essentially, ambition is constrained by feasibility and, given that feasibility is left to subjective judgement, so too is ambition.

This is, however, based on two underlying assumptions. First, that global food security, a conditional element to climate stabilisation, requires a country to produce and export food to its maximum potential. Secondly, that its ability to reduce emissions therefore depends primarily on technological advance. And this rests on an erroneous assumption that the global carrying capacity is congruent with the current global population. The scientific understanding, in fact, is that today's population exceeds the planet's carrying capacity, based on current technology and lifestyle, by 56%.²⁵ A feasible level of global food production needs to be determined by what is sustainable.²⁶ And that level, in turn, is dependent on early climate stabilisation.

The Framework Convention's three conditions to climate stabilisation, noted above, are inter-related: sustainable food security consistent with sustainable development through an open economy. It is self-defeating to produce food through the 21st century at a level where emissions cause dangerous climate change that, among other serious setbacks, disrupts food-production capacity. Unrestrained food production in the short term undermines sustainable food production in the long term.

This has direct relevance for food-exporting countries such as New Zealand, including their policy framework for relative emission levels of different greenhouse gases, in the short term. Ambition (staying within the global budget) is an eco-centric imperative. Feasibility (what an individual country determines it can do) is an anthropocentric judgement.

Relationship between ambition and transparency

The above two principles, enhanced transparency and highest ambition, are critical to successful global climate governance. As the UNFCCC puts it, the Enhanced Transparency Framework (ETF) is 'designed to build trust and confidence that all countries are contributing their share of the global effort'.²⁷ The fall-back to national sovereignty since 2015 is thus balanced through a heightened expectation that each State Party will fulfil its responsibility to meet what is required of it in the global interest – highest ambition and enhanced transparency in reporting its national goals and implementation.

(b) Global methodology

The methodology applied to planning, implementing and reporting on a Party's climate targets for 2030 and 2050 are identified in Appendix 1. In short, the UNFCCC, based on IPCC scientific findings, decided from the outset that all greenhouse gas emissions should be expressed in a single 'carbon dioxide equivalent' (CO₂-e), and based on a 'global warming potential' metric (GWP) with a 100-year time horizon (GWP₁₀₀). Alternative

and any (elusive) agreement among States Parties on the extent to which it should be acknowledged and accepted for future mitigation reduction levels.

²⁵ Earth Overshoot Day marks the date when humanity's demand for ecological resources and services in a given year exceeds what Earth can regenerate in that year. It is computed by Global Footprint Network (<https://www.footprintnetwork.org>) by dividing the planet's bio-capacity (the amount of ecological resources Earth is able to generate that year) by humanity's Ecological Footprint (humanity's demand for that year), and multiplying by 365, the number of days in a year. Thus: (Earth's bio-capacity/humanity's ecological footprint) x 365 = EOD. Earth Overshoot Day 2020 fell on August 22 (<https://www.overshootday.org/>). Humanity is thus exceeding Earth's carrying capacity by 56%.

²⁶ The issue is complicated by land-use inter-relationships between emission level, productive capacity and calorie intake. But the 'order of magnitude' in this respect does not stretch to '156%' of carrying capacity.

²⁷ <https://unfccc.int/process-and-meetings/transparency-and-reporting/reporting-and-review-under-the-paris-agreement>

time horizons can also be used – of 20 years and 500 years. The longer time horizon has been dropped but the 20-year time horizon is retained for judgement on the impact of emissions in the short term.

The main alternative metric, ‘global temperature potential’ (GTP) has also been used, but GWP remains the primary metric. In recent years, another metric (GWP*) has been proposed, but has not been adopted by UNFCCC. Notwithstanding, there has been some enthusiasm in New Zealand for this metric. While the metric rests on sound science, its attraction within New Zealand is due primarily to its policy implications, since it rationalises less far-reaching reductions in methane.

The calculations in this Paper are based on the continuing UNFCCC use of carbon dioxide equivalent and the GWP₁₀₀ metric, since this responds to the Paris Agreement’s Enhanced Transparency Framework.

1.3 The ‘global effort’

The 1992 Framework Convention identified the ‘global effort’ as essentially the mitigation level required to meet the finite global emissions budget.²⁸ It is on the basis of the ‘Rio-Paris objective’ that the global mitigation targets are currently formulated. The progression in the targets is shown below:

- 2000: A return to 1990 GHG levels by 2000.²⁹
- 2008–20: Two sub-global ‘period-budgets’, involving legally binding reductions:
 - (a) 2008–12: CP-1, for Annex I Parties covering 30% of global gross emissions, requiring a cut of 5% in their combined aggregate 1990 level using gross-to-net accounting (US non-participation halved the global coverage).³⁰
 - (b) 2013–20: CP-2, covering 15% of global emissions, involved the remaining participating Parties to reduce by 18% off 1990 levels.
- 2021–30: A global ‘period-budget’ involving nationally determined contributions by all Parties (2021–30) to be compatible with the Paris temperature goal (well below 2°C with a global effort for 1.5°C).³¹
- 2031–2100: A broad long-term goal (global emissions peaking ‘as soon as possible’), that is, net-zero GHG neutrality between 2051 and 2100.³²

(a) *The global emissions gap*

The climate treaties have never provided specific quantitative targets. The current estimates are based on the IPCC’s 2018 Special 1.5 Report.³³ In adopting the Paris Agreement in 2015, however, the Parties noted ‘with concern’ the estimated 2030 global emissions level of 55 Gt CO₂e based on the intended NDCs compared with 40 Gt required for the 2°C goal, leaving an ‘emissions gap’ of 15 Gt.³⁴

Since 2010, UNEP has produced an annual Emissions Gap Report, the most recent being its 2020 Report. The current global targets and the collective shortfalls from both current policies and NDC commitments are shown in Table 1.

²⁸ UNFCCC, Art. 4.2(a)

²⁹ UNFCCC, Art. 4.2(a)

³⁰ Kyoto, Art. 3.1

³¹ Paris, Art. 4.1

³² Paris, Art. 4.19. The Paris Agreement stipulates that all Parties ‘should strive’ to formulate and communicate long-term, low GHG emission development strategies.

³³ ‘This Special Report also shows that recent trends in emissions and the level of international ambition indicated by nationally determined contributions, within the Paris Agreement, deviate from a track consistent with limiting warming to well below 2°C. Without increased and urgent mitigation ambition in the coming years, leading to a sharp decline in greenhouse gas emissions by 2030, global warming will surpass 1.5°C in the following decades, leading to irreversible loss of the most fragile ecosystems, and crisis after crisis for the most vulnerable people and societies’. Foreword by WMO and UNEP, *Global Warming of 1.5°C: IPCC Special Report*, <https://www.ipcc.ch/sr15/>

³⁴ Dec. 1/CP.21, para. 17, in FCCC/CP/2015/10/Add.1 (29 Jan. 2016)

Table 1
The global emissions gap (Gt CO₂-e)

Temp. target		2.0°C		1.8°C		1.5°C	
Emissions	Recorded	Required	Gap	Required	Gap	Required	Gap
1990	38						
2000	49						
2010	50						
2019	52						
	Projected						
2030	59	41	17	35	24	25	34

Source: UNEP Emissions Gap Report 2020, Fig. ES1 (p. XV) and Table ES1 (p. XIX).³⁵

UNEP estimates that to meet the 1.5°C goal without overshoot, global emissions are required to reduce by 7.6% each year from 2020 to 2030.³⁶ UNEP concludes that, on the basis of current unconditional NDCs, the world is heading for a temperature increase of 3.2°C in 2100.³⁷

(b) Circumstantial change: Scientific findings and global action

Over the past year, a discernible change has occurred within the global community in both scientific concern with the increasing impact of climate change and the need for more effective global action.

Change in scientific findings

During 2021, three crucial reports updating the scientific understanding of climate change have been released, as follows.

WMO: State of the Global Climate 2020: Unpacking the Indicators (21 April 2021)

a) Major gas emissions in 2019

In 2019, GHG concentrations reached new highs:

- Carbon dioxide: 410.5±0.2 ppm = 148% of pre-industrial levels
- Methane: 1877±2 ppb = 260% of pre-industrial levels
- Nitrous oxide: 332.0±0.1 ppb = 123% of pre-industrial levels.

Despite setbacks from COVID-19, global greenhouse gas emissions *increased* in 2020.

b) Global mean surface temperature (GMST)

In 2020, GMST was 1.2 ± 0.1 °C warmer than the pre-industrial baseline (1850–1900). Despite developing La Niña cooling conditions, 2020 was one of the three warmest years on record. The last decade, 2011–2020, is the warmest on record.

c) Sea-level rise

Globally, sea level has been rising at an average of 3.29 (+/- 0.3) mm per year, peaking in 2020. In 2020, the world remained on course to exceed 2°C above pre-industrial levels, which will increase the risk of experiencing the pervasive effects of climate change beyond what is already seen.³⁸

³⁵ <https://www.unep.org/emissions-gap-report-2020> Note:

- The 'emissions gap' for 2030 is defined as estimated total GHG emissions resulting from full implementation of the NDCs less GHG emissions (least-cost scenarios) consistent with 1.5, 1.8 or 2.0°C (66% probability).
- The projected figure of 59 Gt CO₂-e is based on current policies of Paris Agreement Parties. By comparison, 'unconditional NDCs' would result in 56 Gt and 'conditional NDCs' in 53 Gt.
- The global goal of 25 Gt. In 2030 is based on a scenario of temperature increase peaking below 1.7°C and returning to under 1.5°C by 2100 (66% probability).

³⁶ <https://www.un.org/en/climatechange/science/key-findings>

³⁷ Ibid., p. XIII

³⁸ <https://public.wmo.int/en/our-mandate/climate/wmo-statement-state-of-global-climate>

WMO: Global Annual to Decadal Climate Update (27 May 2021)

The Update has calculated a 40% chance of temporarily reaching 1.5°C global warming at least once between 2021 and 2025, and a 90% likelihood of at least one year becoming the warmest on record.³⁹

IPCC: Climate Change 2021: The Physical Science Basis (9 August 2021)

The IPCC's Working Group I has produced its contribution to the 6th Assessment Report. The Report uses scenarios drawn from the updated version of the CMIP models utilised by the IPCC. The 5th Assessment Report (2014) developed three basic scenarios (Representative Concentrated Pathways, RCPs) using the CMIP-5 model, and the IPCC's 1.5 Degree Report (2018) was based on these. The 6th Assessment Report has developed five scenarios (Shared Socio-economic Pathways, SSPs) using the CMIP-6 model. Only one scenario, the most ambitious, is consistent with the Paris Agreement's goal of 1.5°C. CMIP-6 represents a 'substantial expansion over CMIP-5' in terms of the number of modelling groups participating, the number of future scenarios examined, and the number of different experiments conducted.⁴⁰

As the IPCC puts it, the Report provides 'new estimates of the chances of crossing the global warming level of 1.5°C'. The Group's Co-Chair observes that 'we now have a much clearer picture of the past, present and future climate, which is essential for understanding where we are headed, what can be done, and how we can prepare'.⁴¹

The Report is described by the UN Secretary-General as a 'code red for humanity':

The alarm bells are deafening, and the evidence is irrefutable ... The internationally agreed threshold of 1.5°C is perilously close. We are at imminent risk of hitting 1.5°C in the near term. The only way to prevent exceeding this threshold is by urgently stepping up our efforts and pursuing the most ambitious path.

We must act decisively now to keep 1.5°C alive. We are already at 1.2°C and rising. Warming has accelerated in recent decades. Every fraction of a degree counts. Greenhouse-gas concentrations are at record levels. ... Climate impacts will undoubtedly worsen. There is a clear moral and economic imperative to protect the lives and livelihoods of those on the front lines of the climate crisis. ... The public and private sector must work together to ensure a just and rapid transformation to a net-zero global economy.⁴²

Change in global action

Climate change has proven to be a challenge for global governance. At the outset, the international community judged the issue to be most appropriately left to traditional international negotiations and, as a result, the UNFCCC proceeds by universal consensus, with 197 sovereign Parties.

In 2007, as concern grew over the future impact of climate change, the UN Security Council considered the matter under the monthly presidency of the UK. The Council was unable to agree, however, that climate change was an appropriate issue within its mandate. When the matter was reconsidered, under German presidency, in 2011, the Council determined that climate change was a 'risk multiplier' but did not constitute a 'threat to international peace and security' – the critical phrase for collective enforcement action. Global climate governance therefore continues to be left to the UNFCCC negotiating framework.

In the past year, a heightened sense of alarm has entered the global discourse over climate change. In recent months the international community has responded to the above scientific findings:

- December 2020: The UN Secretary-General hosted a virtual Climate Ambition Summit in which he urged UN Member States to each declare a climate emergency.⁴³

³⁹ <https://public.wmo.int/en/media/press-release/new-climate-predictions-increase-likelihood-of-temporarily-reaching-15-%C2%B0c-next-5>

⁴⁰ <https://www.carbonbrief.org/cmip6-the-next-generation-of-climate-models-explained>

⁴¹ <https://www.ipcc.ch/2021/08/09/ar6-wg1-20210809-pr/>

⁴² <https://www.un.org/press/en/2021/sgsm20847.doc.htm>

⁴³ 'If we don't change course, we may be headed for a catastrophic temperature rise of more than 3 degrees this century. Can anybody still deny that we are facing a dramatic emergency? That is why today, I call on all leaders worldwide to declare a State of Climate Emergency in their countries until carbon neutrality is reached. Some 38 countries have already done so, recognizing the urgency and the stakes. I urge all others to follow.'

- February 2021: The UNFCCC’s interim NDC Synthesis Report was released, assessing the adequacy of current 2030 pledges for 75 Parties, accounting for 30% of global emissions.⁴⁴ Their combined NDC pledges will result in a 2.1% reduction in 2030 emission levels off 2017, compared with the required reduction of 45% (IPCC 1.5° Report).⁴⁵ As the UNSG commented, the UNFCCC Report is ‘a red alert for our planet. ... Now is the time. The global coalition committed to net-zero emissions by 2050 is growing’.⁴⁶ The final report, assessing the NDCs of all 191 Parties, will be released later this year, before COP-26.
- April 2021: The US Special Presidential Envoy for Climate declared that the US is committed to work with other countries to adopt the goal of net-zero emissions from international shipping by 2050.⁴⁷ Immediately thereafter (April 22–23), the US President hosted a virtual summit of 40 world leaders, including the NZ Prime Minister, with the goal of catalysing efforts at keeping the 1.5°C goal ‘within reach’. The President coined the concept of ‘enhanced climate ambition’, suggesting that the Summit would be an opportunity to address the ‘global security challenges’ posed by climate change.⁴⁸ For its part the US announced an ‘ambitious 2030 emissions target’ as its new NDC under the Paris Agreement. The President also urged the group to address the role of nature-based solutions in achieving ‘net zero by 2050 goals’.
- April 2021: Following the WMO report, the UN Secretary-General declared that ‘We are on the verge of the abyss. ... we have no time to waste. The climate is changing, and the impacts are already too costly for people and the planet. This is the year for action’. He called for all countries to commit to zero emissions by 2050.⁴⁹

The current targets (short- and medium-term), some recently announced, are shown in Table 2.

<https://www.un.org/sg/en/content/sg/statement/2020-12-12/secretary-generals-remarks-the-climate-ambition-summit-bilingual-delivered-scroll-down-for-all-english-version>

⁴⁴ *Nationally Determined Contributions under the Paris Agreement: Synthesis Report by the Secretariat* FCCC/PA/CMA/2021/2 (26 February 2021)

⁴⁵ *Ibid.*, para. 11(b). Equivalent to 0.7% off 1990 and 0.5% off 2010

⁴⁶ <https://unfccc.int/news/greater-climate-ambition-urged-as-initial-ndc-synthesis-report-is-published>

⁴⁷ ‘In support of the global effort to keep us in reach of 1.5°C and in support of global efforts to achieve net-zero by no later than 2050, the United States is committing to work with countries in the IMO to adopt the goal of achieving net-zero emissions from international shipping by no later than 2050.’

<https://www.ship-technology.com/news/us-join-imos-effort-achieve-net-zero-emissions/>

⁴⁸ ‘In recent years, scientists have underscored the need to limit planetary warming to 1.5 degrees Celsius in order to stave off the worst impacts of climate change. ... The Summit will also highlight examples of how enhanced climate ambition will create good paying jobs, advance innovative technologies, and help vulnerable countries adapt to climate impacts’. <https://www.whitehouse.gov/briefing-room/statements-releases/2021/03/26/president-biden-invites-40-world-leaders-to-leaders-summit-on-climate/>

⁴⁹ <https://news.un.org/en/story/2021/04/1090072>

Table 2
Circumstantial change: Enhanced ambition in the climate emergency

	2030			2050	2060
	Reduction	Base-year	Off 1990		
China	Peak CO ₂				Net-zero CO ₂
USA	50–52% GHG	2005		Net-zero GHG	
EU	55% GHG	1990	55%	Net-zero GHG	
UK	78% CO ₂ 40% GHG	2035 1990	40%	Net-zero GHG	
Canada	40–45% GHG	2005			
Australia	26–28% GHG	2005		none	
NZ	30% GHG	2005	11%	19–28 Mt CO ₂ -e	
NZCC	≥35% GHG	2005		13 Mt CO ₂ -e	

Sources: UNFCCC, Grantham Institute, Climate Action Tracker

<https://edition.cnn.com/2021/04/22/politics/white-house-climate-summit/index.html>

2. National Climate Governance and Policy

It is only within the context of global climate governance and policy that New Zealand's experience is relevant and can be objectively assessed. The Commission is required under the Statute to advance 'realistic' recommendations, and unavoidably it has to deal with New Zealand's climate policy over the past three decades, as well as the strengthening of the global effort with regard to the temperature goal. This section reviews the national experience in climate governance and policy over the past 30 years, then summarises the Commission's Report, with particular focus on the budgets and the two 2030 and 2050 targets.

2.1 NZ emissions: Historical and projected (1990–2050)

New Zealand's climate governance and policy has broadly responded to the global experience described in Section 1, with a time-lag of several years in each case.

New Zealand's target commitments, summarised below, have been weaker than most developed country Annex I Parties.

NZ original commitment under UNFCCC (1994): Return to 1990 by 2000

In 1994, New Zealand conveyed to UNFCCC its two national mitigation objectives:

- by 2000, a return in net CO₂-e emissions to its 1990 level, and 8% cut in livestock methane;
- an 'ultimate objective' of 20% off 1990 subject to certain conditions.⁵⁰

In 2001, New Zealand advised UNFCCC that its net emissions had increased by 6% over the 10-year period. New Zealand was, henceforth, focused on national policy-making to meet the Kyoto Protocol commitment.⁵¹

NZ commitments under Kyoto/UNFCCC (1997/2013): 5% off 1990 by 2020

The original commitment was followed by a dual Kyoto/Framework Convention commitment for the period 2008 to 2020:

- In 1997, New Zealand essentially recommitted to its 1994 pledge, committing under the Kyoto Protocol to return to 1990 levels by 2012. The five-year commitment period of 2008 to 2012 is known as CP-1 (Commitment Period 1). The aggregate Kyoto target was stronger – at a 5% reduction.
- In 2013, New Zealand declined to accept a binding mitigation commitment for 2013–20 (CP-2), adopting a voluntary UNFCCC target of 5% (1990/2020; gross-to-net). The aggregate Kyoto target for CP-2 was 18%.

The difference with the original commitment was that the 1994 target was aimed at exclusively domestic mitigation, whereas the Kyoto/UNFCCC commitments allowed for offshore mitigation.

During the three decades, 1990 to 2020, New Zealand's gross emissions increased by 26% and its net emissions by 34%.⁵²

NZ first commitment under Paris Agreement – NDC (2015–16): 11% off 1990 by 2030

The Paris Agreement marked a turning point in global climate governance in three respects:

- A strengthening in temperature goal, from 'below 2°C' to 'well below 2°C and pursuing effort towards 1.5°C', with consequent strengthening of emission reductions ('highest possible ambition');
- A link between the short-term goal (2030 NDC target) and long-term strategies (2050 Target);
- A change from specific national targets negotiated and included in the legal text (Kyoto Protocol) to nationally-determined targets as contributions to the global effort.

New Zealand's NDC Responsibility Target of 11% off 1990 was decided provisionally by Cabinet in July 2015 and formally communicated to UNFCCC in October 2016.

⁵⁰ *Climate Change: The New Zealand Response: New Zealand's First National Communication under the Framework Convention on Climate Change, Sept. 1994* (FCCC/NC/2 (12 June 1995) Exec. Summary, p. 3)

⁵¹ NC-3 (2001), Table 1, p. 3

⁵² NZ National GHG Inventory 1990–2019 (MfE; April 2021), p. 3 (using UNFCCC/Kyoto framework rules). The 2020 annual emissions figure is estimated.

NZ long-term 2050 Target under Paris Agreement (2019)

In the 2019 amending legislation, New Zealand committed to a single 2050 Target, comprised of two separate emissions baskets. Although the aggregate GHG level is not specified in the Act, the target range is calculated at 19-28 Mt CO₂-e. The Government’s projected net emissions level for 2050 is 23 Mt CO₂-e.

Figures 1 and 2 give the history of New Zealand’s emissions over the past three decades, projected emissions over the next three decades, and its planned ‘target accounting emissions’ for the same period.

Figure 1
NZ GHG emissions: Actual and projected (1990–2050)

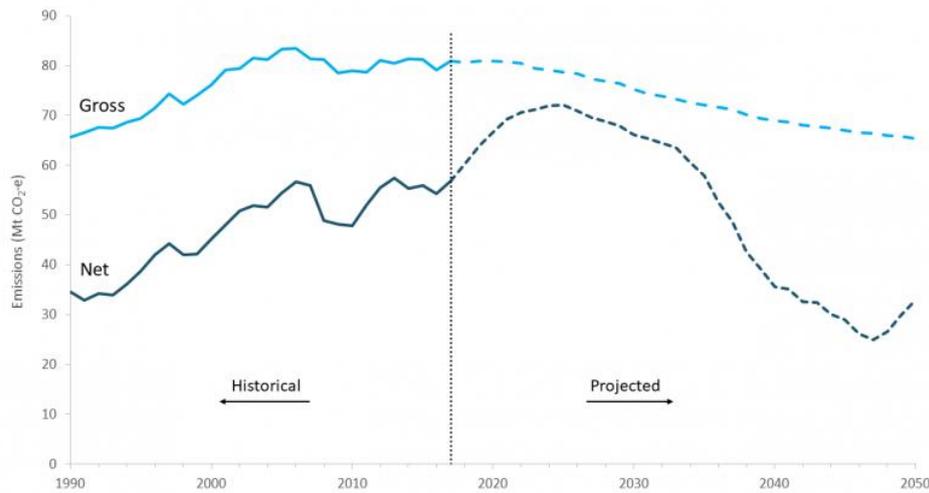
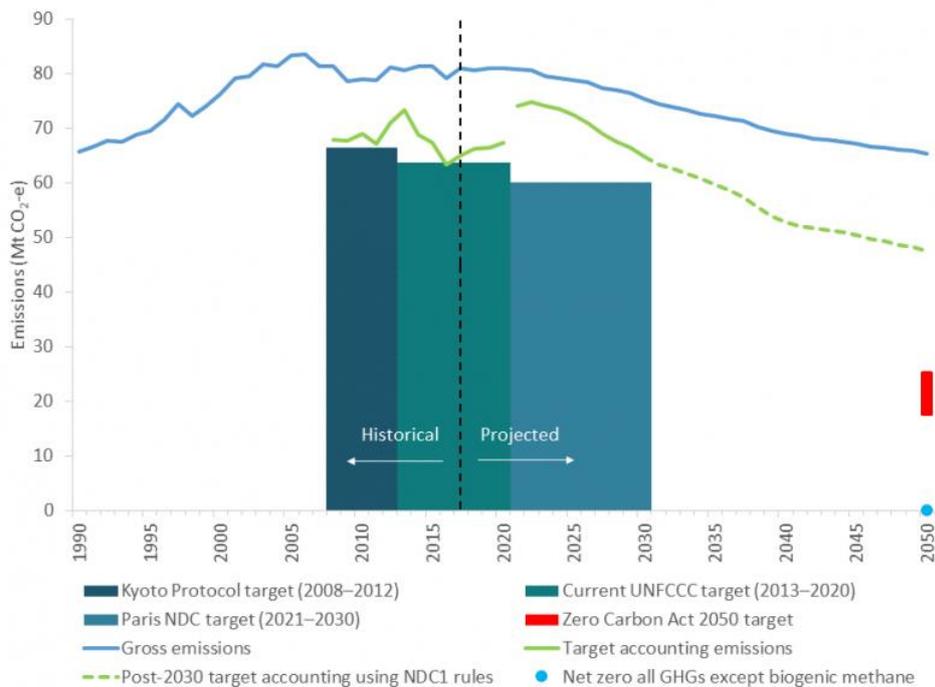


Figure 2
NZ GHG emissions: Target accounting (1990–2050)



Source: Ministry for the Environment: NZ historical and projected emissions GHG emissions from 1990 to 2050⁵³ While the above graphs are accurate on the MfE website, its accompanying comment states that the NZ 'targeted accounting emissions' for 2050 are projected at 39.4 Mt, when it appears to be 49.4 Mt CO₂-e.

The implications of New Zealand's emissions history and projections are explored in Section 3 (a).

2.2 The Climate Commission's report

The Commission is a Crown entity with a dual statutory purpose: to advise the Government on mitigating climate change (including through reducing emissions of greenhouse gases) and adapting to its effects; and to monitor and review the Government's progress towards these goals.⁵⁴ This Paper addresses the first purpose only, namely: advice on mitigation.

The Commission is a Crown entity which 'must act independently'.⁵⁵ In fulfilling its purpose the Commission is required to provide 'independent and expert advice'.⁵⁶ The Crown Entities Act 2004 applies to its work 'except to the extent that this Act [Climate Change Response Act 2002] applies otherwise'.⁵⁷ The legislation governing the work of Crown entities explicitly provides for safeguarding the independence of Crown entities.⁵⁸

The statute accords the Commission various duties, functions and powers.⁵⁹ Its duties are essentially three-fold: public engagement, independence of advice, and confidentiality of information. Its powers are referred to, but not explicitly identified.

The Act enumerates 12 functions,⁶⁰ which may be informally understood as comprising two kinds: 'automatic tasks' which the Commission is required and empowered to do without further reference or mandate; and 'discretionary tasks' in response to ministerial request.

The automatic tasks are essentially two-fold: planning, monitoring and reporting with regard to the emission budgets; and reviewing the 2050 Target. There is a difference in timing between these two tasks:

- the advice on the Budgets 1 to 3 (2022–35) are to be tendered in 2021; but
- any recommendation for change in the 2050 Target is scheduled for 2024/25 (coincident with advice on Budget 4, 2036–40), unless the Minister requests advice at any time.⁶¹

The discretionary tasks arise whenever the Minister requests advice on matters related to GHG emission mitigation and to climate change adaptation.⁶² In April 2020 the Minister requested advice on two matters:

- compatibility of New Zealand's current 2030 Target (NDC for the period 2021–30) with the global effort for the 1.5°C temperature goal; and
- eventual reductions that may be required in biogenic methane reductions.

The Commission addresses the automatic and discretionary tasks in the same Report, which is comprised of three parts. The first two address the Commission's 'automatic' tasks, conveying six of the eight 'pieces of

⁵³ <https://environment.govt.nz/what-government-is-doing/areas-of-work/climate-change/emissions-reduction-targets/new-zealands-projected-greenhouse-gas-emissions-to-2050/>

⁵⁴ CCRA 2002, Sect. 5(B)

⁵⁵ CCRA 2002, Sects. 5C, 5O. The Climate Commission falls into the category of 'independent Crown entity', the other categories being 'autonomous Crown entities' or 'Crown agents'. <https://teara.govt.nz/mi/crown-entities>

⁵⁶ CCRA 2002, Sect. 5(C). Given its independent status, it is puzzling that the Commission's Report contains the term 'New Zealand Government' on the front page, whereas the draft report did not. The 2018 Report on a low-emissions economy by the Productivity Commission, also an independent Crown entity, does not have this nomenclature.

⁵⁷ CCRA 2002, Sect. 5C(2)

⁵⁸ Crown Entities Act 2004, Sect. 113

⁵⁹ CCRA 2002, Part 1A, Sect. 5J to 5P

⁶⁰ CCRA, Sect. 5J, subs. (a) to (i)

⁶¹ CCRA 2002, s. 5S

⁶² CCRA 2002, s. 5K

advice’: budget levels, their domestic proportions, offshore justification, measurement rules, pricing policy and the Reduction Plan.⁶³ The third part addresses the ‘discretionary tasks’ pertaining to two ministerial requests: the adequacy of New Zealand’s 2030 Target (NDC), and the likely level of eventual biogenic methane reductions. This sub-section focuses on the recommended budgets (2022–35) and the recommended 2030 NDC target, including compatibility with the 1.5° global effort.

a) *The emissions budgets*

Methodology

The Commission has used the usual methodology for climate change studies, which has been generally reviewed positively. This involves scenarios, a scenario range boundary, and pathways within the range.⁶⁴

Four scenarios are envisaged (Tailwinds, Technology, Behaviour, Headwinds), with corresponding annual emissions for each over the 14-year period.⁶⁵ The most ambitious scenario (Tailwinds) and the least ambitious (Headwinds) form the boundaries of the emissions range. A ‘demonstration 2050 pathway’ of emissions within the range is plotted for the period, and alternative pathways also offered.

The Report is supported by a ‘substantial body of evidence’, with contractual work by two consultancies (Motu, Wellington; Vivid Economics, London). For calculating the effectiveness and impact of pricing and policy, the Commission used evidence from modelling, with data taken from Stats NZ Integrated Data Infrastructure, and three modelling systems based on CPR (Current Policy Reference case), viz. C-PLAN (for computer general equilibrium), ENZ (for environment – land use) and DIM (for distributional impacts).

Content

In Recommendation 1, the Commission identifies the three emissions budgets for 2022–35 as follows:⁶⁶

Table 3
The Commission’s budget recommendations

(a) Emissions budget levels (Mt CO₂-e)

	2019	Budget 1 (2022–25)	Budget 2 (2026–30)	Budget 3 (2031–35)
All gases net (AR5)		290	312	253
Annual average	78.0	72.4	62.4	50.6

In Recommendation 2, the Commission ‘recommends policies’ that will meet emissions budgets as follows:⁶⁷

⁶³ Report, p. 40. The Emissions Reduction Plan is to be developed for ‘the next emissions budget’, but may include policies and strategies for meeting subsequent budgets (see the inter-relationship in the Act between s. 5ZC(2), 5ZD, 5ZG, 5X(3) and 5ZH(1).

⁶⁴ The Evidence Report, released on 26 January, runs to 650 pages.

<https://www.climatecommission.govt.nz/get-involved/our-advice-and-evidence/>

⁶⁵ The scenario characteristics are as follows:

- **Headwinds:** Higher barriers to tech/behaviour changes; conservative improvements in technology beyond CPR (Current Policy Reference case); and modest change from existing behaviour by people/businesses.
- **Technology:** New technologies developed/deployed = faster emissions reductions; available sooner, perform better or have lower costs = drive greater adoption.
- **Behaviour:** Change in people/business preferences = behaviour change from high-emitting activities; conservative tech. progress (as in Headwinds) but barriers to adoption of existing tech. = lower.
- **Tailwinds:** Both tech./behaviour change = potential upper bound for how far and fast beyond CPR.

⁶⁶ Report, p. 74

⁶⁷ Report, p. 78

(b) Breakdown of emissions budget (Mt)

	Budget 1 (2022–25)	Budget 2 (2026–30)	Budget 3 (2031–35)	Metric	
Total net emissions budget	278	298	240	CO ₂ -e	
Annual average	69.5	59.7	47.9		
Forestry carbon removals	26	50	69		
Emissions: Long-Lived Gases(gross)	178	199	166		
Carbon dioxide	136	149	121		
Nitrous oxide	32	38	36		
F-gases	7	8	6		
Non-biogenic methane	3	4	3		
Emissions: Biogenic Methane (gross)	5.04	5.99	5.70		CH ₄
Emissions: Biogenic Methane (gross)	126	150	143		CO₂-e

Note: The figures in red do not appear in the Commission’s Report, but are consistent with its calculations.

Compatibility of the budgets with the 1.5°C global effort

The Commission, noting that the 2050 ‘targets’ were judged by the Government to be compatible with contributing to the 1.5°C global effort,⁶⁸ assessed whether its budgets were compatible with that goal.⁶⁹ In setting the targets, Parliament had ‘set the direction’ for what domestic contribution will be made to the global effort.

It follows that the first three budgets under consideration (2022–35) must:

- be met completely through domestic mitigation; and
- be compatible with the 2030 Target, which can have an offshore component; and
- be compatible with the 2050 Target, which is to be completely domestic.⁷⁰

In its assessment the Commission considered two issues: compatibility of the budgets with the 2050 ‘targets’, and how the different gas reductions in the budgets compared with the IPCC’s 1.5°C pathways. In this respect, the recommended NZ budgets compare well with the interquartile ranges of the IPCC pathways:

- carbon dioxide: NZ emissions reach net-zero by 2038, whereas the IPCC range is 2045–55;
- nitrous oxide: NZ mitigation at 3% (2030/2010) is within the IPCC range;
- methane: NZ agricultural mitigation (2030/2010) is outside the IPCC range; biogenic is within.

The Commission’s assessment is that the recommended budgets (2022–35) are ‘compatible’ with both the 2050 ‘targets’ and the requirements of the Act; and with ‘contributing to the global effort’ to limit warming to the 1.5°C goal.⁷¹

b) The 2050 Target

In finalising this assessment, the Commission noted its ‘ongoing role’ of reviewing the 2050 Target in the future to make sure that it remains compatible with New Zealand’s 1.5°C contribution ‘in light of changing global circumstances and new knowledge’.⁷²

⁶⁸ Some loose terminology is employed here: the Act specifies one single 2050 Target that requires two different quantitative emission goals (s. 5Q).

⁶⁹ Report, p. 184

⁷⁰ Report, p. 185. This is not strictly correct. While s. 5W of the Act identifies the budget purpose domestic mitigation, s. 5Z provides for domestic mitigation ‘as far as possible’.

⁷¹ Report, p. 194. Some loose terminology is employed here; the Act specifies, in fact, one single 2050 ‘target’ which requires success in meeting two different quantitative emission goals.

⁷² Report, p. 194

c) *The 2030 NDC Target*

The Commission has no direct ‘automatic’ function under the Act pertaining to the 2030 Target (NDC, 2021–30).⁷³ The Act does, however, identify New Zealand’s NDCs as a potential item for the Commission’s advice in response to a request at ministerial discretion.⁷⁴ Because of a request at the discretion of the Minister in April 2020, the Commission was tasked, in addition to confirming that its first three budgets are compatible with the 2050 target and the 1.5°C global effort, to advise whether the current 2030 Target is also compatible. As the Minister explained: ‘I consider a review necessary to ensure consistency between the NDC and the more recent temperature and emissions reductions goals in the Act after its amendment in 2019; and because the science has evolved considerably since the NDC was lodged in 2016 (in particular, the IPCC’s 2018 Special Report on Global Warming of 1.5°C).’

Applying the IPCC 1.5°C pathways to the 2030 Target

The starting-point for the Commission’s assessment of the compatibility of the NDC with the 1.5°C global effort is the interquartile range of the IPCC’s pathways in its Special 1.5 Report. These are shown in Table 4.

Table 4
The Commission’s 2030 NDC recommendations:
Converting global IPCC targets to national targets⁷⁵

Pathways	2030 Target (2030/2005)	NDC Budget 2021–30	Gas breakdown of budget (Mt)		
			Mt by gas		(Mt CO ₂ -e)
<i>Quartile</i>		(Mt CO ₂ -e)			
Lower	27%	608	225 CO ₂	Carbon dioxide	225
			12.4 CH ₄	Methane	310
			0.228 N ₂ O	Nitrous oxide	68
			6.2 CO ₂ -e	F-gases	6
Mid-point	36%	568			
Upper	45%	527	191 CO ₂	Carbon dioxide	191
			10.9 CH ₄	Methane	273
			0.194 N ₂ O	Nitrous oxide	58
			5.4	F-gases (Mt CO ₂ -e)	5

Note: The figures in red do not appear in the Commission’s Report, but are consistent with its calculations

If New Zealand were to make its 2030 Target compatible with the 1.5°C goal, its NDC budget for 2021–30 will need to be between 568 and 527 Mt CO₂-e. As the Commission explained:

Developed countries have emitted more cumulative emissions than developing countries, for longer, and have benefitted as a result. A core principle of UNFCCC (Art. 3.1) is that “the developed country Parties should take the lead in combating climate change”. And the Paris Agreement (Art. 4(1)) acknowledges that ‘peaking will take longer for developing countries’. Global emission reductions are a zero-sum game. If one country reduces emissions by a smaller amount, another country must reduce emissions by more if the world is to remain on track. Given that emissions in developing countries will peak later, in recognition of their development needs, emissions in developed countries must peak and reduce more quickly than the global average. New Zealand should therefore contribute more than the global average required for the 1.5°C global effort. Our advice is that the NDC be much less than the 2021–30 budget of 568 Mt CO₂-e, i.e. much more than 36% off 2005 by 2030.⁷⁶

⁷³ CCRA 2002, Sect. 5J. The Commission’s primary responsibility in this respect is the 2050 Target.

⁷⁴ CCRA 2002, Sect. 5K, Report to Government; and 5O, Commission must act independently, para. 2(b).

⁷⁵ Report, Section 21.2.1, pp. 354–55

⁷⁶ Report, p. 356–57

A stronger 2030 Target: Much more than 36%

The Commission concluded that the current NDC (30% off 2005 gross) is ‘not compatible’ with contributing to global efforts for 1.5°C, and that compatibility would require ‘much more than a 36% reduction’. Its judgement of ‘much more than 36%’ rested on the following ‘global-to-national’ method of reasoning:

- choosing among the IPCC’s Special 1.5°C Report (2018), with its many scenarios and pathways (resulting in significant, limited or no overshoot of 1.5°C) of gas-by-gas reductions for 2030, 2050 and 2100;
- acknowledging that, as a developed country, New Zealand ‘should commit to greater proportional reductions than the global average’;
- calculating that, based on the range (mid-point to upper quartile) in the IPCC’s relevant global emissions would result, for New Zealand, in emission reductions of 36% to 45% off 2005 (gross-to-net).⁷⁷

A precise figure: Beyond the Commission’s mandate

Because there is no universally agreed approach to reaching the 1.5°C goal, this starting-point is a ‘blunt approach’.⁷⁸ Relevant factors in deciding the precise level include: (i) the cost the country is ‘willing to bear’; (ii) social and economic impacts; (iii) international expectations and reputation; (iv) relative comfort with climate risk; and (v) balance between domestic and offshore mitigation.⁷⁹ Recommending a particular level for the NDC ‘is beyond our mandate, and falls under the remit of the Government of the day’.⁸⁰ How much above 36% is a political and ethical issue requiring decision from the ‘elected representatives’.⁸¹

The ‘national emissions gap’ and offshore mitigation

The Report gives considerable attention to offshore mitigation, one of the more contentious issues in climate policy. Offshore mitigation, the Commission points out, is a valid contribution under the Paris Agreement (Art. 6) provided it is ‘real, verifiable and additional’⁸² and, in the Commission’s judgement, not only valid but ‘critical’ for meeting even the current NDC.⁸³

- There is a growing gap between the NDC and domestic net emissions;⁸⁴ meeting the current NDC through domestic mitigation alone would be ‘highly challenging’.⁸⁵
- Emission reductions to meet the NDC will come from a combination of domestic and offshore mitigation. Any increase in NDC ambition, can be met in three ways: faster reduction of gross GHG emissions, increased CO₂ removals, or purchase of additional offshore mitigation.⁸⁶

The reason for this, the Commission concludes, is a combination of legislative requirements and historical shortcomings in national mitigation policy:

- The gap between the NDC and net emissions has arisen because past climate change targets have been met primarily using offsets from exotic production forestry, planted in the 1990s, rather than gross emission reductions. These forests are now reaching their long-term average carbon stock and no longer adding to CO₂ removal. As offsetting slows, net emissions will rise during 2019–22.
- The concurrent Paris requirement of highest possible ambition and progressively stronger NDCs means that New Zealand’s NDCs will become more stringent than previous targets.
- Increased forest planting will assist future targets but not the 2022–30 NDC target (6 years average).⁸⁷

The challenge in meeting the current NDC through domestic action alone is as follows:⁸⁸

⁷⁷ Report, pp. 352–58

⁷⁸ Report, p. 350

⁷⁹ Report, p. 349

⁸⁰ Report, p. 354

⁸¹ Report, p. 354

⁸² Report, p. 364

⁸³ Report, p. 364

⁸⁴ Report, p. 361

⁸⁵ Report, p. 363

⁸⁶ Report, p. 360

⁸⁷ Report, pp. 361–62

⁸⁸ Report, p. 363–65

- The Act states that the budgets must be ambitious but achievable, and met ‘as far as possible’ through domestic actions. These budgets are ambitious but achievable, and are ‘on track’ to meet the 2050 targets.
- Faster net domestic mitigation risks losing technological solutions over time.
- The scale of domestic mitigation to bridge the ‘NDC-domestic gap’ would likely lead to severe social and economic impacts on communities, people and businesses – far more than would be necessary to achieve the same mitigation over time.
- Mitigation above the proposed budget levels is dependent on unproven technologies.
- To an extent, constraints on the current level of the country’s ambition have been shaped by the policy settings of the previous several decades.

Focusing on unlocking greater ambition in the second NDC (2031–40) is not deferring or delaying action – it reflects the reality that policies implemented today will take time to take effect, requiring policy action now.

Planning to meet the NDC⁸⁹

Because of the above realities, the Commission advises that New Zealand must undertake rapid planning, with far-reaching implications:

- The Paris Agreement allows for both bilateral agreements (Art. 6.2) and a multilateral market mechanism (Art. 6.4), but the latter is not yet operational. Because there is currently no centralised UN-overseen market that is easily accessible, it is incumbent on countries to negotiate bilateral arrangements, such as Switzerland has already done.
- It is critically important to uphold ‘high standards of environmental integrity’.
- The issue needs to be settled of how the purchasing will be paid for and by whom (Government or emitters).
- The Government needs a plan for accessing and purchasing offshore mitigation. Neither the domestic nor international reporting frameworks currently provide sufficient information on how achievement of the NDC target, including through purchasing offshore mitigation, may impact public finances. This, however, was not within the Commission’s scope.
- The Government should hold itself accountable for meeting the NDC through regular and transparent reporting, including disclosure of possible fiscal risk from offshore mitigation.

The ‘form’ of the 2030 Target: Reputational implications⁹⁰

The Commission believes that the 2030 NDC ‘serves a different purpose’ from the domestic 2050 Target. The two targets, it suggests, also are differentiated in two ways:

- the NDC ‘includes an international contribution through purchasing offshore mitigation’;
- the NDC is a commitment under the Paris Agreement, and so decisions on form should take into account its agreed rules and expectations.

With this in mind, the Commission identified four hypothetical forms that New Zealand’s NDC could take:

- full all-gas target, with no reference to the domestic split-gas target in the headline target or its breakdown;
- headline all-gas target with acknowledgement of a split-gas domestic target;
- headline split-gas domestic target whose detailed breakdown contains all gases;
- fully split-gas target, which applies to both domestic and international contributions.

The Commission warns against the fourth option of two separate targets, mainly on two grounds:

- it ‘would be unlikely to meet current international expectations’ of a developed country whose contribution should be an all-sector, all-gas absolute emissions reduction target; and thus ‘some reputational impact’ from moving away from such norms and expectations;
- the Paris requirement of progressively increased ambition could limit flexibility in mitigation among the gases, with mandatory increases in national methane targets.

The Commission favours option 2, of ‘clearly maintaining a single, all-gas target’, while clearly setting out the contribution from the different constituent gases.

⁸⁹ Report, pp. 366–67

⁹⁰ Report, pp. 373–75

Summary

The substantive advice from the Report can be summarised as follows:

1. *The national contribution to the 1.5°C global effort should be above the global median*
While there is no universally agreed formula for a country's 'fair share', New Zealand has an obligation as a developed country to specify a mitigation target above the global average.
2. *The 2030 and 2050 targets are different in nature*
The two NZ targets are different in nature: the 2030 NDC is an international target by treaty that permits offshore mitigation as a component; whereas 2050 is a national target by legislation that must be met domestically.
3. *The recommended budgets are domestic*
The Act requires that the first three budgets (2022–35) are met domestically, and the recommended budgets, which are ambitious but achievable, meet the legislative requirement.
4. *The 2030 Target requires offshore mitigation*
The budgets, totalling 648 Mt CO₂-e for 2021–30 (2022–30 plus 2021 estimate), exceed the 2030 Target; offshore mitigation will therefore be needed to bridge the 'national emissions gap':
 - 9% offshore mitigation for the current NDC target of 596 Mt;
 - 14% to 23% for an NDC target, depending on ambition (568 Mt to 527 Mt).
5. *There will be a tri-decadal trajectory to 2050 full-domestic mitigation*
Future short-term reliance on offshore mitigation is due to past failure in gross emissions mitigation, New Zealand having met its previous net targets (2008–20) through domestic forestry plus foreign credits of dubious integrity. Because a UN global market is not yet operational, bilateral agreements are required short-term, which must be fiscally managed. A trajectory to full reliance on domestic mitigation by 2050 requires technological and behavioural change that requires an initial 'investment' period – especially in renewable energy, re-forestation and sustainable, low-emissions land-use.
6. *The 2050 Target can be met domestically*
The Act requires the 2050 Target to be met domestically, and the demonstration path shows New Zealand is 'on track' to meet this through net-emission reductions in Budgets 4, 5 and 6 (2036–50).
7. *The 2050 'split target' has implications for our international reputation*
New Zealand's 2050 'split target' will be most appropriately reported as an overall (headline) target expressed as carbon dioxide equivalent, with its dual gas componentry explained. Anything less may carry reputational risk through failing international standards of transparent reporting.
8. *The 2050 Target review may alter the budgets*
The Commission will review the 2050 Target by 2025; any significant change in specified circumstances will result in an altered target, and revised budgets.

3. Analysis: The Legislation and the Report

An assessment of any country's climate policy concerns two fundamental issues in relation to its national target: its ambition, and its composition. Two questions are relevant:

- Is the National Responsibility Target compatible with the global effort of 1.5°C, and is the proportion of domestic-offshore mitigation justifiable?
- Is the Target a 'single-combined' figure (expressed as carbon dioxide equivalent) or a 'dual-split' figure (comprising different sectoral or gas baskets)?

These two questions raise the issue of the relationship between a country's national policy and its international responsibilities, particularly with regard to the UNFCCC principles of ambition and transparency, strengthened under the Paris Agreement to 'highest possible ambition' and the 'Enhanced Transparency Framework'. This section analyses New Zealand's climate legislation and the Commission's Report within that context.

(a) Transparency

New Zealand's climate governance and policy have encountered complications in recent years as a result of its decision to construct a 2050 Responsibility Target in a particular way. As noted in section 1.2(b), the UNFCCC standard requirement is to express a national target as a single figure of carbon dioxide equivalent (CO₂-e), using the warming metric of GWP₁₀₀. For a 40-year period (1990 to 2030), New Zealand's targets have been, and continue to be, expressed in this manner. The 2050 Target, however, is not, which has given rise to shortcomings in transparency and public comprehension of its purpose and nature.

(i) Transparency problems in the 2019 legislation

Some loose drafting in the 2019 Act itself gives rise to confusion. Sect. 5Q specifies that the 2050 Target will be met if emission reductions 'meet or exceed' the reduction levels required in two emission baskets that make up the target.

- The first requirement is net-zero for 'emissions of greenhouse gases other than biogenic methane'. Biogenic methane is not a greenhouse gas. The legislation should have specified 'emissions of greenhouse gases other than those from biogenic methane'.
- The second requirement is a reduction in emissions of biogenic methane from 24% to 47% off a specified base-year. This is not a point-target but a range. The intent of specifying a range is normally for an outcome to fall within the range, but the Act's wording does not result in that. The result is that if biogenic methane reductions meet or exceed the less ambitious 24% goal, this component of the target's condition is met. The 47% boundary is irrelevant.

An additional shortcoming is that the Act leaves a major issue unresolved. It fails to clarify whether, if the sub-target of 5Q(1)(a) is surpassed in sufficient magnitude (net-negative emissions well beyond net-zero) to compensate for a failure in 5Q(1)(b) to meet a 24% reduction, the 2050 Target is met. The implication is that if either sub-target fails, the target fails. This promotes a 'split-target' to a doctrinal level that is counter-productive to sound climate governance. It falls short of an economy-wide, all-gas target expressed in one overall target of carbon-dioxide equivalent.

The 2050 Target is formally described in the legislation as a single target comprised of two emissions baskets but the Government, the Commission, and as a result the public speak of it as two targets or a 'split-target'. It is described as a 'split-gas target' which is incorrect since the methane gas appears in both emission components. The legislation's terminology is misleading, conveying 'biogenic methane' as a gas with the other basket being 'all other gases' which is incorrect.

In the policy formulation leading up to the May 2019 Cabinet decision, neither official advice nor Cabinet record contains any explicit rationale for separating biogenic methane (agricultural and waste) into one component of the 2050 Target. As the Productivity Commission notes, the GWP₁₀₀ (AR4) value of biogenic methane is 25 whereas fossil methane is 28, but this is insufficient as a criterion for any separation.

(ii) *Transparency problems in the Commission's Report*

The attachment to the particular 'split-target' within New Zealand has given rise to a variety of problems for the Climate Commission. The Productivity Commission's recommendation of 2018 was to express the 2050 Target as a single target which could be composed of long-lived and short-lived gases, and a separate policy basket for biogenic methane. The 2019 legislation, however, did not strictly do this.

For the Climate Commission to refer in the Report to the 2050 Target's first category ('greenhouse gases other than biogenic methane'; s. 5Q (1)(a)) as long-lived gases (LLGs) for 'ease of presentation' reflects a lack of professional rigour that is unbecoming of a Crown entity giving 'independent and expert advice'.⁹¹ The short-lived gases that are included in the basket described by the Commission as 'long-lived gases' amount to 4.3% of New Zealand's gross emissions.⁹²

The presentation of figures in the Commission's Report is significantly different to how the Government will be reporting the updated 2021–30 NDC, and reporting to UNFCCC the country's progress towards the 2050 Target. The problem of transparency could have been avoided in the event that the Act, and the Commission's Report, had simply complemented the 'split target' and the 'split-metrics' with an accompanying re-presentation of the same information in terms of the single UNFCCC carbon dioxide equivalent metric (CO₂-e), for both domestic understanding and international reporting.

(iii) *Transparency problems with official statements*

A consequence of developing two gas-categories and announcing the target as a 'carbon-zero' goal, is that the public, including informed groups, confuses the 'carbon-zero' target with an all-gas 'GHG zero' target.⁹³ It thwarts public understanding and weakens support for the 'ultimate objective'. In political commentary associated with the legislation, the Act is referred to as 'net-zero carbon'. Apart from causing domestic confusion, the choice of a split target has also drawn international criticism,⁹⁴ evoking an unseemly response from some NZ researchers.⁹⁵

None of this is a repudiation of the scientific distinction between long-lived and short-lived gases, or the policy merit of different emission reduction rates, by sector or by gas, according to IPCC pathways. The problem that has arisen is purely in terms of NZ climate governance: a doctrinal affiliation to the manner in which the 2050 Target is expressed using different metrics, at some cost – ease of comprehension.

Despite the final decision being to defer New Zealand's attainment of climate neutrality (net-zero GHG) to post-2050, the Government has continued at the highest levels to refer loosely to 'net-zero emissions' by 2050:

⁹¹ Report, p. 397

⁹² While the budget totals are expressed as CO₂-e, the details are not. Figure 7.17 of the Report (p. 126) appears to express biogenic methane as CO₂-e, without specifically acknowledging this.

⁹³ See, for example, the understanding of the British organisation, Business Green: 'New Zealand passes 2050 net zero target into law: New Zealand has become the latest country to legislate to cut greenhouse gas emissions to net zero by the middle of the century, placing in law a target that aims to keep global warming below 1.5C.'

<https://www.businessgreen.com/news/3083524/new-zealand-passes-2050-net-zero-target-into-law> and:

'[P]assing the Zero Carbon Act 2019, which commits New Zealand to reducing emissions. That legislation – which sets up a Climate Change Commission tasked with putting the country on a path to net zero emissions by 2050 – made New Zealand one of few countries to have a zero-emissions goal enshrined in law.'

<https://www.theguardian.com/world/2020/dec/02/new-zealand-declares-a-climate-change-emergency>

⁹⁴ For example, the Chair of the UK Climate Committee has conveyed the view New Zealand's split-gas framework 'puts its international climate change reputation at risk': 'I think you have to be a bit careful about the idea that, somehow or other, because it is short-lived compared with long-lived, it doesn't really count in the same way.' <https://www.newsroom.co.nz/uk-climate-advisor-nz-can-lead-the-world>

⁹⁵ The NZ experts argue that New Zealand's target is, in fact, stronger than the British target: 'The UK has pledged to get to net zero emissions in order to halt its contribution to warming by 2045. This is a great goal. New Zealand – if it meets its net zero long-lived gas target for 2050, and the mid-point of its methane target – would halt its contribution to warming some time in the 2030s.'

<https://thespinoff.co.nz/science/22-03-2021/dear-british-friends-spare-us-the-gassy-lectures-on-emissions/>

- October 2019: During the passage of the Bill through Parliament, the three relevant ministers (Prime Minister, Deputy PM, Climate Minister) issued a joint statement which, among other announcements, affirmed that the Government's actions to date on climate change included the Zero Carbon Bill to 'get us to net zero emissions by 2050'.⁹⁶
- December 2020: In moving a motion for Parliament to declare a national 'Climate Emergency', the Prime Minister referred to New Zealand 'establishing emissions budgets that set us on a path to net zero by 2050'.⁹⁷ This description is incorrect.

Separately from the Government, the chief executive of the independent Climate Commission wrote in July 2020 that 'Reaching net zero is possible. It just involves developing a collective new normal'.⁹⁸

(b) Ambition

It is important, for the sake of policy integrity and public understanding, for every country to be clear over the distinction between the various kinds of 'neutrality': GHG neutrality (climate neutrality), LLG neutrality (long-lived gas neutrality) and CO₂ neutrality (carbon neutrality). There is considerable confusion over this, especially in New Zealand. There is also some confusion over the extent to which a country can, and should, meet its Responsibility Target through offshore mitigation rather than domestic mitigation. Together, these two issues determine whether a Party has met its obligation to fulfil its 'highest possible ambition' under the Paris Agreement.

(i) New Zealand and climate neutrality

As Appendix 3 shows, the NZ Government was unsure for a considerable period over what form of neutrality – what level of ambition – it should aim for in its 2050 Responsibility Target.

- In December 2017 it had advised the Productivity Commission that one of its policy options for 2050 was climate neutrality, and the Commission accordingly responded in its Report (August 2018) with one of its two modelled scenarios at net-zero GHGs (the other being 25 Mt CO₂-e).
- A climate-neutral target was identified as one of three options in the Discussion Document (June 2018).
- A climate-neutral target was one of six options in the departmental Regulatory Impact Statement (Nov. 2018) but was not preferred because of its 'significant risk of economic impacts', even though such a target would show 'considerable international leadership'.
- The Chief Executive Board's advice to Cabinet (21 Nov. 2018) conveyed a 'strong consensus across agencies' in favour of two separate targets (biogenic methane; AOGs) for a carbon neutral target, with a 'range of views' over climate neutrality.
- The critical decision for less than climate neutrality was made by Cabinet on 19 December 2018, based on a Cabinet paper (lodged 7 Dec.) for an Emissions Reduction Target comprising two components: a biogenic methane reduction and 'net zero for all other greenhouse gases except biogenic methane'. The Target was 'informed by climate science, likely economic impacts, the international context and the need to achieve political consensus'.⁹⁹
- The precise target level (see below) was decided by Cabinet on 2 May 2019, a week before it agreed to introduce the Bill into Parliament. The Bill was adopted on 7 November, with Royal Assent on 21 November 2019.

(ii) The precursor reports: Scenarios for 2°C and 1.5°C

The two reports that preceded the 2019 legislation, the 2017 cross-party Vivid Report and the 2018 Productivity Report, both developed scenarios that contained pathways to the two 'temperature goals' of 2°C and 1.5°C.

⁹⁶ <https://www.beehive.govt.nz/release/world-first-plan-farmers-reduce-emissions#https://www.beehive.govt.nz/release/world-first-plan-farmers-reduce-emissions>. Press release 24 October 2019

⁹⁷ https://www.parliament.nz/en/pb/hansard-debates/rhr/combined/HansDeb_20201202_20201202_08

⁹⁸ https://issuu.com/ipanz/docs/ipanz_july_2020_low_res_657 pdf, p. 25

⁹⁹ Government Response to Productivity Commission Report, p. 11

The Vivid Report identified its 14 Mt CO₂-e target with 2.0°C and its net-zero GHG target with 1.5°C. The Report makes it clear that the a 2050 net-zero GHG target is compatible with the 1.5 goal, but that the less ambitious target of 14 Mt CO₂-e is more aligned with the 2.0°C goal. This distinction applies equally to the Productivity Commission’s higher target of 25 Mt and the Act’s target-range of 19 to 28 Mt. Table 5 illustrates New Zealand’s 2050 Responsibility Target as it developed over the past decade, and its relationship to the global temperature goal. The first Target, struck in 2011, was consciously designed to contribute to what was then the stated goal of a 2°C increase limit. The Vivid and Productivity Commission Reports offered scenarios that responded to either a 2°C limit or a 1.5°C limit, in recognition of the 2015 Paris Agreement. The Government’s 2019 amending legislation adopts the purpose of a full contribution to the 1.5°C goal, but its single Target, expressed as CO₂-e, makes it clear that it is within the range of 2°C rather than 1.5°C.

Table 5
NZ 2050 National Responsibility Target:
Compatibility with the 1.5°C global effort

			Responsibility Target	Domestic Mitigation	Offshore Mitigation	Temp Goal	
1990		Scenarios	Mt CO ₂ -e			%	
63.6	NZ Govt (2011)		31.8			2.0°C	
65.8	GLOBE-NZ (2017)	<i>Resourceful</i>	13.8	52.0	0	0	2.0°C
		<i>Net-zero</i>	1.8	64.0	0	0	1.5°C
65.8	Prod. Comm. (2018)	<i>Low ambition</i>	25.0				2.0°C
		<i>High ambition</i>		0			1.5°C
65.1	NZ Govt/NZCC (2019)/(2021)	<i>CCRA 24% BM</i>	27.6	37.5	0	0	1.5°C
		<i>CCRA 47% BM</i>	19.3	45.8	0	0	1.5°C

Notes:

1. Figures are net emissions GWP₁₀₀ (IPCC AR4 values).
2. The Government’s original 2050 Target (gazetted in 2011; lapsed in 2019) was net emissions equal to 50% of 1990 gross emissions. The 1990 gross emissions identified in the 2019 National Inventory (p. 2) was 63.6 Mt CO₂-e. The gross emissions figure of 65.8 in the Vivid and Productivity reports are based on the 2016 and 2018 Inventories respectively, and the Climate Commission’s figure of 65.1 is based on the 2021 Inventory.
3. The Act’s 2019 target and the Climate Commission’s Report require the target to be met domestically ‘as far as possible’, but allows offshore mitigation in the event of circumstantial change.
4. The Productivity Report did not comment on the temperature effect of its 25 Mt emissions target.

(iii) The Commission, the 2050 Target and the 1.5°C global effort

The most important issue to clarify is the relationship between the Commission’s functions, the Act’s 2050 Target, and the 1.5°C global effort. The issue is complex, and it is important to avoid circular reasoning in the interaction between New Zealand’s climate governance and policy.

The Commission is bound by the Act which established it. Unlike the UK Climate Committee, whose task since inception has been to recommend target levels to government,¹⁰⁰ the NZ Climate Commission is obliged to accept the NZ Government’s judgement of a 2050 Target that fully contributes to the 1.5° goal, prior to its establishment. It consequently wrestles with issues of independence and, to some extent, circularity of logic.

The Commission’s task is to recommend emissions budgets that fulfil the ministerial obligation in s. 5W(a) that the budgets meet the 2050 Target and contribute to the 1.5° global effort. The Government has made it clear that this means ‘fully contribute’, which implies that New Zealand is to meet its ‘fair share’.

¹⁰⁰ In December 2008, the UK Climate Committee recommended net-GHG emissions targets of 34% off 1990 by 2030 and 80% by 2050. In 2010, it recommended a budget that would result in a 2030 Target of 60%. In 2020, it recommended a 2050 Target of net-zero GHG emissions, which the UK Government has adopted. <https://www.theccc.org.uk/2020/10/16/ccc-welcomes-government-commitment-to-publish-net-zero-strategy/>

In its Report, the Commission notes that New Zealand's 'domestic emissions reduction targets' are set at a level that 'the Government has judged to be in line with contributing to global efforts to limit warming to 1.5°C', which is a requirement under the Act.¹⁰¹ Having identified an obligation to confirm this, it carries out its own 'detailed assessment'. Based on the IPCC's 2018 scenarios and pathways, the Commission develops its own view, concluding that:

Overall, our assessment is that our recommended budgets are compatible with the 2050 targets and the requirements of the Act, and with contributing to the global effort to limit warming to 1.5°C above preindustrial levels.

The Commission then notes, however, it has an 'ongoing role' reviewing the 2050 targets in the future to make sure that they 'remain compatible' with contributing to the 1.5°C effort in light of changing global circumstances and new knowledge'.¹⁰² Under s. 5S(1) of the Act, it is obliged to review the Target in 2024, unless the Minister requests an earlier review.

The situation in 2021, therefore, is that while the Commission explicitly concludes that its budgets are compatible with the Target and the 1.5°C contribution, implying that the current 2050 Target is 'in line with' the 1.5 goal in 2021, it is possible that new knowledge and changed global circumstances might result in New Zealand's 2050 target not being 'in line with' the 1.5°C goal after 2024.

It is important to clarify the logic of this situation. The IPCC/UNFCCC 1.5°C goal rests on scientific-political judgement that this is the temperature-increase limit necessary to avoid the impacts of dangerous climate change. While nothing is immutable, it is highly unlikely that this judgement will change, and thus the 1.5° goal can be accepted as a constant for the purposes of global and national climate policy. Any review of New Zealand's 2050 Target is unlikely to be influenced by a change from the 1.5°C temperature goal.

The same does not hold for the remaining global emissions budget, which diminishes with every passing year of inadequate global action. The global budgets for the 1.5°C goal advised in the IPCC Special Report (420 Gt CO₂ for 66% probability) were calculated on a 2017 base-year.¹⁰³ With regard to all GHGs, the Report states that:

Limiting warming to 1.5°C depends on greenhouse gas (GHG) emissions over the next decades, where lower GHG emissions in 2030 lead to a higher chance of keeping peak warming to 1.5°C (high confidence). ... Limiting warming to 1.5° implies reaching net zero CO₂ emissions globally around 2050 and concurrent deep reductions in emissions of non-CO₂ forces, particularly methane (high confidence).¹⁰⁴

Four subsequent years of the global emissions gap (described in Section 1) have already diminished this global net GHG budget further, as the UNEP 2020 Emissions Gap has shown (Section 1.3(a)).

It should therefore be recognised that any review of New Zealand's 2050 Target, whether it is undertaken in 2024 or in 2021, affirms that, based on change in global action (that is, continuation of the global emissions gap and diminution of the remaining Global GHG Budget), New Zealand's single all-gas Target has to be stronger than the 2019 amending legislation has provided for.

The change is not based on any reconsideration of whether the 2050 Target was correctly judged in 2019 to be compatible with the 1.5°C goal, but rather on the fact that in 2021 or 2024 it is no longer compatible. The sooner the review is undertaken, the better it will be for New Zealand's climate governance. If 'national feasibility' requires offshore mitigation all the way through to 2050, this may prove to be a necessary part of the decision.

¹⁰¹ Report, p. 184

¹⁰² Report, p. 194

¹⁰³ IPCC Special 1.5 Report (2018): Ch. 2 Exec. Summ., p. 96: 'The remaining carbon budget is defined here as cumulative CO₂ emissions from the start of 2018 until the time of net zero global emissions'.

¹⁰⁴ Ibid., p. 95

The current Target is weaker than 2050 climate neutrality, achieving net-zero GHG target around 2065, but it is stronger than 2050 LLG neutrality and carbon neutrality. The rationale within the official policy-reasoning was that the Paris Agreement envisages global peaking 'in the second half of the century', with the (unstated) implication that 2065 would be a reasonable year for New Zealand to achieve climate neutrality. But while the reasoning acknowledged that developed countries had to take the lead in global peaking, the official advice did not explicitly advance any analysis of what this might mean, in terms of a target year, for New Zealand attaining climate neutrality.

To the contrary, the critical advice in the RIS was that Option 4 (net-zero GHG emissions across all gases by 2050) was 'viable but not preferred'. The reasoning was as follows:

Option 4 succeeds on the criteria of bold ambition and sending a clear signal to the domestic economy and to the international community. A target set at this level would represent considerable international leadership and put New Zealand front and centre among the countries making every possible effort to keep the world on a trajectory that is consistent with holding the global average temperature to 1.5°C above pre-industrial levels. This option was also preferred by a clear majority of submissions (99.9% form submission; 58% non-form; 90.6% overall).

However, it does not explicitly acknowledge the scientific basis for different pathways for different gases. The level of ambition also carries with it the risk of the most significant economic impacts, which would exacerbate the risks of uneven distributional impacts and require greater measures in support of a just transition. While these risks could, to an extent, be mitigated by the use of international units, this would come to the detriment of a clearly signalled transition to a low-emissions economy domestically. Alternatively, the timeframe for achievement of GHG neutrality could be extended beyond 2050.¹⁰⁵

Thus the official advice was not to prefer the viable option that would make 'every possible effort ... consistent with' the 1.5°C global goal. This effectively repudiates the Paris Agreement objective that all Parties aim to reach global peaking of greenhouse gas emissions 'as soon as possible', and that the 2030 target reflects each country's 'highest possible ambition'.¹⁰⁶ Under Paris, global peaking is qualified by three conditions: equity, sustainable development, and poverty eradication; and a country's highest possible ambition is qualified by its differentiated responsibilities and respective capabilities, and its different national circumstances. But the official advice remains that net-GHG by 2050 is viable; simply not preferred.

Yet net-zero GHG by 2050 was preferred by a majority in the public consultation, and both the Vivid and Productivity Commission reports contained scenarios that achieved the goal. The 'strong cross-agency consensus' appears to have superseded the Paris Agreement and domestic public opinion, and the Cabinet concurred.

The target year for climate neutrality of 2065 is consistent with the 2°C goal. The target year of 2050, as the RIS explicitly noted, is consistent with the 1.5°C goal. Notwithstanding this, the 2019 legislation asserts that the 2050 target, and thus a 2065 climate neutrality year, is consistent with the 1.5 goal. And the Climate Commission has assessed in 2021 that this is the case as well. Yet the Commission also advised that New Zealand's updated 2030 target should be much more than 'just aligning with the middle of the IPCC interquartile range'. Applying the same reasoning to New Zealand's 2050 target, the biogenic methane target would need to be a 35–47% reduction (IPCC's mid-point to upper quartile range).

(iv) *Is the Commission's advice 'lawful'?*

In July 2021, proceedings were filed in the High Court seeking judicial review of the Commission's advice in its Report to the Minister.¹⁰⁷ The Action submits that the advice does not comply with the Act or with New Zealand's obligations under the Paris Agreement, primarily on the grounds that it has misinterpreted or failed to comply with the requirements of the IPCC Special 1.5°C Report.

¹⁰⁵ Regulatory Impact Statement, p. 65

¹⁰⁶ Paris, Art. 4.1, 4.3

¹⁰⁷ <https://www.lawyersforclimateaction.nz/news-events/ccr-jr>

The IPCC, however, had made it explicitly clear that ‘national and sectoral characteristics can differ substantially from the global trends shown’ in its pathways, and that ‘these pathways illustrate relative global differences in mitigation strategies, but do not represent central estimates, national strategies, and do not indicate requirements’.¹⁰⁸ And as the Commission noted, the IPCC 2018 pathways were simply a ‘starting-point’ for its calculation, and further assessment on the NDC’s compatibility with the 1.5°C goal depended on ethical and political judgements about international equity.¹⁰⁹

Under the domestic legislation, there is no judicial remedy or relief for failure to meet the 2050 Target or the emissions budgets, other than a court declaration and awarding of legal costs. If a final declaration to that effect is made, the Minister must present it to Parliament with advice on the Government’s response.¹¹⁰

It may be argued, as a political judgement, that the recommended NDC is not strong enough on grounds of equity, but not that the Commission’s judgement and advice is unlawful through a failed methodology. This does raise, however, the contentious issue of what a ‘fair share’ is for any country, and particularly for a developed country, in terms of its contribution to the 1.5°C goal. This is explored below.

(v) The concept of ‘fair share’

The most elusive, yet critical, concept in global climate governance is that of ‘fair share’. The legal texts do not use the precise phrase but they establish the principle for national interpretation:

- The Framework Convention notes that the ‘largest share of historical and current global emissions’ has originated in developed countries and that their ‘share of global emissions’ will grow in light of their development needs.¹¹¹
- The Paris Agreement is ‘in pursuit of the objective of the Convention’ and is ‘guided by its principles including [the] principle of equity and common but differentiated responsibilities and respective capabilities, in the light of different national circumstances’. States Parties are to undertake and communicate ambitious efforts in their nationally determined contributions to the global response.¹¹²
- Above all, the COP-21 decision adopting the Paris Agreement, as noted above, agreed that information the Parties provide to UNFCCC on compliance with their NDCs ‘may include, as appropriate, ... information ... on how the Party considers that its national-determined contribution is fair and ambitious in light of its national circumstances’.

States Parties, however, have chosen not to develop any formal methodology for determining a country’s ‘fair share’ for the 1.5°C global effort. The UNFCCC Synthesis Report noted, with solemn irony, that: ‘Almost all Parties explained, using different metrics, how they consider their NDCs to be fair and ambitious in the light of their national circumstances’,¹¹³ even though their combined effort had recorded a 2.1% reduction instead of the required 45% – compelling evidence that an exclusively ‘bottom-up’ approach to solving a shared global problem will not succeed.

¹⁰⁸ IPCC Special Report, *Global Warming of 1.5°C* (2018): Note to Fig. SPM 3(b), pp. 14–15

¹⁰⁹ Report, p. 354

¹¹⁰ CCRA, Sect. 5ZM

¹¹¹ Framework Convention, Preamble, para. 3

¹¹² Paris Agreement, Preamble, para. 3

¹¹³ FCCC/PA/CMA/2021/2 (26 February 2021), Section H. Fairness and ambition in the light of national circumstances (paras 118–121). See also, the UNFCCC Secretariat’s earlier observation in its 2016 Report on the INDCs of 189 States Parties: ‘All Parties included a narrative as to how they consider their INDCs to be fair and ambitious, as well as to how they contribute to the objective of the Convention. Many Parties provided information on the global context in which their INDCs should be viewed, including: a shared global effort undertaken in a fair and equitable manner with the participation of all Parties: equity; common but differentiated responsibilities and respective capabilities; recognition of national circumstances and the right to sustainable development; and application of the same rules to all Parties and the use by all Parties of the same legal form of commitment. Some Parties noted that no single indicator can reflect fairness or a globally equitable distribution of efforts.’ *Aggregate Effect of the Intended Nationally Determined Contributions: An Update* (FCCC/CP/2016/2, para. 25; and Sect. 7. Fairness, ambition and contribution to the objective of the Convention, paras 169–252.

It is a telling feature of contemporary global climate governance that development of such a methodology is left to academic research and civil society. The purpose of such a framework was accurately explained in the joint report by an NGO group in November 2015 on the eve of COP 21:

[E]ven through there's room for discussion about the precise definition and qualification of fair shares, equity is far beyond a matter of opinion. While different Parties may never precisely agree on an exact formulaic definition of fair shares, it is entirely possible to offer decision-makers and citizens equity benchmarks based on meaningful 'equity ranges' that reasonably represent a broad range of legitimate interpretations of the Convention's core equity principles. ... Well-defined equity ranges are narrow enough to tell if a given nation's contribution is consistent with the demands of science and equity and to identify those who need to do more to meet their fair share.¹¹⁴

The recognised framework for a 'fair share methodology' is provided by the Climate Equity Reference Project (CERP).¹¹⁵ The integrity of the CERP methodology is set out in the comprehensive and thorough report by EcoEquity and the Stockholm Environment Institute:

This framework is based upon an effort-sharing approach, uses flexibly-defined national 'responsibility and capacity indicators', and is explicitly designed to reflect the UNFCCC's core equity principles. It can be applied using a range of possible assumptions, and whatever values are chosen, they are applied to all countries, in a dynamic fashion that reflects the changing global economy. ... Each country's share of global responsibility and capacity determines its fair share of the global mitigation effort. ... this fair share is expressed as a sum of domestically- and internationally-supported mitigation.¹¹⁶

The methodology known as the 'Ambition and Equity Settings', with the ensuing calculator, draws upon two primary factors:

- historical and projected data for each State Party (GDP, population, GHG emissions);
- global capacity, i.e. the remaining global emissions budget for both 2°C and 1.5°C.

Each country's share of the global capacity is thus estimated, and the calculated 'Resulting Responsibility and Capacity Index' (RCI) determines its 'fair share' as a percentage of the global mitigation effort.

The most recent report of 2018 (Energy Research Centre, Univ. of Cape Town; New Climate Institute, Cologne, Germany, and Environmental Systems Analysis Group, Wageningen University, Netherlands) assesses the 'fairness' of 163 INDCs. The report concludes:

A hybrid approach to equity—combining bottom-up assessment and top-down allocation—would be consistent with the hybrid architecture of the Paris Agreement, which comprises bottom-up elements such as NDCs and top-down elements such as global goals. Improved information on equity in NDCs will be an important input to the global stocktake 'in the light of equity'.¹¹⁷

It is on the basis of this methodology that the global community is able to make an objective judgement about the adequacy of the combined NDCs of all States Parties and whether a particular country has contributed its 'fair share'. This is undertaken by Climate Action Tracker, operated by two institutes (Climate Analytics, New

¹¹⁴ *Fair Shares: A Civil Society Equity Review of INDCs*, November 2015, p. 6 pdf

¹¹⁵ Also of note, for a thorough review of historic emissions and future global carbon budget, is the paper provided by the South Centre for the UNFCCC AWG-LCA Equity Workshop: *The Equitable Sharing of Atmospheric and Development Space: Summary*, M. Khor, South Centre (Bonn, 16 May 2012)

¹¹⁶ *National Fair Shares: The Mitigation Gap – Domestic Action and International Support*, Climate Equity Reference Project Report: EcoEquity & SEI (Nov. 2014), p. 2

¹¹⁷ Winkler, H., Höhne, N., Cunliffe, G. et al. *Countries Start to Explain how their Climate Contributions are Fair: More Rigour Needed*. *Int. Environ. Agreements* 18, pp. 99–115 (2018). <https://doi.org/10.1007/s10784-017-9381-x>. The report was funded by UNEP, and references 49 studies.

York, Lomé, Perth; and New Climate Institute, Cologne, Berlin), with support collaboration from the Potsdam Institute for Climate Impact Research (PIK).¹¹⁸

Climate Action Tracker judges New Zealand’s 2030 NDC of rating to be ‘insufficient’, resulting in global warming of $\geq 3^{\circ}\text{C}$.¹¹⁹ The CERP calculator, selecting the default ‘middle range’, results in a National Responsibility Level (NDC) for 2030 of -4 Mt CO₂-e.¹²⁰

UNFCCC, pursuant to the non-intrusive, non-punitive, non-adversarial approach laid out in the Paris Agreement, conducted, in March 2021, a technical review of New Zealand’s 4th Biennial Report, which was submitted in 2019 (revised version in 2020).¹²¹ In the report, no assessment is made regarding the adequacy of the various NZ targets.¹²²

How does New Zealand compare with other developed countries? The UK served as the principal model for New Zealand in establishing its Climate Commission. Although there are independent advisory bodies in other countries, the UK was the pioneer in national climate governance, establishing its independent Climate Change Committee (CCC) in 2008, and there are lessons that New Zealand can still take from the British experience. The comparative history in ‘target ambition’ of the UK and New Zealand is shown in Table 6.

Table 6
UK and NZ net GHG emission targets (CO₂-e) off 1990

(a) UK Climate Change Committee

Year of advice	Target year			
	2020	2030	2035	2050
2008				80%
2009	34%			
2010		60%		
2019				$\geq 100\%$ Net-zero GHG
2020		68%	78%	

Source: <https://www.theccc.org.uk/uk-action-on-climate-change/reaching-net-zero-in-the-uk/>
CCC Carbon Budgets & Targets: <https://www.theccc.org.uk/topic/carbon-budgets/>

(b) NZ Government & Climate Change Commission

Year of advice	Target year			
	2020	2030	2035	2050
2011 (Govt)				50%
2013 (Govt)	[5%]			
2016 (Govt)		11%		
2019 (Govt)				58–70%
2021 (Commission)		17%		
2021 (Commission)				80%

Notes:

- The UK-CCC recommendation for 2030 was that the entire 68% reduction should be domestic mitigation, as part of its NDC.
- The NZ-CCC recommendation for 2030 was that while the 11% reduction should be entirely domestic mitigation, anything more towards the 17% target would require offshore mitigation.

¹¹⁸ <https://climateactiontracker.org/about/the-consortium/>

¹¹⁹ <https://climateactiontracker.org/countries/new-zealand/>

¹²⁰ <https://calculator.climateequityreference.org/>

¹²¹ <https://unfccc.int/documents/266364>

¹²² FCCC/TRR.4/NZL (8 March 2021). https://unfccc.int/sites/default/files/resource/trr4_NZL.pdf

From the above, it is clear that the UK is far ahead of New Zealand on climate governance, with positive effect on timing and substance of national policy. Yet despite the demonstrable difference, New Zealand has continually asserted that it is doing its fair share.¹²³

(vi) *The Climate Emergency, the 2030 Target, and short-term methane mitigation*

The UK and New Zealand management of methane emissions is illustrative of the respective quality of their climate governance. Between 1990 and 2019:

- UK methane emissions level dropped by 60% while New Zealand's increased by 6%.¹²⁴
- The proportion of methane in each country's gross emissions level changed: in the UK from 17% to 12%; in New Zealand from 50% to 42%.¹²⁵

The fact that New Zealand has a higher proportion of methane in its emissions profile is immaterial to the global challenge for all countries to share in reducing methane emissions. Ireland also has a high proportion of methane; New Zealand has more but the difference is relative, not qualitative for policy purposes.¹²⁶ Given the nature of the emergency status of climate change today and the need for urgent action towards temperature stabilisation in the short-term, and noting that the above figures are based on GWP₁₀₀, the reasoning is conclusive that the priority for national climate policy in the 2020s is methane mitigation.

The Commission makes the following observation about methane:

Molecule for molecule, methane emissions have a much greater warming effect in the atmosphere than carbon dioxide. However, methane is a short-lived greenhouse gas. It has an intense warming effect for the first few decades after it is emitted, but this effect dissipates as methane breaks down in the atmosphere. Methane's properties mean it has a different effect on warming, which is an important factor when considering global and domestic pathways for reducing emissions.¹²⁷

¹²³See, for example: NZ Climate Minister's announcement on the 2020 Target of 11% (2016): 'The target is affordable and demonstrates that New Zealand is doing its fair share to address global climate change. In deciding this target, the Government has carefully balanced the cost to New Zealand households and businesses against taking ambitious action to tackle climate change.' And: NZ Climate Commission: Letter from the Chair (Advisory Report 2021): 'As a country we should use only our fair share of the remaining global carbon budget – the greenhouse gases we can emit and still limit warming.' For the UK, see the Climate Committee (Dec 2020): 'Raising the UK's climate ambitions for 2035 will put Net Zero within reach and change the UK for the better. The CCC's message to Government is clear: the 2020s must be the decisive decade of progress and action on climate change. ... The CCC concludes that these changes are feasible and affordable but only if they are led by decisive action from Government now. And the process must also be fair and just – the report includes important new insights into how the costs and the benefits of Net Zero can be shared more evenly. ... With bold new climate commitments from China and, soon, the US, over half of global greenhouse emissions will shortly be covered by Net Zero targets. This has brought the goals of the Paris Agreement within reach. If the CCC's recommendations are adopted by Ministers next year, the Sixth Carbon Budget will position the UK as a true global climate leader, as it prepares to host heads of state for the next major climate summit in Glasgow.' <https://www.theccc.org.uk/2020/12/09/building-back-better-raising-the-uks-climate-ambitions-for-2035-will-put-net-zero-within-reach-and-change-the-uk-for-the-better/>

¹²⁴ UK: from 133.9 Mt to 54.0 Mt CO₂e

[file:///D:/210522/UK %20methane%20\(CH4\)%201990-2019%20 %20Statista.html](file:///D:/210522/UK_%20methane%20(CH4)%201990-2019%20%20Statista.html)

NZ: from 32.795 Mt to 34.621 Mt CO₂e (National GHG Inventory 1990–2019, Table ES 3.1, p. 5)

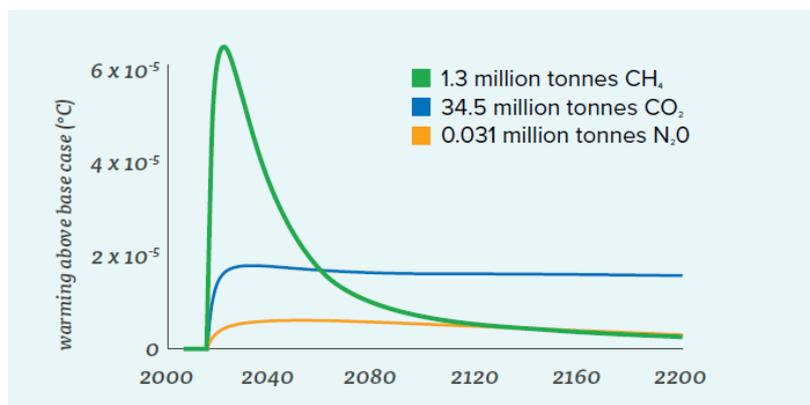
¹²⁵ UK National GHG Inventory 1990–2019, pp. 36–38

¹²⁶ As further comparison: Ireland is part of the EU's targets of 40% for 2030 off 1990 (55% recommended by the EC in 2020) and net-zero GHG by 2050. Ireland's national methane proportion was 24% in 1990 and 2019, with its emissions increasing 10% over the period. (Ireland's National Inventory Report 2021 (1990–2019), Tables 1.2, 1.3 p. 14 (Ireland EPA) <https://unfccc.int/ghg-inventories-annex-i-parties/2021>. Uruguay, with a national methane proportion of 43%, has committed to a 57% reduction in CH₄ emissions intensity per GDP unit by 2025 (Uruguay NDC, Nov. 2017, p. 3).

¹²⁷ Report, p. 186

In 2019, the Interim Committee showed graphically how much of greater impact methane has in the short-term than any other greenhouse gas (see Figure 3):¹²⁸

Figure 3
Short-term and long-term impact of greenhouse gases (2000–2200)



The standard UNFCCC method of depicting this is to show the effect of methane emissions in terms of GWP with the two time-horizons. Table 7 gives the GWP of New Zealand’s methane emissions over the next 20 years (2020 to 2040) compared with the other gases, and in turn, a comparison over the next century.

Table 7
NZ GHG emissions in 2019 (Mt CO₂-e) based on GWP₂₀ and GWP₁₀₀ (AR5 values)

	GWP₂₀	GWP₁₀₀
CO ₂	37.5	37.5
N ₂ O	7.4	7.4
CH ₄	116.4	38.8
F-gases	6.6	1.8
Total (gross)	167.9	85.5
C ₂ O removals	27.4	27.4
Total (net)	140.5	58.1

These calculations show that, with regard to New Zealand’s 2019 emissions, the global warming potential:

- over the next 20 years (in 2040) is measured at 141 Mt CO₂-e;
- over the next 100 years (in 2120) is measured at 58 Mt CO₂-e.

New Zealand’s 2019 emissions are thus more than twice more potent for global warming over the next two decades than over the next century, with methane contributing 83% of the country’s contribution to short-term global warming. Even in the long-term, a century from now, methane is New Zealand’s largest contributor. This suggests that, given New Zealand’s Climate Emergency Declaration of December 2020, there is an overwhelming need to reduce its methane emissions to meet its ‘highest possible ambition’ over the short-term.

Notwithstanding this, the Commission adopts the following approach:

In our analysis of how Aotearoa could achieve our recommended emissions budgets, we have applied a split-gas framework that takes into account methane’s different properties. This is consistent with the approach taken by the Act. This avoids the use of metrics to

¹²⁸ *Action on Agricultural Emissions*, Interim Climate Change Committee (April 2019), Fig. 4.2, p. 25 <https://www.iccc.mfe.govt.nz/what-we-do/agriculture/agriculture-inquiry-final-report/>
 Reproduced in the Climate Commission Report (Fig. 9.1, p. 188)

compare methane with other greenhouse gases or trade off effort across the different greenhouse gases.¹²⁹

This also avoids assessing the ‘intense warming effect’ of methane over the next few decades. The acceptance of 10% mitigation (2050/2017) in biogenic methane in the 2050 Target is below the IPCC interquartile range (11%–30%). A more ambitious 2030 biogenic methane target would require land use and behavioural change rather than technological change, which is feasible, as the Vivid and Productivity reports indicated in their net-zero GHG scenarios.

Composition: The domestic/offshore mitigation balance

The notion of a country engaging in ‘offshore mitigation’ as part of its National Responsibility Target became formalised in the Kyoto Protocol (1997), and refined in the Paris Agreement (2015).

The Kyoto Protocol established three ‘flexibility mechanisms’ for this: Joint Implementation (purchasing among Annex I Parties); Clean Development Mechanism (assistance to developing countries); and International Emissions Trading. For the Kyoto CP-1 period (2008–12), New Zealand relied heavily on international ‘Kyoto units’, many of fraudulent quality. It carried such units over into the second period (2013–20), surrendering some before 2015, when UNFCCC excluded New Zealand from the Kyoto international carbon market. New Zealand is still relying on its own Kyoto units (NZ-AAUs) to get it through to meet its 2020 target. This is explained in detail in Appendix 3.

Mitigation in the short-term: 2030

The Paris Agreement (2021–30) also provides for offshore mitigation (Internationally-Transferred Mitigation Outcomes: ITMOs). New Zealand plans to use offshore mitigation as a significant component of its Responsibility Target (NDC) for 2030.

- New Zealand’s 2016 NDC Communication cites two conditions: acceptance of New Zealand’s preferred forestry accounting method, and access to a ‘global carbon market’.¹³⁰ The emissions budget figure (2021–30) of 596 Mt CO-e, based on an emissions price of \$50/tonne CO-e by 2030, relied on 80% offshore mitigation.¹³¹
- The Vivid Report scenarios allow for no offshore mitigation, relying entirely on domestic mitigation.
- The Productivity Report makes no specific recommendations but aims for domestic mitigation, noting the possibility of offshore mitigation.
- The Climate Commission Report explores offshore mitigation in detail, as shown below.

Mitigation in the long-term: 2050

All reports focus on domestic mitigation, although the 2019 Act allows for the possibility of offshore mitigation if necessary.

Under the Act the Minister is required to set a series of budgets in a way that can be met domestically.¹³² Although the budgets must be met domestically, the Act also states that they must be met domestically only ‘as far as possible’.¹³³ Offshore mitigation may be used.

¹²⁹ Report. p. 186

¹³⁰ Submission under the Paris Agreement: New Zealand’s Nationally-Determined Contribution: ‘Use of market mechanisms and cooperative approaches In meeting its target New Zealand intends to use international market mechanisms, cooperative approaches and carbon markets that enable trading and use of a wide variety of units/emission reductions/mitigation outcomes that meet reasonable standards and guidelines to ensure the environmental integrity of emissions reductions generated or purchased, guard against double-claiming/double-counting, and ensure transparency in accounting and governance.’

¹³¹ These details are not cited in the formal communication of the NDC to UNFCCC but are sourced in the consultancy report commissioned by the Government: *A General Equilibrium Analysis of Options for New Zealand’s Post-2020 Climate Change Contribution*, Infometrics (April 2015)

https://environment.govt.nz/assets/Publications/Files/general-equilibrium-analysis_0.pdf

¹³² CCRA 2002, s. 5W(b)

¹³³ CCRA 2002, s. 5Z(1)

Because of its past failure to reduce gross emissions, New Zealand judges that it has no alternative but to rely on offshore mitigation, at least in the short-term for the current 2030 target. Table 8 shows the expected reliance on offshore mitigation that is being contemplated, for the 2021–30 NDC.

Table 8
NZ 2030 National Responsibility Target:
Domestic/offshore mitigation

			Responsibility Target	Domestic Mitigation	Offshore Mitigation	Temp Goal	
		Scenarios	Mt CO ₂ -e			%	
NDC	NZ Govt (2015)		596	119	477	80%	2.0°C
n. a.	GLOBE-NZ (2017)	<i>Resourceful</i>	629	629	0	-	2.0°C
		<i>Net-zero</i>	584	584	0		1.5°C
NDC	Climate Comm. (2021)		596	648	52	9%	
NDC	Climate Comm. (2021)	<i>Mid-point</i>	568	648	80	14%	1.5°C
		<i>Lower</i>	527	648	121	23%	1.5°C

Note:

Emission figures are shown as CO₂-e based on IPCC AR4 values of GWP₁₀₀, taken from the Commission’s Report, pp. 354–55. Calculations are based on information in the Report (pp. 354–55 for IPCC, and p. 363 for the NZ budgets (576 Mt for the 2022–30 budgets plus forecast emissions of 72 Mt for 2021). The current NDC1, of 596 Mt, is shown on p. 355.

A single or ‘split’ Responsibility Target

From the early 1990s, the international community had identified national targets as a single CO₂-e target. In deciding its NDC, the Government considered a split target, and decided against it. In the proposal to Cabinet in June 2015, the Minister considered a ‘split target’ with methane treated separately but recommended against this for the following reasons:

I have also considered an alternate ‘split-target’ form with a different treatment for agricultural emissions. ... I do not recommend this approach. ... The accounting rules we use take into account these differences to factor in the relative ‘harmfulness’ of the different gases. There are other potential approaches which put less relative weight on methane but New Zealand has not gained traction in previous international negotiations on this use. Taking a split target would suit New Zealand’s national circumstances and we could attempt to justify it internationally. If we table such a target and these risks came to pass, then we could respond by revisiting our target form and level. However, it is unlikely this would fully reverse damage to our international reputation.¹³⁴

The Government agreed that the NDC should be an economy-wide, all-gas target expressed in terms of CO₂-e.

In 2018, however, a different policy approach was developed. Summary details are below:

- The Productivity Commission’s Draft Report (April 2018) explored in depth the relationship between long-lived and short-lived gases and its policy implications for national mitigation, but it made no mention of ‘biogenic methane’. Its Final Report in August, however, recommended that a 2050 target for biogenic methane be adopted.
- The departmental RIS of November 2018 did not specify a precise percentage of biogenic methane in its six options.
- In November 2018, the Climate Change Chief Executives Board advised Cabinet to adopt a biogenic methane target of 22–35% (2050/2016) plus net-zero for AOGs. The 22% figure had been identified by the PCE as the level of livestock methane reduction (2050/2018) required to prevent additional

¹³⁴ <https://environment.govt.nz/assets/Publications/Cabinet-paper-Paris-Agreement-on-Climate-Change-Approval-to-Begin-the-Parliamentary-Treaty-Examination-Process-proactively-released-for-information.pdf>, paras 25, 65

warming. The 35% figure was the mid-point of the IPCC global pathway for agricultural methane emissions for the 1.5°C goal.

- In December, the Minister proposed to Cabinet (in the paper lodged on 7 Dec.) a 35% reduction in biogenic methane. At its meeting of 19 December, however, Cabinet deferred a decision on the precise level. It agreed that the 2050 Target would include a reduction in biogenic methane, including if necessary net-zero, which would be decided following further inter-ministerial consultations. The Minister was asked to report back with a recommendation by 29 January 2019.
- On 2 May 2019, Cabinet made the final decision that the biogenic methane reduction (off 2017) would be 10% for 2030 and 24–47% for 2050. A range for 2050 was more appropriate given the uncertainties surrounding the science (in the IPCC Special Report) and future technology. The range adopted had regard for the IPCC Report, and the NZ reports by BERG and the PCE.

The decision to proceed along these lines is, as noted above, separating New Zealand from the approach taken by other countries.

4. Conclusions and Recommendations

The Paper has focused primarily on two aspects:

- the relationship between the recommended budgets (2022–35) and the 2030 Target; and
- the compatibility with the 2050 Target and with the national contribution to the 1.5°C global effort.

(a) Conclusions

While the Commission's advice is thorough and based on professional methodology, the Report contains shortcomings in its perception of the relationship between global and national climate governance. They are as follows.

1. New Zealand's 'fair share'

Although the Report acknowledges certain efforts at calculating a national 'fair share' undertaken by the academic community and civil society, it does not explore or rely on them in any way. The Commission's decision to leave the precise figure of a stronger 2030 target to the 'elected representatives' on the ground that it involves political and ethical judgements is questionable. The purpose of establishing a Crown entity giving independent and expert advice is to de-politicise such issues to an extent that facilitates a broad national and parliamentary consensus. This role is explicitly laid down in the Act for the Commission in its 2050 Target review, with assistance given in the form of 'significant circumstantial change', some of whose factors are clearly political and ethical (distributional impacts; equity; social and cultural issues). The Commission should have recommended a figure, with explanatory support.

2. Nature of the targets

Suggesting that New Zealand's 2030 and 2050 targets are different in nature is simply incorrect. Both targets derive from the Paris Agreement (Art. 4.2 for 2030; Art. 4.19 for 2050) and the UNFCCC decision adopting it (paras 17 and 24 for the 2030 Target; para. 35 for the 2050 Target). The Paris Agreement, being an integral part of New Zealand's Act (Schedule 2A), incorporates targets, strategies and procedures into domestic law. Both the 'nationally-determined contribution' (2021–30) and the 2050 Target for the 'long-term strategy' are the product of national decision-making in response to international obligation, the former by the country's executive (Cabinet) and the latter by its legislature (Parliament). The international principles and procedures apply similarly to both.

It is also incorrect to conclude that the 2030 Target allows offshore mitigation but the 2050 Target does not and must be domestic only. Offshore mitigation for the 2030 Target is provided for in the Paris Agreement (Art. 6). Offshore mitigation is permitted for the 2050 Target in the domestic legislation (CCRA s. 5T.1(d)). Even the six budgets, out to 2050, are to be met through domestic mitigation only 'as far as possible', with offshore mitigation permitted if circumstances change significantly (s. 5Z(1)).

3. The 2050 'split-gas target' and international reputation

The Commission is ensnared in the tension that is developing between New Zealand's 2050 'split-gas target' and its international reporting responsibilities, but it has not handled this well in the Report.

- While it is statutorily bound to recognise, and work with, the two emission goals in the Act, it has embraced what might be seen as loyalty to what it terms a 'split target', at a cost to statutory independence. It expresses headline targets in terms of the carbon dioxide equivalent metric (CO₂-e), but details of the budgets and the potential 2030 NDC are expressed in different metrics. This makes the Commission's advice near impossible to comprehend statistically without exogenous calculation. While the potential reputational harm is acknowledged, the Report does nothing to pre-empt it. This could have been rectified by including an additional table, whenever relevant, with all figures expressed in the same CO₂-e metric.
- Labelling the Act's first emissions category as long-lived gases for reasons of 'comfort' and 'ease of presentation', when some are short-lived gases, displays a lack of professional rigour.

While these shortcomings may respond to a domestic faith in a national 'split-target', it falls short of the international standards in the Enhanced Transparency Framework of the Paris Agreement.

4. Timing of the 2030 and 2050 target reviews

While this issue is not of the Commission's making, the timing of its two target reviews (with the 2030 Target being reviewed in 2021 and the 2050 Target to be reviewed in 2024), bestows further complication on New Zealand's climate governance.

- The ministerial request for advice on an updated 2030 NDC was conveyed in April 2020, with a reply anticipated in 'early 2021'. In fact, the Government received the advice in June alongside the emissions budgets, having undertaken to communicate an updated NDC to UNFCCC later in the year. The stronger NDC will affect, not the Commission's budgets but the size of New Zealand's offshore mitigation, with associated fiscal implications. Had the ministerial request been given in early 2020 for advice and governmental decision in late 2020, the 2021 Report would have been clearer concerning the amount of offshore mitigation, whose fiscal implications could have been addressed in the Government's 2021 Annual Budget. A year of planning has been lost.
- The statutory obligation to review the 2050 Target within three years would require, in the event it is strengthened, and yet is also domestic 'as far as possible', a review of Budgets 2 and 3 (2026–35). In addition, any strengthening of the 2050 Target will, through 'back-casting', affect the upgraded 2030 Target (NDC), insofar as the trajectory of the domestic/offshore mitigation relationship is influenced over time (2026–50).

b) Recommendations: Governance and policy in the 'climate emergency' era

Two recommendations are advanced:

Enhanced transparency

All NZ Responsibility Targets (the 2030 NDC and the 2050 Target), and their associated emissions budgets and demonstration pathways, should be expressed in terms of carbon-dioxide equivalence, using GWP₁₀₀ (AR5 values), including all component baskets of the 2050 Target.

Highest possible ambition

In light of significant circumstantial change in recent scientific findings regarding climate change, and in recent global action regarding 2030 NDCs and 2050 targets as well as declarations of climate emergency, a review of New Zealand's 2050 Target should be undertaken by the Commission by 31 October, through a request from the Minister under section 5K(1) of the Act. The Government should defer communication to UNFCCC of its upgraded NDC for the 2021–30 period until it is satisfied that it will be consistent with a revised 2050 Target that ensures New Zealand is fully contributing to the 1.5°C global effort.

Appendices

The following supporting appendices are available on request:

- NZ National Communications to UNFCCC: Summary;
- NZ offshore mitigation under Kyoto and UNFCCC (2008–20);
- Statutory and fiduciary obligations.

Appendix 1: Climate metrics and values

Both the UNFCCC and the IPCC have, from the outset, adopted relevant reporting guidelines and common metrics that, in updated form, still apply to all States Parties.

UNFCCC reporting guidelines

The relevant Guidelines on Annual Inventories were first adopted in 1999, revised in 2002 and 2005, and again in 2013, when the UNFCCC adopted reporting guidelines, revised common reporting format tables (CRF) and updated GWP₁₀₀ values.¹³⁵ The central component of this framework is the metric developed by the IPCC and adopted by UNFCCC to record the emissions of all greenhouse gases and their impact on the climate.

IPCC inventory guidelines

The IPCC Guidelines for National Greenhouse Gas Inventories, originally compiled in 1994, are subject to continuous monitoring and updating, commencing in 1996, but the basic metrics have remained endorsed. The *2006 IPCC Guidelines for National Greenhouse Gas Inventories* remain the extant guidelines for all States Parties to this day.

In 2014 the Bureau of IPCC's Inventories Task Force decided that an update was appropriate:

- The *2006 IPCC Guidelines for National Greenhouse Gas Inventories (2006 IPCC Guidelines)* provide a technically sound methodological basis of national greenhouse gas inventories, and therefore fundamental revision is unnecessary.
- To maintain the scientific validity of the *2006 IPCC Guidelines*, certain refinements may be required, taking into account scientific and other technical advances that have matured sufficiently since 2006. Such refinement will help all UNFCCC Parties use good practice inventory methodologies based on up-to-date scientific knowledge. The overall aim is to provide an updated and sound scientific basis for supporting the preparation and continuous improvement of national GHG inventories.

The *2019 Refinement* was not aimed to revise the *2006 IPCC Guidelines*, but rather to update, supplement and/or elaborate the *2006 IPCC Guidelines* where gaps or out-of-date science might be identified. It did not replace these, and should be used 'in conjunction with' the *2006 IPCC Guidelines*.¹³⁶

Common global metrics

The purpose of the climate change metrics is to quantify and compare the relative effect of the different gases in terms of radiative forcing and temperature response, providing an 'exchange rate' for assessing multi-component policies, or for comparing emissions from regions or countries, or from sources or sectors. The default metric developed by IPCC and adopted by UNFCCC is the 'global warming potential' of a particular gas, over a chosen time-horizon of 20 years (GWP₂₀) or 100 years (GWP₁₀₀), expressed in terms of 'carbon dioxide equivalent' (CO₂-e).¹³⁷

From the outset, the UNFCCC has used the above metric, with IPCC guidance. It has universally endorsed the original GWP metrics, while acknowledging their inherent uncertainties and limitations. The current situation reflects the 2018 decision to use GWP₁₀₀ values contained in IPCC's AR5 (2014).

¹³⁵ Dec. 24/CP.19: *Revision of the UNFCCC Reporting Guidelines on Annual Inventories for Parties Included in Annex I to the Convention*; Doc. FCCC/CP/2013/10/Add 3 (31 Jan. 2014) Annexes I, II and III listed the detailed revisions.

¹³⁶ <https://www.ipcc.ch/report/2019-refinement-to-the-2006-ipcc-guidelines-for-national-greenhouse-gas-inventories/>

¹³⁷ <https://unfccc.int/documents/1168>

The national debate over metrics

In recent years, New Zealand has become engaged in an internal debate over the most relevant and accurate metric to use to judge the climate impact of different gases, particularly the difference between long-lived and short-lived gases.

Some researchers have advocated an alternative metric, GWP*, which would report emissions as ‘warming-equivalents’ resulting in similar warming impacts to GWP₁₀₀ without requiring a ‘like-for-like weighting per emission’. GWP*, it is contended, provides ‘a useful indication of warming, while conventional application of GWP₁₀₀ falls short in many scenarios and an improved means of assessing alternative mitigation strategies, particularly when methane emissions are stable or declining, with important implications for how we consider ‘zero emission’ or ‘climate neutral’ targets for sectors emitting different compositions of gases’.¹³⁸

Under the 2018 Katowice ‘climate package’, New Zealand faces the following choices.

- New Zealand may use another metric such as GWP* provided that this is simply additional to GWP₁₀₀ (AR5) and provided that it reports on the value of the metrics used and the IPCC assessment report they were ‘sourced from’ (para. 37);
- Despite splitting methane emissions into two baskets with different target levels in its domestic legislation, New Zealand is obliged to report to UNFCCC in its National Inventory methane emissions (both recorded emissions and future projections) as one gas (paras 48, 98).

It has been suggested that New Zealand could consider some options:¹³⁹

- (i) Retention: Domestic policy under the Act, NDC, and Inventory all use solely GWP₁₀₀;
- (ii) Supplement: New Zealand reports in its National Inventories both GWP₁₀₀, as is legally required, and GWP*, as an optional addition, while adopting GWP* as the legal basis for domestic policy;
- (iii) Transfer: New Zealand undertakes a full shift to GWP*.

The third option would constitute a violation of the Enhanced Transparency Framework. The second option is permissible, but neither the UNFCCC nor the NZ Government or Climate Commission has accepted the need for GWP*. It is probably most practical to retain GWP₁₀₀ as the domestic policy metric and as the obligatory international reporting metric. This would not prevent researchers supplementing it with GWP*. But in light of the complexity that arises from simultaneously pursuing a domestic policy goal while meeting different international reporting obligations, New Zealand must be careful to meet the UNFCCC’s MPGs of promoting transparency, accuracy, completeness, consistency and comparability, and avoiding placing ‘undue burden on the UNFCCC secretariat’ (para. 3).

The values used for the GWP₁₀₀ metric: The IPCC’s 4th or 5th Assessment Report (AR4 or AR5)

Selecting AR4 or AR5 for the budgets

The Commission’s decision over its choice of GWP values generates unnecessary confusion. The budget figures in the two recommendations differ (855 Mt and 816 Mt in totals) because the Commission has used GWP₁₀₀ values from the IPCC’s 5th Assessment Report (AR5, of 2014) in Recommendation 1 and from its 4th Assessment Report (AR4, of 2007) in Recommendation 2.

In its draft report, the Commission advised that:

Emissions generated from 2021 onwards will be reported in the Inventory using more up-to-date GWP₁₀₀ values from the IPCC’s 5th Assessment Report (AR5). When we provide our final advice, we will convert the proposed emissions budgets using the AR5 GWP₁₀₀ values. We expect that the Government will set emissions budgets using the GWP₁₀₀ metric from AR5 for consistency with the Inventory.¹⁴⁰

¹³⁸ *Demonstrating GWP*: A Means of Reporting Warming-Equivalent Emissions that Captures the Contrasting Impacts of Short- and Long-Lived Climate Pollutants*, Lynch, J. et al, Environ. Res. Lett. 15 (2020). <https://iopscience.iop.org/article/10.1088/1748-9326/ab6d7e/data>

¹³⁹ *Submission to CCC on Emissions Metrics and Related Issues*, Myles Allen et al.

¹⁴⁰ Draft Report, p. 29

In fact, the Commission did not do this in its final report, confining AR5 numbers solely to the budget totals rather than their detailed breakdowns. Its explanation for this in the final Report is that the details remain based on AR4 values because they were the budgets it had consulted.¹⁴¹

The problem thus bequeathed to the Government is that it is expected to adopt Budgets 1 to 3, whose component details equate to 95% of what the Commission itself has recommended.

While the Government is no doubt capable of converting the AR4 version into its AR5 counterpart, the Commission has not explained whether, and how, the policy direction in the accompanying Plan might be influenced. There is no reason why the Commission could not have recalled that its budget details had been based on AR4 values, but were updated to AR5 values, including each budget breakdown, so that the Commission's recommended budget details and the Government's official budget details were easily compared. This would have been preferable for public comprehension, both domestically and internationally.

Use of AR4 and AR5 values

Independent of its work on the budgets, the Commission again decided to use AR4 values for its recommendation of a stronger 2030 Target (NDC), because New Zealand's original NDC (2016) was based on AR4, and the Commission decided upon AR4 for 'consistency of comparison'.

Yet the Commission states that if the Government revises its NDC, there is a strong rationale, as part of that update, to apply the AR5 values. This is because NZ emissions in 2021 and thereafter are to be reported to UNFCCC (in 2023) using AR5 values.¹⁴² And, as the Commission notes, this will change the figures, and 'this effect should be factored into the Government's consideration' of its upgraded NDC.

Appendix 2: Precursor reports on 'low emission' and 'net-zero' economies

GLOBE-NZ Parliamentary Cross-Party Report (2016–17): 'Domestic net-zero in the 21st century'

In March 2017, the parliamentary cross-party group on climate change (GLOBE-NZ) released the Vivid Report it had commissioned. This was an informal cross-party initiative and did not involve the Government, but in the thematic parliamentary debate on 13 April the Climate Change Minister stated that the Report would usefully feed into the work the Government was doing.¹⁴³

The GLOBE-NZ reports are based on two documents: the Vivid Report, *Net zero in New Zealand: Scenarios to Achieve Domestic Emissions Neutrality in the Second Half of the Century*,¹⁴⁴ and the ensuing Discussion Paper, *Towards a 2050 Pathway for New Zealand*.¹⁴⁵

- The Report applied four economy-wide, all-gases mitigation scenarios based on GWP₁₀₀ with IPCC-AR4 values. Three scenarios were designed to respond to the temperature goal of the Paris Agreement of 'well below 2°C' and pursuing efforts at 1.5°C, based on domestic mitigation with no offshore mitigation.

¹⁴¹ Report, p. 73. The challenge to public comprehension of the statistics is further compounded by the fact that the IPCC AR4 emission figures in the final Report, based on the 2021 National Inventory (covering the period 1990–2019), are higher than the AR4 figures in the draft Report, which are based on the preceding years 2020 Inventory (covering 1990–2018). The latest Inventory was released in April 2021, between the completion of the Commission's draft report (31 January 2021) and its revised, final version (31 May).

¹⁴² Report, p. 375 (as decided by the Parties to the Paris Agreement, Decision 18/CMA.1)

¹⁴³ 'I like the fact that we have got a cross-party piece of work. I admire and respect the work that Vivid has done. As a consequence of that, I think that even as a Minister in the Government, it can help feed into the work that we are doing.' Hon Paula Bennett, Minister for Climate Change Issues

https://www.parliament.nz/en/pb/hansard-debates/rhr/combined/HansDeb_20170413_20170413_12

¹⁴⁴ <https://www.parliament.nz/en/get-involved/features/mps-collaborate-across-party-lines-in-response-to-climate-change/>

<https://www.vivideconomics.com/casestudy/net-zero-in-new-zealand/>

¹⁴⁵ <https://www.parliament.nz/media/4449/towards-a-2050-pathway-for-new-zealand-young.pdf>

The 2050 Target Range: 14 Mt to 2 Mt

The boundary of the three scenarios resulted in 14 Mt (least ambitious) to 2 Mt (most ambitious). Abatement opportunities were placed in three 2050 cost categories: low-cost at under \$50/tonne CO₂-e; medium-cost at \$50–\$100; and high-cost at above \$100. The Report noted that ‘the bulk of international estimates suggests that a reasonable range could well be above \$100.’¹⁴⁶

- Building on the Report, the GLOBE-NZ Discussion Paper calculated five-yearly budgets of CO₂-e (2021–2050) based on Vivid’s boundary range, with one of the pathways achieving domestic net-zero GHG emissions by 2050 (Budget 1 with 314 Mt; Budget 6 with 41 Mt).
- The Vivid Report was circulated to MPs in March and a Special Debate on it was held in April.¹⁴⁷

The Vivid Report formed the following conclusions:

- Any pathway to substantially reduce the country’s domestic emissions will involve changes to patterns of energy supply and use.
- It is possible for New Zealand to move onto a pathway consistent with domestic net-zero emissions, but this will require altering its land-use patterns.
- If New Zealand does seek to move its domestic economy onto a net-zero consistent trajectory, there is choice between the extent to which it makes use of new technologies and the pattern of land use.
- If it chooses to substantially afforest and is fortunate enough to benefit from the extensive deployment of new technologies, then it could be possible for New Zealand to achieve domestic net-zero emissions by 2050.
- The more New Zealand relies on forestry sequestration to reduce its emissions in the period to 2050, the more it will need to rely on enhanced technologies in the period beyond 2050 to ensure emissions neutrality.¹⁴⁸

Regarding the difference between 2°C and 1.5°C, the Vivid Report made the following observations:

- The Resourceful NZ scenario allows the economy to achieve a domestic net-zero emissions profile consistent with the 2°C global goal.
- The Net Zero NZ scenario, applying the more ambitious components of Resourceful and Innovative scenarios, combined with the closure or improved intensity of the aluminium, steel and refinery industries, would drive NZ’s net-emissions close to net-zero total GHGs by 2050 (about 2 Mt CO₂-e). In comparison with the other scenarios, this would be more consistent with the domestic emissions profile likely to be needed to meet the lower end (1.5°C) aspirational temperature goal defined in the Paris Agreement. As interest around the implications of the Paris Agreement’s 1.5°C temperature goal grows, more detailed analysis of this and similar scenarios that deliver net-zero emissions by 2050 ‘may well be warranted’.¹⁴⁹

Productivity Commission Inquiry (2017–18): ‘Low Emissions Economy’

On 26 April 2017 the Government requested the Productivity Commission to undertake an Inquiry into the Opportunities and Challenges of a Transition to a Lower Net Emissions Economy for New Zealand. The Ministers (Climate Change, Finance, Economic Development) asked the Commission to take account of existing policy work and current evidence-gathering groups, including the Biological Emissions Reference Group, the Forestry Reference Group, and the GLOBE-NZ work by Vivid Economics.¹⁵⁰

During the Commission’s work, the Inquiry’s terms of reference were strengthened regarding the compatibility of a ‘low emissions economy’ with the global temperature goal and the national 2050 Target.

- In December, the new Minister for Climate Change advised the Commission of the new Government’s intention to transition New Zealand to a ‘low emissions economy by 2050’, in light of its commitment under the Paris Agreement to achieve a net-zero emissions economy by the second half of the century. The Zero Carbon Bill would set a more ambitious 2050 target, which ‘may include setting a

¹⁴⁶ Vivid Technical Report, pp. 11–13

¹⁴⁷ https://www.parliament.nz/en/pb/hansard-debates/rhr/combined/HansDeb_20170413_20170413_12

¹⁴⁸¹⁴⁸ Vivid: Summary Report, pp. 33–34

¹⁴⁹¹⁴⁹ Ibid., p. 32

¹⁵⁰ *Low Emissions Economy*, NZ Productivity Commission (August 2018), pp. ii–iv
<https://www.productivity.govt.nz/inquiries/lowemissions/>

zero net emissions target for 2050.’ This was supported by the Ministers of Finance and of Economic Development. As a developed country, New Zealand was expected to take the lead in such a transition. The Inquiry was encouraged to consider the full range of potential benefits and opportunities that might arise from New Zealand ‘taking the global lead’.

2050 Target range: 25 Mt to net-zero GHG

In response, the Productivity Report identified two 2050 domestic targets: net-zero GHG emissions and 25 Mt CO₂-e. Three scenarios were applied to each (Policy Driven, Disruptive Decarbonisation, and Stabilising Decarbonisation). The Commission’s modelling (using Concept Consulting, Motu and Vivid Economics) suggested that the less ambitious goal could be achieved on an emissions price rising to \$75–\$150, and the ‘more ambitious target of net-zero GHG emissions by 2050’ could be achieved on a price of \$150–\$250/tonne CO₂-e.¹⁵¹

The Report did not calculate emission budgets, and its judgement on the target’s componentry between domestic and offshore mitigation was a general comment:

The choice between abating domestically and through purchasing emissions reductions from other countries must be carefully weighed. When international credits are of a high integrity, investing in reductions overseas may provide a way for New Zealand to deliver global emissions reductions for which it is responsible at lower cost to New Zealand. Even so, comparing international and domestic abatement costs must be done correctly in terms of capital costs, reputation costs, co-benefits, and future opportunities.¹⁵²

The Productivity Report: A single target or a split-target

The Productivity Commission focused on the question of a split-gas target. Its draft Report in April 2018 made the following recommendation:¹⁵³

R8.1: The Government should establish separate long-term domestic targets for short- and long-lived gases. ... The long-lived target should be a net-zero target by a specified end-date and the short-lived gas target should aim for a stabilisation level within a specified temperature limit. The short-lived target must be underpinned by an explicit quantity goal (i.e. maximum emissions rate).

The Government should support these separate targets with a single all-gases target. The all-gases target should be set in primary legislation. The Government should carefully consider the appropriate legislative instrument to express the separate short- and long-lived gas targets.

No reference is made in the draft Report to biogenic methane.

The final Report of August 2018, however, advanced a different set of recommendations, which surrendered the concept of a single all-gases target:

R9.1: The Government should seek to enact a long-lived gas target of net-zero by a specified point in time (e.g. 2050) in primary legislation.

R9.2: The Government should establish separate emissions budgets for short-lived and long-lived gases and set their size based on the advice of the Climate Commission.

R9.3: The ETS should include all LLGs as well as fossil methane (CH₄) and all fluorinated gases.

R9.4: The Government should enact in primary legislation the principle that New Zealand’s emissions of biogenic CH₄ should be lowered to a specified level by a specified date, consistent with the Paris temperature limit. The legislation should also specify a framework for guiding how the target level of CH₄ should be set. The legislation should establish an obligation on the Government to set the specific target level of emissions for biogenic CH₄ based on the advice of the proposed Climate Change Commission, The legislation would include the power to change the target from time to time in the light of new information.

¹⁵¹ Productivity Inquiry, p. 10

¹⁵² Productivity Inquiry, p. 122

¹⁵³ Productivity Commission Draft Report (April 2018), Recommendation 8.1, p. 424

R9.5: The Government should ensure separate emissions budgets for biogenic CH₄ based on the advice of the Climate Change Commission.

R9.6: Biogenic CH₄ should be included in an emissions pricing mechanism that recognises its different atmospheric properties compared to long-lived gases. The Interim Climate Committee should assess both a dual-cap NZ ETS and a methane quota system in its report to the Government on recommended policy for agricultural GHG mitigation due at the end of April 2019.

Although it no longer recommended a single, all-gas target, the Commission nonetheless recommended that the 'split target' be between long-lived gases and short-lived gases. It also recommended, as a policy measure within this target framework, that biogenic methane be lowered to a specified level, have its own emissions budget, and be part of a pricing mechanism that reflected its different atmospheric properties.

Summary

The table below shows the most ambitious 2050 scenario for the two precursor studies (Vivid Report = 1.8 Mt; Productivity Report = 0.4 Mt) and the range developed in the Climate Commission's Report (4.3–20.5 Mt).

- The Vivid Report (virtually) reaches the net-zero GHG emissions target ('climate neutrality') and thus attain the global 1.5°C goal. But it assumes closure, before 2050, of New Zealand's aluminium, steel and oil refinery plants. It is ambitious on agricultural reductions and feasible on forestry removals.
- The Productivity Report effectively reaches the GHG 1.5°C target. It is, however, lacking ambition on energy and agriculture, and would place an excessive reliance on exotic forestry for sequestration;
- The Climate Commission Report's demonstration pathway misses the net-zero GHG emissions target.

Comparable studies for NZ net-zero (Mt CO₂-e)

Scenarios		1990	2050				
			Vivid	Prod-Comm.	Climate Comm.		
			Net-Zero	SD-0	Tailwinds	Pathway	Headwinds
	Gross LLG			30.0			
	Net LLG			-12.0	-9.5	-9.5	-2.0
	Energy	24.0	9.4	18.7			
	Industry	4.0	1.4	0.7			
	Waste	4.0	2.7	1.0			
	Agric.	34.4	24.7	32.0			
	Total SLG			45.0	13.8	22.5	22.5
GROSS		66.4	38.2	52.4			
LULUCF	Forest exotic				- 15.0		
	Forest native				- 2.5		
	Total	-29.0	-36.5	-52.0	- 17.5		
NET		37.4	1.8	0.4	4.3	13.0	20.5

Note: The figures in this table are based on GWP values in IPCC's AR 4 (2007).

Appendix 3: The pathway to New Zealand's Zero Carbon Bill

The pathway to the Zero Carbon Bill offers insight into New Zealand's climate change governance and policy. The two critical issues involved are the degree of ambition (the year net-zero GHG is reached) and the nature of the target (expressed in a single metric or as a 'split-target').

The precursor reports

As noted in Appendix 2, the precursors to the Bill were two-fold: the Vivid Report in 2017 and the Productivity Commission's Inquiry in 2018. The Government's initiative for a 2050 Target commenced in December 2017 and began to take shape in May 2018.

The two reports identified scenarios for economy-wide, all-gas, GHG targets for 2050, pursuant to the 2015 Paris temperature range (well below 2° to 1.5°C). The net emission targets ranged from zero to 25 Mt CO₂-e,

implying net-GHG neutrality either by 2050 (net-zero at 2050) or later in the century (25 Mt at 2050). A subsequent discussion paper, however, commissioned in September 2017 by GLOBE-NZ, noted that the Vivid scenarios would never reach net-zero and return to net-positive levels around 2070, because of the extent of reliance on forestry and only a modest reduction in gross emissions.¹⁵⁴

The Government's path

The Government's two-year path from December 2017 to November 2019 displayed a degree of uncertainty and ambiguity over the precise 2050 Target intended – whether it was to be climate neutrality (net-zero GHG) or carbon neutrality (net-zero CO₂), and, if it were to be the latter, when in the second half of the 21st century climate neutrality might be achieved.

In this section, references to 2050 climate neutrality are shown in green; and to 2050 carbon neutrality in red.

The uncertainty can be discerned from the outset in the slight but significant difference in the formative political agreements forming the Government. The majority party's agreements on coalition and confidence and supply contained slight but significant differences:¹⁵⁵

- The coalition agreement had the following reference: 'Introduce a **Zero Carbon Act** and an independent Climate Commission, based on the recommendations of the Parliamentary Commissioner for the Environment.'
- The confidence and supply agreement had a more ambitious reference:
'1. Adopt and make progress towards the goal of a **Net-Zero Emissions Economy by 2050**,
a. Introduce a **Zero Carbon Act** and establish an independent Climate Commission.'

In November the Speech from the Throne (8 November 2017) declared that:

This will be a government of aspiration. It aspires to make this a nation ... where we become world leaders on environmental issues and climate change. ... This government will set a target of a **Net Zero Carbon Emissions Economy by 2050**, with legally binding emissions reduction targets and carbon budgets to keep New Zealand on track to this goal.¹⁵⁶

Initial planning: 100-day plan for climate change

A ministerial paper before Cabinet in December advanced the proposal for a 100-day climate action plan and for amending legislation that would set a new 2050 target, without specifying precisely what the target level would be.¹⁵⁷

On 18 December, Cabinet approved a '100-Day Plan for Climate Change'. It noted the Climate Change Minister's intent to establish a new 2050 target for reducing GHGs, and to establish an independent Climate Commission.¹⁵⁸ It formed an Interim Climate Committee to provide preliminary policy advice on agriculture and electricity, which commenced in May 2018 and reported back one year later.¹⁵⁹ The precise nature of the target was not identified.

Following the Cabinet meeting, the Prime Minister announced the intended formulation of the **Zero Carbon Act**.¹⁶⁰ In the joint press briefing, the Climate Minister announced that the framework 'for a net zero emissions

¹⁵⁴ *Towards a 2050 Pathway for New Zealand: A Discussion Paper for GLOBE-NZ* (P. Young), pp. 3–6, <https://www.parliament.nz/media/4449/towards-a-2050-pathway-for-new-zealand-young.pdf>

¹⁵⁵ Cabinet Office Circular CO (17) 10, 15 December 2017, containing coalition agreements of 24 Oct. 2017, <https://dpmc.govt.nz/sites/default/files/2017-12/coc-17-10.pdf>

¹⁵⁶ Speech from the Throne, 8 November 2017, <https://www.beehive.govt.nz/speech/speech-throne-2017>

¹⁵⁷ Minister's Proposal to Cabinet for a 100 Day Plan for Climate Change, https://environment.govt.nz/assets/Publications/Cabinet_paper_The_100_Day_Plan_for_Climate_Change.pdf

¹⁵⁸ CAB-17-0547.01

¹⁵⁹ In April 2019, the Interim Committee released its Report on Agriculture, but its work was not focused on the 2050 Target nor did it consider 'biogenic methane' as an issue for analysis.

¹⁶⁰ <https://www.beehive.govt.nz/release/first-important-step-towards-zero-carbon-act>

economy by 2050 should be in place by the end of the parliamentary term'. The new target would place New Zealand 'in a small group of countries who aspire to net-zero emissions in the next few decades'.¹⁶¹

Meanwhile, the Productivity Commission's Inquiry into a 'low emissions economy' was well underway. On 22 December, the Minister effectively updated the Commission's terms of reference, advising that the new Government intended to transition New Zealand to a 'low emission economy by 2050', in light of its commitment under the Paris Agreement to achieve a net-zero emissions economy by the second half of the century. The Zero Carbon Bill would set a more ambitious 2050 target, which 'may include setting a zero net emissions target for 2050'. As a developed country, New Zealand was expected to take the lead in such a transition. The Inquiry was encouraged to consider the full range of potential benefits and opportunities that might arise from New Zealand 'taking the global lead'.

Four periods over 16 months in 2018–19 can be identified in the build-up to the introduction of the Bill in Parliament:¹⁶²

January–May 2018	Economic modelling and policy development
June–July 2018	Public consultation
July–Dec. 2018	Submissions analysed and policy development
Dec. 2018–May 2019	Cabinet decisions

Policy development

On 1 February 2018, the Prime Minister announced the completion of the Government's 100-Day Plan with 18 points of achievement, one of which was to 'set a zero carbon emissions goal'.¹⁶³

Public consultation

In May 2018, Cabinet authorised a public Discussion Document, which was released in June. This followed the release of the draft Productivity Commission Inquiry (April), which had recommended a split-target between LLGs and SLGs within a single all-gases target. Three options of the 2050 target were advanced for public feedback:¹⁶⁴

- **Net-zero carbon dioxide by 2050:** This target would reduce net carbon dioxide emissions in New Zealand to zero by 2050 (but not other gases like methane or nitrous oxide);
- **Net-zero long-lived gases and stabilised short-lived gases by 2050:** This target would reduce emissions of long-lived gases (including carbon dioxide and nitrous oxide) in New Zealand to net zero by 2050, while stabilising emissions of short-lived gases (including methane);
- **Net-zero emissions by 2050:** This target would reduce net emissions across all greenhouse gases by 2050.

Policy formulation

The period August to November was critical. During this period two documents came to form the basis of the Government's work for the legislation and, consequently, for the independent Commission's advisory work:

- 31 August 2018: The Productivity Commission Inquiry's Final Report;
- 8 October 2018: The IPCC Special Report was released with its focus on the 1.5°C temperature goal and pathways, gas-by-gas, that were compatible with the goal.

These two documents, one national and one global, provided the basis for decisions on the 2050 target's ambition (net-zero carbon; or net-zero GHG) and its composition (a single all-gas CO₂-e, perhaps with a dual component; or a split target without an overall CO₂-e figure).

Official advice

On 21 November, the Climate Change Chief Executives Board gave formal advice to Cabinet:¹⁶⁵

- Four key features would support an efficient transition: credibility, certainty, early action, durability;

¹⁶¹ http://www.nzherald.co.nz/nz/news/article.cfm?c_id=1&objectid=11961862

¹⁶² Lewis Stevens-Rembe, Ministry for Environment; presentation to BEC, 21 May 2019, https://www.bec.org.nz/_data/assets/pdf_file/0019/169120/ZCA-slide-pack-May-2019-BNZ.pdf

¹⁶³ <https://www.beehive.govt.nz/release/we-did-100-day-plan-complete>

¹⁶⁴ <https://environment.govt.nz/assets/Publications/Files/FINAL-Zero-Carbon-Bill-Discussion-Document.pdf>

¹⁶⁵ (2018-B-05126),

<https://environment.govt.nz/acts-and-regulations/acts/climate-change-response-amendment-act-2019/>

- Durability would require some degree of political consensus;
- The IPCC finding was that 1.5°C compatibility required global net-zero CO₂ around 2050, and negative thereafter; plus global agricultural methane cuts of 24–47% (2050/2010); which together would result in a **global net CO₂-e reduction (GWP₁₀₀) of 81–93% (2050/2010)**;
- There was a **strong consensus ‘across agencies’ for New Zealand to have two separate targets (biogenic methane at 22–35% (2050/2016); and all other greenhouse gases at net-zero, including forestry offsets plus international emissions reductions)**;¹⁶⁶
- There was a **‘range of views’** as to ‘whether and when’ New Zealand should achieve overall emissions neutrality;
- The **above biogenic methane target could be included in the Bill**, decided through the select committee process, or left to the Climate Commission for advice. Either way, an ‘overall aggregated emissions target’ would be able to be determined only after the biogenic methane target was set.

An attachment to the Advice showed the results of the modelled economic and social impacts of two optional targets: **net-zero GHG** or a **split-target comprised of net-zero AOG and 25% biogenic methane**.

Legislative drafting

A Cabinet paper was lodged with Cabinet on 7 December, based on a Regulatory Impact Statement. Six target options were considered in the RIS. The first four (one was split into two options) had been offered in the Public Discussion Document:

1. **net-zero CO₂**;
2. **net-zero LLGs and stabilised SLGs (fungible: non-methane offsets can be counted towards the stabilisation level)**;
3. **net-zero LLGs and stabilised SLGs (non-fungible: absolute cap on biogenic methane)**;
4. **net-zero GHG emissions across all gases by 2050**.

Following policy consultation, two further options were identified by officials:

5. **net-zero emissions in the second half of the century, with different pathways for LLGs and SLGs biogenic methane to [x]% (2050/2016), and net-zero AOGs**;
6. **domestic-only target similar to 5 above, within an overall net-zero GHG target that is conditional on partial use of international units**.

Options 1 to 3 were ‘not preferred’.

Option 4 was ‘viable but not preferred’. It succeeded on the criteria of ‘bold ambition’ and ‘considerable international leadership’, but did not explicitly acknowledge the scientific basis for different pathways for different gases, and carried risks of ‘significant economic impacts’. While this could be mitigated through offshore mitigation, this would be to the detriment of domestic mitigation. An alternative would be to extend the net-zero GHG target beyond 2050.

Option 6 was viable but not preferred.

The RIS recommended Option 5 on the grounds that it aligned with the IPCC temperature goal ‘below 2°C’, and with reaching GHG neutrality in the second half of the century. New Zealand’s remaining biogenic methane emissions would need to be balanced by an equivalent net-negative level of all other GHGs. The recommendation was for [x]% reduction (2050/2016).¹⁶⁷

Having regard to the above, the Minister proposed that the 2050 target should be a **35% reduction in biogenic methane (2050/2016) and net-zero for all-other-gases (AOG)**.

On 19 December, Cabinet’s Environment, Energy and Climate Committee agreed that the Bill would set a 2050 Emissions Reduction Target to achieve:

- **net-zero for all GHGs except for biogenic methane**;

¹⁶⁶ The 22% figure was based on the NZ PCE assessment for livestock methane (2050/2016), while the 35% was based on the IPCC assessment for agricultural methane (2050/2010). A strange basis for a consensus...

¹⁶⁷ RIS, p. 66

- a reduction in biogenic methane (including if necessary net-zero), which would be decided following further inter-ministerial consultations.

The Minister was asked to report back with a recommended BM reduction by 29 January 2019.¹⁶⁸

Cabinet decisions

On 1 May 2019, the Minister proposed, and on 2 May Cabinet agreed on, a 2050 Target composed of:

- net-zero for all GHGs except for biogenic methane;
- gross reductions of biogenic methane off 2017 levels:
 - (a) within the range of 24–47% by 2050; and
 - (b) 10% by 2030 (i.e. from 33.1 Mt to 29.8 Mt CO₂-e (2030/2017)).¹⁶⁹

The reasoning for the decision on biogenic methane was the following:

- A range, rather than a fixed figure reduction, reflected the current uncertainty about what was required for the 1.5°C temperature goal, and also future technological developments, as noted in the IPCC Special Report and New Zealand’s separate BERG and PCE reports.¹⁷⁰
- The IPCC range of 24–47% for agricultural methane (2050/2010) was not a prescription for any individual country. But a national target of this range would align New Zealand with the 1.5°C temperature goal, signalling a commitment to strong global action.
- The Climate Commission could review the methane targets in 2024.

On 6 May, Cabinet agreed to release the Climate Change Response (Zero Carbon) Bill to the public and introduce it into Parliament, on the above basis, noting that the Bill provided an enduring framework for the transition to a low-emissions New Zealand which ‘contributes’ to the collective global 1.5°C effort.¹⁷¹

Parliament held its first reading on the Bill on 21 May, referring it to the Environment Select Committee, which reported back on 21 October with recommended changes. The previous month, with advance knowledge of the Select Committee’s deliberations, Cabinet agreed to most of the proposed changes, including an explicit reference in the Bill that the emissions budgets must contribute to the 1.5°C global effort.¹⁷²

Adoption of Bill

The final passage of the Bill through Parliament occurred in November (with the second reading on the 5th, Committee of the Whole on the 6th, third reading and adoption on the 7th, with Royal Assent on the 18th).

¹⁶⁸ ENV-18-MIN-0053, 19 December 2018

¹⁶⁹ ENV-19-MIN-0015, 2 May 2019

¹⁷⁰ Ibid. It was noted that the BERG Report concluded that total agricultural emissions (carbon dioxide, nitrous oxide, methane) could be reduced 10–21% by 2030, relative to baseline projections). NZAGRC concluded (low confidence) that reductions could be 30% by 2030 (pp. 3–4).

¹⁷¹ CAB-19-MIN-0208, 6 May 2019

¹⁷² CAB-19-MIN-0448, 2 September 2019

Glossary

AAU	Amount Assigned Unit (Kyoto Protocol)
AR	Assessment Report (of the IPCC)
CCRA	Climate Change Response Act (2002)
CBDR/RC	Common but differentiated responsibilities and respective capabilities (1992 UNFCCC)
ESG	Environmental, social and governance (responsibility)
ETS	Emissions Trading Scheme
GWP	Global Warming Potential
GTP	Global Temperature Potential
Gt	Gigatonne (one billion tonnes of a greenhouse gas or gases)
INDC	Intended Nationally Determined Contribution
ITMO	Internationally Transferred Mitigation Outcome (under the Paris Agreement)
LLG	Long-lived gas (atmospheric lifespan)
Mt	Megatonne (one million tonnes of a greenhouse gas or gases)
NC	National Communication: submitted to the UNFCCC every four years
NI	National Greenhouse Gas Inventory: submitted to the UNFCCC every year
ERP	Emissions Reduction Plan
NDC	Nationally Determined Contribution (Paris Agreement)
SDGs	Sustainable Development Goals (UN General Assembly)
SLG	Short-lived gas (atmospheric lifespan)
QELRO	Quantified emissions limitation or reduction objective (Kyoto Protocol)
Treaties:	
UNFCCC	UN Framework Convention on Climate Change (1992)
KP	Kyoto Protocol to the UN Framework Convention on Climate Change (1997)
PA	Paris Agreement (2015)
Gases:	
CO ₂	Carbon dioxide
CH ₄	Methane
N ₂ O	Nitrous oxide
SF ₆	Sulphur hexafluoride
HFCs	Hydrofluorocarbons
Institutions:	
CMP	Kyoto Protocol Conference of the Parties
CMA	Paris Agreement Conference of the Parties
COP	UNFCCC Conference of the Parties
ICAO	International Civil Aviation Organization
ICSU	International Council of Scientific Unions (subsequently, ISC)
IPCC	Intergovernmental Panel on Climate Change (UNEP and WMO)
IUCN	International Union for the Conservation of Nature
NIWA	National Institute of Water and Atmospheric Research
PCE	Parliamentary Commissioner for the Environment
SBI	UNFCCC Subsidiary Body for Implementation
SBSTA	UNFCCC Subsidiary Body of Scientific and Technological Advice
UNCED	UN Conference on Environment and Development ('Rio Earth Summit') 1992
UNEP	United Nations Environmental Programme
UNEP FI	UNEP Finance Initiative
UNFCCC	United Nations Framework Convention on Climate Change
WMO	World Meteorological Organization