

GREENHOUSE GAS INVENTORY REPORT

2022



INTRODUCTION

This document is the annual greenhouse gas (GHG) emissions inventory report for the Air New Zealand group of companies for the period 1 July 2021 to 30 June 2022. This report has been written in accordance with The Greenhouse Gas Protocol – A Corporate Accounting and Reporting Standard, Revised Edition ('Greenhouse Gas Protocol').

Deloitte Limited has been appointed as the third-party independent assurance provider for the 2022 financial year Greenhouse Gas Inventory Report. A reasonable level of assurance has been given over the scope 1 and 2 emissions included in this report and a limited level of assurance over the scope 3 emissions.



GREENHOUSE GAS INVENTORY REPORT



Table 1: Greenhouse Gas Emissions Inventory Summary

Scope 1 – Emissions Tonnes of CO ₂ -e ¹					
Category	2011 ²	2019	2020	2021	2022
Jet Fuel - Domestic	551,837	629,876	518,607	508,737	465,303
Jet Fuel – International	2,516,069	3,286,502	2,649,922	817,078	1,040,786
Jet Fuel – Ground ³	-	941	1,180	1,616	1,048
LPG	3,610	1,579	1,437	1,227	1,413
Natural Gas	2,520	2,732	2,275	2,249	2,141
Diesel ⁴	977	3,935	3,129	2,218	2,129
Bio-Diesel	1,194	-	-	-	-
Petrol	84	73	67	52	52
Coal	2,246	-	-	-	-
Wood Pellets (CH ₄ & N ₂ O)	20	13	18	14	14
Total Scope 1	3,078,557	3,925,650	3,176,634	1,333,192	1,512,886

Scope 2 Emissions Tonnes CO ₂ -e ⁵					
Category	2011 ²	2019	2020	2021	2022
Electricity	7,246	3,098	2,832	2,720	2,736
Total Scope 2	7,246	3,098	2,832	2,720	2,736
Total CO₂-e Emissions (Scope 1 & 2)	3,085,803	3,928,748	3,179,466	1,335,912	1,515,622

Scope 3 Emissions Tonnes CO ₂ -e ⁶					
Category	2011 ²	2019	2020	2021	2022
Jet Fuel – Domestic	-	-	-	-	93,343
Jet Fuel – International	-	-	-	-	208,790
Jet Fuel – Ground	-	-	-	-	210
LPG	-	-	-	-	1,682
Natural Gas	-	-	-	-	127
Diesel ⁴	-	-	-	-	2,845
Petrol	-	-	-	-	76
Electricity	-	-	-	-	262
Total Scope 3	-	-	-	-	307,335
Total CO₂-e Emissions (Scope 1 & 2 & 3)	-	-	-	-	1,822,957

Biomass Tonnes CO ₂					
Category	2011 ²	2019	2020	2021	2022
Wood Pellets	1,423	725	1,050	828	818

Notes to Table 1

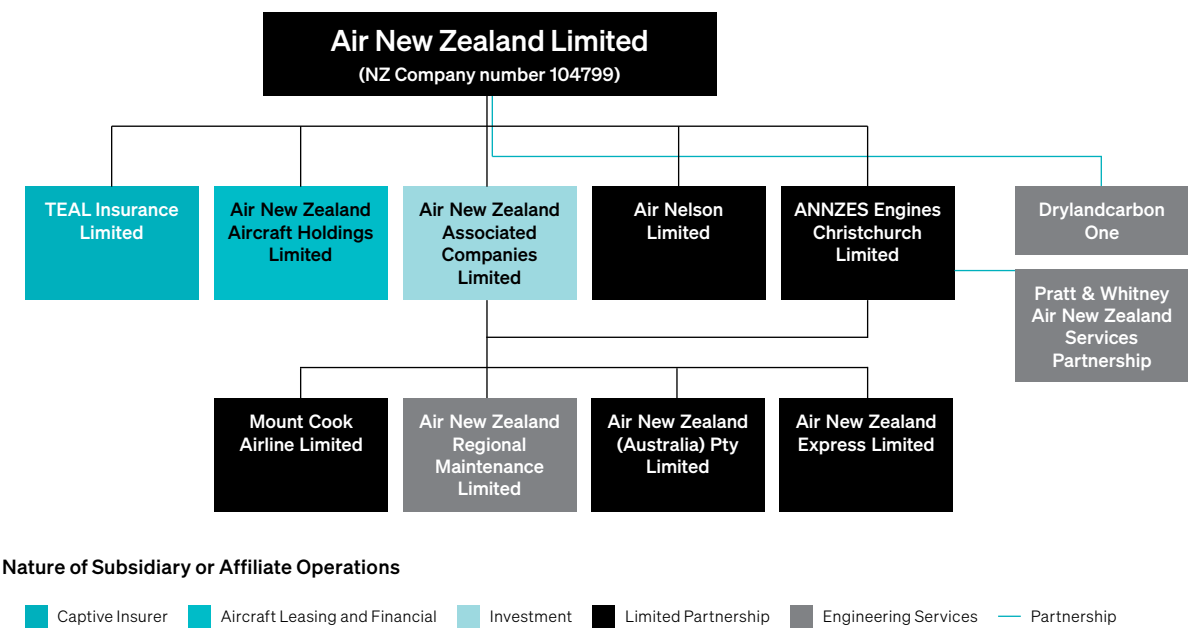
- Scope 1 Emissions: Accounts for direct GHG emissions from Jet Fuel, LPG, Natural Gas, Diesel, Petrol and Wood Pellets that are operated or controlled by Air New Zealand.
- In 2019, the New Zealand Ministry for the Environment updated greenhouse gas emissions factors for organisational reporting, including for the first time an emissions factor for aviation fuel. Air New Zealand has adopted this figure to stay consistent with national greenhouse gas inventory guidance, a process which has included updating the baseline inventory (2011).
- Emissions from Jet Fuel - Ground sources were not measured in 2011.
- Diesel includes mobile and stationary sources.
- Scope 2 Emissions: Accounts for GHG emissions from the generation of purchased electricity consumed by Air New Zealand.
- Scope 3 Emissions: Accounts for indirect GHG emissions from Jet Fuel, LPG, Natural Gas, Diesel, Petrol and Electricity that occur in the company's value chain.



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Organisational boundary

Air New Zealand’s organisational boundary encompasses the companies listed in the table below. Apart from where indicated in the exclusions (table 2) overleaf, Air New Zealand has operational control of these companies.



Operational Boundary

Air New Zealand applies an operational control approach to determine the boundary of the airline’s GHG Inventory. A company has operational control over an operation if the former or one of its subsidiaries has the full authority to introduce and implement its operating policies at the operation.

Emissions from excluded entities are described in Table 2.

Air New Zealand reports on Scope 1 and 2 emissions and for the first time is reporting Scope 3 category 3 emissions. This includes emissions from the upstream carbon impacts of aviation fuel and other energy sources. Emissions from the use of aviation jet fuel are the most significant emissions source in the organisation’s value chain and are under Air New Zealand’s ability to manage and influence.

Baseline Year

The base year is 1 July 2010 to 30 June 2011. This was chosen as the base year because it was the first year that Air New Zealand had complete data for Scope 1 and 2 emissions. If Air New Zealand’s Scope 1 or 2 emissions were to change by more than 10% due to company or portfolio acquisitions or divestments, it acknowledges a base year recalculation would be appropriate.

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Table 2: List of Excluded Entities

Entity	Reason for exclusion
TEAL Insurance Limited	No activities that produce GHG emissions
Air Nelson Limited	No activities that produce GHG emissions
Mount Cook Airline Limited	No activities that produce GHG emissions
Air New Zealand Aircraft Holdings limited	No activities that produce GHG emissions
Air New Zealand Associated Companies Limited	Non-operating holding company
Air New Zealand Express Limited	Non-operating holding company
Air New Zealand (Australia) Pty Limited	Non-operating holding company
ANNZES Engines Christchurch Limited	Non-operating holding company
Pratt & Whitney Air New Zealand Services Partnership	No operational control
Drylandcarbon One Limited Partnership	Limited partnership, no operational control

Methodologies and Uncertainties

Emissions for Scope 1, 2 and 3 have been quantified using the calculation method based on activity data multiplied by greenhouse gas emissions factors. Emissions factors have been sourced from official Ministry for the Environment factors, the Australian National Greenhouse Gas Accounts Factors and the UK Department for Environment, Food and Rural Affairs BEIS factors as detailed in Table 4.





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Table 3: Inclusions

Scope 1 Emissions			
Category	GHG Emissions Source	Data Source	Methodology, Data Quality, Uncertainty
Jet Fuel	Fuel used to operate aircraft (domestic and international)	Records from supplier invoices	Records of fuel purchased
Jet Fuel Ground	Fuel used for ground engine testing	Fuel reconciliation process	Records of fuel purchased
LPG	Fuel used for heating and process plant	Records from supplier invoices	Records of fuel purchased
Natural Gas	Fuel used for heating and process plant	Records from supplier invoices	Records of fuel purchased
Diesel ¹	Fuel for light vehicle fleet in New Zealand	Records not available due to a change in supplier. Fleet Partners are the new suppliers	Estimations based on 2021 fleet fuel consumption data. There was no change to size or mix of the fleet vehicles
	Fuel for Ground Support Equipment (GSE) at five domestic airports and by fleet at Engineering and Cargo operations in Auckland and Christchurch	Records from supplier (Minitankers)	Records of fuel purchased
Diesel ²	Fuel for Ground Support Equipment at Regional airports and Rarotonga	Estimated for Regional New Zealand airports and Rarotonga	Estimated based on diesel use at the five domestic airports
Diesel ³	Testing hangar deluge systems, emergency generators and boilers	Estimated for Auckland and Christchurch Engineering bases	Estimations based on testing duration and consumption data
Bio Diesel	Fuel for ground vehicle fleet	Records from supplier invoices	(N/A in current reporting year however included in base year)
Petrol ¹	Fuel for light vehicle fleet in New Zealand	Records not available due to a change in supplier. Fleet Partners are the new suppliers	Estimations based on 2021 fleet fuel consumption data. There was no change to size or mix of the fleet vehicles
Coal	Not used during relevant reporting period	No invoices held for relevant reporting period	(N/A in current reporting year however included in base year)
Scope 2 Emissions			
Category	GHG Emissions Source	Data Source	Methodology, Data Quality, Uncertainty
Electricity	Electricity used in offices and facilities in New Zealand	Records from supplier invoices validated by energy meters	Accurate records of electricity purchased

GREENHOUSE GAS INVENTORY REPORT (CONTINUED)



Table 3: Inclusions (continued)

Scope 3 Emissions			
Category	GHG Emissions Source	Data Source	Methodology, Data Quality, Uncertainty
Jet Fuel	Fuel used to operate aircraft (domestic and international) and ground engine testing	Records from supplier invoices	Records of fuel purchased
Jet Fuel Ground	Fuel used for ground engine testing	Fuel reconciliation process	Records of fuel purchased
LPG	Fuel used for heating and process plant	Records from supplier invoices	Records of fuel purchased
Natural Gas	Fuel used for heating and process plant	Records from supplier invoices	Records of fuel purchased
Diesel (Total)	Fuel used to operate ground fleet and ground support equipment in New Zealand and Rarotonga	Combination of records from suppliers and estimates	Combination of records of fuel purchased and estimates
Petrol ¹	Fuel used to operate ground fleet	Records not available due to a change in supplier. Fleet Partners are the new suppliers	Estimations based on 2021 fleet fuel consumption data. There was no change to size or mix of the fleet vehicles
Biomass Emissions			
Category	GHG Emissions Source	Data Source	Methodology, Data Quality, Uncertainty
Wood pellets	Fuel used for heating	Records from supplier invoices	Records of wood pellets purchased from supplier

- Notes to Table 3**
- Diesel GSE, and petrol and diesel light vehicle fleet assumptions & exclusions
 - Diesel (GSE) consumed at the five main New Zealand domestic airports – Auckland, Wellington, Christchurch, Nelson and Dunedin; diesel consumed by fleet at Engineering and Cargo operations at Auckland and Christchurch; 690,776 Litres.
 - Air New Zealand has 105 fleet vehicles consisting of: Diesel (36); Petrol (9); Plug-in Electric (Fully) (22); Plugin Hybrid Electric (PHEV) (22); Hybrid (Battery/Petrol) (15); Hybrid (Battery/Diesel) (1). Fuel consumption was estimated based on 2021 usage at 42,199 Litres (diesel and petrol).
 - Exclusion:
 - There are 13 light vehicles offshore. There is no visibility on fuel consumption for these vehicles.
 - Diesel (Ground Support Equipment) at New Zealand regional airports and including Rarotonga. At the time of writing, Air New Zealand had no data on diesel consumption at regional airports and Rarotonga. The following assumptions were made.
 - Estimations for diesel consumption at regional airports and Rarotonga (70,500L).
 - Diesel GPUs (Ground Power Units) at regional airports and Rarotonga. Based on 4,000 litres per year (the average diesel GPU use at the five New Zealand domestic ports) the estimate for diesel use is 36,000 litres per year.
 - Aircraft container loaders at regional airports and Rarotonga. Based on 1,800 litres per year (the average diesel Transporter use at Dunedin) – the estimate for diesel use is 21,600 litres.
 - Tugs at regional and airports and Rarotonga. Based on 600 litres per year (the average diesel Tug use at Dunedin) – the estimate for diesel use is 4,800 litres.
 - Pushback tractors at regional airports and Rarotonga. Based on 900 litres per year (the average diesel Tug use at Dunedin) – the estimate for diesel use is 2,700 litres.
 - Ambulifts at regional airports and Rarotonga. Based on 400 litres per year the estimate for diesel use is 1,200 litres.
 - Toilet truck in the regional airports. Estimated diesel consumption is 1,000 litres.
 - Fork hoists at regional airports and Rarotonga. Based on 300 Litres per year (the average diesel fork hoist use at Dunedin) – the estimate for diesel use is 1,500 litres.
 - Belt loaders at regional airports and Rarotonga. Based on 300 litres per year (the average diesel Tug use at Dunedin) – the estimate for diesel use is 1,200 litres.
 - Truck-mounted stair at a regional airport. Estimated diesel consumption is 250 litres.
 - Motorised stairs at regional airports and Rarotonga. Estimated diesel consumption is 250 litres.
 - Diesel (Stationary systems) at Auckland & Christchurch Engineering estimated at 7,877 Litres



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Table 4: Greenhouse Gas Emissions by Greenhouse Gas Type

Scope 1 – Emissions Tonnes of CO ₂ -e					
	Ref	Emissions (tonnes)*1			
Source	1	CO ₂ -e	CO ₂	CH ₄	N ₂ O
Jet Fuel – Domestic	1	465,303	449,617.4	3,163.5	12,522.3
Jet Fuel – International	1	1,040,786	1,005,700.4	7,076.2	28,009.8
Jet Fuel – Ground	1	1,048	1,012.8	7.1	28.2
Jet Fuel – Total	1	1,507,138	1,456,330.7	10,246.8	40,560.4
LPG	1	1,413	1,411.6	0.6	0.7
Natural Gas	1	2,141	2,139.0	0.9	1.1
Diesel ¹ (mobile)	1	1,861	1,829.3	2.4	29.1
Diesel ² (mobile)	1	247	242.6	0.3	3.9
Diesel ³ (stationary)	1	21	20.9	0.0	0.1
Diesel Total – Mobile	1	2,108	2,071.9	2.8	33
Diesel Total – Stationary	1	21	20.9	0.0	0.1
Petrol ²	1	52	49.5	0.6	1.7
Wood Pellets (CH ₄ & N ₂ O)	1	14	-	5.5	8.7
Total Scope 1		1,512,886	1,462,023	10,257	40,606

Scope 2 Emissions Tonnes CO ₂ -e ⁵					
Source	Ref	CO ₂ -e	CO ₂	CH ₄	N ₂ O
Electricity	3	2,736	2,627	105	4
Total Scope 2		2,736	2,627	105	4
Total CO ₂ -e Emissions (Scope 1 & 2)		1,515,622			

Scope 3 Emissions Tonnes CO ₂ -e ⁶					
Source	Ref	CO ₂ -e	CO ₂	CH ₄	N ₂ O
Jet Fuel – Domestic	2	93,343	-	-	-
Jet Fuel – International	2	208,790	-	-	-
Jet Fuel – Ground	2	210	-	-	-
LPG	3	1,682	-	-	-
Natural Gas	1	127	-	-	-
Diesel Total ⁴	3	2,845	-	-	-
Petrol	3	76	-	-	-
Electricity	1	262	-	-	-
Total Scope 3		307,335	-	-	-
Total CO ₂ -e Emissions (Scope 1 & 2 & 3)		1,822,957	-	-	-

Biomass Tonnes CO ₂				
Source	CO ₂ -e	CO ₂	CH ₄	N ₂ O
Wood Pellets	818	818		

GREENHOUSE GAS INVENTORY REPORT (CONTINUED)



Table 4: Greenhouse Gas Emissions by Greenhouse Gas Type
(continued)

- References to Table 4
- 1. 2022 MfE Factors
 - 2. BEIS WTT Factors
 - 3. 2021 Australian National Greenhouse Accounts Factors
- Notes to Table 4
- 1. Actual figures from five New Zealand domestic airports and Engineering and Cargo operations in Auckland and Christchurch (diesel only, GSE)
 - 2. Estimated fuel consumption for New Zealand (diesel and petrol) and Ground Support Equipment at regional airports and Rarotonga
 - 3. Testing stationary systems at Auckland and Christchurch Engineering
 - 4. Diesel total (mobile and stationary)



Table 5: List of Excluded Emissions Sources

Scope	Category	GHG Emission Source	Reason for exclusion
1	Aircraft Engine Oil	Operation of aircraft	Difficult to obtain data
1	Fugitive Emissions	Fugitive HFC emissions from air-conditioning systems	Difficult to obtain data
1	Diesel and Petrol	Owned light vehicle fleet at regional airports and offshore vehicles	Difficult to obtain data
1	Fugitive Emissions	SF6 used in electrical switchgear, and transformers as electrical insulation	Difficult to obtain data
2	Electricity	Used in buildings/facilities in overseas locations	Difficult to obtain data

Marty Forsman
Senior Manager Environmental Stewardship
25 August 2022



APPENDIX



Independent assurance report on the Air New Zealand Group 2022 Greenhouse Gas Emissions Inventory Report to the Board of Directors of Air New Zealand Limited.

Report on Greenhouse Gas Emissions Inventory Report

We have undertaken a reasonable assurance engagement in relation to Scope 1 and 2 emissions and limited assurance engagement relating to Scope 3 emissions for the Greenhouse Gas Emissions Inventory Report (the 'Inventory Report') of Air New Zealand Limited and its subsidiaries ("the Group") for the year ended 30 June 2022, comprising the Emissions Inventory Report and explanatory notes set out on pages 1 to 9.

The Inventory Report provides information about the greenhouse gas emissions ('GHG') of the Group for the year ended 30 June 2022 and is based on historical information. This information is stated in accordance with the requirements of the Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (2004) ('the GHG Protocol').

Board of Directors' Responsibility

The Board of Directors are responsible for the preparation of the inventory report, in accordance with the GHG Protocol. This responsibility includes the design, implementation, and maintenance of internal control relevant to the preparation of an inventory report that is free from material misstatement, whether due to fraud or error.

Our Responsibility

Reasonable assurance for Scope 1 and 2 emissions

Our responsibility is to express an opinion whether, in our opinion the Scope 1 and 2 emissions within the Inventory Report for the period 1 July 2021 to 30 June 2022 have been prepared, in all material respects in accordance with the GHG Protocol.

Limited assurance for Scope 3 emissions

Our responsibility is to form a conclusion whether, based on the procedures performed, anything has come to our attention that causes us to believe that the Scope 3 emissions within the inventory report for the 1 July 2021 to 30 June 2022 have not been prepared, in all material respects, in accordance with the GHG Protocol.

We conducted our engagement in accordance with International Standard on Assurance Engagements (New Zealand) 3410: Assurance Engagements on Greenhouse Gas Statements ('ISAE (NZ) 3410'), issued by the New Zealand Auditing and Assurance Standards Board. That standard requires that we plan and perform this engagement to obtain reasonable and limited assurance about whether the Inventory Report is free from material misstatement.

We did not evaluate the security and controls over the electronic publication of the Inventory Report.

Reasonable Assurance

A reasonable assurance engagement undertaken in accordance with ISAE (NZ) 3410 involves performing procedures to obtain evidence about the quantification of emissions and related information in the Inventory Report. The nature, timing and extent of procedures selected depend on the assurance practitioner's judgement, including the assessment of the risks of material misstatement, whether due to fraud or error, in the Inventory Report. In making those risk assessments, we will consider internal control relevant to the Group's preparation of the Inventory Report. A reasonable assurance engagement also includes:

- Assessing the suitability in the circumstances of the Group's use of the GHG Protocol, as the basis for preparing the Inventory Report;
- Evaluating the appropriateness of quantification methods and reporting policies used, and the reasonableness of estimates made by the Group; and
- Evaluating the overall presentation of the Inventory Report.

We believe that the evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

Limited Assurance

A limited assurance engagement undertaken in accordance with ISAE (NZ) 3410 involves assessing the suitability in the circumstances of the Company's use of the GHG Protocol as the basis for the preparation of the Scope 3 elements of the inventory report, assessing the risks of material misstatement whether due to fraud or error, responding to the assessed risks as necessary in the circumstances, and evaluating the overall presentation of the inventory report. A limited assurance engagement is substantially less in scope than a reasonable assurance engagement in relation to both the risk assessment procedures, including an understanding of internal control, and the procedures performed in response to the assessed risks.

Our engagement will include such procedures as we consider necessary in the circumstances, including, but not limited to:

- A review of adherence to the principles and requirements outlined in the GHG Protocol, which includes a consideration of completeness and balance;
- Obtaining an understanding of the process of compiling and validating information received from data owners for inclusion in the Inventory Report;
- Review of material quantitative data, including corroborative enquiry and examination of selected supported documentation and calculations;
- Undertaking site visits to key Company operations as required;
- Comparing the Inventory Report to the reporting requirements of the GHG Protocol; and
- Reviewing the contents of the Inventory Report against the findings of our work and, as necessary, providing recommendations for improvement.

APPENDIX CONTINUED



Inherent Limitations

Non-financial information, such as that included in the Group's inventory report, is subject to more inherent limitations than financial information, given both its nature and the methods used and assumptions applied in determining, calculating and sampling or estimating such information. Specifically, GHG quantification is subject to inherent uncertainty because of incomplete scientific knowledge used to determine emissions factors and the values needed to combine emissions of different gases.

Our Independence and Quality Control

We have complied with the independence and other ethical requirements of Professional and Ethical Standard 1 International Code of Ethics for Assurance Practitioners (including International Independence Standards) (New Zealand) issued by the New Zealand Auditing and Assurance Standards Board, which is founded on fundamental principles of integrity, objectivity, professional competence and due care, confidentiality and professional behaviour.

The Auditor-General has appointed Melissa Collier, using the staff and resources of Deloitte Limited to carry out the audit of the consolidated financial statements of the Group on his behalf. In addition to this engagement, we have carried out assurance services relating to the review of the interim financial statements and compliance with student fee protection rules. In addition, we provide non-assurance services relating to tax compliance for the Corporate Taxpayers Group. These services are compatible with those independence requirements. In addition to these engagements, principals, and employees of our firm deal with the Group on normal terms within the ordinary course of trading activities of the Group. These engagements and trading activities have not impaired our independence as auditor of the Group. Other than in the above capacities, we have no relationship with or interests in Group.

The firm applies Professional and Ethical Standard 3 (Amended): Quality Control for Firms that Perform Audits and Reviews of Financial Statements, and Other Assurance Engagements issued by the New Zealand Auditing and Assurance Standards Board, and accordingly maintains a comprehensive system of quality control including documented policies and procedures regarding compliance with ethical requirements, professional standards and applicable legal and regulatory requirements.

Use of Report

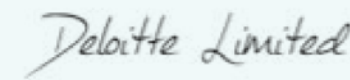
Our assurance report is made solely to the directors of Air New Zealand Group in accordance with the terms of our engagement. Our work has been undertaken so that we might state to the directors those matters we have been engaged to state in this assurance report and for no other purpose. To the fullest extent permitted by law, we do not accept or assume responsibility to anyone other than the directors of Air New Zealand Group for our work, for this assurance report, or for the conclusions we have reached.

Reasonable Assurance Opinion

In our opinion, the Scope 1 and Scope 2 emissions disclosed within inventory report of Air New Zealand Group for the year ended 30 June 2022 has been prepared, in all material respects, in accordance with the requirements of the GHG Protocol.

Limited Assurance Conclusion


Based on the procedures we have performed and the evidence we have obtained, nothing has come to our attention that causes us to believe that Air New Zealand Group's Scope 3 emissions disclosed within the inventory report for the year ended 30 June 2022 is not prepared, in all material respects, in accordance with the requirements of the GHG Protocol.



Chartered Accountants

25 August 2022
Auckland, New Zealand

This reasonable and limited assurance report relates to the GREENHOUSE GAS EMISSIONS INVENTORY REPORT of Air New Zealand Limited for the year ended 30 June 2022 included on Air New Zealand Limited's website. Air New Zealand Limited is responsible for the maintenance and integrity of the Air New Zealand Limited website. We have not been engaged to report on the integrity of the Air New Zealand Limited's website. We accept no responsibility for any changes that may have occurred to the GREENHOUSE GAS EMISSIONS INVENTORY REPORT since they were initially presented on the website. The reasonable and limited assurance report refers only to the GREENHOUSE GAS EMISSIONS INVENTORY REPORT named above. It does not provide an opinion on any other information which may have been hyperlinked to/from these GREENHOUSE GAS EMISSIONS INVENTORY REPORT. If readers of this report are concerned with the inherent risks arising from electronic data communication they should refer to the published hard copy of the GREENHOUSE GAS EMISSIONS INVENTORY REPORT and related reasonable and limited assurance report to confirm the information included in the GREENHOUSE GAS EMISSIONS INVENTORY REPORT presented on this website.

AIR NEW ZEALAND 



A STAR ALLIANCE MEMBER 