



# Greenhouse Gas Inventory Report

Arvida Group Limited  
31 March 2023



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**Approved by:** Jeremy Nicoll, Chief Executive Officer

**Audited by:** Ernst & Young Limited

## Introduction

The purpose of this document is to disclose the annual greenhouse gas ('GHG') emissions inventory report for Arvida Group Limited ('Arvida'), covering the period 1 April 2022 to 31 March 2023. This report is in accordance with The Greenhouse Gas Protocol – A Corporate Accounting and Reporting Standard, Revised Edition ('Greenhouse Gas Protocol') and ISO 14064-1: Greenhouse gases – Part 1: Specification with guidance at the organisation level for quantification and reporting of greenhouse gas emissions and removals ('ISO 14064-1:2018').

Ernst & Young Limited ('EY') has been appointed as the third-party independent assurance provider and a limited level of assurance has been given over the Scope 1, 2 and 3 emissions for the year ended 31 March 2023 included in this report. Toitū Envirocare provided independent assurance over the years ended 31 March 2020, 2021 and 2022.

### Direct emissions - Scope 1 – tCO<sub>2</sub>e

Category	2020	2021	2022	2023
Stationary combustion	1,626	1,930	2,032	2,562
Mobile combustion	504	353	449 <sup>1</sup>	570
Fugitive emissions	209	128	241	97
<b>Total Scope 1</b>	<b>2,339</b>	<b>2,411</b>	<b>2,722</b>	<b>3,228</b>

<sup>1</sup> Changes to the prior year. Refer to 'Adjustments to Inventory' section

### Indirect emissions - Scope 2 – tCO<sub>2</sub>e

Category	2020	2021	2022	2023
Imported electricity	1,454	1,573	1,888	2,196
<b>Total Scope 2</b>	<b>1,454</b>	<b>1,573</b>	<b>1,888</b>	<b>2,196</b>
<b>Total Scope 1 &amp; 2</b>	<b>3,792</b>	<b>3,984</b>	<b>4,610</b>	<b>5,424</b>

### Indirect emissions - Scope 3 – tCO<sub>2</sub>e

Category	2020	2021	2022	2023
<b>Indirect emissions from transportation</b>				
Business travel	185	86	139	270
Employee commuting	-	-	2,695 <sup>1</sup>	2,847
<b>Indirect emissions from use of upstream products and services</b>				
Purchased goods and services	-	-	29,886 <sup>1</sup>	31,318
Capital goods	-	-	32,374 <sup>1</sup>	40,734
Well to tank emissions			104 <sup>1</sup>	132
Transmission and distribution losses	110	135	258	320
Waste generated from operations	842	617	568	596
<b>Indirect emissions from downstream use of products and services</b>				
Downstream leased assets	-	-	1,597 <sup>1</sup>	2,157
Investments	-	-	1,774 <sup>1</sup>	1,556
<b>Total Scope 3</b>	<b>1,137</b>	<b>838</b>	<b>69,394</b>	<b>79,931</b>
<b>Total Scope 1, 2 &amp; 3</b>	<b>4,929</b>	<b>4,822</b>	<b>74,004</b>	<b>85,355</b>

<sup>1</sup> Changes to the prior year. Refer to 'Adjustments to Inventory' section

Greenhouse Gas Inventory

Emissions intensity – calculated on mandatory emissions sources only

Category	2020	2021	2022	2023
Primary emissions <sup>1</sup>	4,929	4,822	5,574	6,610
Operating revenue IFRS (gross tCO <sub>2</sub> e / \$Millions)	30.1	27.6	27.6	29.0
Total revenue (gross tCO <sub>2</sub> e / \$Millions) <sup>2</sup>	33.3	26.4	22.0	21.7
Retirement living units (gross tCO <sub>2</sub> e / number)	1.2	1.1	1.0	1.2

1 Primary emissions include all of Scope 1 & Scope 2 and Business travel, Waste generated from operations and Transmission and distribution losses from Scope 3.

2 Includes gross value of occupation rights sold.

### About Arvida

Arvida builds, owns, and operates retirement communities that provide quality retirement village living and aged care services to older New Zealanders.

The organisation was formed in 2014 when it listed on the New Zealand stock exchange with 18 retirement communities. Since then, Arvida has grown to become a group spread across 36 locations nationally. Retirement living accommodation and aged care services is now offered to over 6,750 residents and the organisation is one of the largest providers of aged care services in New Zealand.

Arvida is reimagining how communities will age with a vision to transform the ageing experience and setting strategy accordingly. The focus is on the customer – it is resident-led in outcomes. This resonates through strategy from sustainability of new builds and villages acquired, to the proprietary care model implemented by the organisation which is called The Attitude of Living Well.™

### Persons Responsible

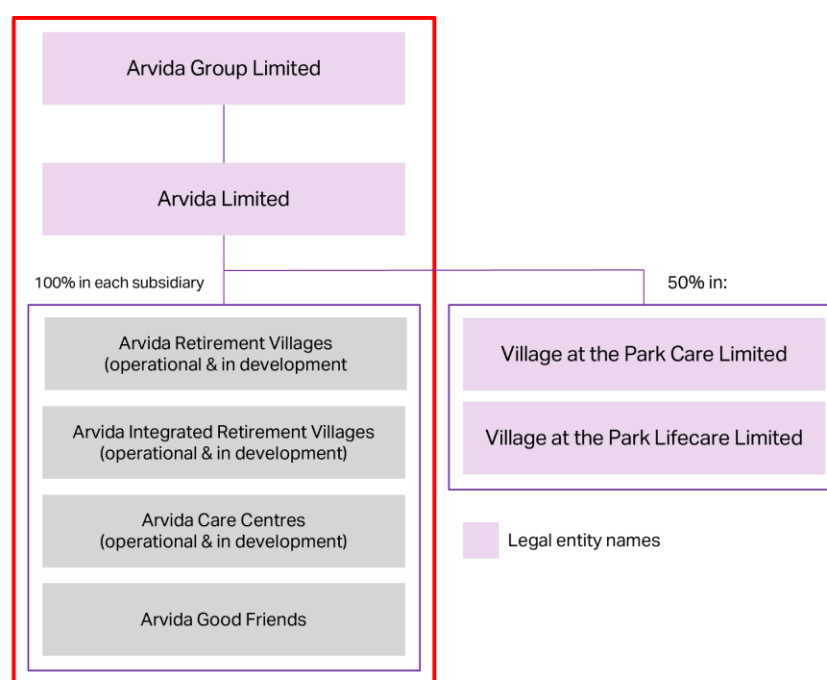
The Board of Directors are ultimately responsible for the Greenhouse Gas Inventory report. The person responsible for this report is Jeremy Nicoll, Chief Executive Officer.

### Organisational Boundary

Arvida's organisational boundary were set with reference to the methodology described in the GHG Protocol and ISO 14064-1:2018 standard and includes all companies listed in Appendix 1. The figure below shows the context of the overall structure. Arvida uses an operational control consolidation approach.

All subsidiaries of the group are 100% owned by Arvida Limited which is 100% owned by Arvida Group Limited. A 50% joint venture interest is held in one retirement community, comprising two legal entities, namely, Village at the Park Care Limited, and Village at the Park Lifecare Limited (together, 'Village at the Park'). Arvida does not have operational control of this community and accordingly, it is treated as an investment both in financial statements and emissions inventory.

Practically, this means that Village at the Park is not consolidated into our Scope 1 and 2 emissions. Instead, 50% of all the emissions from Village at the Park (Scope 1, 2 and 3) are included within Arvida's Scope 3 emissions under category 15, Investments.



Operational boundary shown in red

## Greenhouse Gas Inventory

### Reporting Boundary

Greenhouse gas emissions sources from Arvida's value chain were identified with reference to the methodology described in the GHG Protocol, ISO 14064-1, and Scope 3 Corporate Value Chain standards, and classified into categories.

The following categories are used:

- Direct GHG emissions (Scope 1): GHG emissions that are operationally controlled by the company;
- Indirect GHG emissions from imported energy (Scope 2): GHG emissions from purchased electricity, heat or steam consumed by the company;
- Other indirect GHG emissions (Scope 3): all indirect emissions (not included in scope 2) that occur in the value chain of the reporting company, including both upstream and downstream emissions.

These have been further categorised using the Scope 3 Standard categories:

- Purchased goods and services (category 1)
- Capital goods (category 2)
- Fuel- and energy-related activities not included in Scope 1 or 2 (category 3)
  - Transmission and distribution losses
  - Well to tank emissions
- Waste generated in operations (category 5)
- Business travel (category 6)
- Employee commuting (category 7)
- Downstream leased assets (category 13)
- Investments (category 15)

Please refer to the Emissions sources – exclusions section for further details of emissions sources excluded or not considered relevant to Arvida's operations.

Emissions intensity is calculated against mandatory emissions sources which include:

- Direct GHG emissions (Scope 1): GHG emissions that are operationally controlled by the company;
- Indirect GHG emissions from imported energy (Scope 2): GHG emissions from purchased electricity, heat or steam consumed by the company;
- Other indirect GHG emissions (Scope 3): indirect emissions (not included in scope 2) that occur in the value chain of the reporting company, including both upstream and downstream emissions comprising:
  - Fuel- and energy-related activities not included in Scope 1 or 2 (category 3)
  - Waste generated in operations (category 5)
  - Business travel (category 6)

### Base Year

This inventory report relates to the financial period from 1 April 2022 to 31 March 2023. The historical base year is 1 April 2019 to 31 March 2020.

There has been no change to the base year in this inventory. However, the base year does not contain several scope 3 additional categories as these were only calculated for the financial period ending 31 March 2022. Currently there is no emissions reduction target associated with these emissions sources and therefore the base year has not been adjusted to reflect these additional sources of emissions.

The entities that form the Arvida group have changed since the base year was calculated.

The base year included the following entities that no longer form part of the group (entities divested):

- Bainlea House (2013) Limited
- Bainswood House Rest Home Limited
- Bainswood Retirement Village Limited
- The Maples Lifecare (2005) Limited
- The Maples Retirement Village (2005) Limited
- Wendover Rest Home 2006 Limited
- Wendover Retirement Village 2006 Limited

Additionally, the group now includes the following entities that were not part of the group in the base year (entities acquired):

- Knightsbridge RV Limited Partnership
- Mayfair (Auckland) RV Limited
- Mount Eden Gardens RV Limited
- Ocean Shores RV Limited Partnership
- Peninsula Club RV Limited
- Parklane (Auckland) RV Limited

These divestments and acquisitions did not trigger a base year recalculation as individually they were not material (greater than 5% of the total inventory) at the time of divestment or acquisition. It is Arvida's policy to recalculate the base year where there has been a change of more than 5%.

### Adjustments to the inventory

The prior year inventory was recalculated to reflect additional sources of emissions and changes to the calculation methodology in previous periods. They are set out in the table below.

Category	Reason for the adjustment	Adjustment amount (tCO <sub>2</sub> e)
Mobile combustion	Adjusted to reflect an additional source of diesel	21
Employee commuting	Employee commuting added using calculation methodology used in current year as a basis	2,695
Purchased goods and services	Food related emissions calculation methodology updated (please refer to section Emissions Sources – inclusions for details)	23,415
	Water and wastewater emissions factors updated	
Capital goods	Capital goods calculation methodology updated to include additions to WIP as well as Investment Property and Fixed Assets and exclude fair value adjustments	(25,905)
Well to tank emissions	Added to the inventory using calculation methodology determined in current year as a basis.	104
Downstream leased assets	Adjustments made to reflect additional resident usage	112
Investments	Adjustments to the methodology noted above also impacted the calculation for downstream leased assets	(898)

### Emissions Sources - Inclusions

Sources of emissions are described in the table below. The table includes the sources of data, notes about the calculation methodology, quality of the data and any uncertainties. Emissions factors were predominantly sourced from [Ministry for the Environment](#) (MfE, New Zealand).

- Location based emission factors applied to electricity consumption in New Zealand have been calculated from Ministry for the Environment (MfE, New Zealand) data.
- The emissions factors for purchased goods and services (except food) and capital goods have been sourced from [Motu](#)<sup>1</sup> and are adjusted for inflation to 2007 when the research was conducted. The categories of spend per the GL have been matched to categories in the Motu research and are consistently applied year on year.
- The emissions factors for food are based on the work of Jonathan Drew who developed a New Zealand based emissions model which differentiated emissions from both New Zealand food supply and production. Using the ['Healthy and Climate-Friendly Eating Patterns in the New Zealand Context'](#)<sup>2</sup> database developed by Drew and updated by Auckland University, the appropriate emission factors were allocated to each ingredient. Where an appropriate emissions factor could not be found from this research, emissions factors from reputable publicly available sources such as research papers or carbon cloud.
- The emissions factors for well to tank emissions have been sourced from the UK's Department for Energy Security and Net Zero and Department for Business, Energy and Industrial Strategy ([www.gov.uk](http://www.gov.uk)).
- Air travel emission factors include radiative forcing.

Quantities of each greenhouse gas are converted to tonnes CO<sub>2</sub>e using the global warming potential from the Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Report (AR4). The time horizon is 100 years.

Arvida has no anthropogenic biogenic carbon dioxide emissions or removals. The only anthropogenic biogenic methane (CH<sub>4</sub>) and nitrous oxide (N<sub>2</sub>O) emissions relate to assumed emission associated with waste disposal to landfill. Please refer to Appendix 2 for details of those emissions.

<sup>1</sup> Consumption-based greenhouse gas emissions input-output model". 2014. Obtained by Motu Economic and Public Policy Research from Statistics New Zealand, MBIE and MFE in 2013. Unrestricted dataset available online from [www.motu.org.nz](http://www.motu.org.nz).

<sup>2</sup> Drew, J., Cleghorn, C., Macmillan, A., & Macmillan, A. (2020). Healthy and Climate-Friendly Eating Patterns in the New Zealand Context. Environmental Health Perspectives, 128(1), 017007. <https://doi.org/10.1289/EHP5996>,

## Greenhouse Gas Inventory

GHG emissions category	Category	Emissions source	Data source	Methodology, data quality, uncertainty, factors used
Direct emissions	Stationary combustion	LPG, natural gas - reticulated, bottled	Invoices and/or supplier records.	Quantity in kWh, kg or litres <sup>1</sup>
	Mobile combustion	Diesel, petrol	Invoices and/or supplier records.	Quantity in litres <sup>1</sup>
	Fugitive emissions	Refrigerants (chiller units, air conditioning)	Invoices and/or supplier records.	Quantity in g or kg multiplied by emissions factor from IPCC, AR5 GWP in a 100-year period.
Indirect emissions	Indirect emissions from imported electricity	Electricity	Invoices and/or supplier records.	Quantity in kWh <sup>1</sup>
Indirect GHG emissions from transportation	Emissions from Business travel	Air travel (domestic, long haul, short haul), Rental car, Taxi.	Invoices and/or supplier records.	Quantities in pkm, km, miles <sup>1</sup> where possible. \$ spend <sup>1</sup> for some taxi's and rental cars.
Indirect GHG emissions from products used by organization	Emissions from purchased goods and services	Purchased goods and services (except food)	Supplier survey response and \$ spend from internal records of purchases.	Inflation adjusted \$ spend multiplied by appropriate Motu emissions factor where supplier information on (scope 1 and 2 emissions) were not obtained. No adjustment made where reporting periods differed. Refer to emissions sources – inclusions for further details.
	Emissions from purchased goods and services	Food purchases	Invoices and/or supplier records and \$ spend from internal records of purchases	Quantity in kg or litres for main supplier multiplied by emissions factors obtained from research papers or other reputable sources. Refer to emissions sources – inclusions for further details. \$ spend was used to calculate emissions for all other food purchases using main supplier information as a proxy.
	Emissions from capital goods	Additions of capital goods in the period.	Supplier survey response and \$ spend from internal records of purchases.	Inflation adjusted \$ spend multiplied by appropriate Motu emissions factor where supplier information on (scope 1 and 2 emissions) were not obtained. No adjustment made where reporting periods differed. Refer to emissions sources – inclusions for further details.
	Indirect emissions from imported energy	Transmission and distribution losses - electricity, natural gas reticulated	Invoices and/or supplier records.	Quantity in kWh <sup>1</sup>
	Emissions from the disposal of solid waste	Waste to landfill	Invoices and/or supplier records.	Quantity in kg, tonnes <sup>1</sup> . Where no weight was provided by the supplier, assumption was that all bins were at full capacity.
	Emissions from the disposal of liquid waste	Wastewater	Invoices and/or supplier records.	Quantity in m <sup>3</sup> or litres <sup>1</sup> . Wastewater estimated at 90% of water supply.

<sup>1</sup> Multiplied by appropriate MfE emissions factor to determine emissions



GHG emissions category	Category	Emissions source	Data source	Methodology, data quality, uncertainty, factors used
Indirect emissions associated with the use of products from the organisation	Emissions from downstream leased assets	Resident energy use - electricity, reticulated gas	Invoices and/or supplier records available to Arvida and estimated for all other residents.	Quantity in kWh obtained for 4 communities across the country. This quantity was extrapolated over all other independent residents.
	Emissions from investments	Electricity, gas, diesel, petrol, water use, purchased goods and services, capital goods, waste to landfill, refrigerant, business travel	The information gathered was in line with all other data sources collected for other business units.	Quantities obtained and calculations performed in the same manner as all other business units as noted above in the table.

### Emissions Sources - Exclusions

The following Scope 3 categories are not relevant to Arvida's operations:

- Upstream transportation and distribution (category 4).
- Upstream leased assets (category 8)
- Processing of sold products (category 10)
- Use of sold products (category 11)
- End of life treatment of sold products (category 12)
- Franchises (category 14)

These are not relevant to our operations. Arvida does not sell products, we provide our residents with a right to occupy and as such these categories are not relevant to Arvida.

No direct greenhouse gas removals have been included in this inventory and there are no direct emissions from biologically sequestered carbon (from burning biomass or biofuels).

### Uncertainty

There is always some level of uncertainty with preparing a greenhouse gas inventory. To minimise uncertainty, source data has been selected from a verifiable source. Where uncertainty exists in the data, a conservative estimation approach has been taken leading to over, rather than understating of emissions. Qualitative uncertainty has been noted in this inventory where it is considered material, but no quantitative assessment of the uncertainty has been completed.

Arvida acknowledges the categories using inflation adjusted \$ spend to calculate emissions, namely category 1 & 2, (purchased goods & services and capital goods) are the least accurate because spend based emissions factors apply a standard emissions factor for each category and may ignore differences between products and services purchased and/or suppliers, industries and countries procured from. Please refer to 'Emissions Sources – inclusions' for further details of the calculation used. We are working to develop the emissions calculations to avoid using \$ spend in favour of quantities of materials or goods purchased and obtaining emissions information from suppliers for services rendered.

### Offsets

No purchased emission reductions have been included in this inventory.

### Renewable electricity

Arvida generates on-site renewable electricity, and this is included in the inventory. Solar panels are installed on the roof of two communities. One located in Christchurch generated approximately 123MWh of electricity for on-site operational consumption of the care centre, building common areas and recharging a pool of electric cars used by residents. Another located in Auckland generated approximately 105MWh of electricity for onsite operational consumption of the care centre and building common areas.

## Appendix

### Appendix 1: Reporting entities

#### Key

RV – Retirement community

Care – Care community

Company/Business unit/Facility	Physical location	Description
Aria Bay Retirement Village Limited	3-7 Woodlands Crescent, Browns Bay, Auckland 0630	RV
Aria Bay Senior Living Limited	3-7 Woodlands Crescent, Browns Bay, Auckland 0630	Care
Aria Gardens Limited	11 Bass Road, Albany, Auckland 0632	Care
Arvida AL Holdings Limited	L15, Aon Centre, 29 Customs Street West, Auckland, 1010	Support office
Arvida AL Limited	L15, Aon Centre, 29 Customs Street West, Auckland, 1010	Support office
Arvida AL New Zealand Limited	L15, Aon Centre, 29 Customs Street West, Auckland, 1010	Support office
Aria Park Retirement Village Limited	1-3 Claude Road, Epsom, Auckland 1023	RV
Aria Park Senior Living Limited	1-3 Claude Road, Epsom, Auckland 1023	Care
Arvida Group Limited	L15, Aon Centre, 29 Customs Street West, Auckland, 1010	Support office
Arvida Limited	L15, Aon Centre, 29 Customs Street West, Auckland, 1010	Support office
Ashwood Park Lifecare (2012) Limited	118-130 Middle Renwick Road, Springlands, Blenheim 7241	Care
Ashwood Park Retirement Village (2012) Limited	118-130 Middle Renwick Road, Springlands, Blenheim 7241	RV
Bethlehem Country Club Village Limited	111 Carmichael Road, Bethlehem, Tauranga 3110	RV
Bethlehem Shores Retirement Village Limited	141 Bethlehem Road, Bethlehem, Tauranga 3110	RV
The Cascades Retirement Resort Limited	55 Pembroke Street, Hamilton Lake, Hamilton 3204	Care
Copper Crest Living Well Limited	52 Condor Dr, Pyes Pa, Tauranga 3112	Care
Copper Crest Retirement Village Limited	52 Condor Dr, Pyes Pa, Tauranga 3112	RV
Glenbrae Village Limited	22 Hilda Street, Fenton Park, Rotorua 3010	RV
Good Friends Limited	35 Whiteleigh Avenue, Tower Junction, Christchurch 8024	Care
Glenbrae Resthome And Hospital Limited	22 Hilda Street, Fenton Park, Rotorua 3010	Care
Ilam Lifecare Limited	28 Ilam Road, Upper Riccarton, Christchurch 8041	RV
Ilam Senior Living Limited	28 Ilam Road, Upper Riccarton, Christchurch 8041	Care
Knightsbridge RV Limited Partnership	21 Graham Collins Drive, Windsor Park	RV
Lansdowne Developments Limited	100 Titoki Street, Lansdowne, Masterton 5810	RV
Lauriston Park Retirement Village Limited	91 Coleridge Street, Cambridge 3432	RV
Lansdowne Park Village Limited	100 Titoki Street, Lansdowne, Masterton 5810	Care
Mayfair (Auckland) RV Limited	14 Oteha Valley Road, Northcross	RV
Mary Doyle Healthcare Limited	3 Karanema Drive, Havelock North 4130	Care
Mary Doyle Trust Lifecare Complex Limited	3 Karanema Drive, Havelock North 4130	RV
Mount Eden Gardens RV Limited	467 Mount Eden Road, Mount Eden	RV
Mayfair Lifecare (2008) Limited	104 Wharenui Road, Upper Riccarton, Christchurch 8041	Care
Mayfair Retirement Village (2008) Limited	104 Wharenui Road, Upper Riccarton, Christchurch 8041	RV

Company/Business unit/Facility	Physical location	Description
Molly Ryan Lifecare (2007) Limited	269 Mangorei Road, Merrilands, New Plymouth 4312	Care
Molly Ryan Retirement Village (2007) Limited	269 Mangorei Road, Merrilands, New Plymouth 4312	RV
Ocean Shores RV Limited Partnership	80 Maranui Street, Mount Maunganui	RV
Olive Tree Apartments Limited	11-13 Dalwood Grove, Palmerston North 4412	RV
Olive Tree Holdings Limited	11-13 Dalwood Grove, Palmerston North 4412	Care
Olive Tree Village (2008) Limited	11-13 Dalwood Grove, Palmerston North 4412	RV
Oakwoods Lifecare (2012) Limited	357 Lower Queen Street, Richmond, Nelson 7020	Care
Oakwoods Retirement Village (2012) Limited	357 Lower Queen Street, Richmond, Nelson 7020	RV
Parklane (Auckland) RV Limited	106 Becroft Drive, Forrest Hill	RV
Park Lane Lifecare Limited	35 Whiteleigh Avenue, Tower Junction, Christchurch 8024	Care
Park Lane Retirement Village Limited	35 Whiteleigh Avenue, Tower Junction, Christchurch 8024	RV
Peninsula Club RV Limited	441 Whangaparaoa Road, Stanmore Bay	RV
Queenstown Country Club – Lake Wakatipu Care Centre	20 Douglas Street, Queenstown, 9300	Care
Queenstown Country Club Village Limited	420 Frankton-Ladies Mile Hwy, Cnr Howards Drive, Queenstown 9371	RV
Rhodes On Cashmere Healthcare Limited	5 Overdale Drive, Cashmere, Christchurch 8022	Care
Rhodes On Cashmere Lifecare Limited	5 Overdale Drive, Cashmere, Christchurch 8022	RV
St Albans Lifecare Limited	41 Caledonian Road, St Albans, Christchurch 8014	Care
St Albans Retirement Village Limited	41 Caledonian Road, St Albans, Christchurch 8014	RV
St Allisa Rest Home (2010) Limited	46 Main South Road, Upper Riccarton, Christchurch 8042	Care
Strathallan Healthcare Limited	31 Konini Street, Gleniti, Timaru 7910	Care
Strathallan Lifecare Village Limited	31 Konini Street, Gleniti, Timaru 7910	RV
Te Awamutu Country Club Village Limited	100 Frontier Road, Te Awamutu	RV
Te Puna Waiora Rv Limited	59 Hall Road, Kerikeri 0230	RV
The Wood Lifecare (2007) Limited	156 Milton Street, Nelson 7010	Care
The Wood Retirement Village (2007) Limited	156 Milton Street, Nelson 7010	RV
Tml(2005) Limited	71 Middleton Road, Upper Riccarton, Christchurch 8041	Care
Tmrv(2005) Limited	71 Middleton Road, Upper Riccarton, Christchurch 8041	RV
Views Lifecare Limited	186 Cambridge Road, Bethlehem, Tauranga 3110	Care
Waikanae Beach Retirement Village Limited	394 Te Moana Road, Waikanae, Kapiti Coast 5036	RV
Waikanae Country Lodge Limited	394 Te Moana Road, Waikanae, Kapiti Coast 5036	Care
Waikanae Country Lodge Village Limited	394 Te Moana Road, Waikanae, Kapiti Coast 5036	RV
Waimea Plains Living Well Limited	455 Lower Queen Street, Richmond 7020	Care
Waimea Plains Retirement Village Limited	455 Lower Queen Street, Richmond 7020	RV
<b>Joint Venture entities</b>	<b>Physical location</b>	<b>Description</b>
Village at the Park Healthcare Limited	130 Rintoul St, Newtown, Wellington 6021	Care - JV
Village at the Park Lifecare Limited	130 Rintoul St, Newtown, Wellington 6021	RV - JV

## Appendix

### Appendix 2: Emissions by Greenhouse Gas

#### Scope 1

Category	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	NF <sub>3</sub>	SF <sub>6</sub>	HFC	PFC	CO <sub>2</sub> e <sup>1</sup>	Total (tCO <sub>2</sub> e)
Stationary combustion	2,555	5	1	-	-	-	-	-	2,562
Mobile combustion	557	2	11	-	-	-	-	-	570
Fugitive emissions	0	-	0	-	-	96	-	-	97
<b>Total emissions</b>	<b>3,112</b>	<b>7</b>	<b>12</b>	<b>-</b>	<b>-</b>	<b>96</b>	<b>-</b>	<b>-</b>	<b>3,228</b>

1 Reported as tCO<sub>2</sub>e where no breakdown of the emission factor by gas is available

#### Scope 2

Category	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	NF <sub>3</sub>	SF <sub>6</sub>	HFC	PFC	CO <sub>2</sub> e <sup>1</sup>	Total (tCO <sub>2</sub> e)
Imported electricity	2,141	51	4	-	-	-	-	-	2,196
<b>Total emissions</b>	<b>2,141</b>	<b>51</b>	<b>4</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>2,196</b>

1 Reported as tCO<sub>2</sub>e where no breakdown of the emission factor by gas is available

#### Scope 3

Category	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	NF <sub>3</sub>	SF <sub>6</sub>	HFC	PFC	CO <sub>2</sub> e <sup>1</sup>	Total (tCO <sub>2</sub> e)
<b>Indirect emissions from transportation</b>									
Business travel	264	1	4	-	-	-	-	-	270
Employee commuting	2,725	32	91	-	-	-	-	-	2,847
<b>Indirect emissions from use of upstream products and services</b>									
Purchased goods and services	66	101	141	-	-	-	-	31,010	31,318
Capital goods	-	-	-	-	-	-	-	40,734	40,734
Well to tank emissions	-	-	-	-	-	-	-	132	132
Transmission and distribution losses	197	123	0	-	-	-	-	-	320
Waste	-	596	-	-	-	-	-	-	596
<b>Indirect emissions from downstream use of products and services</b>									
Downstream leased assets	2,109	45	4	-	-	-	-	0	2,157
Investments	418	44	94	-	-	-	-	1,000	1,556
<b>Total emissions</b>	<b>5,778</b>	<b>942</b>	<b>335</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>72,876</b>	<b>79,931</b>

1 Reported as tCO<sub>2</sub>e where no breakdown of the emission factor by gas is available



### Appendix 3: Reporting Index

This report aligns with ISO 14064-1:2018 and the Greenhouse Gas Protocol. The following table cross references the requirements against the relevant section(s) of this report.

Section of this report	ISO 14064-1:2018 clause	Greenhouse Gas Protocol (bullets)
Cover page	9.3.1 b, c	3
Introduction	9.2 d	
	9.3.1 c, r, s	
	9.3.2 a	
Table 1	9.3.1 j	4, 5
About Arvida	9.3.1 a	
Persons responsible	9.3.1 b	
Organisational boundary	9.3.1 d	1
Reporting boundary	9.3.1 e	2
Base year	9.3.1 k, l	7, 8
Emissions sources - inclusions	9.3.1 f, g, m, n, p, t	10
Emissions sources - exclusions	9.3.1 h, i	9
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## **Independent Limited Assurance Report to the Directors and Management of Arvida Group Limited ('Arvida')**

### **Assurance Conclusion**

Based on our limited assurance procedures described below, nothing has come to our attention that causes us to believe that Arvida Limited's greenhouse gas ('GHG') emissions inventory ('GHG Inventory') (including Scope 1, Scope 2 and Scope 3 emissions) disclosed within Arvida's Greenhouse Gas Inventory Report for the year ended 31 March 2023 has not been prepared and presented fairly, in all material respects, in accordance with the Criteria defined below.

### **Emphasis of Matter**

We draw attention to page 8 and 9 (the GHG emissions category table and the Uncertainty paragraph) within Arvida's Inventory Report 2023 and related disclosures in which Arvida describes the significant uncertainty associated with the calculation methodology of Scope 3 category: Capital Goods and Purchased Goods and Services GHG emissions, due to the use of 2007 inflation adjusted spend emissions factors. Our conclusion is not modified in respect of this matter.

### **Other Matter**

The GHG Inventory of Arvida for the years ended 31 March 2020, 2021 and 2022 were audited by another auditor who expressed an unmodified opinion on those statements on [date], [date] and 28 November 2022, respectively.

### **Scope**

Ernst & Young Limited ('EY') has undertaken a limited assurance engagement of Arvida's GHG Inventory Scope 1, Scope 2 and Scope 3 and related disclosures contained within Arvida's Greenhouse Gas Inventory Report for the year ended 31 March 2023 (the "Subject Matter").

Other than as described in the preceding paragraph, which sets out the scope of our engagement, we did not perform assurance procedures on the remaining information included in the Report, and accordingly, we do not express a conclusion on this information.

### **Criteria applied by Arvida**

In preparing the Subject Matter, Arvida applied the Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (revised version) and Corporate Value Chain (Scope 3) Accounting and Reporting Standards, and ISO 14064-1: Greenhouse gases - Part 1: Specification with guidance at the organization level for quantification and reporting of greenhouse gas emissions and removals. Emissions factor used within the inventory are from:

- ▶ New Zealand Ministry for the Environment, Measuring Emissions: A Guide for Organisations (2022)
- ▶ Motu Research - Consumption-based Greenhouse Gas Emissions Input-Output Model
- ▶ Healthy and Climate-Friendly Eating Patterns in the New Zealand Context, CID: 017007, New Zealand-specific life-cycle assessment (LCA) database

- ▶ United Kingdom Government Department for Business, Energy and Industrial Strategy: Greenhouse gas reporting: conversion factors 2022

(collectively the "Criteria").

### **Arvida's Responsibility**

Arvida's management is responsible for selecting the Criteria and presenting the Subject Matter in accordance with that Criteria in all material respects. This responsibility includes establishing and maintaining internal controls maintaining adequate records and making estimates that are relevant to the preparation of the GHG statement, such that it is free from material misstatement, whether due to fraud or error.

### **EY's Responsibility**

Our responsibility is to express a conclusion on the presentation of the Subject Matter based on the evidence we have obtained.

Our engagement was conducted in accordance with the International Standard for Assurance Engagements: Assurance Engagements Other than Audits or Reviews of Historical Financial Information ('ISAE (NZ) 3000') and International Standard for Assurance Engagements: Assurance Engagements on Greenhouse Gas Statements ('ISAE (NZ) 3410'), and the terms of reference for this engagement as agreed with Arvida on 1 February 2023. Those standards require that we plan and perform our engagement to obtain limited assurance about whether, in all material respects, the Subject Matter is presented in accordance with the Criteria, and to issue a report. The nature, timing, and extent of the procedures selected depend on our judgment, including an assessment of the risk of material misstatement, whether due to fraud or error.

We believe that the evidence obtained is sufficient and appropriate to provide a basis for our limited assurance conclusion.



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#### **Level of Assurance**

A limited assurance engagement consists of making enquiries and applying analytical, and other evidence-gathering procedures sufficient for us to obtain a meaningful level of assurance as the basis for providing a negative form of conclusion. The procedures performed depend on the assurance practitioner's judgement including the risk of material misstatement of the specific activity data, whether due to fraud or error. While we considered the effectiveness of Management's internal controls when determining the nature and extent of our procedures, these procedures were not designed to provide assurance on internal controls. We believe that the evidence we have obtained is sufficient and appropriate to provide a basis for our conclusion.

#### **Our Independence and Quality Management**

We have complied with the independence and other ethical requirements of the 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 firm applies Professional and Ethical Standard 3, which requires the firm to design, implement and operate a system of quality management including policies or procedures regarding compliance with ethical requirements, professional standards and applicable legal and regulatory requirements.

#### **Description of procedures performed**

Procedures performed in a limited assurance engagement vary in nature and timing from, and are less in extent than for a reasonable assurance engagement. Consequently the level of assurance obtained in a limited assurance engagement is substantially lower than the assurance that would have been obtained had a reasonable assurance engagement been performed. Our procedures were designed to obtain a limited level of assurance on which to base our conclusion and do not provide all the evidence that would be required to provide a reasonable level of assurance.

Although we considered the effectiveness of management's internal controls when determining the nature and extent of our procedures, our assurance engagement was not designed to provide assurance on internal controls. Our procedures did not include testing controls or performing procedures relating to checking aggregation or calculation of data within IT systems.

The Green House Gas quantification process is subject to scientific uncertainty, which arises because of incomplete scientific knowledge about the measurement of GHGs.

Additionally, GHG procedures are subject to estimation (or measurement) uncertainty resulting from the measurement and calculation processes used to quantify emissions within the bounds of existing scientific knowledge.

The engagement consists of making enquiries, primarily of persons responsible for preparing the Subject Matter and related information, and applying analytical and other relevant procedures.

Our procedures included:

- ▶ Conducting interviews with personnel to understand the business and reporting process.
- ▶ Conducting interviews to understand the process for collecting, collating and reporting the Subject Matter during the reporting period.
- ▶ Checked data used in calculating the GHG emissions back to source files, and testing, on a sample basis, underlying data to check the accuracy of data.
- ▶ Identifying and testing assumptions supporting the calculations.
- ▶ Tests of calculation and aggregation.
- ▶ Comparing year on year activity-based GHG emissions and energy data, where possible.
- ▶ Checking organisational and operational boundaries to test completeness of GHG emissions sources.
- ▶ Checking that GHG emissions factors and methodologies have been correctly applied as per the Criteria.
- ▶ Obtaining management representations over the completeness and accuracy of the GHG emission calculation.
- ▶ Reviewing the appropriateness of the presentation of disclosures.

We also performed such other procedures as we considered necessary in the circumstances.

#### **Limitations on scope**

There are inherent limitations in performing assurance - for example, assurance engagements are based on selective testing of the information being examined - and it is possible that fraud, error, or non-compliance may occur and not be detected. There are additional inherent risks associated with assurance over non-financial information including reporting against standards which require information to be assured against source data compiled using definitions and estimation methods that are developed by the reporting entity. Finally, adherence to ISAE 3000 (NZ), ISAE 3410 (NZ), the GHG Protocol and ISO 14064-1 is subjective and will be interpreted differently by different stakeholder groups.

Our assurance was limited to the Subject Matter and did not include statutory financial statements. While we considered the effectiveness of management's internal controls when determining the nature and extent of our procedures, our assurance engagement was not designed to provide assurance on internal controls. Our procedures



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did not include testing controls or performing procedures relating to checking aggregation or calculation of data within IT systems. Our assurance is limited to policies, and procedures in place as of 29 May 2023, ahead of the publication of Arvida's GHG Inventory.

### **Independence**

We confirm that EY has complied with all professional regulations relating to Independence in relation to this engagement. EY has stringent policies and procedures in place to ensure independence requirements are addressed and monitored on a timely basis.

### **Restricted use**

This report is intended solely for the information and use of Arvida and for the purpose of disclosing their GHG inventory and is not intended to be and should not be used by anyone other than those specified parties.

A stylized, handwritten-style signature of 'Ernst &amp; Young' in black ink.

Pip Best  
EY New Zealand Climate Change and Sustainability  
Services Partner  
Ernst & Young Limited  
29 May 2023