

# Valio GHG Inventory Report 2022

## Part 1: Descriptive information

Descriptive information	Company response
Company name	Valio Ltd
Description of the company	<p>Valio Ltd is a dairy company owned by dairy cooperatives. The company was founded in 1905 by Finnish farmers and currently is a limited liability company owned by 14 dairy cooperatives. Valio has a supply agreement with five cooperatives, which have about 3 700 Finnish milk suppliers as members. Valio is Finland's largest milk processor, producing about 80% of the country's milk. Valio has about 4000 employees working in Finland, Estonia, Sweden, China and the United States (US).</p> <p>Valio Ltd has 12 production plants in Finland and two in Estonia. The production plants focus on consumer dairy products but also plant based products. In addition, about 30-40% of the company revenue comes from industrial and food service items. Valio is Finland's biggest food exporter and sells products to nearly 60 countries. In 2022 Valio's share of Finland's dairy product exports was above 95%, and almost one third of Finland's food exports. In Finland Valio has a wholesale subsidiary Valionova tukku- ja logistiikkapalvelut Ltd. Subsidiaries Valio Sweden and Valio China sells only products made in Finland. Valio US sells Finnish and Estonian products and they have also some contract productions locally.</p>
Chosen consolidation approach (equity share, operational control or financial control)	Operational control
Description of the businesses and operations included in the company's organizational boundary	<p><b>Finland</b></p> <p>The greenhouse gas emissions reported by Valio under Scope 1 and Scope 2 of the GHG Protocol include all operating in Finland (home office in Helsinki, warehouse in Tuusula, 12 factories around Finland and four wholesale properties by Valionova tukku- ja logistiikkapalvelut Ltd. The climate impacts of Valionova tukku- ja logistiikkapalvelut Ltd. (previous Heino Tukku), acquired by Valio in July 2021, are reported first time in the 2022 data as a part of Valio Finland's emissions according to the GHG Protocol.</p> <p>All indirect emissions (not included in Scopes 1 and 2) that occur along Valio's value chain, including both upstream and downstream emissions, are presented in the Scope 3 emissions inventory. The Scope 3 GHG emissions inventory of Valio includes emissions from all operating divisions in Finland.</p>

The division between Scope 1 and 2 is made according to the following principle:

Scope 1

- Heating plants, which produce heat only for Valio
- Refrigerant leaks
- Solar energy (own production)

Scope 2

- Heating plants, which produce heat for Valio and other customers
- District heating
- Purchased electricity

Local breakdown by heating plants and other properties:

**Valio Ltd.**

Haapavesi

- Scope 1 and 2

Juice factory, Helsinki

- Scope 1

Head office, Helsinki

- Scope 2

Riihimäki

- Scope 1

Joensuu

- Scope 1 and 2

Jyväskylä

- Scope 1

Lapinlahti

- Scope 1

Oulu

- Scope 1

Seinäjoki

- Scope 1

Suonenjoki

- Scope 1 and 2

Turenki

- Scope 2

Vantaa

- Scope 1

Äänekoski

- Scope 1 and 2

Tuusula

- Scope 2

**Valionova tukku- ja logistiikkapalvelut Ltd.**

Sörnäisten pikatukku, Helsinki

- Scope 2

Toimitustukku, Espoo

- Scope 2

Pikatukku, Vantaa

- Scope 2

Toimitustukku, Kuopio

- Scope 2

	<p><b>Estonia</b></p> <p>The greenhouse gas emissions reported by Valio (Baltics) under Scope 1 and Scope 2 of the GHG Protocol include all operating in Estonia.</p> <p>The division between Scope 1 and 2 is made according to the following principle:</p> <p>Scope 1</p> <ul style="list-style-type: none"> <li>• Heating plants</li> <li>• Logistics (raw milk collection logistics, own vehicles)</li> </ul> <p>Scope 2</p> <ul style="list-style-type: none"> <li>• Purchased electricity</li> </ul>
<p>A list of Scope 1 and 2 activities <b>excluded</b> from the report with justification of their exclusion</p>	<p>Scope 1 and 2 are limited outside the inventory:</p> <ul style="list-style-type: none"> <li>• Valio has small properties outside of its offices and factories in Finland. Emissions of those properties bases most on electricity and the usage of electricity in 2022 was 1,8% of Valio’s total electricity use and emissions in Finland. Emissions of these properties are excluded from the inventory.</li> <li>• Estonia’s possible refrigerant leaks (scope 1) are excluded because there is no data available.</li> <li>• Swedish and Chinese operations, as they do not manufacture products, there is only smaller marketing organizations, are excluded from the inventory. In 2022 there were 22 employees in Valio China and 64 in Valio Sweden. The greenhouse gas emissions of Valio Sweden are currently being harmonized with the GHG Protocol.</li> <li>• US operations do not have significant scope 1 and 2 emissions (only a small office with 26 employees in 2022).</li> </ul>
<p>The reporting period covered</p>	<p>01/01/2022-31/12/2022</p>
<p>A list of scope 3 activities included in the report</p>	<p>The following categories, adapting the GHG Protocol, are included in Valio’s Scope 3 GHG emissions inventory. Under Finland operations are reported Valio Ltd. and Valionova tukku- ja logistiikkapalvelut Ltd.</p> <p><b>Finland</b></p> <p>Category 1: Purchased goods and services</p> <ul style="list-style-type: none"> <li>• Raw milk</li> <li>• Berries, fruits, salt, sugar, oil, etc. raw materials used in the manufacture of Valio products</li> <li>• Packaging materials (Valio products)</li> <li>• Wholesale products</li> <li>• Packaging materials used by wholesalers related to the sale of products</li> <li>• Cleaning agents and cleaning services</li> </ul>

Category 2: Capital goods

- New constructed production facilities and equipments

Category 3: Fuel- and energy-related activities (not included in Scope 1 and 2)

- Upstream emissions from purchased fuels and heat
- Transmissions and distribution losses from purchased electricity, district heating and heat
- Emissions of peat production and storage

Category 4: Upstream transportation and distribution

- Outsourced contract operators for collecting milk
- Outsourced contract operators for transfers of raw materials between factories
- Purchased freight logistics

Category 5: Waste generated in operations

- Waste in Valio's factories and offices
- Waste in wholesale properties

Category 6: Business travel

- Business flights
- Leased cars, travel allowances and train travel
- Hotel accommodations

Category 7: Employee commuting

- Employee commuting (car and public transport)

Category 9: Downstream transportation and distribution

- Outsourced contract operators for transfers of finished products between stocks
- Outsourced retail and wholesale logistics

Category 10. Processing of sold products

- Sold products

Category 11: Use of sold products

- Sold products

Category 12. End-of-life treatment of sold products

- Sold products

<p>A list of Scope 3 activities <b>excluded</b> from the report with justification of their exclusion</p>	<p>The following list presents the Scope 3 activities excluded from the report with justification for their exclusion by category:</p> <p><b>Finland</b></p> <p>Category 8: Upstream leased assets</p> <ul style="list-style-type: none"> <li>• This category is not relevant for Valio. Valio does not have assets that are leased for other companies and are not already included in the company's Scope 1 or Scope 2 inventories.</li> </ul> <p>Category 11a: Downstream emissions from fossil fuels distributed but not sold by the company</p> <ul style="list-style-type: none"> <li>• This category is not relevant for Valio, since Valio does not distribute any fossil fuels.</li> </ul> <p>Category 13: Downstream leased assets</p> <ul style="list-style-type: none"> <li>• This category is not relevant for Valio. Valio does not have assets that are leased for other companies and are not already included in the company's Scope 1 or Scope 2 inventories.</li> </ul> <p>Category 14: Franchises</p> <ul style="list-style-type: none"> <li>• This category is not relevant for Valio, since Valio has no franchise activities.</li> </ul> <p>Category 15: Investments</p> <ul style="list-style-type: none"> <li>• This category is not relevant for Valio, since Valio has no financial investments.</li> </ul> <p><b>Estonia</b></p> <p>Scope 3 in Estonia was screened* in 2022 (2021 data). Those emissions were not so relevant compared to Valio Finland's scope 3, so they have so far been excluded from the inventory. Estonia's scope 3 emissions were roughly estimated as 6% of Valio Finland's scope 3 emissions and the emissions on Finnish raw milk were still 81% of total Finland and Estonian scope emissions.</p> <p>Category 1: Purchased goods and services</p> <ul style="list-style-type: none"> <li>• Raw milk</li> <li>• Other ingredients</li> <li>• Packaging materials</li> <li>• Cleaning agents</li> </ul> <p>Category 2: Capital goods</p> <ul style="list-style-type: none"> <li>• All the Valio Group's investments were included in Valio Finland's category 2 in 2022</li> </ul>
---	--

Category 3: Fuel- and energy-related activities (not included in Scope 1 and 2)

- Transmissions and distribution losses from purchased electricity and heat

Category 4: Upstream transportation and distribution

- Outsourced contract operators for transfers of raw materials between factories
- Milk collection logistics already included in scope 1 emissions

Category 5: Waste generated in operations

- Waste in Valio's factories and offices

Category 6: Business travel

- No data is available for this, but the majority of Valio Group's business travel takes place in the Finnish head office operations.

Category 7: Employee commuting

- Employee commuting (car and public transport)

Category 8: Upstream leased assets

- This category is not relevant for Valio. Valio does not have assets that are leased for other companies and are not already included in the company's Scope 1 or Scope 2 inventories.

Category 9: Downstream transportation and distribution

- Outsourced contract operators for transfers of finished products between stocks
- Outsourced retail logistics

Category 10. Processing of sold products

- Sold products

Category 11: Use of sold products

- Sold products

Category 11a: Downstream emissions from fossil fuels distributed but not sold by the company

- This category is not relevant for Valio, since Valio does not distribute any fossil fuels.

Category 12. End-of-life treatment of sold products

- Sold products

Category 13: Downstream leased assets

- This category is not relevant for Valio. Valio does not have assets that are leased for other companies and are not already included in the company's Scope 1 or Scope 2 inventories.

	<p>Category 14: Franchises</p> <ul style="list-style-type: none"><li>• This category is not relevant for Valio, since Valio has no franchise activities.</li></ul> <p>Category 15: Investments</p> <ul style="list-style-type: none"><li>• This category is not relevant for Valio, since Valio has no financial investments.</li></ul> <p><b>Sweden and China</b></p> <ul style="list-style-type: none"><li>• Scope 3 is not relevant for these marketing operations, because they sell only Valio products manufactured in Finland (most of the emissions are already included in Valio Finland emissions). In 2022 there were 22 employees in Valio China and 64 in Valio Sweden. The greenhouse gas emissions of Valio Sweden are currently being harmonized with the GHG Protocol.</li></ul> <p><b>United States (US)</b></p> <ul style="list-style-type: none"><li>• Valio US is a marketing organization (26 employees selling Valio Finland and Estonia products) with a small scale of contract manufacturing locally. The emissions of contract manufactured products in Valio USA have been roughly estimated for 2022 based on product types and volumes (kilograms, kg). Those emissions were about 60 000 tons CO<sub>2</sub>e, which is about 2,7 % of Valio Finland's total scope 3 emissions. Those emissions are so far excluded from the inventory (not so relevant compared to Valio Finland's total scope 3 emissions).</li></ul>
--	--



## Part 2: Greenhouse gas emissions data

Scopes 1 and 2	Metric tons CO <sub>2</sub> e
Scope 1: Direct emissions from owned/controlled operations	<p><b>Finland</b> 43600</p> <p><b>Estonia</b> 9800</p>
Scope 2: Indirect emissions from the use of purchased electricity, steam, heating and cooling	<p><b>Finland</b></p> <p><u>Location based</u> purchased electricity: 21100</p> <p><u>Market based</u> purchased electricity: 44700</p> <p>Heating &amp; cooling: 12200</p> <p>District heating 2100</p> <p><b>Estonia</b></p> <p><u>Location based</u> purchased electricity: 17500</p> <p><u>Market based</u> purchased electricity: 11800</p>

Scope 3					
No.	Category	Emissions (metric tons CO <sub>2</sub> e.)	Primary data 1)	Secondary data, estimation 2)	% of total scope 3 emissions
<b>Upstream emissions</b>					
1	Purchased goods and services	<b>Finland</b> Raw milk 1909000  Other purchased goods and services 202000	60%  80%	40%  20%	80,3  8,5
2	Capital goods	<b>Finland</b> 69900		100%	2,9
3	Fuel- and energy-related activities (not included in Scope 1 or Scope 2)	<b>Finland</b> 27900	100%		1,2
4	Upstream transportation and distribution	<b>Finland</b> Milk collection logistics 13300  Other Upstream logistics 2300	100%  100%		0,6  0,1
5	Waste generated in operations	<b>Finland</b> 1700	100%		0,1
6	Business travel	<b>Finland</b> 1100	100%		0,1
7	Employee commuting 3)	<b>Finland</b> 5400	61%	39%	0,2
8	Upstream leased assets	N/A			

Downstream emissions					
9	Downstream transportation and distribution	<b>Finland</b> Product distribution 17200  Other Downstream logistics 5400	100%  100%		0,7  0,2
10	Processing of sold products	<b>Finland</b> 43000	100%		1,8
11	Use of sold products	<b>Finland</b> 66300	100%		2,8
11a	Category 11a: Downstream emissions from fossil fuels <i>distributed but not sold by the company</i>	N/A			
12	End-of-life treatment of sold products	<b>Finland</b> 14300		100%	0,6
13	Downstream leased assets	N/A			
14	Franchises	N/A			
15	Investments	N/A			

1) Primary data: Calculations based on company-specific data

2) Secondary data: Calculations based on generic or industry average data from published sources, estimation or extrapolated data

## Part 3: Description of methodologies and data used

Scope	Methodologies used to calculate or measure emissions, providing a reference or link to any calculation tools used
Scope 1	<p>Activity data:</p> <ul style="list-style-type: none"> <li>Oil, gas, peat and renewable energy sources (different wood materials): MWh of heat produced with oil, gas, peat and wood as measured and registered in Valio's facilities in collaboration with heat energy suppliers</li> <li>Refrigerant leaks: kilograms (kg) of substance as reported fill-ups of the equipment by the service provider for each Valio's factory (no data available from Estonia).</li> <li>Milk collection logistics: mileage monitoring (primary data, Valio)</li> </ul> <p>Emission factors (secondary data):</p> <p><b>Finland</b></p> <ul style="list-style-type: none"> <li>Primarily: emission figures from heat suppliers</li> <li>Necessary clarifications and verification: oil, gas, peat and renewable energy sources (different wood materials): Tilastokeskus Polttoaineluokitus 2022. <a href="https://www.stat.fi/tup/khkinv/khkaasut_polttoaineluokitus.html">https://www.stat.fi/tup/khkinv/khkaasut_polttoaineluokitus.html</a></li> <li>Refrigerant leaks: <a href="https://helda.helsinki.fi/handle/10138/155617">https://helda.helsinki.fi/handle/10138/155617</a>, IPCC and emission factors from suppliers (Linde, etc.)</li> </ul> <p><b>Estonia</b></p> <ul style="list-style-type: none"> <li>Heating: Emissions from fuels. <a href="https://www.riigiteataja.ee/akt/108032019006?leiaKehtiv">https://www.riigiteataja.ee/akt/108032019006?leiaKehtiv</a></li> <li>Logistics: Diesel, natural gas and biogas: <a href="https://www.stat.fi/tup/khkinv/khkaasut_polttoaineluokitus.html">https://www.stat.fi/tup/khkinv/khkaasut_polttoaineluokitus.html</a></li> </ul>
Scope 2	<p>Activity data:</p> <ul style="list-style-type: none"> <li>Oil, gas, peat and renewable energy sources (different wood materials): MWh of heat produced with oil, gas, peat and wood as measured and registered in Valio's facilities in collaboration with heat energy suppliers</li> <li>Electricity and district heat: consumption data in MWh based on suppliers' measurement</li> </ul> <p>Emission factors:</p> <p><b>Finland</b></p> <ul style="list-style-type: none"> <li>Primarily: emission figures from heat suppliers</li> <li>Oil, gas, peat and renewable energy sources (different wood materials): Tilastokeskus Polttoaineluokitus 2022. <a href="https://www.stat.fi/tup/khkinv/khkaasut_polttoaineluokitus.html">https://www.stat.fi/tup/khkinv/khkaasut_polttoaineluokitus.html</a></li> <li>District heating: Supplier specific emission factors:  Helen 190 CO<sub>2</sub>e kg / MWh <a href="https://www.helen.fi/yriitykset/lampoa-yriityksille/kaukolampoa-yriitykselle#alkupera">https://www.helen.fi/yriitykset/lampoa-yriityksille/kaukolampoa-yriitykselle#alkupera</a>  Fortum 156 CO<sub>2</sub>e kg / MWh <a href="https://www.fortum.fi/yriityksille-ja-yhteisoille/lammitys-ja-jaahdytys/kaukolampo/kaukolampoa-yha-puhtaamin/kaukolammon-tuotantoluvut">https://www.fortum.fi/yriityksille-ja-yhteisoille/lammitys-ja-jaahdytys/kaukolampo/kaukolampoa-yha-puhtaamin/kaukolammon-tuotantoluvut</a>  Savon Voima 114 CO<sub>2</sub>e kg / MWh Information directly from the heat supplier by email  Kuopion energia 129 CO<sub>2</sub>e kg / MWh <a href="https://www.kuopionenergia.fi/kotitaloudet/lampoa-kotiisi/lammon-alkupera-koti-lampo/">https://www.kuopionenergia.fi/kotitaloudet/lampoa-kotiisi/lammon-alkupera-koti-lampo/</a>  Vantaan energia 162,7 CO<sub>2</sub>e kg / MWh <a href="https://www.vantaanenergia.fi/lampo/vantaalainen-lampo-on-hintavakaa-ja-ilmastoystavallinen-lammitysratkaisu/">https://www.vantaanenergia.fi/lampo/vantaalainen-lampo-on-hintavakaa-ja-ilmastoystavallinen-lammitysratkaisu/</a></li> </ul>

	<ul style="list-style-type: none"> <li>Electricity (market-based): Finland 2021 Residual mix 234,9 CO<sub>2</sub>e kg / MWh (2022 was not available in early 2023) <a href="#">Jäännösjakauma+2021+julkaisu+FI.pdf (energiavirasto.fi)</a></li> <li>Electricity (location-based): Country specific emission factor in Finland 89 CO<sub>2</sub>e / MWh (2022 was not available in early 2023) <a href="https://www.motiva.fi/ratkaisut/energian kaytto suomessa/co2-laskentaohje_energiankulutuksen_hiilidioksidipaastojen_laskentaan/co2-paastokertoimet">https://www.motiva.fi/ratkaisut/energian kaytto suomessa/co2-laskentaohje_energiankulutuksen_hiilidioksidipaastojen_laskentaan/co2-paastokertoimet</a></li> </ul> <p><b>Estonia</b></p> <ul style="list-style-type: none"> <li>Electricity (market-based): Estonia 2021 Residual mix 636,58 CO<sub>2</sub>e / MWh (2022 was not available in early 2023) <a href="https://elering.ee/en/residual-mix">https://elering.ee/en/residual-mix</a></li> <li>Electricity (location-based): Country specific emission factor in Estonia 946,0 CO<sub>2</sub>e kg / MWh. European Environment Agency <a href="https://www.eea.europa.eu/data-and-maps/daviz/co2-emission-intensity-12/#tab-chart_2">https://www.eea.europa.eu/data-and-maps/daviz/co2-emission-intensity-12/#tab-chart_2</a></li> </ul>
--	---

Scope 3 category	Description of the types and sources of data used to calculate emissions	Description of the methodologies, allocation methods and consumptions used to calculate emissions*	Percentage (%) of emissions calculated using data obtained directly from suppliers or other value chain partners
1. Purchased goods and services	Description: This is the most important category for Valio, as it includes all the raw materials used in factory production. The following purchased goods cover most of the Category 1. Data have been collected extensively from Finnish operations.	<p>Coverage in category level: Coverage in category level is calculated based on the value of purchases (euros) meaning that, measured in euros, most of this category is included in the emissions calculations.</p> <p>Coverage in product or service level: Coverage in the product level (raw milk, salt, berries, packaging materials, cleaning services, wholesale products, etc.) is calculated based on the value (euros) or on the amount (kilograms, kg, liters, l or pieces, pcs.) of purchased products. If the coverage of the emission calculations does not cover the whole product or service level, the results have been extended to the rest of this category to 100%. Data is refined annually.</p> <p>Coverage</p> <ul style="list-style-type: none"> <li>Raw milk (100%)</li> <li>Salt, sugar, vegetable oils, orange juices, berries and fruits (almost 100%)</li> <li>Packaging materials (100%)</li> <li>Cleaning agents and services (almost 100%)</li> <li>Wholesale products and packaging materials (100%)</li> </ul>	<p><b>Finland</b></p> <p>Raw milk 60%</p> <p>Other raw materials 0%</p> <p>Packages 56%</p> <p>Cleaning agents and cleaning services 0%</p> <p>Wholesale products and packaging materials 0%</p>

	<p><u>Raw milk</u></p> <p>Milk produced by Finnish farms is Valio's most important raw material and the most significant (80%) emission source in scope 3.</p> <p>Activity data (primary data): The data is based on the amount of milk (l) converted to kilograms (kg) and its content (protein, fat and lactose) received from the Finnish farms by Valio in 2022.</p> <p>Emission factors (secondary data): Raw milk emissions calculation is based on a systematic farm level (Tier 3) life cycle assessment (LCA). The average carbon footprint of raw milk received by Valio Finland is 1,02 CO<sub>2</sub>e. kg / 1 kg energy corrected milk (ECM). The most recent farm level data is from 2021. This emission factor is based on:</p> <ul style="list-style-type: none"> <li>• Valio's Carbo® Farm Calculator (LCA model certified annually by Carbon Trust). At this point the Valio's own carbon footprint data covers 60 percent of the milk received by Valio in 2022. The carbon footprints of the rest of the dairy farms will be calculated in the future, which further improves the accuracy. The goal is for all dairy farms to calculate their carbon footprint annually.</li> <li>• A study of the carbon footprint of Valio's raw milk: Astartsev, A. 2018. Carbon footprint of raw milk production – modeling and impact assessment <a href="https://aaltodoc.aalto.fi/handle/123456789/32366">https://aaltodoc.aalto.fi/handle/123456789/32366</a></li> <li>• Natural Resource Institute Finland: Information of carbon footprints of Finnish milk: <a href="https://www.luke.fi/tutkittua-tietoa-ruuan-ymparistovaikutuksista/">https://www.luke.fi/tutkittua-tietoa-ruuan-ymparistovaikutuksista/</a></li> </ul>	<p><u>Raw milk</u></p> <p>Coverage: All the milk received by Valio in Finland in 2022.</p> <p>Default: One liter (l) of milk is 1,03 kilogram (kg)</p> <p>Method: Amount of raw milk (kg) multiplied by the average footprint of the raw milk of Valio dairy farms.</p> <p>System boundary: Cradle-to-gate</p> <p>Functional unit: kg ECM (kg of energy corrected milk)</p> <p>Characterization factors: IPCC 2013 (IPCC: Myhre, G., D. Shindell, F. M. Bréon, W. Collins, J. Fuglestvedt, J. Huang, D. Koch, J.-F. Lamarque, D. Lee, B. Mendoza, T. Nakajima, A. Robock, G. Stephens, T. Takemura and H. Zhang. 2013. Anthropogenic and Natural Radiative Forcing. In: Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change, [Stocker, T.F., D. Qin, G.-K. Plattner, M. Tignor, S.K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex and P.M. Midgley (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA. 659-740, doi:10.1017/ CBO9781107415324.018.) (No carbon feedback)</p> <p>Included emissions sectors according to PEFCR (EDA. 2018. Product Environmental Footprint Category Rules. European Dairy Association. Quantis Switzerland. EPFL Innovation Park. Bât. D, 1015 Lausanne - Switzerland. Final PEFCR version.) and IDF (Guinard, C., F. Verones and Y. Loerincik. 2009. Environmental/ecological impact of the dairy sector: Literature review on dairy products for an inventory of key issues, list of environmental initiative and influences on the dairy sector. Bulletin of the International Dairy Federation (Report 436). Brussels, Belgium: International Dairy Federation.)</p> <p>Allocation method between raw milk and beef: Energy content allocation</p>	
--	--	---	--

	<p><u>Salt</u></p> <p>Activity data (primary data): Data from purchase reports (kg)</p> <p>Emission factors (secondary data): Plastics Europe. 2005. Ecoprofiles of the European Plastics Industry. Purified brine. <a href="#">Life cycle assessment • Plastics Europe</a></p> <p>Wanhalinna, V. 2010. Leivän hiilijalanjälki. Helsingin yliopisto. (Information of the emission factor of salt) <a href="https://helda.helsinki.fi/bitstream/handle/10138/18027/maisterin%20tutkielma%20ViiviWanhalinna%2025.10.10.pdf?sequence=1&amp;isAllowed=y">https://helda.helsinki.fi/bitstream/handle/10138/18027/maisterin%20tutkielma%20ViiviWanhalinna%2025.10.10.pdf?sequence=1&amp;isAllowed=y</a></p> <p><u>Sugar</u></p> <p>Activity data (primary data): Data from purchase reports (kg)</p> <p>Emission factors (secondary data): Nordic Sugar. 2010. Closer 2010. <a href="http://www.nordicsugar.com/fileadmin/Closer/Engelsk_low.pdf">http://www.nordicsugar.com/fileadmin/Closer/Engelsk_low.pdf</a></p>	<p>LCA time period: One calendar year</p> <p>According to IPCC Guidelines for National Greenhouse Gas Inventories almost all in-farm GHG emission calculations methods were Tier 3. Off-farm emissions were Tier 1 and 2 (IPCC, 2006. In: Egelston, S., Buendia, L., Miwa, K., Ngara, T., Tanabe, K. (Eds.), 2006 IPCC Guidelines for National Greenhouse Gas Inventories— Volume 4: Agriculture, forestry and other land use. IGES, Japan.)</p> <p><u>Salt, sugar, vegetable oils, fruits, berries and juices</u></p> <p>Coverage: All the salt, sugars and vegetable oils are included in the calculations. The most important juices: orange, apple, grape and blueberry. The most important berries and fruits: strawberry, blueberry, raspberry, mango, peach and banana.</p> <p>Method: The calculations are based on the general emission factors of the most significant raw materials, which were used to multiply the use volumes in kilograms (kg). Primary data on the climate impact of raw materials were not available from suppliers. Results have been extended to the rest of purchased raw materials.</p>	
--	---	--	--

	<p><u>Vegetable oils</u></p> <p>Activity data (primary data): Data from purchase reports (kg)</p> <p>Emission factors (secondary data): Risku-Norja H, Kurppa S, Helenius J. 2009. Impact of consumers' diet choices on greenhouse gas emissions. Conference paper: Future of the consumer society. Proceedings of the conference -Future of the consumer society. Tampere. Ed. Koskela M. ja Vinnari M.</p> <p><u>Orange, apple, grape and blueberry juices and concentrates</u></p> <p>Activity data (primary data): Data from purchase reports (kg)</p> <p>Emission factors (secondary data): Tesco: Product Carbon Footprint Summary. <a href="https://issuu.com/thema1/docs/tesco_product_carbon_footprint_summary_1">https://issuu.com/thema1/docs/tesco_product_carbon_footprint_summary_1</a></p> <p>Khanali et.al. 2020. <a href="#">Energy flow modeling and life cycle assessment of apple juice production: Recommendations for renewable energies implementation and climate change mitigation - ScienceDirect</a></p> <p>Kesko: Näin mittaamme ruokaostosten hiilijalanjäljen. <a href="https://www.k-ruoka.fi/artikkelit/vastuullisuus/nain-mittaamme-ruokaostosten-hiilijalanjalkea">https://www.k-ruoka.fi/artikkelit/vastuullisuus/nain-mittaamme-ruokaostosten-hiilijalanjalkea</a></p> <p>Climatiq <a href="#">Climatiq Data Explorer - Search Global Carbon Emission Factors</a></p>		
--	---	--	--



	<p><u>Berries and fruits</u></p> <p>Activity data (primary data): Data from purchase reports (kg)</p> <p>Emission factors (secondary data):</p> <p>Climatiq <a href="#">Climatiq Data Explorer - Search Global Carbon Emission Factors</a></p> <p>CarbonScopeData <a href="https://www.cleanmetrics.com/carbonscopedata/browsecli.aspx">https://www.cleanmetrics.com/carbonscopedata/browsecli.aspx</a></p> <p><u>Packaging materials</u></p> <p>Activity data (primary data): Sievo CO<sub>2</sub> Analytics. Data from invoices (euro)</p> <p>Emission factors (secondary data): Emission factors from Sievo CO<sub>2</sub> Analytics:</p> <p>Exiobase <a href="#">Exiobase - Home</a></p> <p>Ecoinvent <a href="#">ecoinvent Database - ecoinvent</a></p> <p>Emission factors provided by supplier: Liquid board: Accurate data from Tetrapak. <a href="https://www.ifeu.de/oekobilanzen/pdf/LCA_Nordic_final_report_incl_Critical_Review.pdf">https://www.ifeu.de/oekobilanzen/pdf/LCA_Nordic_final_report_incl_Critical_Review.pdf</a></p>	<p><u>Packaging materials</u></p> <p>Coverage: Emission calculations for packaging materials used in Valio products cover 100 % of the amount of packaging materials used in 2022 in kilograms (kg), pieces (pcs.) or in euros.</p> <p>Method: The emissions of all packaging materials used for Valio products were estimated with Sievo CO<sub>2</sub> analytics Tool.</p>	
--	---	--	--

	<p><u>Cleaning agents</u></p> <p>Activity data (primary data): Data from purchase reports (kg)</p> <p>Emission factors (secondary data): Ecoinvent <a href="#">Home - ecoinvent</a></p> <p><u>Cleaning services</u></p> <p>Activity data (primary data): Sievo CO<sub>2</sub> Analytics. Data from cleaning service invoices (euro)</p> <p>Emission factors (secondary data): Emission factors from Sievo CO<sub>2</sub> Analytics:</p> <p>Exiobase <a href="#">Exiobase - Home</a></p> <p><u>Wholesale products</u></p> <p>Activity data (primary data): Data from purchase reports (euro)</p> <p>Activity data (secondary data): Emission calculation is based on the total purchase amount investment amount and the Quantis Tool (GHG Protocol).</p> <ul style="list-style-type: none"> <li>• <a href="#">Scope 3 Evaluator (quantis-suite.com)</a></li> </ul>	<p><u>Cleaning agents</u></p> <p>Coverage: The emission calculation is based on data from the most important cleaning agents (94%: NaOH, HNO<sub>3</sub>, HCl) used in Valio's factories.</p> <p>Method: The calculations are based on the general emission factors, which were used to multiply the use volumes. Primary data on the climate impact of raw materials were not available from suppliers. Results have been extended to the rest of purchased raw materials.</p> <p><u>Cleaning services</u></p> <p>Coverage: Head office in Helsinki and all the wholesale properties in Helsinki, Espoo, Vantaa and Kuopio.</p> <p>Method: The emissions of all cleaning services were estimated with Sievo CO<sub>2</sub> analytics Tool.</p> <p><u>Wholesale products</u></p> <p>Coverage: The emission calculation is based on data from purchase reports of total wholesale products (euro).</p> <p>Method: There was no detailed information available on the climate impact of the wholesale products, so an estimate based on euros was used in the calculation.</p>	
--	--	--	--

	<p><u>Packaging materials used in wholesale properties</u></p> <p>Activity data (primary data): Data from purchase reports (kg)</p> <p>Emission factors (secondary data): Ecoinvent <a href="#">Home - ecoinvent</a></p> <p>Fefco <a href="https://www.fefco.org/sites/default/files/documents/The%20carbon%20footprint%20of%20corrugated%20packaging%202018_final-recalculated%202019_1.pdf">https://www.fefco.org/sites/default/files/documents/The%20carbon%20footprint%20of%20corrugated%20packaging%202018_final-recalculated%202019_1.pdf</a></p>	<p><u>Packaging materials used in wholesale properties</u></p> <p>Coverage: Packaging materials used in all wholesale properties in Helsinki, Espoo, Vantaa and Kuopio.</p> <p>Method: The calculations are based on the general emission factors which were used to multiply the purchase volumes. Primary data on the climate impact of packaging materials were not available from suppliers.</p>	
2. Capital goods	<p>Activity data (primary data): Valio's investments in 2022 were Valio Ltd. 46,2 million euros and Valionova tukku- ja logistiikkapalvelut Ltd. 0,4 million euros.</p> <p>Activity data (secondary data): Emission calculation is based on the total investment amount (46,7 million euros) and the Quantis Tool.</p> <ul style="list-style-type: none"> <li>• <a href="#">Scope 3 Evaluator (quantis-suite.com)</a></li> </ul>	<p>Coverage: Valio Ltd. and Valionova tukku- ja logistiikkapalvelut Ltd.</p> <p>Method: There was no detailed information available on the climate impact of the investments, so an estimate based on euros was used in the calculation.</p>	0%
3. Fuel- and energy-related activities (not included in Scope 1 and 2)	<p>Activity data (primary data): Fuel and energy use data was gathered from Valio's and Valionova tukku- ja logistiikkapalvelut Ltd.'s operational systems.</p> <p>Emission factors (secondary data): Defra Transmissions and distribution losses from purchased electricity, burning oil and natural gas <a href="https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2019">https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2019</a></p> <p>Emissions from peat production: VTT Technical Research Centre of Finland <a href="https://www.bioenergia.fi/wp-content/uploads/2020/05/Turpeen-tuotanto-ja-k%C3%A4ytt%C3%B6-yhteenveto-selvityksist%C3%A4-VTT-tiedotteita-2550-.pdf">https://www.bioenergia.fi/wp-content/uploads/2020/05/Turpeen-tuotanto-ja-k%C3%A4ytt%C3%B6-yhteenveto-selvityksist%C3%A4-VTT-tiedotteita-2550-.pdf</a></p>	<p>Coverage: Transmissions and distribution losses from purchased electricity, district heating and well to tank (WTT) emissions from use of burning oil, natural gas, bioenergy and peat.</p> <p>Method: Calculated based on fuel consumption used for scope 1 and 2 calculations and corresponding VTT factories. Transmission and distribution losses from electricity and district heat consumption were calculated based on scope 2 electricity and district heat consumption and emission factories from Defra.</p>	0%

<p>4. Upstream transportation and distribution</p>	<p><u>Milk collection and logistics between factories</u></p> <p>Activity data (primary data): Data of the kilometers driven are taken from logistics partner's reported mileage from driving reports. The average consumption of the vehicles (fuel used) is calculated as a weighted average. The kilometers driven by biogas have been deducted from the kilometers and have been calculated separately so that emissions are 85% lower compared to diesel.</p> <p>Emissions factors (secondary data):</p> <p>Diesel Tilastokeskus Polttoaineluokitus 2022. <a href="https://www.stat.fi/tup/khkinv/khkaasut_polttoaineluokitus.html">https://www.stat.fi/tup/khkinv/khkaasut_polttoaineluokitus.html</a></p> <p>Biogas VTT Technical Research Centre of Finland: <a href="https://cris.vtt.fi/ws/portalfiles/portal/26329817/REDII_raportti_pivitys_final.pdf">https://cris.vtt.fi/ws/portalfiles/portal/26329817/REDII_raportti_pivitys_final.pdf</a> An emission factor is used for biogas, according to which biogas emissions are 85% lower compared to diesel.</p> <p><u>Freight logistics</u></p> <p>Activity data (primary data): Data from purchase reports (euro) of freight logistics</p> <p>Emission factors (secondary data): Climatiq <a href="#">Climatiq Data Explorer - Search Global Carbon Emission Factors</a></p>	<p><u>Milk collection and logistics between factories</u></p> <p>Coverage: Outsourced contract operators for collecting milk and outsourced contract operators for transfers of raw materials between factories</p> <p>Method: Calculations are based on contracted logistics partners' reported mileage and related GHG emissions.</p> <p><u>Freight logistics</u></p> <p>Coverage: Purchased freight logistics</p> <p>Method: The calculations are based on the general emission factor (spend) which were used to multiply the freight logistics volumes in euros.</p>	<p>100%</p>
--	---	---	-------------

<p>5. Waste generated in operations</p>	<p><u>Valio Ltd.</u></p> <p>Activity data (primary data) and emission factors (secondary data): Zero Waste Tool. <a href="https://new.zerowaste.fi/frontpage">https://new.zerowaste.fi/frontpage</a></p> <p><u>Valionova tukku- ja logistiikkapalvelut Ltd.</u></p> <p>Activity data (primary data): Waste reports by facilities. Emission factors (secondary data): WWF Climate Tool. <a href="https://www.wwf.org/wwf-green-office-ilmastolaskuri">WWF Green Office - Ilmastolaskuri</a></p>	<p>Coverage: All waste management</p> <p><u>Valio Ltd.</u></p> <p>Method: Valio uses Zero Waste Tool, which is an application provided by Itä-Suomen Murskauskuskeskus (coordinator of all Valio’s waste management) to estimate the emissions from the treatment of all Valio Finland’s waste. The tool utilizes the latest emission factors for waste management and considers emissions over the life cycle of the process.</p> <p><u>Valionova tukku- ja logistiikkapalvelut Ltd.</u></p> <p>Method: Waste types in kilograms (kg) were brought into WWF Climate calculator.</p>	<p>99%</p>
<p>6. Business travel</p>	<p>Activity data (primary data): Emissions of business flights: American Express Global Business Travel (“GBT”) Valio Oy GHG Emissions 2022</p> <p>Emissions from accommodation: American Express Global Business Travel (“GBT”) Valio Oy GHG Emission report 2022</p> <p>Business travelling by car: EuropCar report and Valio staff mileage allowances (kilometers)</p> <p>Business travelling by train: VR Group's contract customers' travel and purchase report 2022 (kilometers)</p> <p>Emission factors (secondary data):</p> <p>Emissions from flights and business accommodation are calculated by travel agency (American Express Global Business Travel), emission factors from Defra.</p> <p>Emission factor for passenger cars: Tilastokeskus Polttoaineluokitus 2022. <a href="https://www.stat.fi/tup/khkinv/khkaasut_polttoaineluokitus.html">https://www.stat.fi/tup/khkinv/khkaasut_polttoaineluokitus.html</a></p>	<p>Coverage: business flights, train travel, leased car, Valio staff mileage allowances and business accommodation. Valio Group’s head office is in Finland, and the most significant business travel takes place from there.</p> <p>Method: Data provided by travel agency for flights and accommodation, other business travel calculated based on emission factors and distances.</p>	<p>50%</p>

	<p>Train travel in Finland is carbon neutral. VR Group: <a href="https://ilmastoraiteilleen.vr.fi/">https://ilmastoraiteilleen.vr.fi/</a></p> <p>and <a href="https://www.vrgroup.fi/fi/vrgroup/ uutishuone/uutiset-ja-tiedotteet/jokainen-junamatka-on-ilmastoteko---aivan-kaikki-suomen-matkustajajunat-kulkevat-jatkossa-hiilineutraalisti-031220190655/">https://www.vrgroup.fi/fi/vrgroup/ uutishuone/uutiset-ja-tiedotteet/jokainen-junamatka-on-ilmastoteko---aivan-kaikki-suomen-matkustajajunat-kulkevat-jatkossa-hiilineutraalisti-031220190655/</a></p>		
7. Employee commuting	<p>Activity data (primary data): Commuting emissions for employees have been estimated based on average distance and travel mode of commuting travel. Employee survey conducted in 2020 and updated annually based on the number on personnel per location.</p> <p>Emission factors (secondary data): Tilastokeskus Polttoaineluokitus 2022. <a href="https://www.stat.fi/tup/khkinv/khkaasut_polttoaineluokitus.html">https://www.stat.fi/tup/khkinv/khkaasut_polttoaineluokitus.html</a></p>	<p>Coverage: Valio Oy and Valionova tukku- ja logistiikkapalvelut Ltd.</p> <p>Method: Calculated based on sample (61%) extended to 80% because the majority of office workers worked at home in 2022.</p>	0%
9. Downstream transportation and distribution	<p>Activity data (primary data): logistics partner's reported mileage and fuel used, vehicle mode and load rate taken into account. Data measured partly also from van-specific meters that collect data directly from the engine.</p> <p>Emissions factors (secondary data): Tilastokeskus Polttoaineluokitus 2022. <a href="https://www.stat.fi/tup/khkinv/khkaasut_polttoaineluokitus.html">https://www.stat.fi/tup/khkinv/khkaasut_polttoaineluokitus.html</a></p>	<p>Coverage: transportation of products between warehouses, retail delivery</p> <p>Method: Calculations are based on contracted logistics partners' reported mileage, fuel used and related GHG emissions.</p>	100%

<p>10. Processing of sold products</p>	<p>Activity data (primary data): Valio's Sales Report 2022 (kg)</p> <p>Emission factors (secondary data): PEFCR (EDA. 2018. Product Environmental Footprint Category Rules. European Dairy Association. Quantis Switzerland. EPFL Innovation Park. Bât. D, 1015 Lausanne - Switzerland. Final PEFCR version.) and IDF (Guinard, C., F. Verones and Y. Loerincik. 2009. Environmental/ecological impact of the dairy sector: Literature review on dairy products for an inventory of key issues, list of environmental initiative and influences on the dairy sector. Bulletin of the International Dairy Federation (Report 436). Brussels, Belgium: International Dairy Federation.)  <a href="https://ec.europa.eu/environment/eussd/smgp/PEFCR_OEFSR_en.htm">https://ec.europa.eu/environment/eussd/smgp/PEFCR_OEFSR_en.htm</a></p>	<p>Coverage: Valio products made in Finland</p> <p>Method: The calculations are based on the emission factor which were used to multiply the weight (kg) of sold products in 2022. The emission factors are based on a report from the European Commission, which calculates the life-cycle climate impact of various products, such as the shares of these categories.</p>	<p>0%</p>
<p>11. Use of sold products</p>	<p>Activity data (primary data): Valio's Sales Report 2022 (kg)</p> <p>Emission factors (secondary data): PEFCR (EDA. 2018. Product Environmental Footprint Category Rules. European Dairy Association. Quantis Switzerland. EPFL Innovation Park. Bât. D, 1015 Lausanne - Switzerland. Final PEFCR version.) and IDF (Guinard, C., F. Verones and Y. Loerincik. 2009. Environmental/ecological impact of the dairy sector: Literature review on dairy products for an inventory of key issues, list of environmental initiative and influences on the dairy sector. Bulletin of the International Dairy Federation (Report 436). Brussels, Belgium: International Dairy Federation.)  <a href="https://ec.europa.eu/environment/eussd/smgp/PEFCR_OEFSR_en.htm">https://ec.europa.eu/environment/eussd/smgp/PEFCR_OEFSR_en.htm</a></p>	<p>Coverage: Valio products sold in 2022</p> <p>Method: The calculations are based on the emission factor which were used to multiply the weight (kg) of sold products in 2022. The emission factors are based on a report from the European Commission, which calculates the life-cycle climate impact of various products, such as the shares of these categories.</p>	<p>0%</p>

<p>12. End-of-life treatment of sold products</p>	<p><u>Valio products</u></p> <p>Activity data (primary data): Valio’s Sales Report 2022 (kg)</p> <p>Emission factors (secondary data): PEFCR (EDA. 2018. Product Environmental Footprint Category Rules. European Dairy Association. Quantis Switzerland. EPFL Innovation Park. Bât. D, 1015 Lausanne - Switzerland. Final PEFCR version.) and IDF (Guinard, C., F. Verones and Y. Loerincik. 2009. Environmental/ecological impact of the dairy sector: Literature review on dairy products for an inventory of key issues, list of environmental initiative and influences on the dairy sector. Bulletin of the International Dairy Federation (Report 436). Brussels, Belgium: International Dairy Federation.)  <a href="https://ec.europa.eu/environment/eussd/smgp/PEFCR_OEFSR_en.htm">https://ec.europa.eu/environment/eussd/smgp/PEFCR_OEFSR_en.htm</a></p> <p><u>Wholesale products</u></p> <p>Activity data (primary data): Valio’s Wholesale Report 2022</p> <p>Activity data (secondary data): Calculations made in the Quantis Tool.</p> <ul style="list-style-type: none"> <li>• <a href="https://www.quantis-suite.com">Scope 3 Evaluator (quantis-suite.com)</a></li> </ul>	<p>Coverage: Valio products sold in 2022 and all the wholesale products sold in 2022</p> <p><u>Valio products</u></p> <p>Method: The calculations are based on the emission factor which were used to multiply the weight (kg) of sold products in 2022. The emission factors are based on a report from the European Commission, which calculates the life-cycle climate impact of various products, such as the shares of these categories.  Further clarification: Referring to the same European Commission source, the emission factor for Category 12 is negative, as it considers the circular economy. In Finland, for example, cardboard has a very high recycling rate and several of Valio's plastic packaging are made from recycled plastic.</p> <p><u>Wholesale products</u></p> <p>Method: Emission calculation is based on the total amount of sold wholesale products (euro) and the Quantis Tool.</p>	<p>0%</p>
---	---	---	-----------

\*Estonia: scope 3 screened based on category 1 data and raw milk received ratio (Estonia/Finland 0,12). This was of enough accuracy, as Finnish raw milk emissions cover 81% of scope 3 in 2019 and 86,6% in 2021. The scope 3 emissions of Valio Baltics (Estonia) are so far excluded from the Valio’s GHG inventory.



## Independent practitioner's limited assurance report

To the Management of Valio Oy

We have been engaged by the Management of Valio Oy (hereinafter also the "Company") to perform a limited assurance engagement on selected sustainability information for the reporting period from 1 January 2022 to 31 December 2022, disclosed in Valio Oy Sustainability Report 2022 (hereinafter the Selected sustainability information). In addition, the work covers a review of Valio's updated GHG-inventory after the acquisition of Heinoon Tukku.

---

### Selected sustainability information

The selected sustainability information within the scope of assurance covers:

- GRI 305-1 Direct (Scope 1) GHG emissions
- GRI 305-2 Energy indirect (Scope 2) GHG emissions
- GRI 305-3 Other indirect (Scope 3) GHG emissions

---

### Management's responsibility

The Management of Valio Oy is responsible for preparing the Selected sustainability information in accordance with the reporting criteria as set out in Valio Oy reporting instructions, Global Reporting Initiative (GRI) and Greenhouse Gas Protocol Standards. The Management of Valio Oy is also responsible for such internal control as the management determines is necessary to enable the preparation of the Selected sustainability information that is free from material misstatement, whether due to fraud or error.

---

### Practitioner's independence, other ethical requirements and quality control

We have complied with the independence and other ethical requirements of the International Code of Ethics for Professional Accountants (including International Independence Standards) issued by the International Ethics Standards Board for Accountants (IESBA code), which is founded on fundamental principles of integrity, objectivity, professional competence and due care, confidentiality and professional behavior.

PricewaterhouseCoopers Oy applies International Standard on Quality Control (ISQC) 1 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.

---

### Practitioner's responsibility

Our responsibility is to express a limited assurance conclusion on the Selected sustainability information based on the procedures we have performed and the evidence we have obtained. We conducted our limited assurance engagement in accordance with the International Standard on Assurance Engagements (ISAE) 3000 (revised) "Assurance Engagements Other than Audits or Reviews of Historical Financial Information", and, in respect of greenhouse gas emissions, International Standard on Assurance Engagements (ISAE) 3410 "Assurance Engagements on Greenhouse Gas Statements". These Standards require that we plan and perform the engagement to obtain limited assurance about whether the Selected sustainability information is free from material misstatement.

In a limited assurance engagement, the evidence-gathering procedures are more limited than for a reasonable assurance engagement, and therefore less assurance is obtained than in a reasonable assurance engagement. An assurance engagement involves performing procedures to obtain evidence

about the amounts and other information in the Selected sustainability information. The procedures selected depend on the practitioner's judgment, including an assessment of the risks of material misstatement of the Selected sustainability information.

Our work consisted of, amongst others, the following procedures:

- Interviewing representatives of the Company.
- Performing three virtual site visits in the Company's sites to evaluate the processes and IT systems and how site level data is collected and consolidated into the Company's reporting
- Interviewing employees responsible for collecting and reporting the Selected sustainability information.
- Assessing how the reporting instructions and procedures are applied in the Company.
- Testing the accuracy and completeness of the information from original documents and systems on a sample basis.
- Testing the consolidation of information and performing recalculations on a sample basis.
- Considering the disclosure and presentation of the Selected sustainability information.

---

### 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 Valio Oy's Selected sustainability information for the reporting period 1 January 2022 to 31 December 2022 are not properly prepared, in all material respects, in accordance with the Reporting criteria.

When reading our limited assurance report, the inherent limitations to the accuracy and completeness of sustainability information should be taken into consideration.

Our assurance report has been prepared in accordance with the terms of our engagement. We do not accept, or assume responsibility to anyone else, except to Valio Oy for our work, for this report, or for the conclusions that we have reached.

Helsinki 26 April 2023

**PricewaterhouseCoopers Oy**

Mikael Niskala  
Partner  
ESG Reporting & Assurance Services

Niina Vilske  
Authorised Public Accountant (KHT)