

UPM Greenhouse Gas Inventory 2023

Descriptive information	Company response
Company name	UPM-Kymmene OYJ
Consolidation approach	Financial control
Description of the businesses and operations included in the company's organisational boundary	UPM reports Scope 1 and Scope 2 emissions from all production sites for the entire group. UPM does not report GHG emissions from mobile combustion and from facilities other than production sites and power plants. UPM reports Scope 2 in both market-based and location-based approaches. Scope 3 emissions are reported for the whole of UPM.
Reporting period	01/01/2023 – 31/12/2023
List of scope 3 activities included in the report	<ol style="list-style-type: none"> 1. Purchased goods and services 2. Capital goods 3. Fuel- and energy-related activities not included in scope 1 or scope 2 4. Upstream transportation and distribution 5. Waste generated in operations 6. Business travel 7. Employee commuting 10. Processing of sold products
List of scope 3 activities excluded from the report with justification for their exclusion	<p>8. Upstream leased assets: Not considered as a relevant category in terms of emissions. According to several LCA studies carried out for the paper industry, infrastructure represents less than 1% of CO₂ emissions for paper industry units. The study performed in UPM's Augsburg mill in spring 2012 showed 0.4% of total emissions for machines and buildings. Overall, UPM emissions related to infrastructure (capital goods, leased assets, etc.) are estimated to be less than 100,000 tonnes.</p> <p>9. Downstream transportation and distribution UPM produces mostly intermediate products. As reliable information, availability of reasonable data and our influence on transportation to end-users is scarce, UPM reports only CO₂ emissions related to transport of our (intermediate) products to our customers. This is in line with the Greenhouse Gas Protocol Scope 3 guidelines. Since these transports are purchased by UPM, their emissions are included in category 4 (Upstream transportation and distribution).</p> <p>11. Use of sold products: Not a relevant category. Our products do not generate fossil CO₂ emissions at the use stage. As additional information we report biogenic CO₂ from the combustion of biodiesel, while emissions of other greenhouse gases that occur from the combustion are estimated to be insignificant.</p>

	<p>12. End-of-life treatment of sold products As producer of mostly intermediate products reliable information, availability of reasonable data and our influence on this emission category is limited. Thus, these emissions are excluded from the inventory.</p> <p>13. Downstream leased assets: Not relevant, as covered by other categories.</p> <p>14. Franchises: Not applicable, UPM has no franchise activities.</p> <p>15. Investments: Not applicable, no investments with emissions which are not included in Scopes 1 and 2.</p>
Base year emissions	Scope 3 base year is 2018 with 9,040,000 metric tonnes CO ₂ equivalents
Scopes and categories	Metric tonnes CO₂ equivalents (CO₂ for scope 1 and market-based scope 2)
Scope 1: Direct emissions from owned/controlled operations	2,130,000
Scope 2: Indirect emissions from the use of purchased electricity, steam, heating and cooling	Market based: 1,590,000 Location based: 1,731,000
Scope 3 emissions	7,610,000
1. Purchased goods and services	3,075,000
2. Capital goods	212,000
3. Fuel- and energy-related activities (not included in scope 1 or scope 2)	567,000
4. Upstream transportation and distribution	1,029,000
5. Waste generated in operations	47,000
6. Business travel	13,000
7. Employee commuting	11,000
10. Processing of sold products	2,656,000

Additional information	Metric tonnes biogenic CO ₂
Scope 1 biogenic CO ₂ net removals	<p>4,800,000</p> <p>Net carbon sink of UPM owned and leased forests and plantations. Covers the emissions and removals from logging, natural mortality, growth as well as trees and soil carbon (except soil in USA). The calculations include the carbon balance of both trees and soil and cover the protected areas. In Finland, tree carbon balance is calculated as increment minus drain. In Uruguay and USA, tree carbon balance is calculated as the difference in carbon stored in growing stock between two years. Soil CO₂ balance is calculated in Finland and Uruguay with the Yasso07 model. The model uses litter fall quantity and quality, weather data and initial soil carbon stock as input values. For more details please see https://www.upm.com/responsibility/forests/climate/</p>
Scope 3 biogenic CO ₂ downstream	<p>330,000</p> <p>Use of sold products is not a relevant category. Our products do not generate fossil CO₂ emissions at the use stage. As additional information we report biogenic CO₂ from the combustion of biodiesel.</p>

Description of scope 3 methodologies and data used	
Category	Description of the types and sources of data used and methodologies, allocation methods and assumptions used to calculate emissions.
1. Purchased goods and services	<p>Primary data: quantities (weight or volume) and monetary purchasing volumes (euro) from UPM Sourcing, supplier data.</p> <p>Secondary data: Ecoinvent. Exceptions: emissions of UPM Raflatac's purchased goods are calculated with GaBi factor, IT-related emissions are evaluated based on DEFRA factors per EURO spend.</p> <p>Material categories included in the inventory are: external pulp, wood, recovered paper, pigments and fillers, chemicals (pulp, paper and label production), external paper, films, IT. These material categories cover most of the direct materials sourcing expenditure. The total emissions value for all categories is based on actual amounts used, multiplied by using CO₂-eq factors for each material. IT is evaluated based on spend. For purchased pulp nearly 100% and for pigments and fillers approx. 60% of the calculation is based on primary data from suppliers. For other categories the factors are mainly from secondary sources mentioned above. The factors used do not cover the transportation of these goods from supplier to UPM, but these emissions are reported in Category 4.</p> <p>Data quality: Fair</p> <p>Estimated percentage of emissions calculated using data obtained from suppliers: 20%</p>

2. Capital goods	<p>Primary data: Total capex spend (Euro)</p> <p>Secondary data: Defra 2020 emission factors for capex spend (kg CO₂/Euro)</p> <p>Emissions are calculated based on total capex spend multiplied with the respective Defra factor. This position can vary strongly as capex for investments is included, e.g. investments in our new pulp mill in Uruguay or in a new biorefinery in Germany. In the base year 2018 there were no major capex investments while in 2022 and 2023 those “special investments” had a major impact, thus figures are not directly comparable over time.</p> <p>Data quality: poor</p> <p>Percentage of emissions calculated using data obtained from suppliers: 0%</p>
3. Fuel- and energy-related activities (not included in scope 1 or scope 2)	<p>Primary data: quantities of purchased fuels used in production units from UPM Environmental and Energy reporting databases.</p> <p>Secondary data: Ecoinvent factors for fuels. GaBi factors for purchased electricity.</p> <p>This category includes emissions from extraction, production and transport of purchased fuels used at production sites. The figure is calculated from consumption by fuel types multiplied using CO₂-eq factors from Ecoinvent. Emissions related to producing biogenic fuels are not included in this category as they are already included in the figures under other scope 3 categories: for example, energy wood is included in in Category 1 under wood.</p> <p>Data quality: Fair</p> <p>Percentage of emissions calculated using data obtained from suppliers: 0%</p>
4. Upstream transportation and distribution	<p>Primary data: quantities of raw materials, distances between sources, production units, ports of loading and ports of delivery, emission data from suppliers.</p> <p>Secondary data: emission factors per transport mode from GLEC, only UPM Raflatac’s transport calculation is based on GaBi factors</p> <p>Includes transport for the same raw materials that are reported in Category 1 as well as product deliveries from UPM sites and storage facilities to customers, because they are under our control. Calculation is based on calculated tonne-kilometers and primary emission data from suppliers or secondary emission factors from databases. For raw material transport, the calculation is based on actual received amounts in 2023 and distances per transport mode. Updates for transport distances vary</p>

	<p>between raw material categories and businesses. For product transport both the tonnes per transportation mode and distances represent actual figures for 2023. Only chemical transports are not calculated based on actual distances, but estimated using actual received amounts and an average CO₂-eq per quantity factor of pigment transports as a proxy.</p> <p>Data quality: Fair</p> <p>Estimated percentage of emissions calculated using data obtained from suppliers: 30%</p>
5. Waste generated in operations	<p>Primary data: quantities of different waste fractions from UPM Environmental database.</p> <p>Secondary data: inert shares and methane densities from the GHG-protocol tool for the pulp and paper industry.</p> <p>Methane emissions from own landfills are calculated and converted to CO₂-eq using the GHG-Protocol tool for the pulp and paper industry.</p> <p>Data quality: Fair</p> <p>Percentage of emissions calculated using data obtained from suppliers: 0%</p>
6. Business travel	<p>Primary data: reports of CO₂e emissions from rental car supplier and travel agency.</p> <p>Included in the inventory, although it has minor relevance in terms of emissions. Includes emissions from business flights and use of rental cars. Train travel, ferry and use of own cars are excluded due to lack of data.</p> <p>Data quality: Fair</p> <p>Estimated percentage of emissions calculated using data obtained from suppliers: 80%</p>
7. Employee commuting	<p>Primary data: number of employees 2023</p> <p>Secondary data: calculated emission factors using data from Network for Transport Measures (NTM) and based on travel patterns for commuting in Sweden</p> <p>Included in the inventory, although it has minor relevance in terms of emissions. Emissions are evaluated based on assumptions about average daily commuting distance (20 km) and average emission factors (based on travel patterns for commuting in Sweden which is assumed to be a fair proxy).</p> <p>Data Quality: poor</p>

	<p>Percentage of emissions calculated using data obtained from employees: 0%</p>
<p>10. Processing of sold products</p>	<p>Primary data: amounts of UPM products sold externally, for pulp and paper also percentages of delivery regions. UPM's CO₂ factors for graphic paper and label production.</p> <p>Secondary data: Ecoinvent, literature, data taken from LCA and Environmental Product Declarations</p> <p>CO₂-eq for production of tissue and packaging paper from pulp and industrial printing of paper are calculated based on Ecoinvent data for electricity usage for respective processes and region-specific factors for electricity generation.</p> <p>Home/office printing's CO₂-eq are estimated as average electricity consumption of laser and ink-jet printer and Ecoinvent's region-specific factors for electricity generation.</p> <p>UPM average CO₂-eq emissions from graphic paper and label production are used to estimate external processing. Average represents different regions.</p> <p>Processing of sold labels is based on assumptions and calculations for UPM Raflatac's LCA from 2019 (updated in 2021).</p> <p>For processing of sold timber, plywood and biocomposites, the CO₂eq emissions are based on assumptions and calculations for their verified Environmental Product Declarations:</p> <ul style="list-style-type: none"> - https://api.environdec.com/api/v1/EPDLibrary/Files/ef421572-747e-41e8-535f-08dbdfa90a02/Data - https://api.environdec.com/api/v1/EPDLibrary/Files/f1d64e8a-3844-411f-181c-08dbca69748b/Data - https://api.environdec.com/api/v1/EPDLibrary/Files/c900df79-5c86-4797-b097-08daac2bcf89/Data <p>Data quality: Fair</p> <p>Percentage of emissions calculated using data obtained from customers: 0%</p>