4.2.2022

UPM Greenhouse Gas Inventory 2021

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. Material Scope 3 emissions categories at group level (greater than or equal to 100,000 tonnes CO_2) that are part of UPM's scope 3 emissions inventory are: 1. Purchased goods and services 3. Fuel- and energy-related activities not included in scope 1 or scope 2 4. Upstream transportation and distribution 9. Downstream transportation and distribution 10. Processing of sold products
Reporting period	01/01/2021 – 31/12/2021
List of scope 3 activities included in the report	1. **Purchased goods and services** 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** 9. **Downstream transportation and distribution** 10. **Processing of sold products** 12. **End-of-life treatement of sold products**
List of scope 3 activities excluded from the report with justification for their exclusion	2. **Capital goods:** Not considered as a relevant category in terms of emissions. According to several LCA studies performed for the paper industry, infrastructure represents less than 1% of CO2 emissions for paper industry units. The study carried out 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.) can be estimated to be less than 100,000 tonnes. 7. **Employee commuting:** Not a relevant category and lack of data. According to several LCA studies performed for the paper industry, employee commuting represents less than 1% of CO2 emissions for paper industry units. The study carried out in UPM's Augsburg mill in spring 2012 showed 0.03% of total emissions for employee commuting. If

	all of the approximately 18,000 employees of UPM commuted 30 kilometres per working day using a car with emissions of 180gCO2/km, that would total less than 30,000 t CO2 emissions. 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. 11. **Use of sold products:** Not a relevant category. Our products do not generate emissions at the use stage. 13. **Downstream leased assets:** Not considered as a relevant category in terms of emissions. According to several LCA studies performed for the paper industry, infrastructure represents less than 1% of CO2 emissions for paper industry organisations. The study carried out 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. 14. **Franchises:** Not applicable, UPM has no franchise activities. 15. **Investments:** Not applicable. No investments with emissions not included in Scopes 1 and 2
Base year emissions	No base year established.

Scopes and categories	Metric tonnes CO2
Scope 1: Direct emissions from owned/controlled operations	**2,710,000**
Scope 2: Indirect emissions from the use of purchased electricity, steam, heating and cooling	**Market based: 2,290,000** **Location based: 2,450,000**
Scope 3 emissions	**6,300,000**
Purchased goods and services	**2,810,000**
Fuel- and energy-related activities (not included in scope 1 or scope 2)	640,000
Upstream transportation and distribution	**1,420,000**
Waste generated in operations	58,000
Business travel	2,000

Downstream transportation and distribution	**420,000**
Processing of sold products	**930,000**
End-of-life treatment of sold products	**20,000**
Scope 1 biogenic CO2	**9,800,000** Biomass based energy is originating from sustainably managed forests and therefore considered at least neutral. Source: IPCC

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	Primary data: quantities and monetary purchasing volumes from UPM Sourcing, supplier data. Secondary data: Emissions factors for each material included in the inventory according to CEPI guidance – main database sources for CEPI guidance are GaBi and Ecoinvent. Material categories included in the inventory are: wood, recovered paper, purchased pulp, main chemicals (approximately 80% covered), pigments and fillers, purchased paper, adhesives and films. Last three categories were added to inventory in 2020. These material categories cover the majority 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. For purchased pulp almost 100% and for pigments and fillers about 60% of the emissions are 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. Data quality: Fair Percentage of emissions calculated using data obtained from suppliers: 20%
3. Fuel- and energy-related activities (not included in scope 1 or scope 2)	Primary data: quantities of fuels used in production units from UPM Environmental reporting database (SoFi) and UPM Energy. Secondary data: factors for fossil fuels according to CEPI guidance from Ecoinvent. GaBi scope 3 factors for purchased electricity in SoFi This category includes emissions from extraction, production and transport of fossil 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.

	Data quality: Fair Percentage of emissions calculated using data obtained from suppliers: 0%
4. Upstream transportation and distribution	Primary data: quantities of raw materials, distances between sources, production units, ports of loading and ports of delivery, emission data from suppliers Secondary data: emission factors per transport mode from GHG Protocol, WRI or Lipasto database (2016 factors): http://lipasto.vtt.fi/. Includes transport for the same raw materials that are reported in Category 1 and also product deliveries from UPM mills and storage facilities to customers. Calculation is based on calculated tonne kilometers, and the Lipasto database (2016 factors): http://lipasto.vtt.fi/ is used as a source for CO_2 factors. For raw material transport, the calculation is based on actual received amounts in 2019 and distances per transport mode. Updates for transport distances vary between raw material categories and businesses. For product transport both the tonnes per transportation mode and distances represent actual figures for 2020. Data quality: Fair Percentage of emissions calculated using data obtained from suppliers: 60%
5. Waste generated in operations	Primary data: quantities of different waste fractions from UPM Environmental database (SoFi). Secondary data: inert shares and methane densities from the GHG-protocol tool for the pulp and paper industry. Methane emissions from own landfills are calculated and converted to CO_2 eq. using the GHG-Protocol tool for the pulp and paper industry. Data quality: Fair Percentage of emissions calculated using data obtained from suppliers: 0%
6. Business travel	Primary data: reports from rental car supplier and travel agency. 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. Data quality: Fair Percentage of emissions calculated using data obtained from suppliers: 80%
9. Downstream transportation and distribution	Primary data: production of magazine and newsprint paper from UPM Secondary data: factors for delivery to customers from VTT's report 2560 "Print produts from cradle to grave" from 2010

	The factor from VTT includes the distribution from the printing house to the final customer for printed magazines and printed newspaper, based on the Finnish situation. Data quality: Fair Percentage of emissions calculated using data obtained from suppliers: 0%
10. Processing of sold products	Primary data: production of magazine and newsprint paper from UPM Secondary data: factors for printing (total) from VTT's report 2560 "Print produts from cradle to grave" from 2010 The factor from VTT includes the total emissions for printing for magazines and newspapers covering direct as well as indirect emission sources. Data quality: Fair Percentage of emissions calculated using data obtained from suppliers: 0%
12. End-of-life treatment of sold products	Primary data: whole paper production from UPM Secondary data: factors for different end-of-life options from VTT's report 2560 "Print produts from cradle to grave" from 2010 Factors from VTT for recycling, incineration and landfill of printed newspaper are used for all final paper products. An assumption was made that 5% of the final printed products are landfilled, 60% recycled and 35% incinerated. Data quality: Fair Percentage of emissions calculated using data obtained from suppliers: 0%