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ARTURIA

_The sound explorers

CARBON FOOTPRINT AND CLIMATE STRATEGY EVALUATION

2022-2023

A report produced by UTOPIES ©

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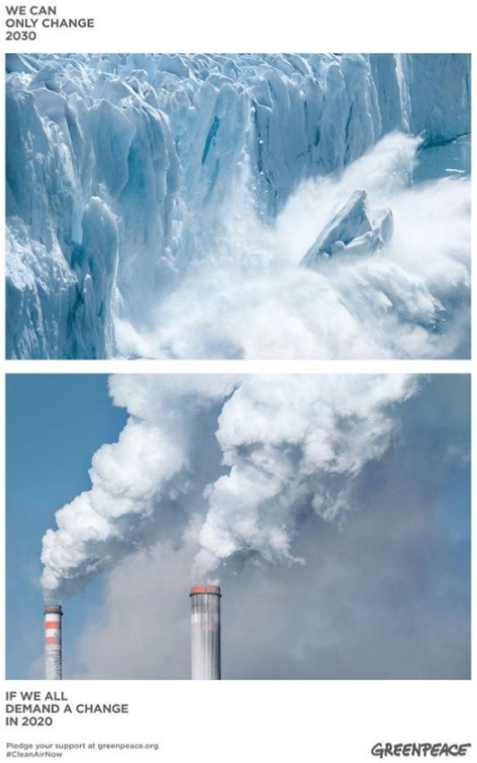


1 METHODOLOGY AND STUDY PARAMETERS

GENERAL PERIMETER OF THE STUDY

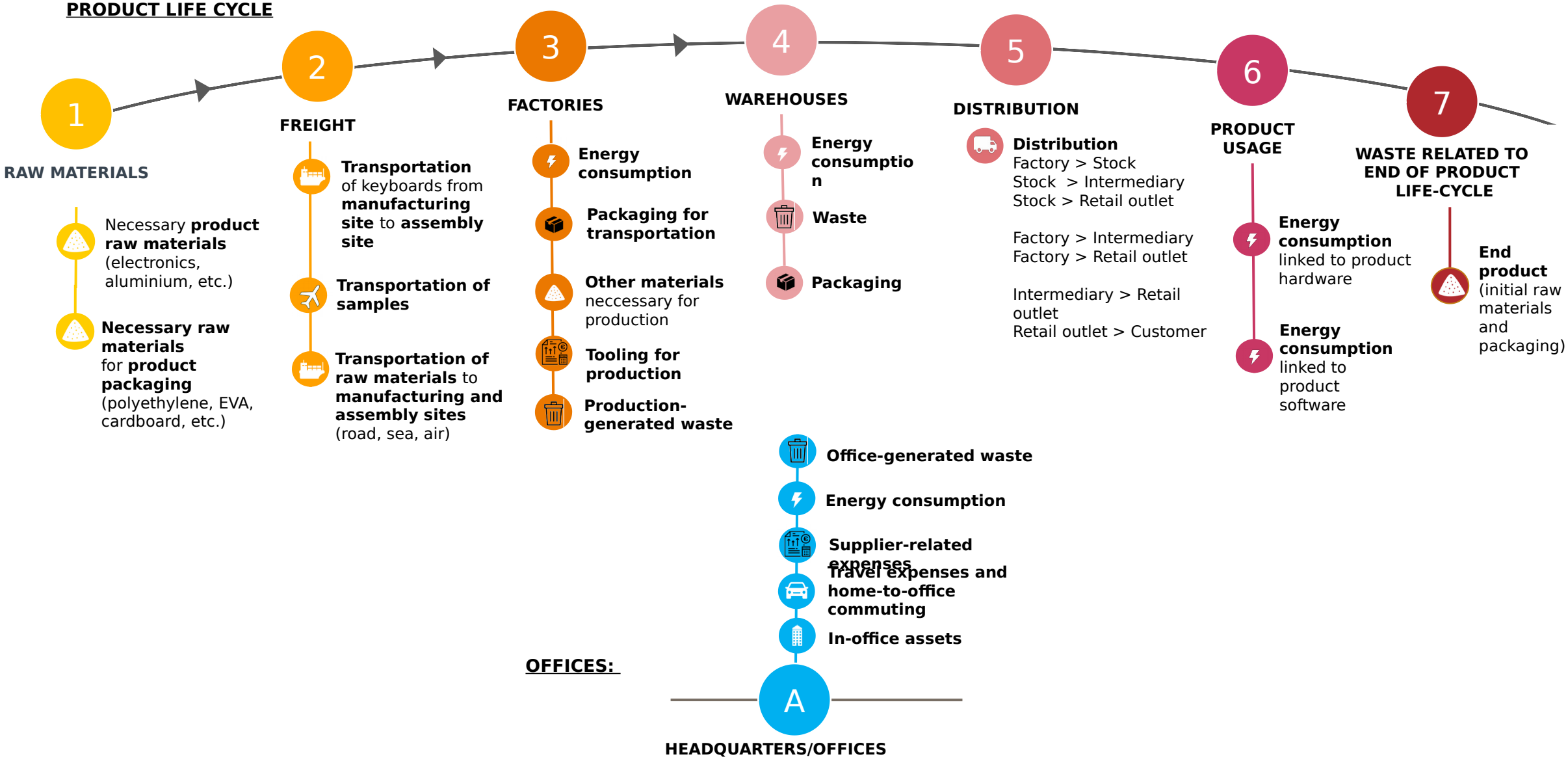
- Organisational scope: for the present study of Arturia's overall carbon footprint, the scope includes **all of the company's activities, both in France and abroad** (internal operations, media and sales) as well as product life cycles.

- Temporal scope: the study focuses on the company's **2022-2023** fiscal year extending from 01 July 2022 to 30 June 2023.

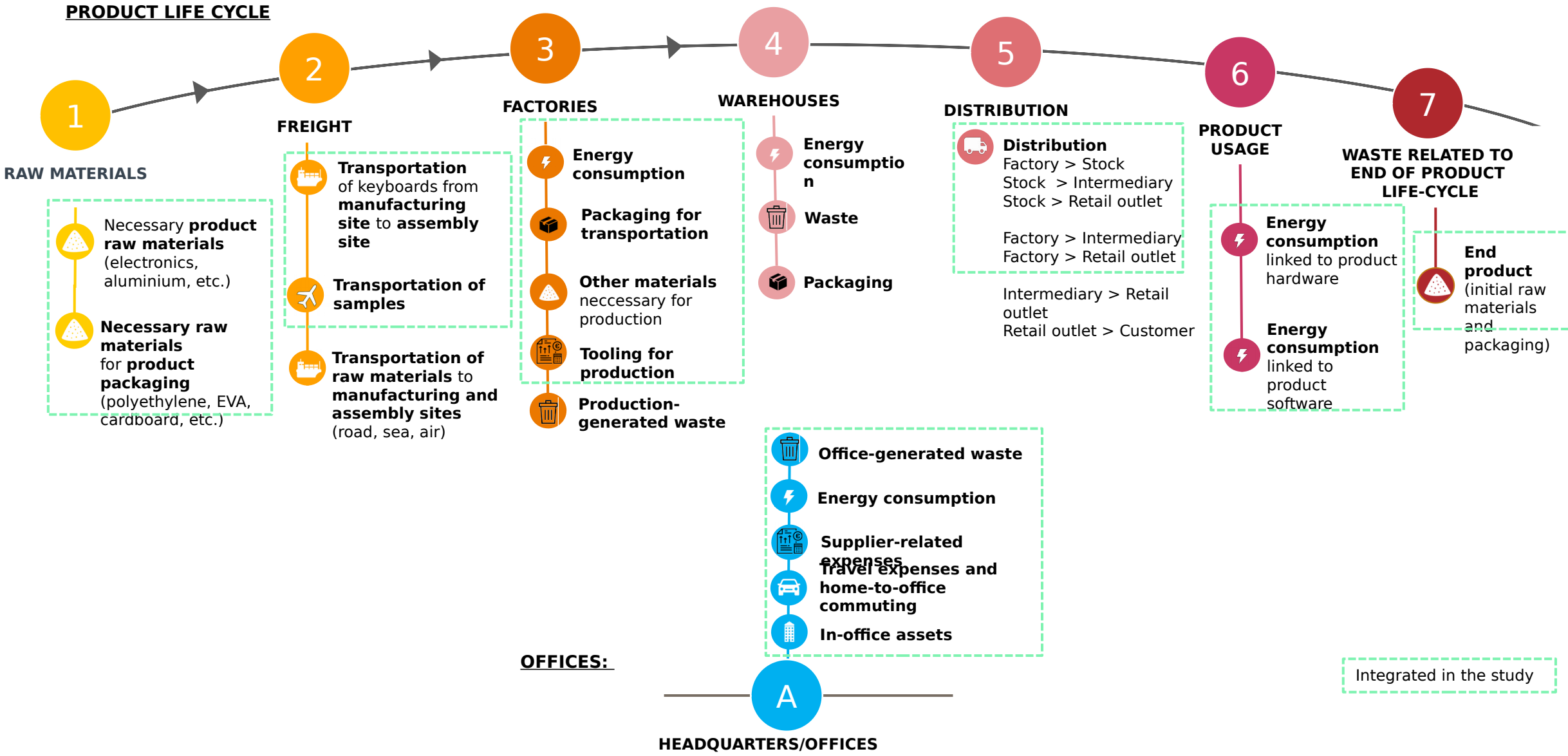
- CO_2 calculations are based on data collected by Arturia. External studies and documentation have been utilised in order to extrapolate certain calculations and thus present the most comprehensive view of the company's carbon impact.

MAP OF ARTURIA'S BUSINESS FLOWS

PRODUCT LIFE CYCLE



MAP OF ARTURIA'S BUSINESS FLOWS



DETAILED PERIMETER OF THE STUDY

Elements not integrated in the study

- **Freight:** carbon emissions linked to the transportation of raw materials between their place of origin (city or country of the post-extraction site of a given raw material) and Arturia's manufacturing site.
- **Warehouse:** emissions linked to packaging if the latter differs from that used in final factory output
- **Distribution:** emissions linked to the final km travelled by product or customer

Concerning emissions emanating from 'final km travelled', it is important to relativise with respect to ADEME* recommendations on this subject:

- ❑ The considerable risk of uncertainty of such emission measurements may undermine the scientific credibility of obtained results.
- ❑ The deployment of a credible system of measurement is too costly in relation to any noticeable significance in results obtained. Companies prefer to devote resources to undertaking direct actions that aim at emissions reduction, or to dialogue with partners.

Additions to the final study

- **Raw materials:** in an effort to preserve the comparability and the homogeneity of the method employed, 'electronic materials' are considered as a whole entity during the V1 study. Given the importance of these components in Arturia's carbon analysis, a more comprehensive V2 study was conducted with the aim of identifying the various elements and the materials they are composed of. The present V4 study has integrated this more comprehensive analysis.
- **Product usage:** to be able to measure adequately all emissions sources, including product utilisation, Arturia implemented a customer-based survey with the goal of better understanding duration and frequency of product use. The present V4 study has included this emissions source.

*ADEME : French national Agency for the Environment and Energy Conservation

2 RESULTS OF THE STUDY

OVERALL RESULTS
DETAILED RESULTS

CARBON FOOTPRINT: SUMMARY OF THE RESULTS

CARBON FOOTPRINT OF COMPANY ACTIVITIES IN 2022-2023

13,795 tCO_2e

ARTURIA
_The sound explorers

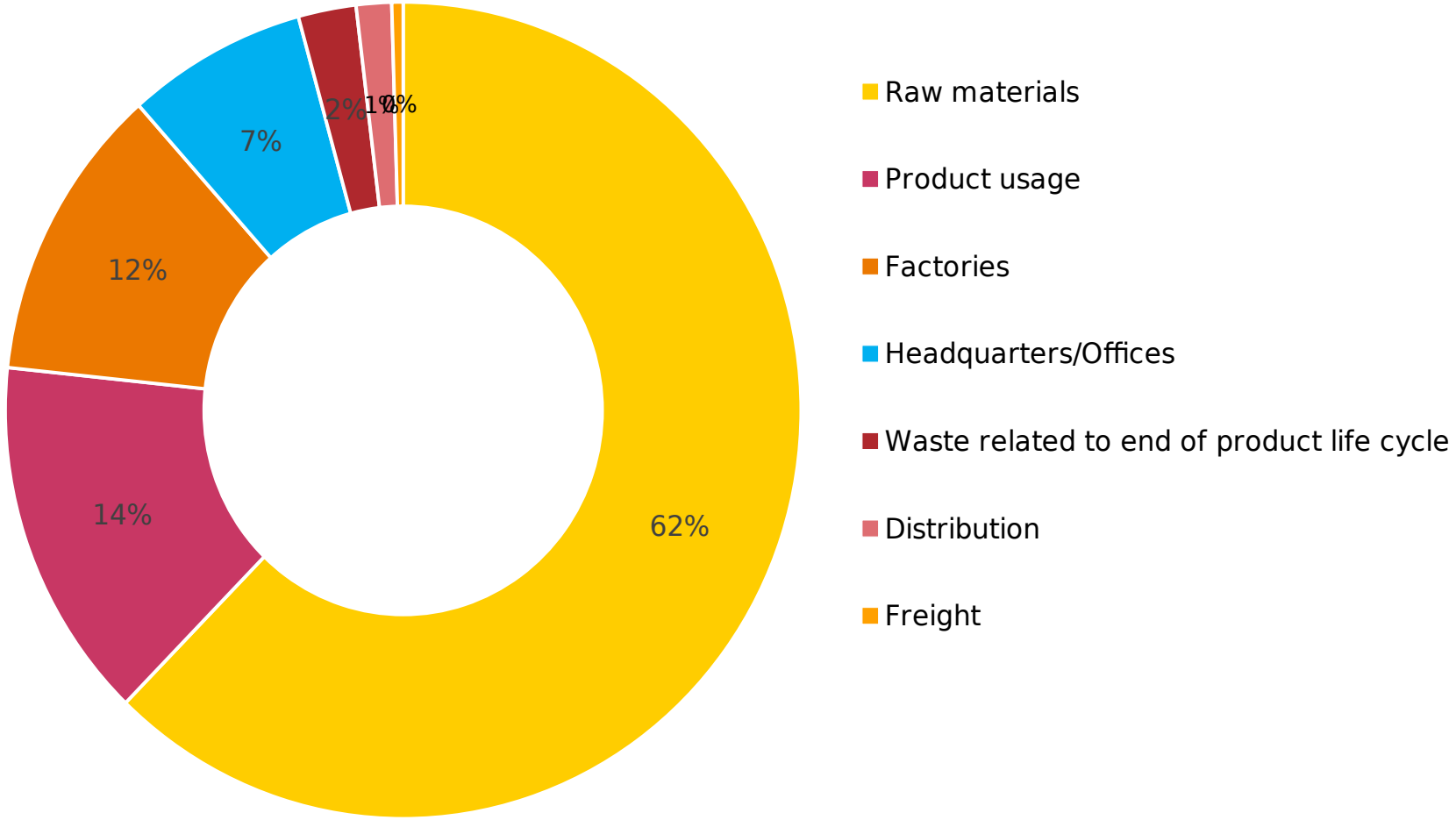
CARBON FOOTPRINT OF ACTIVITIES IN 2022-2023 PER INDIVIDUAL EMPLOYEE

91 tCO_2e/employee*

* Data based on 151 full-time staff members. This ratio does not take into consideration factory employees.

2 13,795 TCO2E EMISSIONS GENERATED BY ARTURIA'S ACTIVITIES IN 2022-2023, OF WHICH 62% IS DIRECTLY LINKED TO RAW MATERIALS

These 13,795 tons of CO2eq come from the following sources of emission:



2 SUMMARY OF RESULTS BY REGULATORY SOURCE OF EMISSIONS

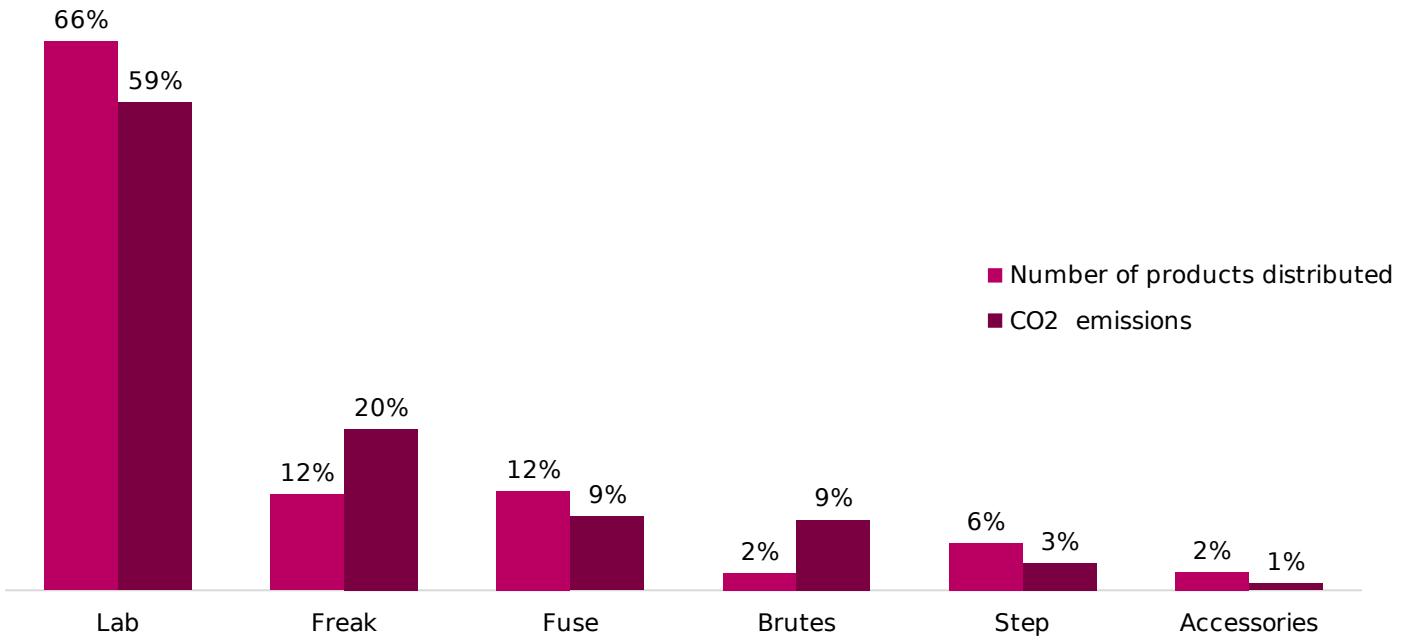
Categories	N°	Regulatory emissions source	Emissions CO2e (kgCO2e)	%
Direct emissions (scope 1)	1	Direct emissions from fixed combustion sources		*0%*
	2	Direct emissions from mobile thermal combustion engine sources		*0%*
	3	Direct emissions from processes not related to energy consumption		*0%*
	4	Direct fugitive emissions		*0%*
	5	Emissions emanating from biomass (soil and forest)		*0%*
Indirect emissions related to energy (scope 2)	6	Indirect emissions linked to electricity consumption	*5,800*	*0%*
	7	Indirect emissions linked to steam, heat or refrigeration	*0*	*0%*
Other GHG emissions (scope 3)	8	Emissions related to energy use not mentioned in sources 1 to 7	*795,100*	*6%*
	9	Purchasing of goods or services	*10,063,600*	*73%*
	10	Permanent office assets	*263,100*	*2%*
	11	Waste	*1,800*	*0%*
	12	Upstream merchandise transportation	*63,300*	*0%*
	13	Employee travel expenses		*0%*
	14	Upstream franchising	*0*	*0%*
	15	Upstream leasing assets	*0*	*0%*
	16	Investments		*0%*
	17	Visitor and customer transportation		*0%*
	18	Downstream merchandise transportation	*198,100*	*1%*
	19	Utilisation of sold products	*1,985,100*	*14%*
	20	End of life of sold products	*324,100*	*2%*
	21	Downstream franchising		*0%*
	22	Downstream leasing		*0%*
	23	Home-to-office commuting	*95,000*	*1%*
	24	Other indirect emissions	*0*	*0%*

TOTAL: ***13,795 tCO2e***

2 SUMMARY OF CARBON FOOTPRINT RESULTS BY PRODUCT CATEGORY

13,795
tCO2e
generated by Arturia's activities in 2022-2023

Percentage of emissions (kgCO2e) by category and sales volume (unit)



- Carbon emissions are disproportionately pronounced for the product cateogories Freak and Brutes as the amount of CO2e emitted is disproportionately higher than the quantity distributed. Conversely, product categories Lab, Fuse, Step and accessories exhibit a markedly lower proportion of carbon emissions than their proportion of products distributed. This is in part due to the **proportion of electric components in the product composition**. For example, electronic components make up 88% of Brutes products, versus 80% of Labs products, which are much less carbon intensive (on average 41 kgCO2e versus 139 kgCO2e for a Brutes).
- Lab products represented **66%** of company output in 2022-2023, corresponding to **59%** of carbon emissions related to products.

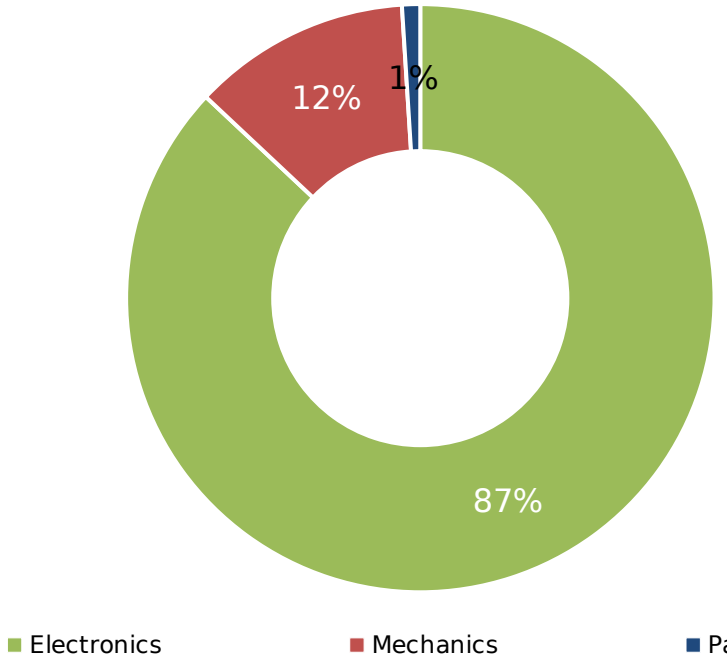
*Emissions comprise the following sources: raw materials, freight, factories, distribution, end of product life cycle

2 RESULTS OF THE STUDY

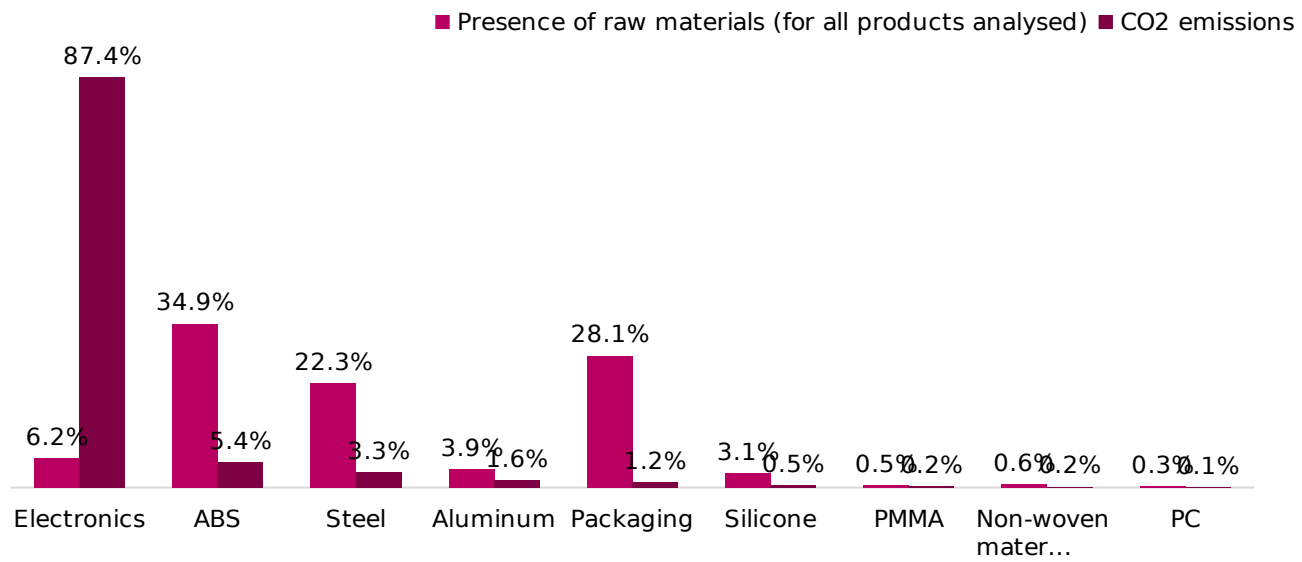
OVERALL RESULTS
DETAILED RESULTS

Raw materials (product components and packaging) account for 8,592 tCO2e, or 62% of the overall carbon assessment

Share of emissions linked to product-based raw materials* (%)



CO2e emissions rate by product composition (%)



- Electronic components account for 87% of the emissions generated by all hardware products analysed, followed by ABS and steel.
- The top three ranked raw materials account for 64% of the total weight of all hardware products; these three raw materials represent 96% of all emissions.

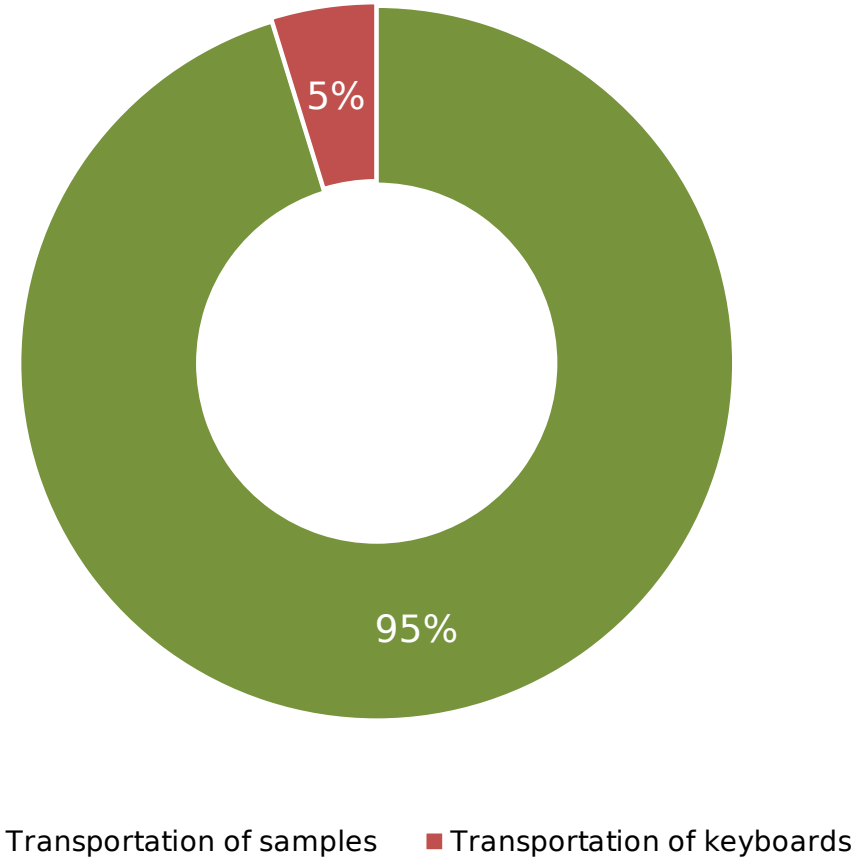
**Data concerning the transportation of raw materials between their place of origin and Arturia's manufacturing site could not be collected and is therefore not included in the "Freight" category. This explains why this category represents less than 0.45% of the carbon footprint, since only the following two items are included:*

The transportation of **samples** by **air freight** represents **95%** of the impact of this category.

The remaining **5%** comes from the transportation of **keyboards** by **sea freight** to Arturia offices.

Freight* represents 63 tCO2e or 0.45% of the overall carbon assessment

Share of emissions linked to manufacturing sub-sources



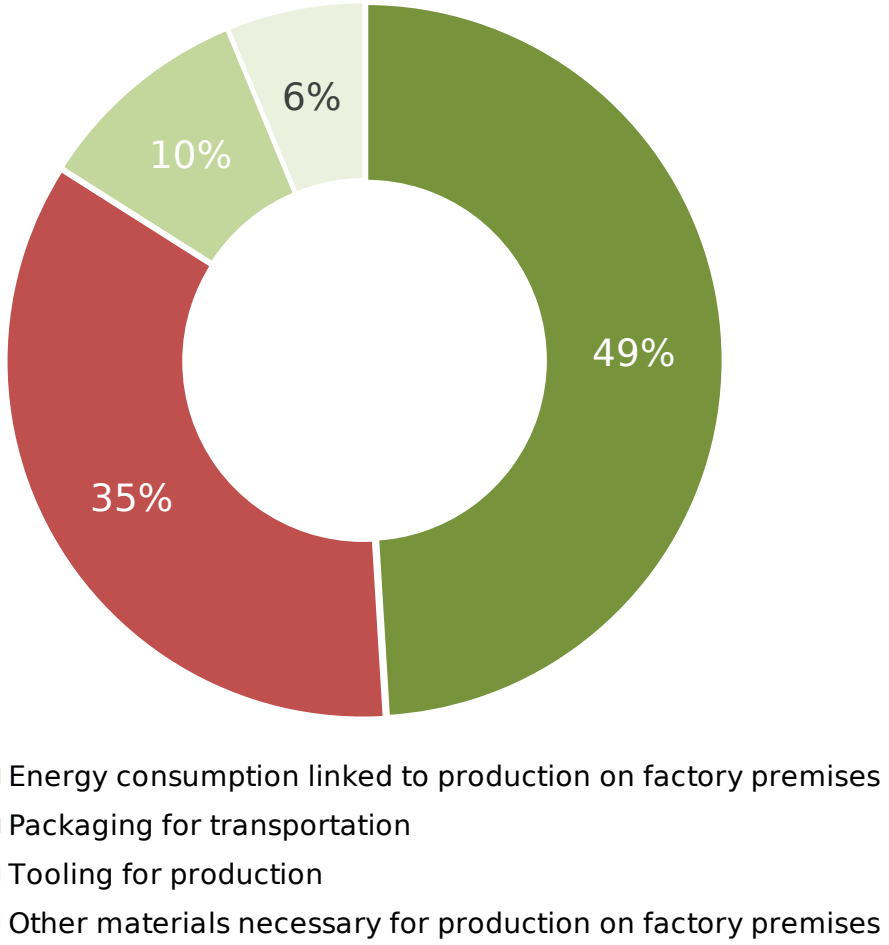
Emissions related to **energy consumption** linked to the manufacturing and assembly of products on factory premises are the first significant sub-source and account for **49%** of total emissions.

This is followed by **packaging for transportation**, which accounts for **35%** of emissions of this category.

Tooling for production and **other materials** used for production account for **10%** and **6%** of emissions, respectively.

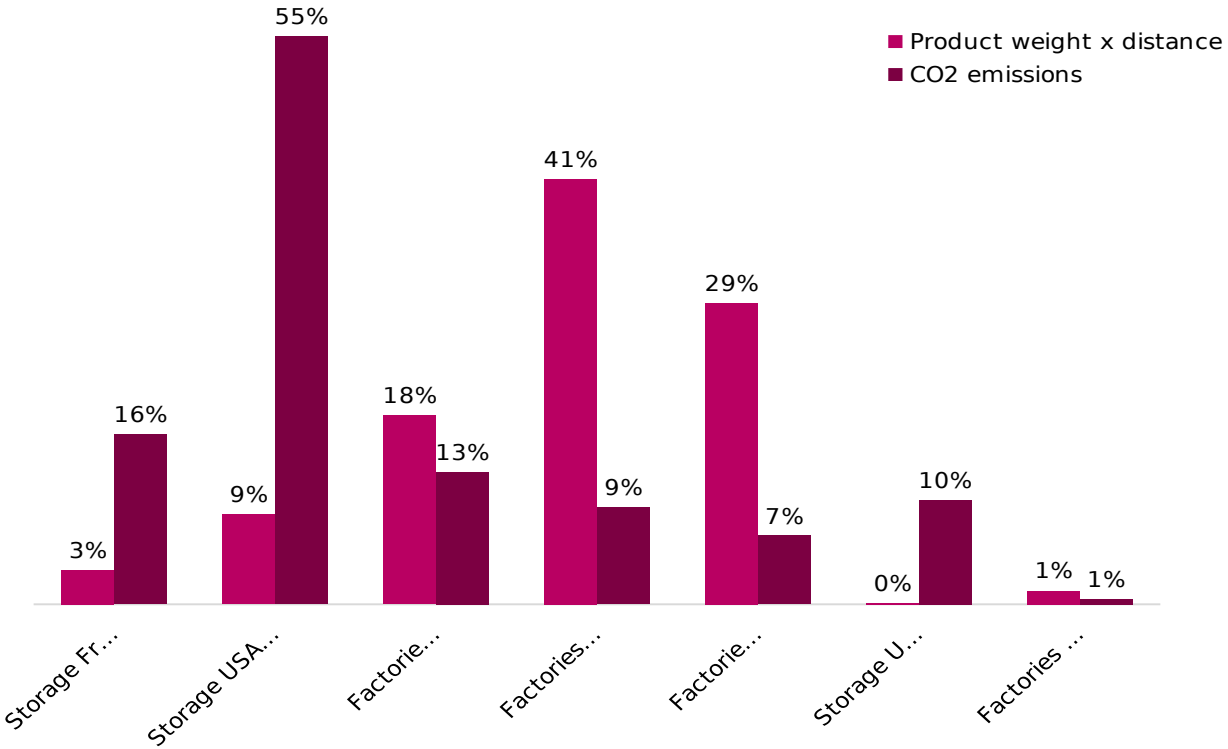
Factory production represents 1,621 tCO2e or 12% of the overall carbon assessment

Share of emissions linked to manufacturing sub-sources

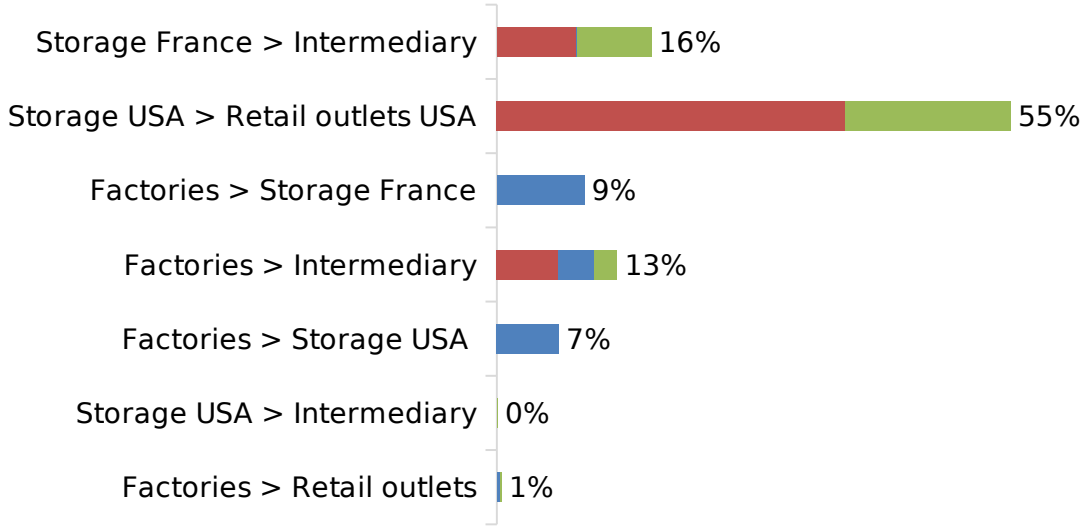


Distribution of finished Arturia products (to storage facilities, intermediaries, retail outlets) accounts for 198 tCO2e or 1% of the carbon assessment

Share of emissions by distribution phase (%)



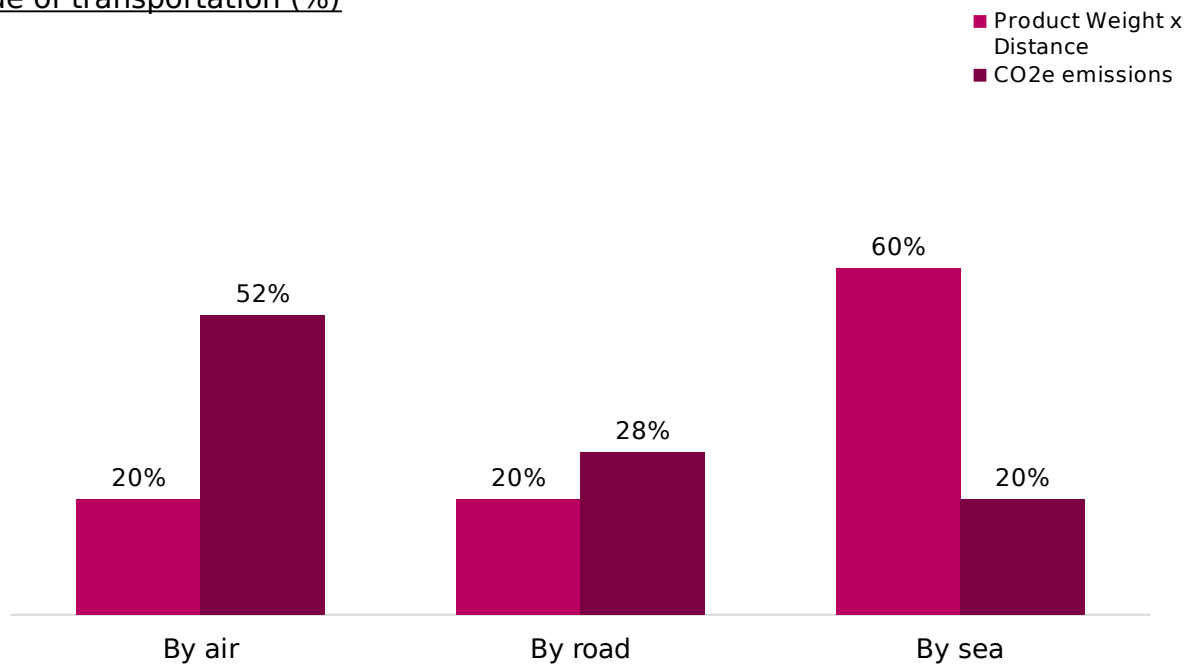
Share of emissions by distribution phase and by mode of transportation (%)



- The transport of goods between storage depots in the USA and retail outlets in the USA, which represent only **9%** of the 'Product weight x distance total', accounts for **55%** of CO2e emissions. This is due to the use of air transport which is very carbon intensive compared to other forms of transport. The same trend can be seen with the transport of goods between storage depots in France and intermediaries.
- Conversely, the transportation of goods between factories and storage depots in France and the USA, done exclusively by sea, generates a lower level of emissions, only **16%** of total emissions for a 'Weight x Distance' ratio of **70%**.

Distribution of finished Arturia products (to storage facilities, intermediaries, retail outlets) accounts for 198 tCO2e or 1% of the carbon assessment

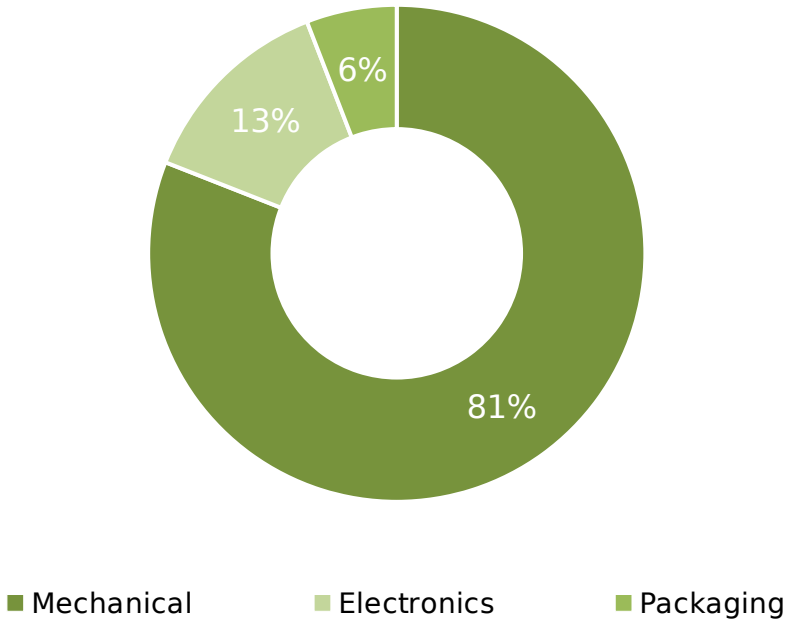
Share of emissions by mode of transportation (%)



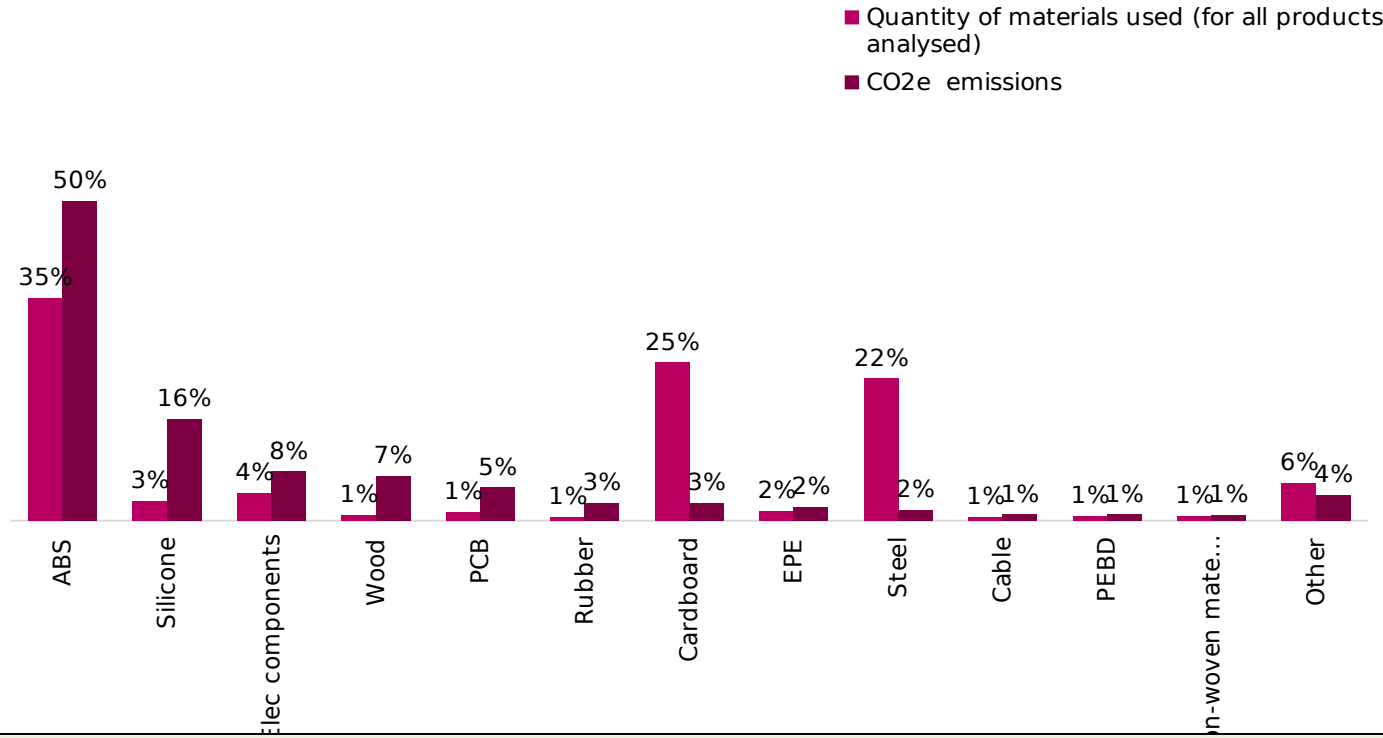
- **Whilst the 'Weight x Distance' ratio for air transport represents 20% of the total**, the resulting emissions account for **52%** of the total. Road transport accounts for the same 'Weight x Distance' ratio but only represents 28% of total emissions.

Waste resulting from product end of life accounts for 324 tCO2e or 2% of the carbon assessment

Share of emissions linked to product-based raw materials (%)



CO2 emissions rate by product composition (%)



- Mechanical parts have the highest concentration (**86%**) of CO2 emissions during their end-of-life, followed by electronics with **14%.** Only **6%** of emissions come from the end-of-life of packaging materials. Whilst electronics are characterised as a carbon intensive material, they are less so than other materials during final phase of product life cycle.
- By comparison, note below the carbon intensities associated with the end-of-life of the most-used materials:
  - Steel : 0,043 kgCO2e/kg
  - Plastic (ABS) : 0,8 kgCO2e/kg
  - Cardboard : 0,067 kgCO2e/kg
  - Electronics : 1,1 kgCO2e/kg
  - Wood : 5,11 kgCO2e/kg

Product usage by customers accounts for 1,985 tCO2e or 14% of the carbon assessment

Utilisation	Number of products sold taken into account	Usage consumption (Wh/unit)	Usage duration (h/yr)	Emissions factors	Usage consumption for all products sold in 2022-2023 (kWh/yr)	Carbon emissions in kgCO2e
Hardware	324 651	Product consumption is measured in accordance with SKU	Duration of usage based on customer survey for 18 macro-products	Energy mix proportionate to each country where an article is sold	830 223 kWh	382 769 kgCO2e
Software	248 714	Product consumption is measured in accordance with SKU	Duration of usage based on customer survey for 18 macro-products	One single emissions factor was taken into account on the basis of a weighted average between sales volumes and energy mixes for each country	3 095 124 kWh	1 602 414 kgCO2e

- **The energy consumption required to power a computer was not taken into account. This value represents 250 kWh** (ex : consumption of a desk-top computer).
- Instead, the supplementary energy required to power Arturia devices was taken into account as follows, from data collected from a user survey in 2019:
- Average consumption of Arturia hardware devices is **5,1 kWh (weighted average 1,2 kWh)**
- Average consumption of Arturia software devices is **15,6 kWh (weighted average 19,3 kWh)**
- **There is a factor of 16 between the two weighted averages corresponding to hard- and software product energy consumption**
- **Duration of usage also has an impact, albeit marginal, since software products are used for an average of 664 hrs/yr, compared to an average of 544hrs/yr for hardware devices (weighted averages).**

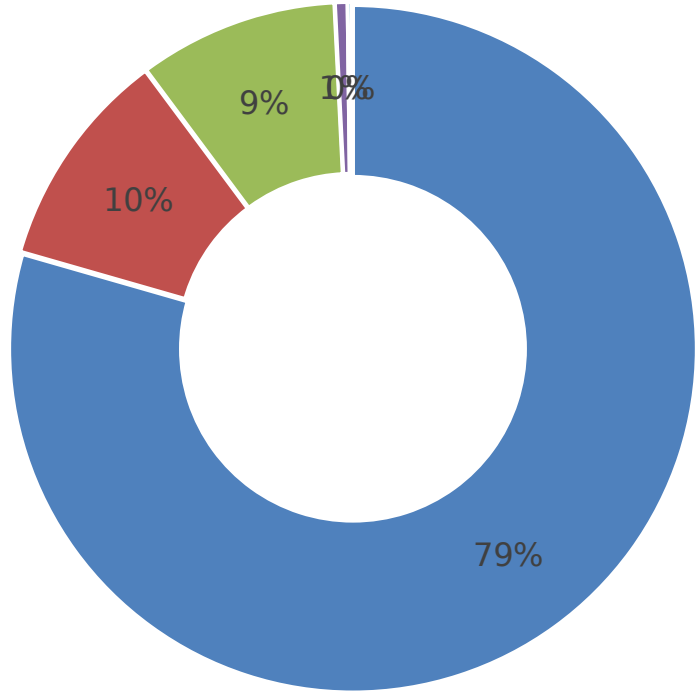
Emissions related to **supplier-related expenses** account for **80%** of emissions related to headquarters and office. *These are studied in detail in the following slide.*

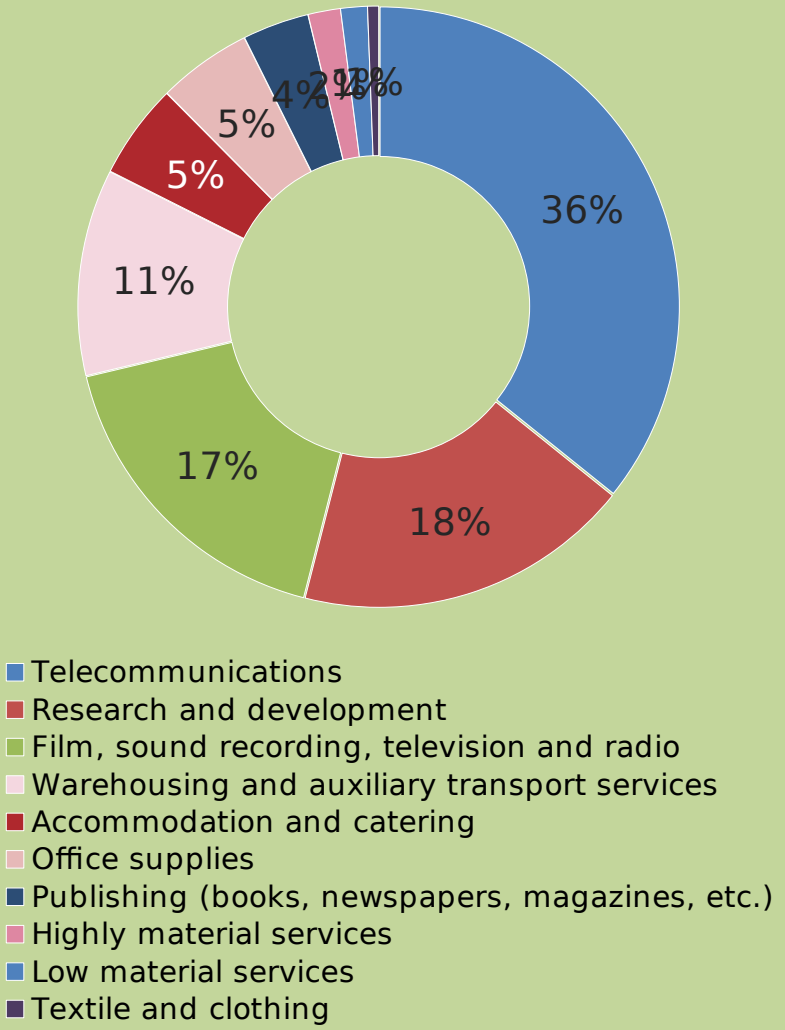
10% and **9%** of emissions from the headquarter/office category are related to **in-office assets** and **travel expenses and commuting**, respectively.

The following sub-sources – energy consumption and office-generated waste– together account for only **1%.**

Emissions related to headquarters/offices account for 1010 tCO2e or 7% of the carbon assessment

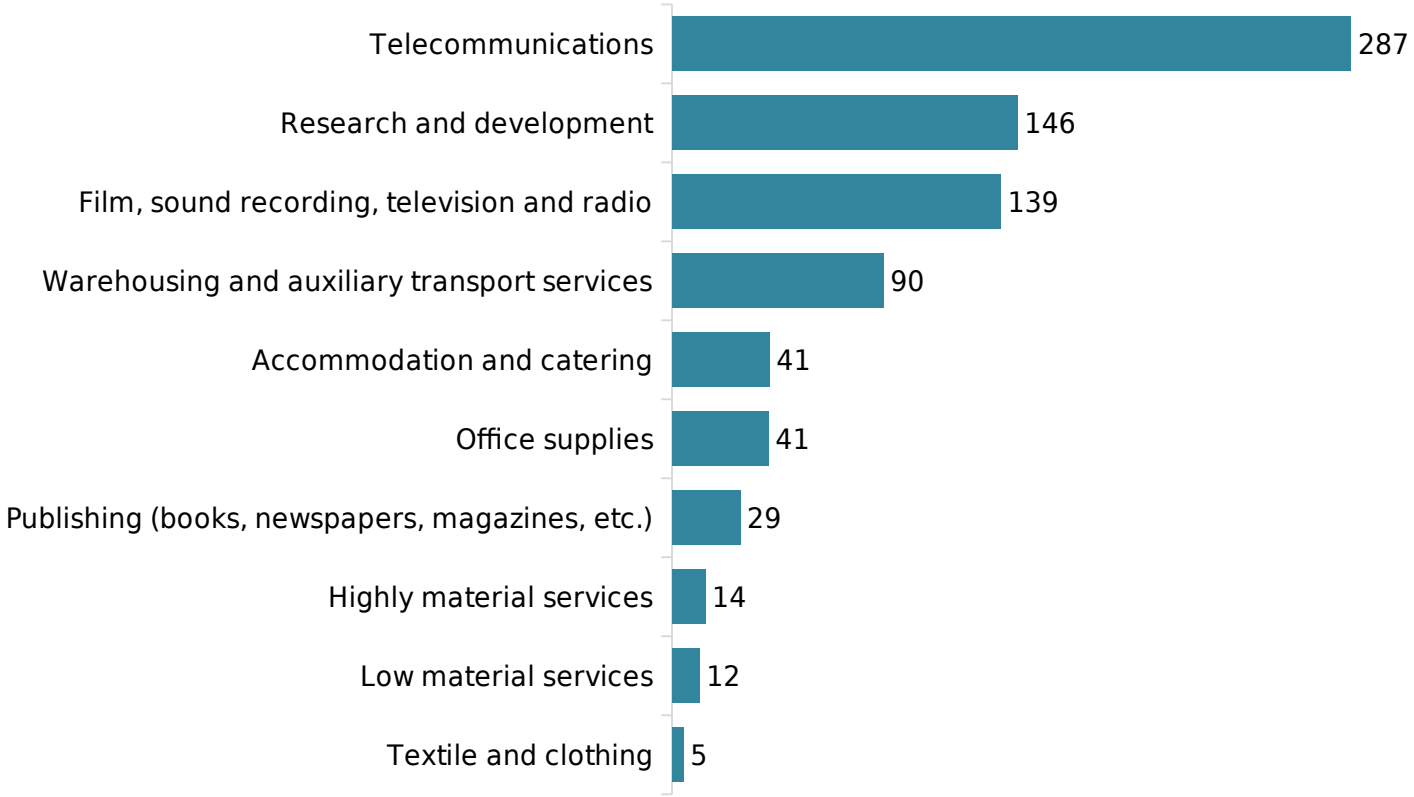
Share of emissions linked to sub-sources





FOCUS ON SUPPLIER-RELATED EXPENSES

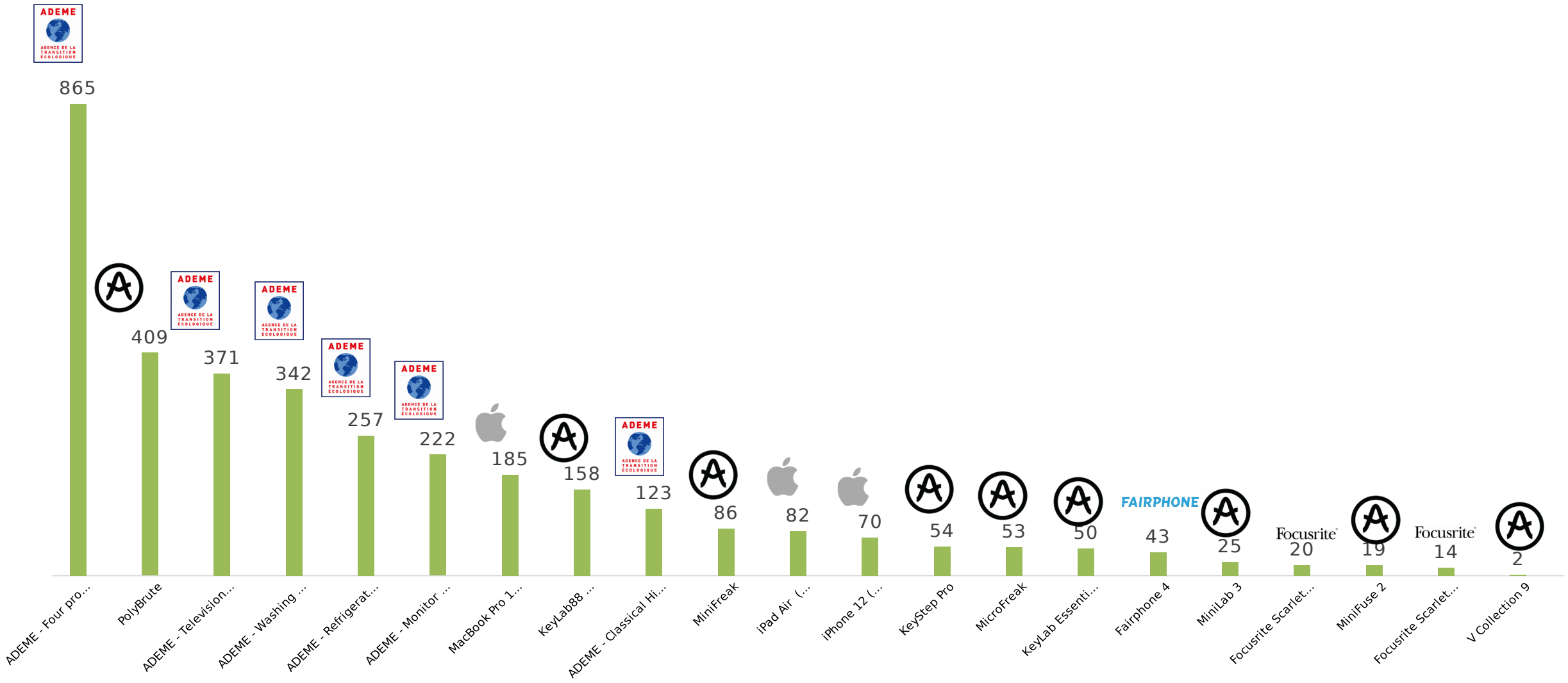
These expenses mainly concern the following sectors: telecommunications (36%), research and development (18%), film, sound recording, television and radio (17%), warehousing and auxiliary transport services (11%). Six other expense categories make up the remaining 18% of emissions related to this emissions source.



3 BENCHMARK DATA

BENCHMARK OF CARBON FOOTPRINTS OF ELECTRONIC DEVICES

Comparative emissions by product (kgCO2e), Not including Arturia product use or end of life



4 APPENDICES

4 GLOSSARY

Scope 1: direct emissions produced by stationary and mobile sources (e.g. natural gas utilised in thermal power stations, heaters installed on company premises or petrol used for company vehicles.

Scope 2: Indirect emissions linked to electricity consumption, or to heating or cooling systems (e.g. electricity or heating purchases)

Scope 3: other indirect emissions (e.g. emissions linked to purchased products or services, emissions associated with upstream or downstream merchandise shipping, emissions linked to the utilisation of purchased products, etc).

Emissions factor (EF): refers to the ratio between the quantity of GHG emitted by an object or a material, as well as the characteristic value attributed to the latter measured in the most convenient unit (weight, cost, etc.)

Carbon Assessment: A 'carbon assessment' aims to analyse the impact perimeter of a given activity in the most exhaustive manner possible. Therefore, it is not sufficient to measure merely the flows generated by an entity, but rather to encompass the totality of the flows and effects upon which its activity depends (ex : concerning home-to-office commuting, the company cannot restrict such mobility. Indeed, without these trajectories, employees and collaborators would not be able to work. Company activity is therefore dependent upon these movements, which in turn justifies their being taken into consideration. Carbon assessment methodology was initiated in 2004.

The most recent update of the ADEME configuration is the Base Carbone® v23.1 which was used for the present study.

What is the difference between a carbon assessment and a LCA (life-cycle analysis)?

- An LCA establishes an inventory of flows from the ‘cradle to the grave’: from the extraction of energy-rich (or not) raw materials necessary for product manufacuring, distribution, utilisation, recycling and elimination toward end-of-life channels. This process includes all phases of transportation.
- In addition, an LCA calculates impact on other categories such as potential toxicity for humans and the environment, resource depletion, use of land/space, acidification, etc.
- Following ISO 14040 norms, an LCA is the 'compilation and evaluation of inputs, outputs, and of the potential environmental impacts caused by product systems in the course of their life cycle.'

Why is the study of scope 3 indirect emissions so crucial?

- Indirect emissions upstream and downstream from the company’s value chain (scope 3) are often not considered in impact evaluations.
- However, in most sectors, such emissions actually constitute the most substantial part of a company’s inventory (e.g. 90% of Sanofi’s carbon footprint in 2018).
- A global view of the impact of such emssions on the supply chain enables a company to:
  - Evaluate where the emissions 'hot spots’ are located in its supply chain;
  - Identify the most efficient suppliers in terms of emissions management and control;
  - Engage and assist suppliers in the implementation of emissions reduction strategies.

The limitations of the present study

This study aims to analyse the magnitude of Arturia's overall CO2 emissions and is based on data provided by the company.

As with any carbon footprint evaluation, the calculations proposed here contain a margin of error which itself is dependent upon the inherent margins of error among the various emissions conversion factors mentioned in data bases (ADEME, Ecoinvent, Codde…), but also upon fluctuations resulting from the necessity to associate different products for data collecting purposes.
Finally, a margin of error may be attributable to hypotheses used for emissions estimates.

This said, the methodology employed here has enabled Arturia to provide a comprehensive carbon assessment for the fourth year running.

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