Report on the ECA's 2022 Carbon Footprint

Calculation of the ECA's carbon footprint (Bilan Carbone® method)

ECA 2022 Carbon Footprint Report

1 Executive summary

2022

968.8 Full-time equivalent

Three buildings

QBC BILAN CARBONE®
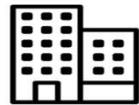
24 %
"Passenger transport" was the largest source of emissions

QBC BILAN CARBONE®

7 989 tCO$_2$e

Total 2022 GHG emissions

8 tCO$_2$e/FTE[1]
(total uncertainties 10 %)

-25 %
Overall decrease in emissions since 2014

[1] Full-time equivalent.

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2013

ECA launches
EMAS² project

2016

1st EMAS
certification

2022

3rd EMAS
certification

2023

Annual carbon footprint
calculation using Bilan
Carbone® method

2014

ECA adopts its first
environmental policy

Goal: continuous
improvement of ECA's
environmental performance

2019

2nd EMAS
certification

2 Eco-Management and Audit Scheme.

2 Context of the study

Main changes for 2022 carbon footprint assessment

The objective of the study was to provide a **high-quality estimate of the greenhouse gas emissions** produced by the European Court of Auditors, **using the Bilan Carbone® methodology.**

To this end, **the ECA conducted a survey on commuting** in order to update its data on staff transport choices and modal share. The teleworking rate and results were calculated using the number of staff on-site days based on access data.

The main changes in relation to the 2022 carbon footprint assessment were as follows:
- the Bilan carbone® included comparisons with 2014, 2019 and 2021;
- external IT consultants (60,2 FTE) worked on site in 2022 (they were all teleworking in 2021);
- data for meals with meat was estimated by extrapolation based on the proportion of meat purchased in 2019 and the number of tickets sold for vegetarian meal in 2022;
- all IT emissions were reported in the "digital" category, including purchase of IT supplies and services;
- the 2022 renovation work on the K2 building was included in "capital goods" (5 097 m²);
- emission factors were updated.
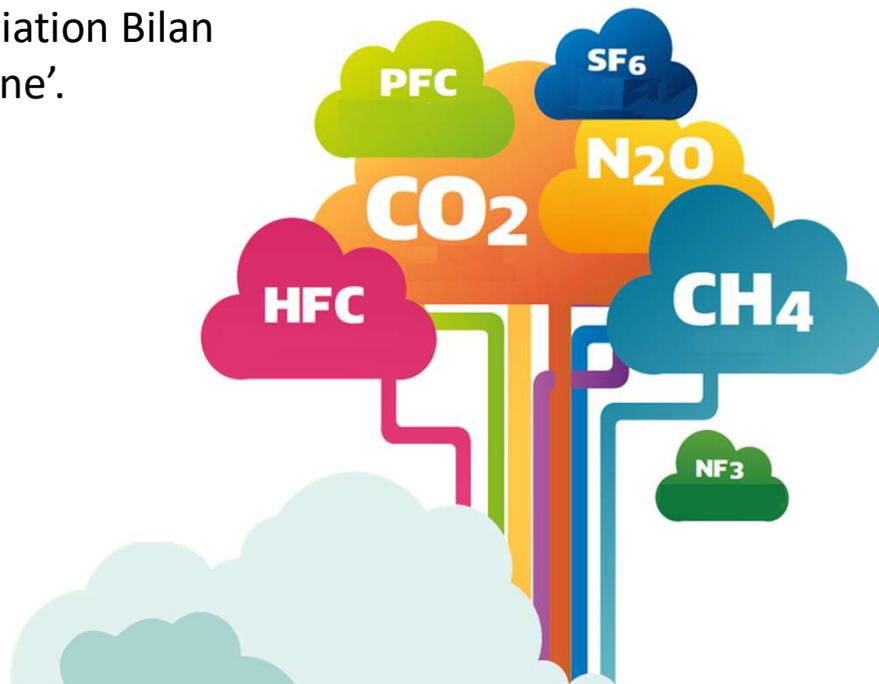
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The Bilan Carbone® method was developed in 2004 by the French Environment and Energy Management Agency (ADEME) to quantify organisations' GHG emissions.

It is promoted by the 'Association Bilan Carbone'.

The method covers the following gases:

✓ Kyoto Protocol gases: CO_2, CH_4, N_2O, SF_6, NF_3, hydrofluorocarbons ($C_nH_mF_p$), perfluorocarbons (C_nF_{2n+2});

✓ CFCs;

✓ water vapour emitted by planes in the stratosphere.

The method multiplies each organisation's activity data by an emission factor, as it is not feasible to measure GHG emissions directly.
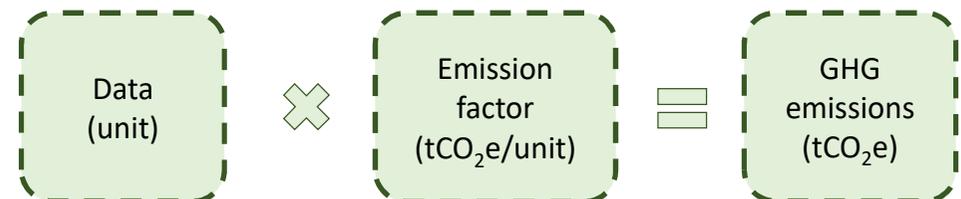
| Data (unit) | ✕ | Emission factor (tCO_2e/unit) | = | GHG emissions (tCO_2e) |
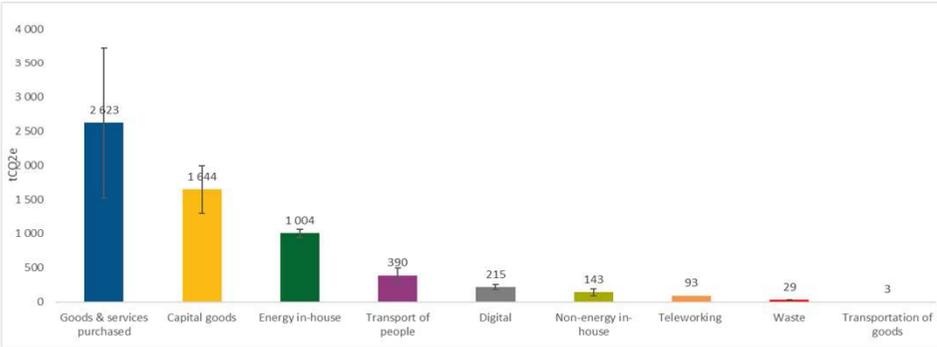
3 Overview of carbon footprint methods

10

Overview of carbon footprint methods

Operational scope of the Bilan Carbone® method in 2022
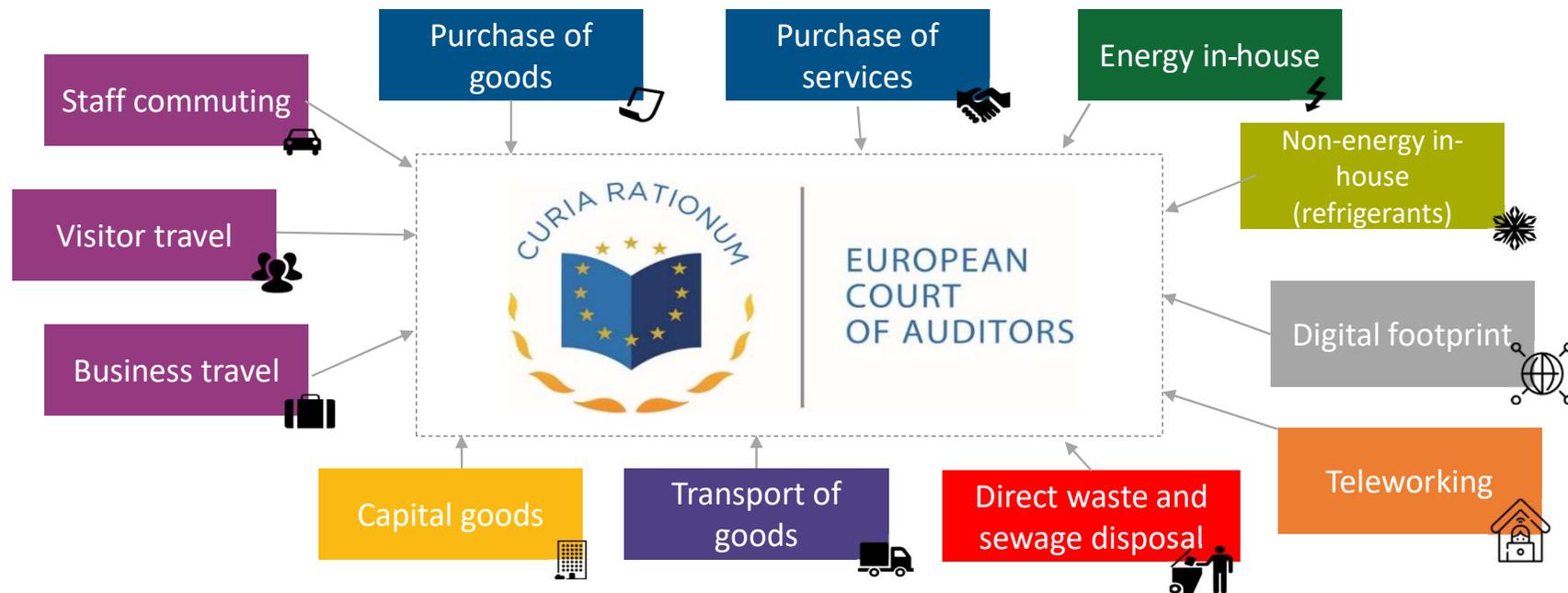
The ECA's carbon footprint includes direct and indirect GHG emissions (scopes 1, 2 and 3).

Temporal and organisational scope

Bilan Carbone® approach: operational control approach

Temporal scope: ECA activities in 2022

Organisational scope: three buildings in Luxembourg (K1, K2, K3)

Building	Area (m²)	FTE
K1	22 404	286.2
K2	17 979	205.6
K3	28 240	477.0

Updated 2022 data

Buildings include office space, basements, underground car parks, two cafeterias, a canteen, archives, a library, walkways between buildings, and other amenities.

Activities of ECA officials and other staff: **968.8** full-time equivalent employees (FTE) as at end of 2022

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2022 Bilan Carbone® results

✓ **Total GHG emissions 7 989 tCO$_2$e**

✓ Largest sources of emissions:
  - **passenger transport (24%)**
  - **goods and services purchased (24%)**
  - **capital goods (21%)**
  - **energy in-house (15%)**
  - **digital (14%)**

✓ non-energy in-house, waste, teleworking and transport of goods made up the remaining 2%

Donut chart labels: Transportation of goods <1%; Waste <1%; Non-energy in-house 1%; Teleworking 1%; Digital 14%; Energy (in-house) 15%; Capital goods 21%; Goods & services purchased 24%; Passenger transport 24%; center: 7 989 tCO$_2$e

Total uncertainties 786 tCO$_2$e (10%)

Bar chart (tCO$_2$e):
- Passenger transport 1 934
- Goods & services purchased 1 924
- Capital goods 1 637
- Energy (in-house) 1 159
- Digital 1 126
- Non-energy in-house 106
- Teleworking 69
- Waste 34
- Transportation of goods 0

4 Overall results

Goods and services
1 924
24%

Digital
1 126
14%

Mobility
1 934
24%

7 989 tCO$_2$e

Teleworking
69
1%

Buildings
2 937
37%

Emissions related to buildings and mobility have been gradually reduced since 2014

	Buildings	Mobility	Goods and services	Digital	Teleworking	
2022	2937	1934	1924	1126	69	7 989 tCO$_2$e
2021	3003	418	1972	2109	7	7 573 tCO$_2$e
2019	3688	3555	1710	478		9 430 tCO$_2$e
2014	3831	4036	1587	1245		10 699 tCO$_2$e

Buildings   Mobility   Goods and services   Digital   Teleworking

Emissions by building

Total GHG emissions by building

Emissions were divided between the buildings according to staff headcount.

Building	FTE	Share (%)
K1	286.2	30%
K2	205.6	21%
K3	477.0	49%
Total	**968.8**	**100%**

K3 houses the most staff and produces the largest share of emissions

Building	tCO$_2$e
K1	2 328
K2	1 820
K3	3 761
TOTAL	**7 909**[3]
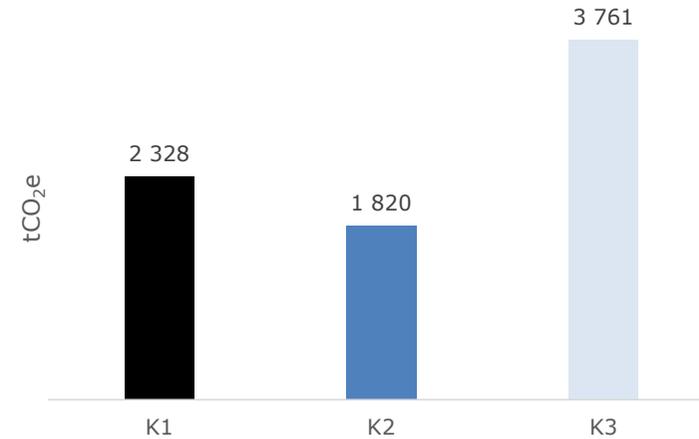
Emissions categories by building
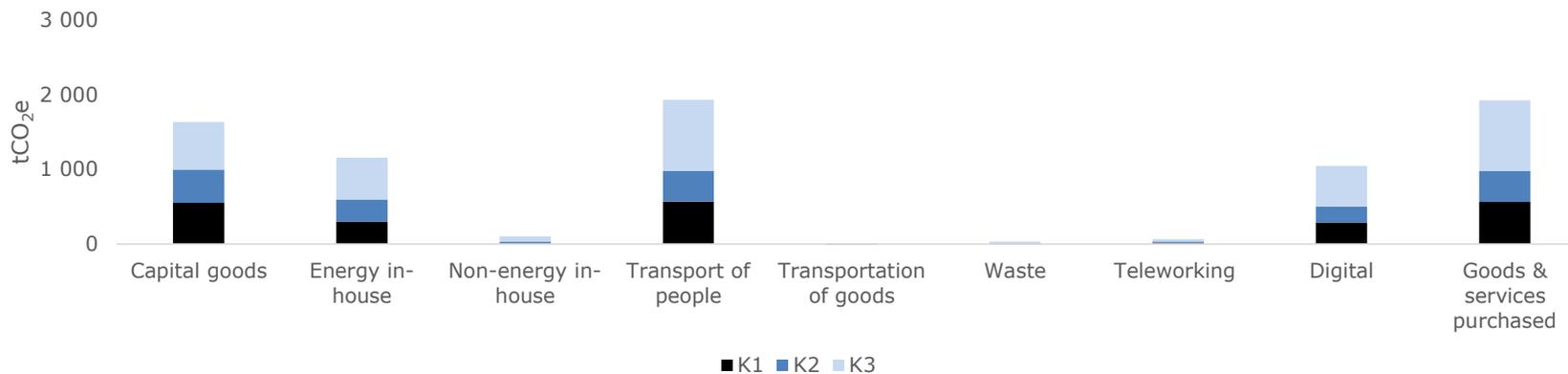
3 Unassigned FTEs were equally distributed between the three buildings. Bersdorf's emissions (80 tCO$_2$e) are not included in this slide.

Comparison with previous years

> Overall, emissions rose by 6 % between 2021 and 2022 and have fallen by **25 %** since 2014

Emission sources tCO$_2$e	2014	2019	2021	2022	Change 2014-2022	Change 2019-2022	Change 2021-2022
Capital goods	1 875	1.829	1 683	1.637	-13% ↘	-10% ↘	-3% ↘
Energy in-house	1 840	1.788	1 246	1.159	-37% ↘	-35% ↘	-7% ↘
Non-energy in-house	82	47	38	106	+30% ↗	+128% ↗	+182% ↗
Passenger transport	4 020	3.550	417	1.934	-52% ↘	-46% ↘	+364% ↗
Transportation of goods	16	5	<1	<1	-99% ↘	-95% ↘	-43% ↘
Waste	34	25	36	34	0%	+38% ↗	-6% ↘
Teleworking	/	/	72	69	/	/	-4% ↘
Digital	1 245	478	2 105	1.126	-10% ↘	+136% ↗	-47% ↘
Goods & services purchased	1 587	1.710	1 972	1.924	+21% ↗	+13% ↗	-2% ↘
TOTAL	**10 699**	**9 430**	**7 569**	**7 989**	-25% ↘	-15% ↘	+6% ↗
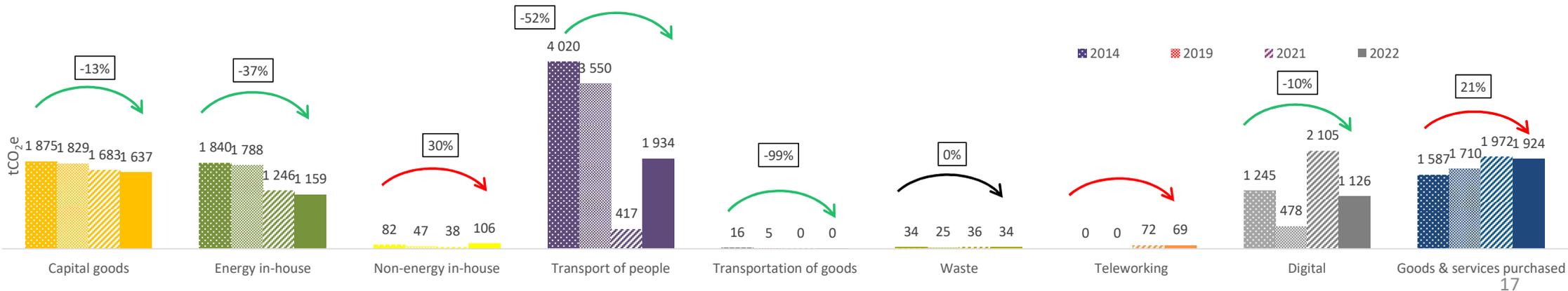
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Passenger transport (24%)

Data and assumptions

Emission sources

✓ Staff commuting and use of official cars for non-business travel (2022 survey on 2022 habits)
✓ Business travel (including "use of official cars")
✓ Visitor travel

Results

Type of transportation	tCO$_2$e
Staff commuting	1 055
Business travel	445
Visitor travel	434
Total	**1 934**

Emissions from passenger transport by travel category

Visitor travel 22%

Business travel 23%

1934 tCO$_2$e

Employee Commuting 55%
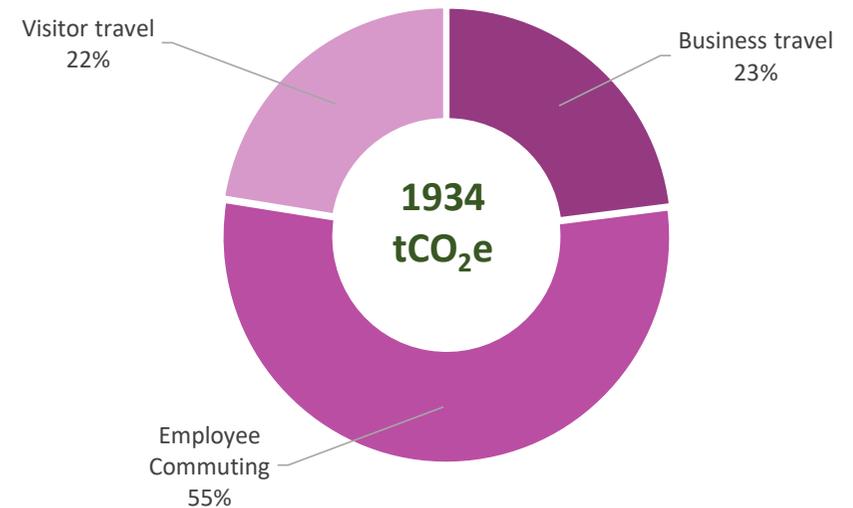
Staff commuting

Data provided

✓ ECA data: 2022 staff commuting survey

Hypothesis

✓ Excluding teleworking days

Cars: 83% of GHG emissions; 71% of kilometres travelled

Extrapolated results

Staff commuting	tCO$_2$e	km
Car	820	4.021.227
Bus	161	796.916
Official cars[4]	34	181.442
Carpooling	15	69.936
Train	14	343.218
Motorbike	10	52.954
Tram	1	250.772
E-bike	<1	19.479
E-scooter	<1	1.177
Bicycle	0	124.833
On Foot	0	123.951
TOTAL	1.055	5.985.903

GHG emissions from commuting

Car 78%, Bus 15%, Official cars 3%, Carpooling 2%, Train 1%, Motorbike 1%, Tram <1%, E-bike 0%, E-scooter 0%, Bicycle 0%, On Foot 0% — 1 055 tCO$_2$e
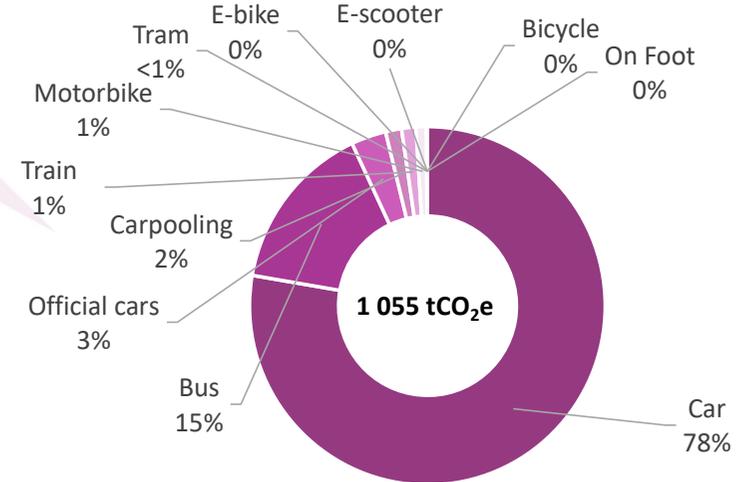
Kilometres travelled for commuting

Car 67%, Bus 13%, Train 6%, Tram 4%, Official... , Bicycle 2%, On Foot 2%, Carpooling 1%, Motorbike 1%, E-bike 1%, E-scooter <1% — 5 985 903 km
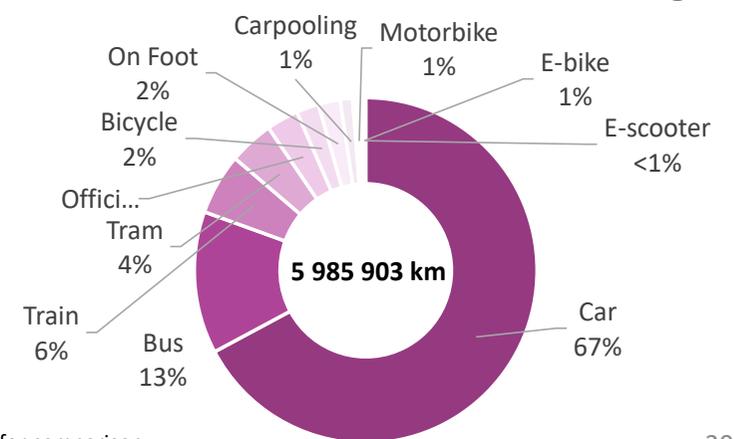
4 Carbon footprint calculation for official cars in litres or kWh. Number of litres and kWh consumption transposed to km with average consumption for comparison.

Business travel

Data provided

Total kilometres by mode of transport
Car: Private, official and rented cars

Results

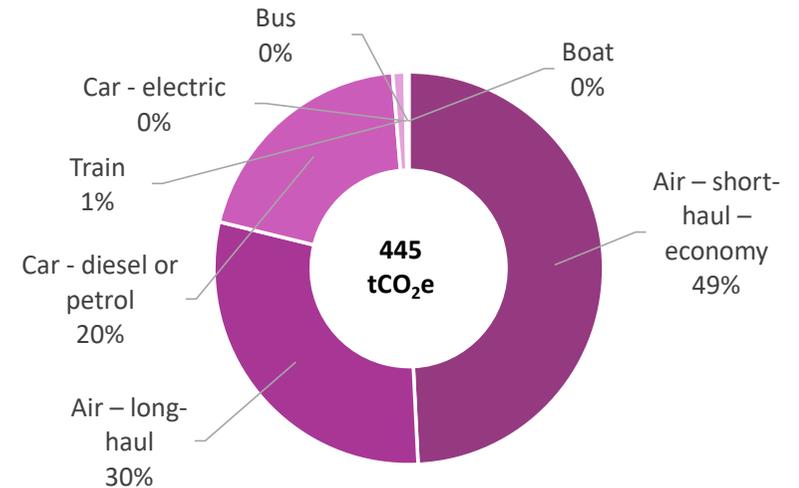| Business travel	tCO$_2$e	km
Air – short-haul – economy	219	1 290 363
Air – long-haul	132	811 316
Car – diesel or petrol	88	200 473
Train	5	115 125
Bus	<1	3 552
Car – electric	<1	3 364
Boat	<1	1863
TOTAL	445	2 426 056

The travel agency reported a total of **33 tCO$_2$e** for short-haul air travel. This difference could be due to the fact that aircraft can affect climate through other emissions and atmospheric processes (H20, NOx, sulfate, contrails, etc.). There are still significant scientific uncertainties about their estimation. The French Ministry (ADEME) recommends including contrails.

Train: 1 % of GHG emissions; 5 % of kilometres travelled

GHG emissions from business travel

Bus 0% · Boat 0% · Car - electric 0% · Train 1% · Car - diesel or petrol 20% · Air – long-haul 30% · Air – short-haul – economy 49% — **445 tCO$_2$e**

Kilometres travelled for business travel

Car - electric <1% · Boat <1% · Bus <1% · Train 5% · Car - diesel or petrol 8% · Air – long-haul 34% · Air – short-haul – economy 53% — **2 426 056 km**

21
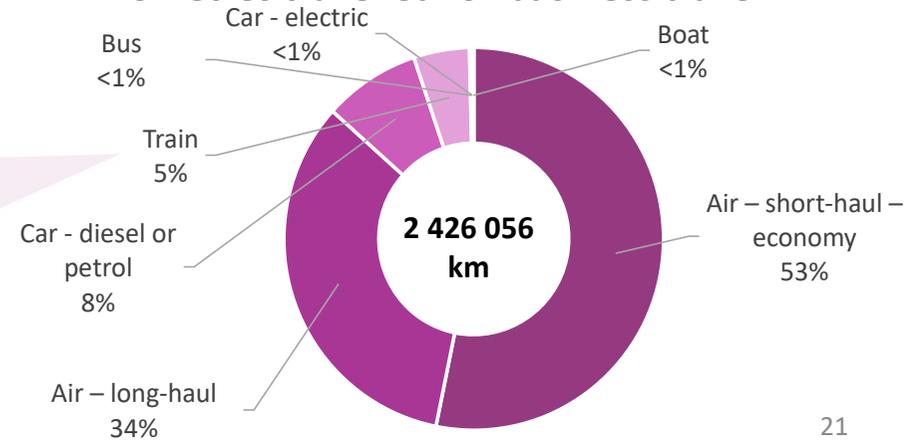
Visitor travel

Data provided

Number of visitors in 2022:
- ✓ 79 visits
- ✓ 1 464 visitors

Assumptions regarding mode of transport

- ✓ Short-haul aircraft: EU
- ✓ Car: BE-LU
- ✓ Bus: DE
- ✓ Train: FR

Plane: 74% of GHG emissions; 73% of kilometres travelled

Results

Visitor travel	tCO$_2$e	km
Short haul aircraft	269	1 583 941
Bus	95	467 985
Long haul aircraft	53	328 396
Car	11	48 132
Train	7	180 768
TOTAL	435	2 609 222

Sources of 2022 GHG emissions from visitor transport

Train 2%
Car 2%
Long haul aircraft 12%
Bus 22%
Short haul aircraft 62%
435 tCO$_2$e
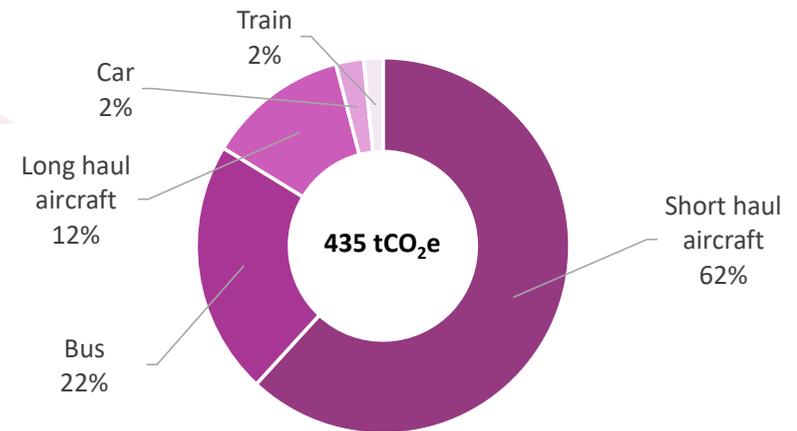
Kilometres travelled by visitors
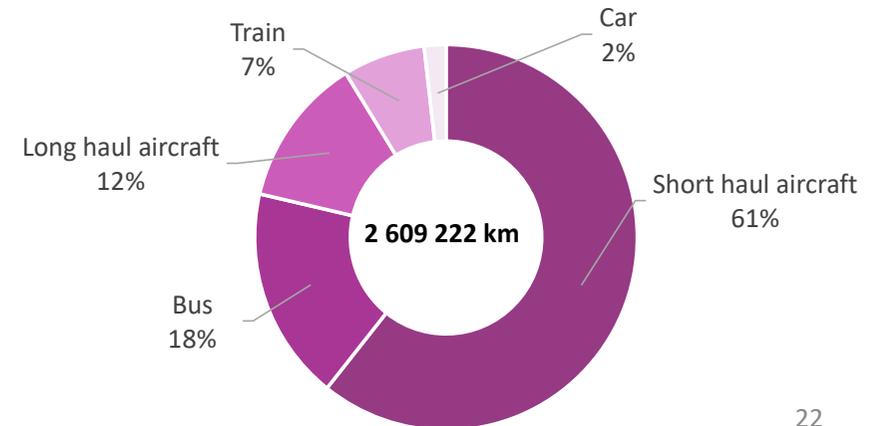
Train 7%
Car 2%
Long haul aircraft 12%
Bus 18%
Short haul aircraft 61%
2 609 222 km

22

Comparison with previous years

GHG emissions tCO$_2$e	2014	2019	2021	2022	Change 2014-2022	Change 2019-2022	Change 2021-2022
Total transport	4 020	3 550	417	1 934	**-52%** ↘	**-46%** ↘	**+364%** ↗

36% reduction in GHG emissions from **staff commuting** in 2022 compared to 2014, mainly due to the decrease in kilometres travelled by car

Business and visitor travel has increased after the COVID-19 crisis

-36%

1 640
1 188
305
1 055

tCO$_2$e

Employee Commuting

-70%

1 475
1 046
85
445

Business travel

-52%

905
1 316
27
435

Visitor travel

■ 2014 ▨ 2019 ▨ 2021 ■ 2022
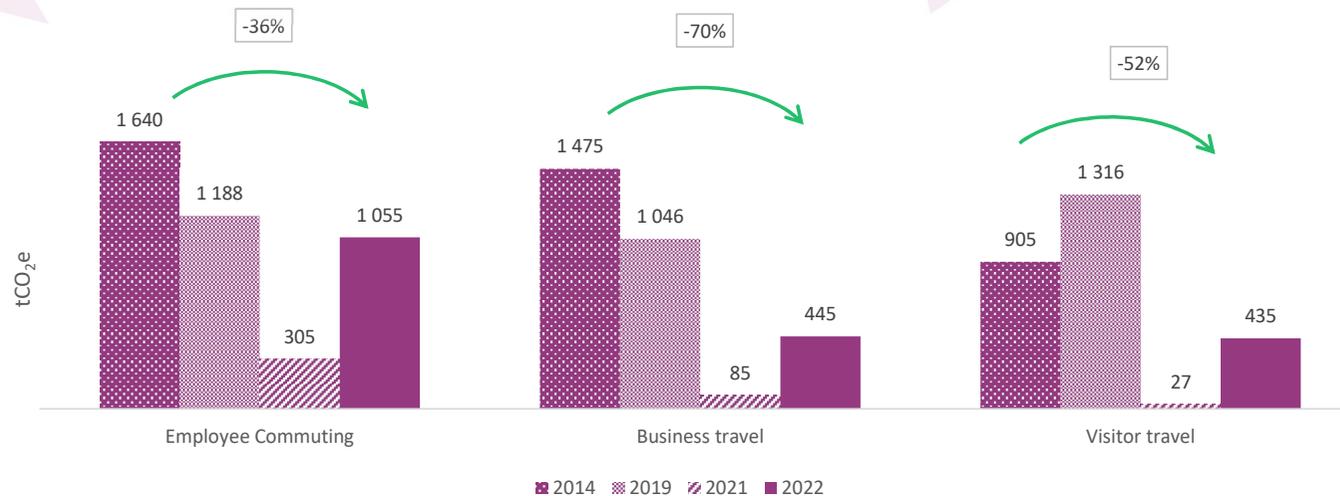
Goods & services purchased (24 %)

Data and assumptions

- ✓ **Services:** (click here to go to the slide)
- ✓ **Meals:** (click here to go to the slide)
- ✓ **Paper:** A4 75gr (95 %) and A3 75 gr/others (5 %), converted into weight (5 g/page)
- ✓ **Water purchased:** total water consumed in 2022
- ✓ **Gifts:** number and type of gifts converted into weight by type of material

Results

Type of goods or services	tCO$_2$e
Services purchased	1 351
Goods purchased	409
Meals	119
Hotel nights during business trips	25
Paper	13
Meals during business trips	5
Water purchased	<1
Gifts	<1
Total	**1 924**

Total GHG emissions from goods and services purchased

Meals during business trips <1%
Meals 6%
Paper 1%
Purchased goods 21%
Purchased water <1%
Hotel nights during business trips <1%
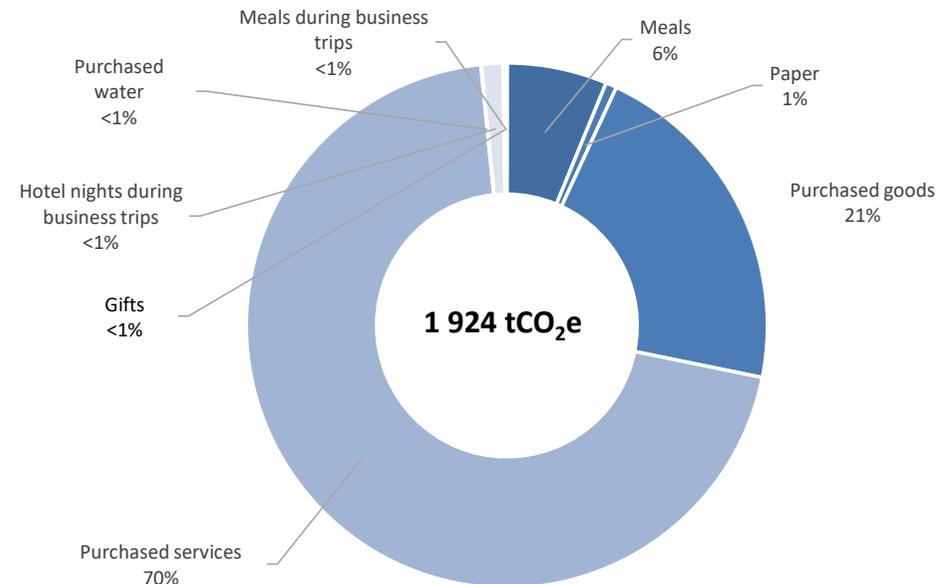Gifts <1%
1 924 tCO$_2$e
Purchased services 70%

Comparison with previous years

GHG emissions (tCO$_2$e)	2014	2019	2021	2022	Change 2014-2022	Change 2019-2022	Change 2021-2022
Total goods and services purchased	1 587	1 710	1 972	1 924	+21%↗	+13%↗	-2%↘

A few categories have been transferred from "Purchased services" to "Digital" since 2020.

Lower service expenditure (-20%) in 2022 than in 2021

Legend: 2014, 2019, 2021, 2022

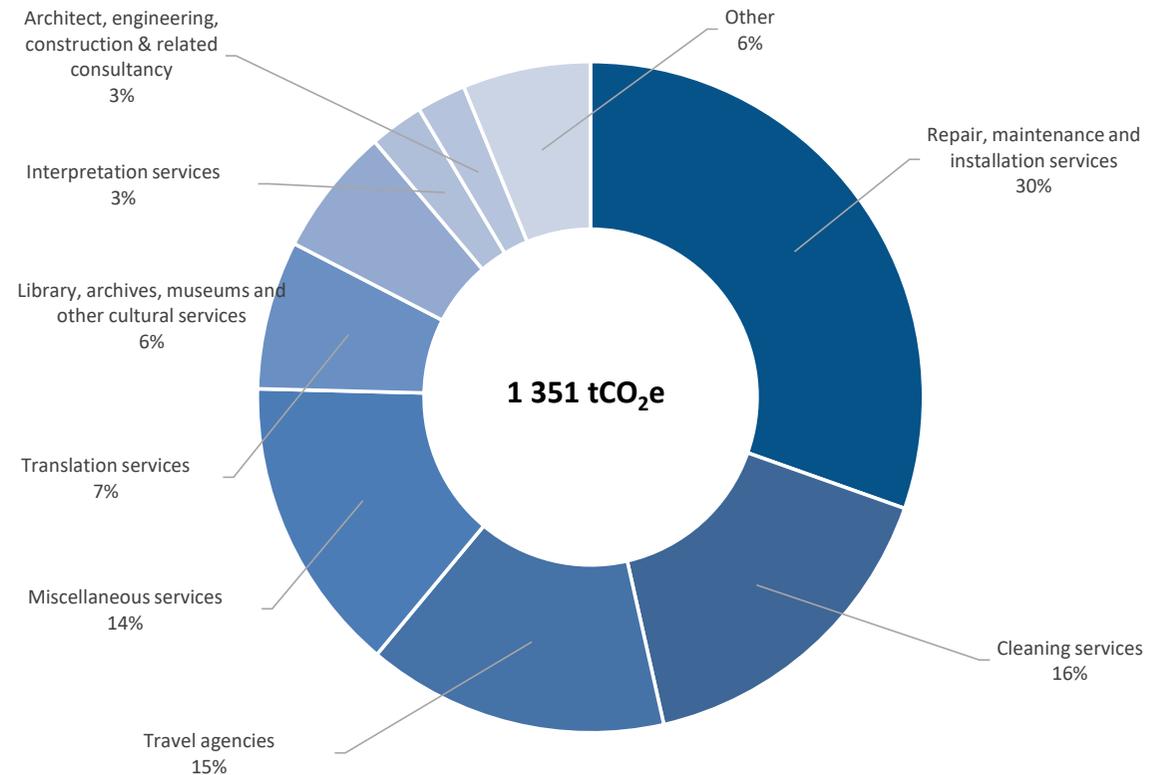| Category	2014	2019	2021	2022	Change
Purchased services	997	1210	1496	1 351	36%
Purchased goods	332	199	355	409	23%
Meals	212	282	91	119	-44%
Paper	39	17	21	13	-67%
Gifts	6	0	0	0	-96%
Purchased water	2	2	0	1	-43%
Hotel nights	0	0	6	25	
Meals during business trips	0	0	2	5	

tCO$_2$e

Services

GHG emissions from services purchased
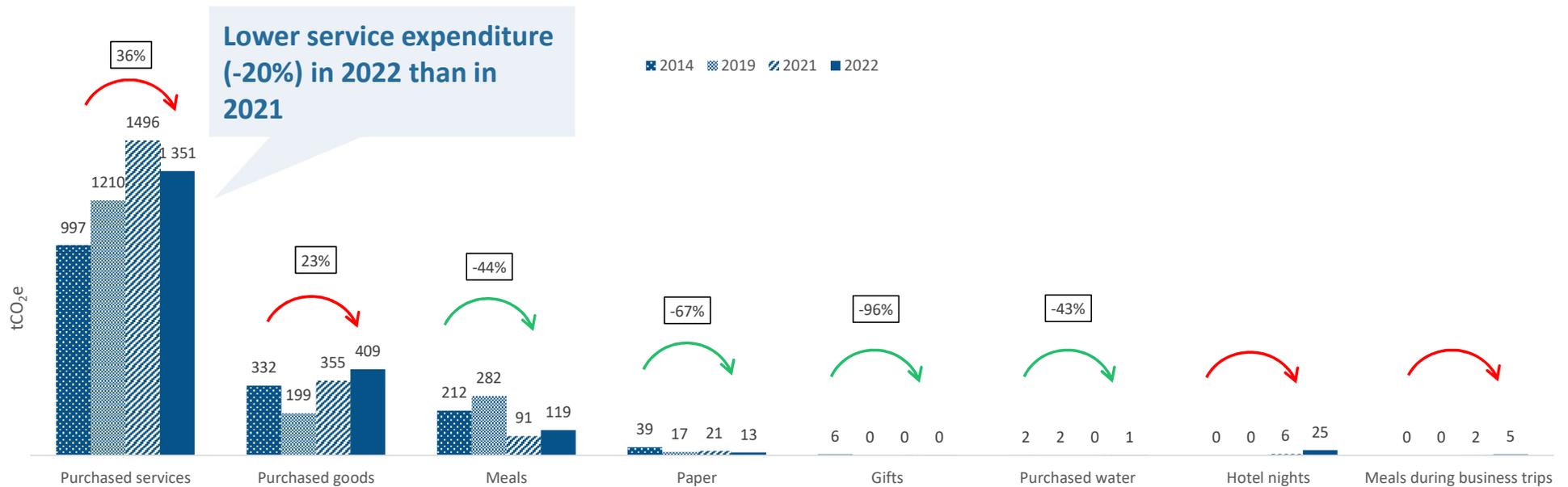
Data and assumptions

Data provided: goods and services purchased by category type and amount in euros

Results

Type of service	tCO$_2$e
Repair, maintenance and installation services	401
Cleaning services	212
Travel agencies	193
Miscellaneous services	189
Translation services	94
Library, archives, museums and other cultural services	82
Interpretation services	35
Labour recruitment and provision of personnel services	33
Architect, engineering, construction & related consultancy	31
Other	82
Total	**1 351**

Architect, engineering, construction & related consultancy
3%

Other
6%

Interpretation services
3%

Repair, maintenance and installation services
30%

Library, archives, museums and other cultural services
6%

1 351 tCO$_2$e

Translation services
7%

Cleaning services
16%

Miscellaneous services
14%

Travel agencies
15%

Miscellaneous services were assigned an average services emission factor extrapolated from the Bilan Carbone® database.
These services ranged from equipment rentals for training (language classes, etc.), painting, document destruction, etc.
The 'Other' category includes advertising and marketing services, health and social work services, insurance & pension services, postal and courier services, sewage/disposal, real estate services.
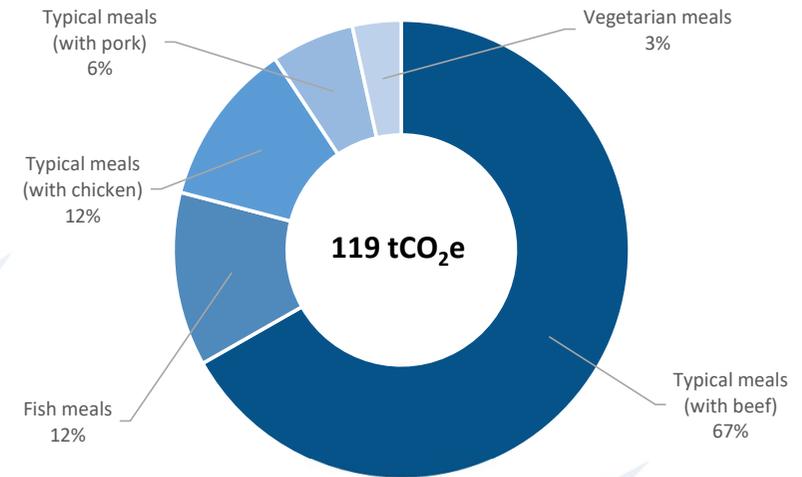
Meals

GHG emissions from meals

Data and assumptions

✓ Number of meals
✓ Data for meat dishes is estimated by extrapolation based on the breakdown of meat dishes in 2019 and the breakdown of meat vs vegetarian dishes sold in 2022
✓ Meat meals were broken down by quantities purchased in 2019 (27 % fish, 23 % beef, 19 % chicken, 16 % pork)

Replacing beef with chicken would reduce carbon impact by 50 %

Typical meals (with pork) 6%

Typical meals (with chicken) 12%

Fish meals 12%

Vegetarian meals 3%

119 tCO$_2$e

Typical meals (with beef) 67%

Replacing beef with vegetarian option would reduce carbon impact by 144 %

Results

| Type of meal	tCO$_2$e
Typical meals (with beef)	80
Fish meals	14
Typical meals (with chicken)	14
Typical meals (with pork)	7
Vegetarian meals	4
Total	**119**

Capital goods (20%)

Data and assumptions

✓ **Buildings and car parks**: parking and office space (m^2) Renovation work included in building emissions (+5 097 m²) Depreciation: 40 years

✓ **Building assets**: generators, refrigerators, air conditioning units, machinery etc. (units per building); furniture, equipment and tools (per building by purchase price) Depreciation: 8 years

✓ **Vehicles**: model of leased and owned vehicles across all three buildings Depreciation: 4 years

Results

Type of capital goods	tCO$_2$e
Buildings	1 150
Building assets	393
Vehicles	94
Total	**1 637**

Total GHG emissions from capital goods
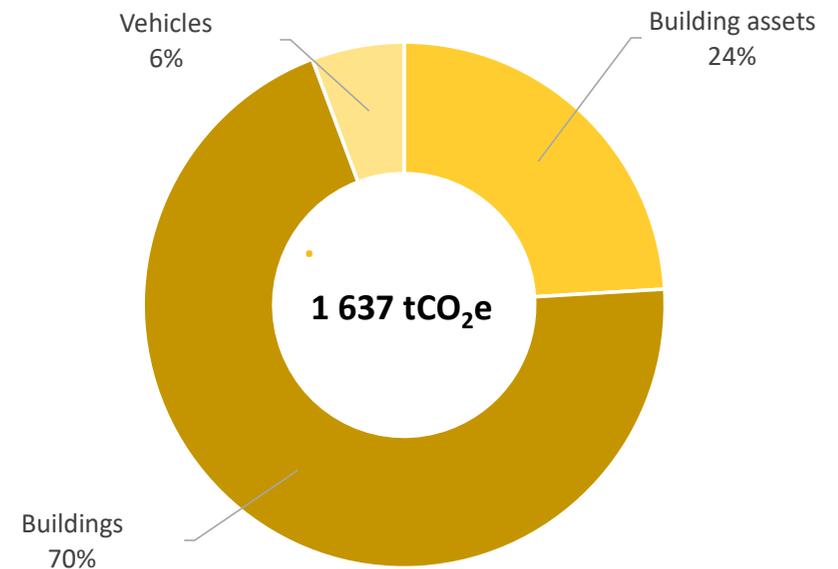
Vehicles 6%
Building assets 24%
Buildings 70%
1 637 tCO$_2$e

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Comparison with previous years

GHG emissions tCO$_2$e	2014	2019	2021	2022	Change 2014-2022	Change 2019-2022	Change 2021-2022
Total capital goods	1 875	1 829	1 683	1 637	-13 % ↘	-11% ↘	-3% ↘

Net office space area has changed due to building renovation work in K2

■2014 ▨2019 ▨2021 ■2022

-5,6%

1 218   1 223   1 207   1 150

tCO$_2$e

Buildings

-31,2%

572   522   382   394

Building assets

10,2%

85   83   94   94

Vehicles
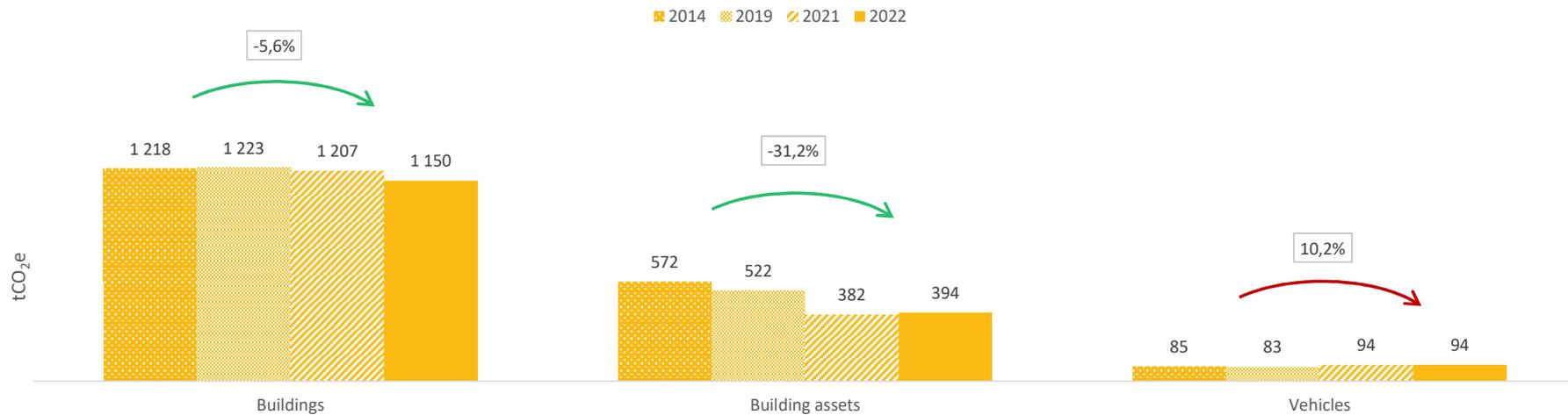
Energy (in-house) (15%)

Data and assumptions

Total GHG emissions from energy

✓ **Electricity consumption:**
The ECA purchases guaranteed green electricity, but the Bilan Carbone® method calculates actual electricity consumption from the national grid (location-based).

✓ **Heat consumption:** 2022 consumption for each building. Energy mix communicated by the heating plant manager.

Heating 35%

1 159 tCO$_2$e

Electricity 64%

Fuel 1%
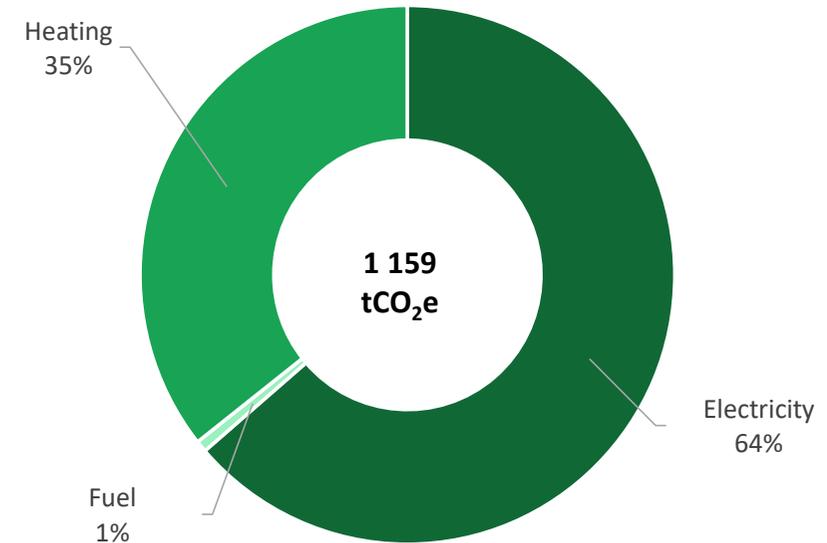
Results

Type of energy source	tCO$_2$e
Electricity	738
Heating	413
Fuel	8
Total	**1 159**

Comparison with previous years

GHG emissions tCO$_2$e	2014	2019	2021	2022	Change 2014-2022	Change 2019-2022	Change 2021-2022
Total energy	1 840	1 788	1 246	1 159	-37% ↘	-35% ↘	-7% ↘

The K3 building logically accounts for the greatest share of energy emissions

Heating-related emissions have decreased in 2022 compared to 2021 (**-21 %**), due to lower consumption and the larger proportion of biomass in the energy mix (150.0 gCO$_2$e/kWh vs 142.4 gCO$_2$e/kWh)

2022 emissions by building

tCO2e — Electricity, Heating, Fuel — ■ K1 ■ K2 ■ K3

tCO$_2$e

Electricity: -58%, 1 759, 1 489, 720, 738

Heating: 425%, 79, 296, 526, 413

Fuel: 163%, 3, 4, 0, 8

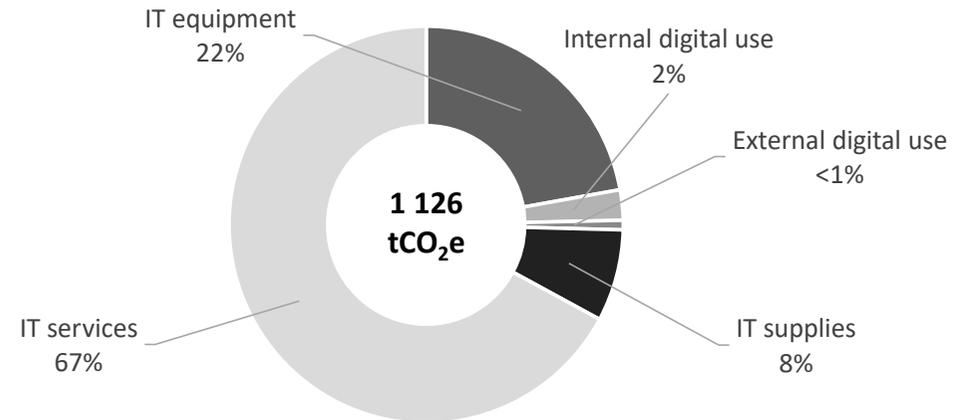■ 2014 ▨ 2019 ▨ 2021 ■ 2022

31
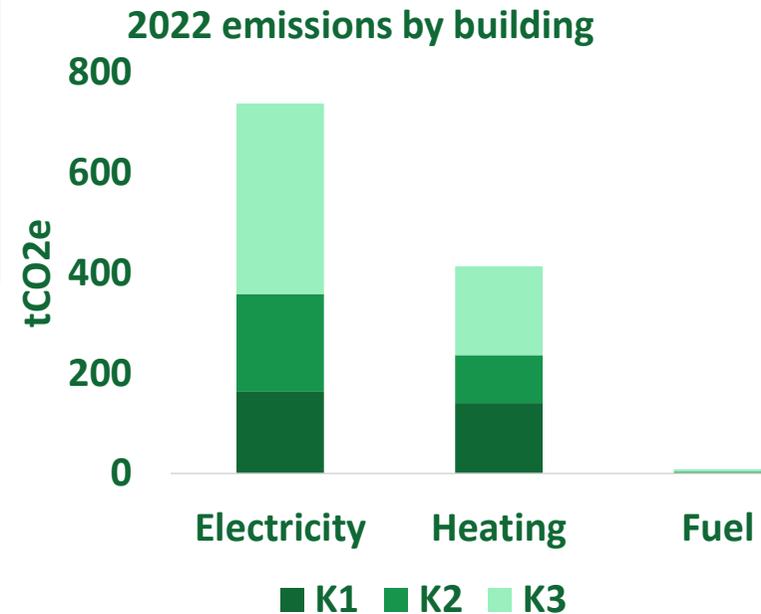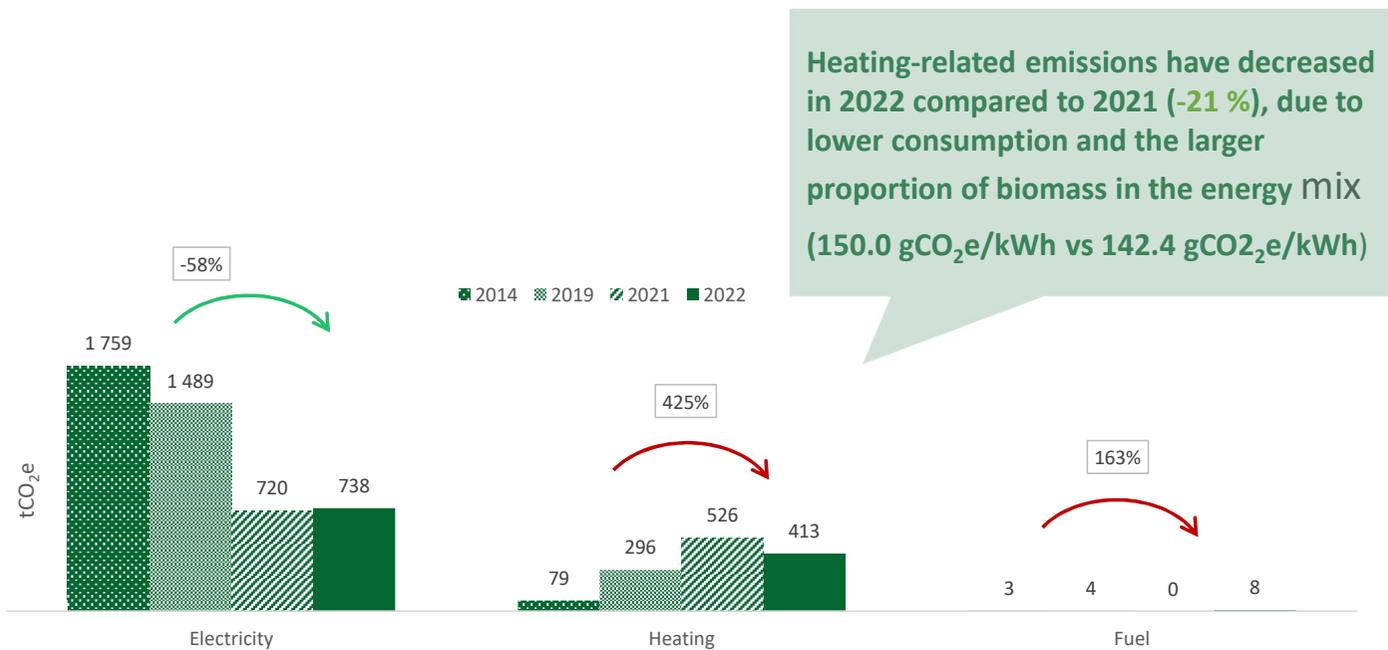
Digital (14%)

Data and assumptions

✓ **Internal digital use**
Energy emissions related to K3 and Bersdorf data centres

✓ **External digital use**
Emissions related to customers' to the ECA's website (including viewing of reports and online videos), Facebook, LinkedIn and Twitter pages, and email communication with the ECA

✓ **IT equipment**
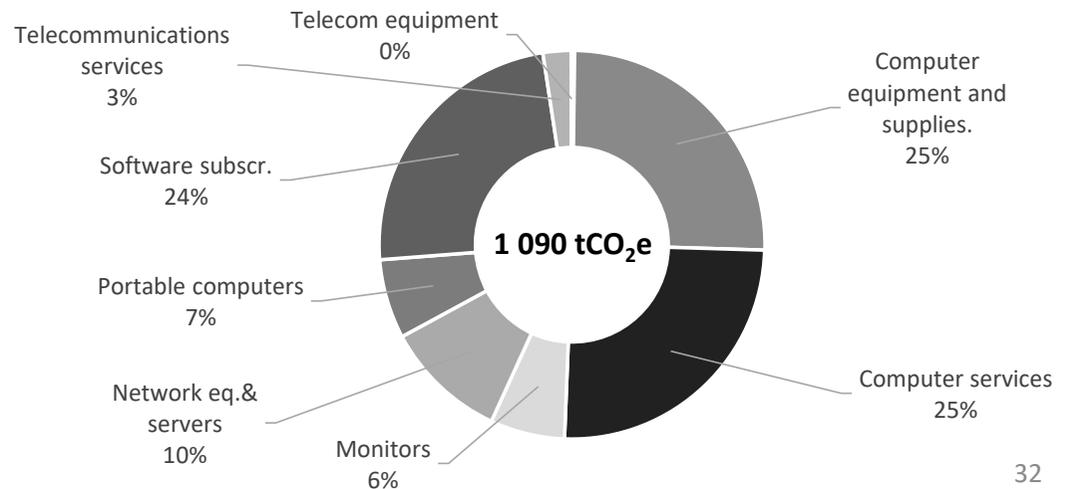IT inventory by goods type

Results

Type of emissions	tCO$_2$e
IT services	756
IT equipment	250
IT supplies	84
Internal digital use	28
External digital use	8
Total	**1 126**

IT services + IT equipment + IT supplies = **1 090**

Total GHG digital emissions

IT equipment 22%
Internal digital use 2%
External digital use <1%
IT supplies 8%
IT services 67%
1 126 tCO$_2$e

Focus on IT services, supplies and equipment

Telecommunications services 3%
Telecom equipment 0%
Computer equipment and supplies. 25%
Software subscr. 24%
Portable computers 7%
Network eq.& servers 10%
Monitors 6%
Computer services 25%
1 090 tCO$_2$e

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Comparison with previous years

| GHG emissions tCO₂e	2014	2019	2021	2022	Change 2014-2022	Change 2019-2022	Change 2021-2022
Total digital	1 245	478	2 105	1 126	**-10%** ↘	**+136%** ↗	**-47%** ↘

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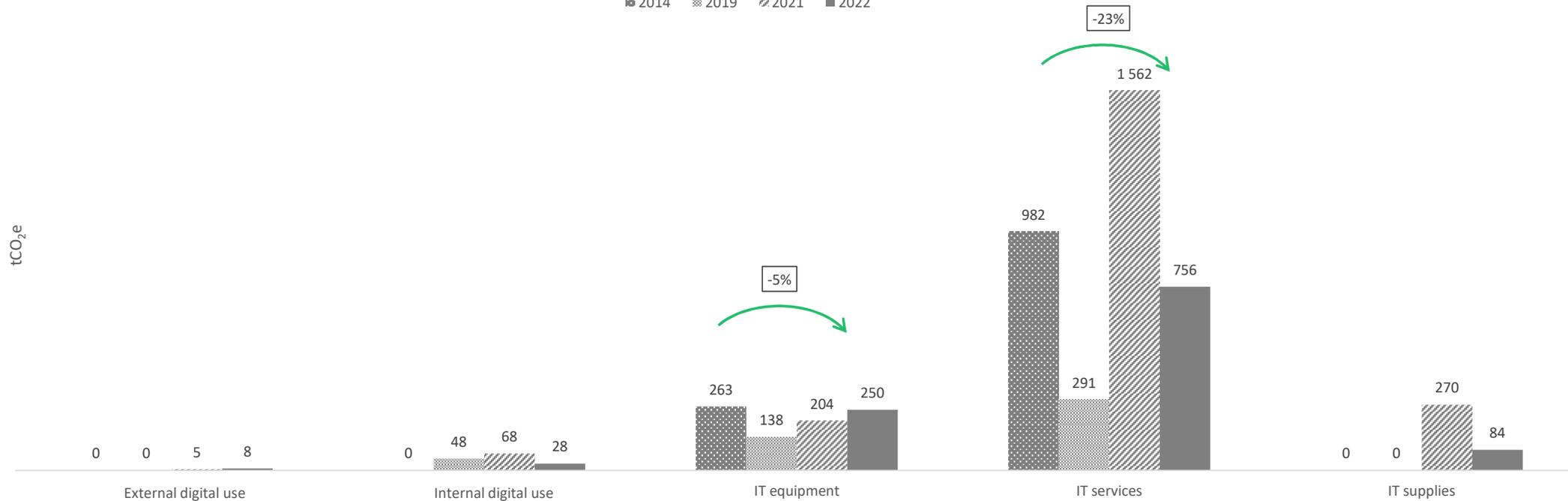
Non-energy in-house (1%)

Data and assumptions

Refrigerant gases: cooling equipment refilled with refrigerant gases in 2022 (R134a, R407c and R452a). Refills were treated as leaks.

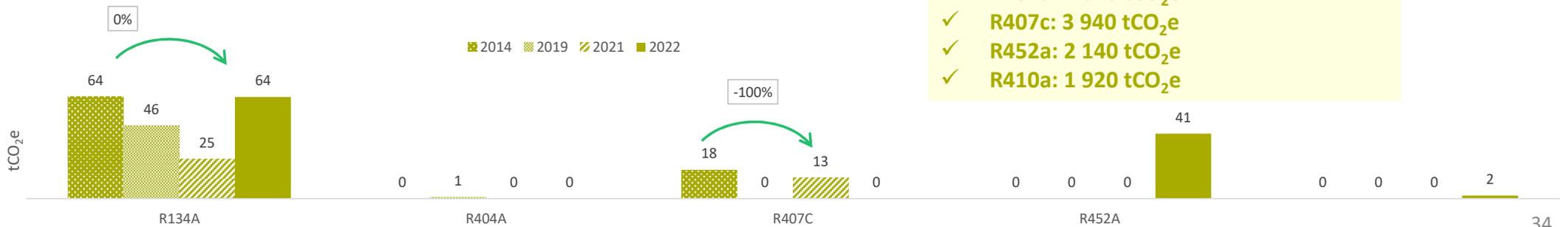### Results and comparison with previous years

GHG emissions tCO_2e	2014	2019	2021	2022	Change 2014-2022	Change 2019-2022	Change 2020-2022
R134A	64	46	25	64	**0%**	**+40%** ↗	**+158%** ↗
R404A	0	1	0	0	/	**-100%** ↘	/
R407C	18	0	13	0	**-100%** ↘	/	**-100%** ↘
R452A	0	0	0	41	/	/	/
R410A	0	0	0	2	/	/	/
Total	**82**	**47**	**38**	**106**	**+30%** ↗	**+128%** ↗	**+182%** ↗

Total non-energy GHG emissions

106 tCO_2e

- R410A 2%
- R452A 38%
- R407C 0%
- R404A 0%
- R134A 60%
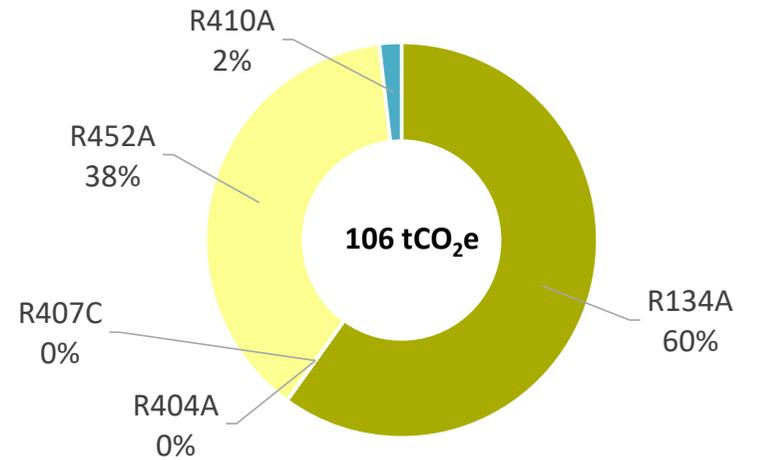
Refrigerant gases have a huge impact, with one tonne equivalent to:
- ✓ **R134a: 1 300 tCO_2e**
- ✓ **R404a: 1 620 tCO_2e**
- ✓ **R407c: 3 940 tCO_2e**
- ✓ **R452a: 2 140 tCO_2e**
- ✓ **R410a: 1 920 tCO_2e**

■ 2014 ▨ 2019 ▨ 2021 ■ 2022

tCO_2e

0%

R134A: 64, 46, 25, 64

R404A: 0, 1, 0, 0

-100%

R407C: 18, 0, 13, 0

R452A: 0, 0, 0, 41

2

Teleworking (1%)

Data and assumptions

✓ **Heating**
Emissions related to home heating: natural gas, fuel oil, heat pump, electricity and green electricity for GHG Protocol, district heating and wood
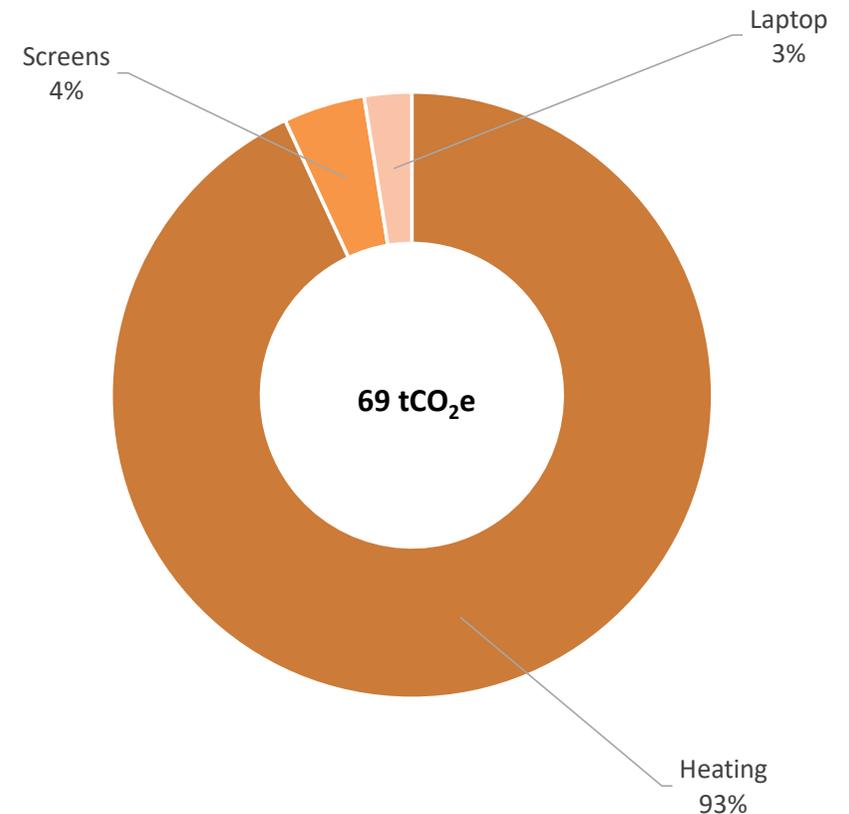
✓ **Laptops and screens**
Emissions related to the energy consumption of IT equipment (electricity and green electricity for GHG Protocol)

Results

Teleworking	2021 tCO_2e	2022 tCO_2e
Heating	67	64
Screens	2	3
Laptop	3	2
Total	**72**	**69**

Bilan® Carbone emissions from teleworking

69 tCO_2e

Screens 4%
Laptop 3%
Heating 93%

Waste <1%

Data and assumptions

✓ **Waste**

Non-hazardous: food and household waste, plastics, paper, cardboard and glass packaging

Hazardous: wastewater and sewage, light bulbs and fluorescent tubes, packaging waste containing harmful products, scrap metal, batteries, accumulators and electronic waste
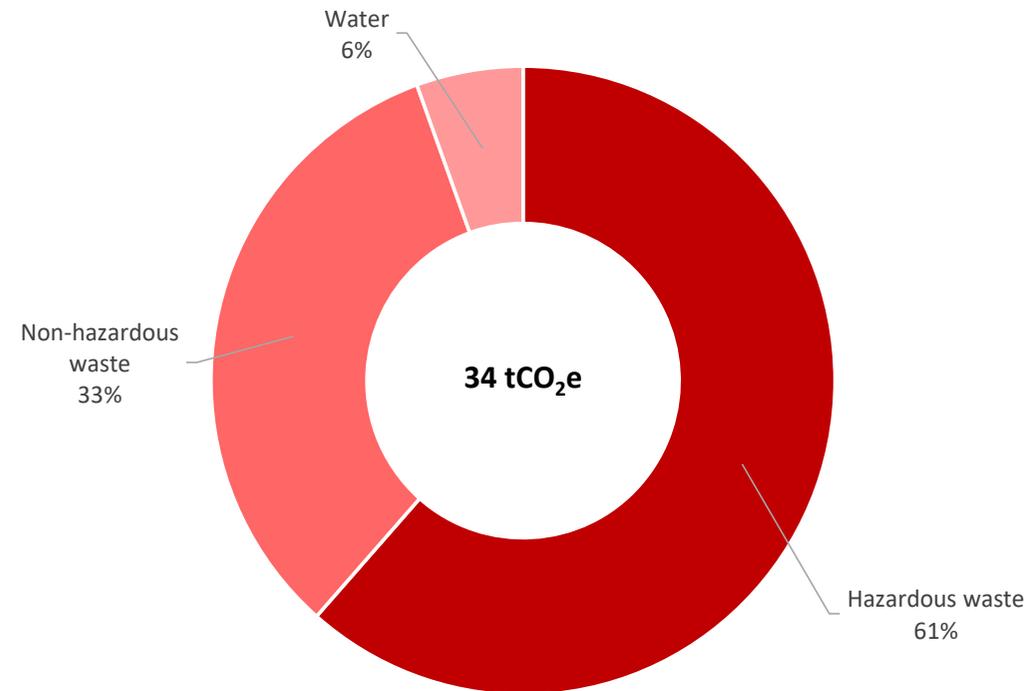
✓ **Water use (sewage)**

Data: based on water consumption, allocated to buildings based on occupancy

Results

Type of waste	tCO$_2$e
Hazardous waste	21
Non-hazardous waste	11
Water	2
Total	**34**

Total GHG emissions from waste

Water 6%

Non-hazardous waste 33%

34 tCO$_2$e

Hazardous waste 61%

Comparison with previous years

GHG emissions tCO$_2$e	2014	2019	2021	2022	Change 2014-2022	Change 2019-2022	Change 2021-2022
Total waste	34	25	36	34	0%	+38% ↗	-6% ↘

~~Scope~~ changed between 2014 and 2020/2021: waste from third parties (service providers and subcontractors) ~~is~~ now included.

Accuracy of data on end-of-life waste has improved.

Processing of food fats and oils improved between 2014 (incineration - worst case scenario) and 2020/2021 (recycling/biological treatment).

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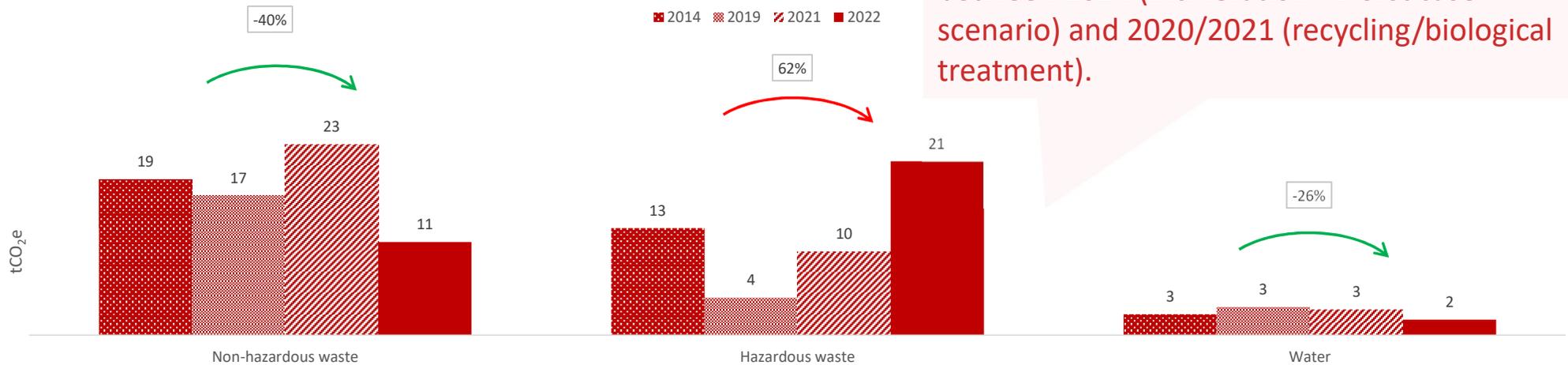
Transport of goods <1 %

Data and assumptions

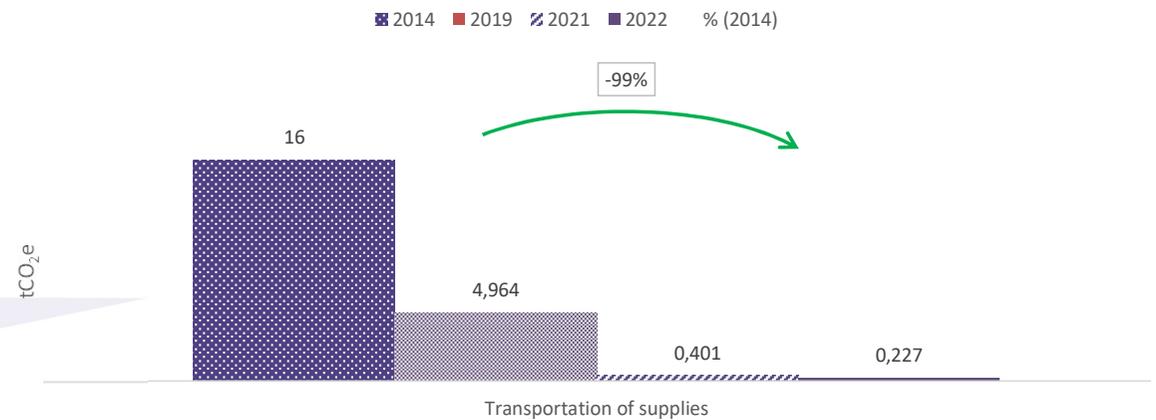**Transport by suppliers:** Real data was available for 2022.

Average distance per delivery in 2022: 24 km

Results

Emission source	tkm	tCO$_2$e
Total transport of goods	1 399	**0.227**

93 % decrease in total tonnes per kilometre in 2022 compared to 2014

🗖 2014 🟥 2019 🗖 2021 🟦 2022   % (2014)

-99%

16

4,964

0,401

0,227

tCO$_2$e

Transportation of supplies

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This report was created for the European Court of Auditors (ECA) by 21 Solutions & COMASE, using ECA data.

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