21 SOLUTIONS

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Report on the ECA's 2024 carbon footprint

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

BC BILAN CARBONE®

ECA 2024 carbon footprint report

ECA 2024 carbon footprint report

1 Executive summary

2024

~ 975 full-time equivalent

Three buildings

BC BILAN CARBONE®

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9 108 tCO_2e

Total 2024 GHG emissions

9.34 tCO_2e/FTE
(total uncertainties 11 %)

31 %

"Goods and services purchased" was the largest source of emissions

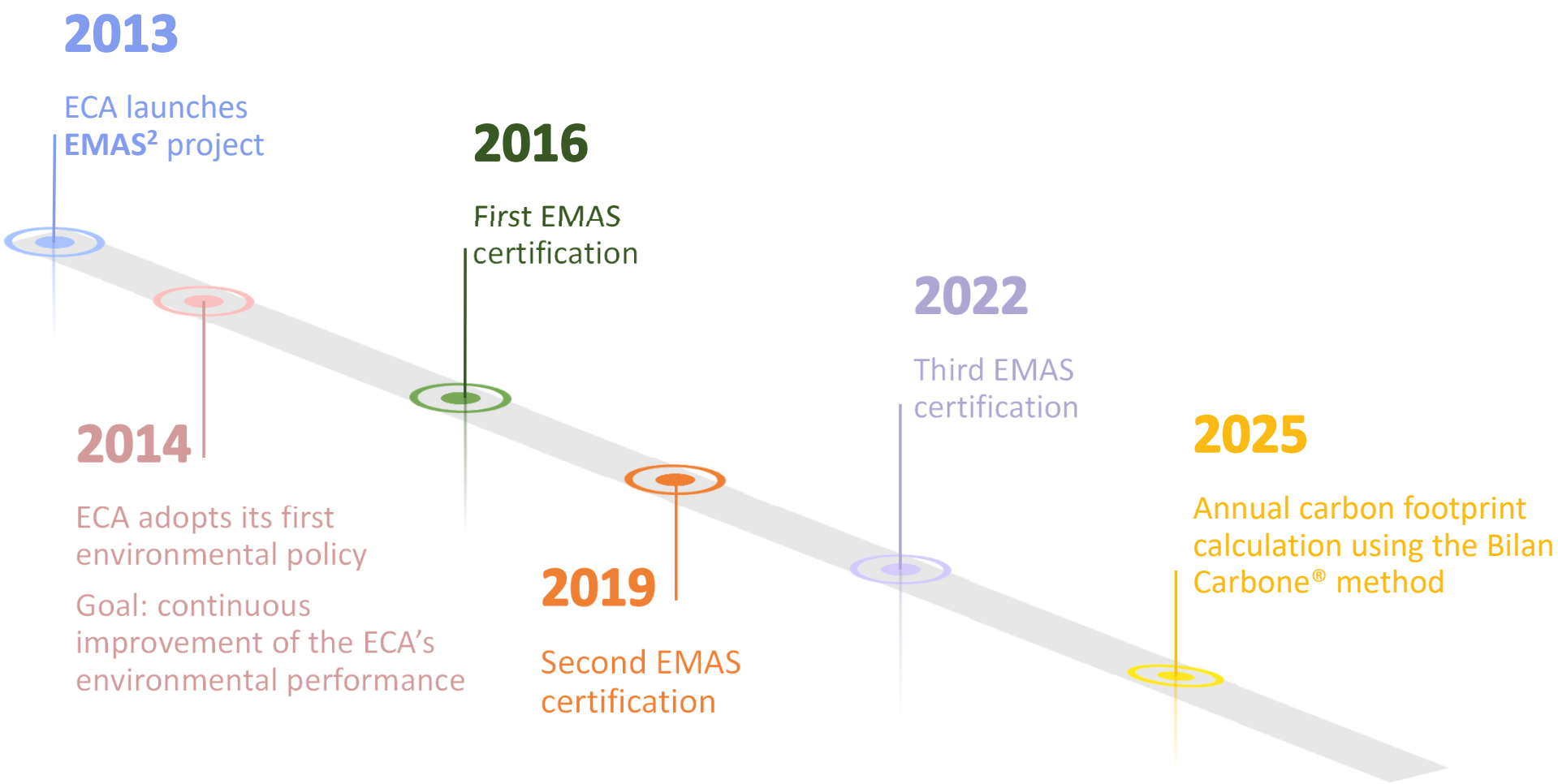
-15 %

Overall decrease in emissions since 2014

[1] Full-time equivalent

ECA 2024 carbon footprint report

2 Context of the study



2 Eco-Management and Audit Scheme

2 Context of the study

Bilan Carbone® methodology (version 9.0) changes for the 2024 carbon footprint

The Bilan Carbone® assessment included comparisons with 2014, 2019 and 2023.

The main changes in the methodology for the ECA 2024 carbon footprint assessment were as follows:

- In 2024, the assessment was carried out using the latest version of the Bilan Carbone® method, version 9.0. This version has been in use since 1 January 2025. The new version includes significant methodological improvements, which enhance the reliability of the results:
  - better accuracy on several emission factors;
  - better assessment of uncertainties..
- The “standard” “maturity level was chosen
- Emission factors (EF) were updated to those of version 9.0.
- When activity data was not available, we used monetary ratios, i.e. the amounts spent on the corresponding items. As monetary emission factors were not yet available in version 9.0, we applied those used in 2023.

2 Context of the study

Main changes in the 2024 carbon footprint assessment

The objective of the study was to provide a **high-quality estimate of the greenhouse gas emissions** produced by the ECA, **using the Bilan Carbone® method (version 9.0).**

The ECA conducted a survey on mobility in order to update its data on commuting.

The **teleworking rates** were calculated using information declared by staff.

The main changes in the 2024 carbon footprint assessment were as follows:

- New visitor travel assumption: not all visitors come to Luxembourg just to visit the ECA, so only 50 % of their impact was considered.
- EF for electricity consumption is now based on the one published in the official journal of the Grand Duchy of Luxembourg by the *Institut luxembourgeois de régulation* (ILR). EF : 187.14 CO_2e/kWh. 2024 incoherence correction.
- Energy heating mix evolves from one year to another. 2024 heating mix = 87.5 % biomass + 12.5 % gas
- Increased investment in renovation and maintenance works.
- All IT emissions were reported under the “digital” category, including purchase of IT supplies and services.

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3 Overview of the Bilan Carbone® method

The Bilan Carbone® method was developed in 2004 by the French Agency for Ecological Transition (ADEME) to quantify organisations' GHG emissions.

It is promoted by the *Association pour la transition Bas 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});
- ✓ chlorofluorocarbons (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 the Bilan Carbone® method

1 – Collect activity data

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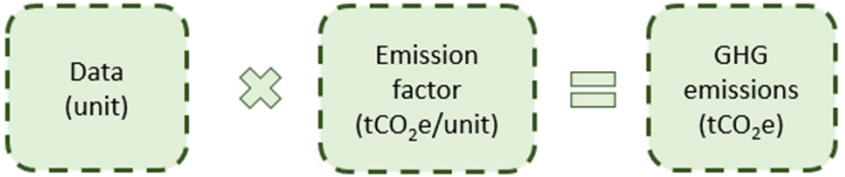
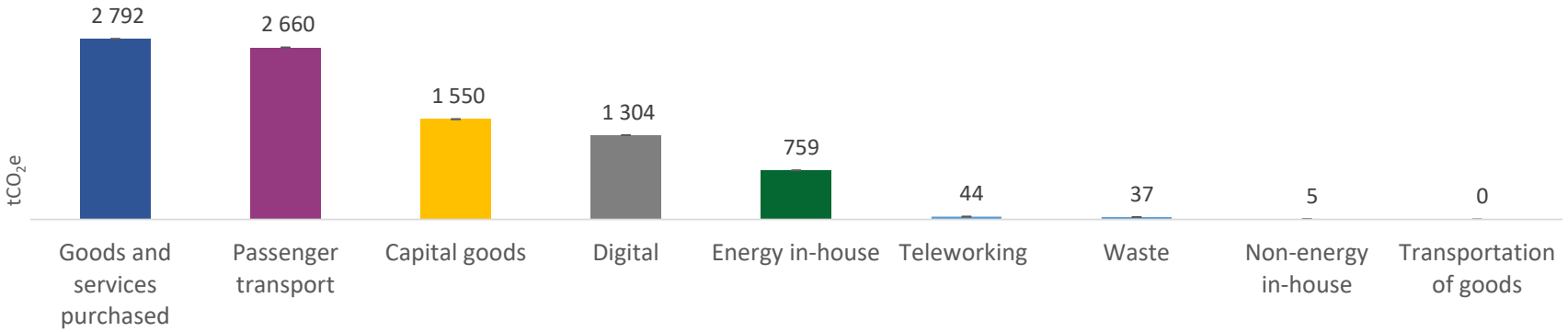
2- Use the emission factors from the Bilan Carbone® database



3 – Visualise and analyse the results



3 Overview of the Bilan Carbone® method

Operational scope of the Bilan Carbone® method in 2024

The ECA's carbon footprint includes direct and indirect GHG emissions (scopes 1, 2 and 3)

3 Overview of the Bilan Carbone® method

Temporal and organisational scope

Bilan Carbone® approach: operational control approach

Temporal scope: ECA activities in 2024

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

Building	Area (m²)	FTE
K1	23 568	288.7
K2	19 359	214.3
K3	30 780	471.9

Updated 2024 data

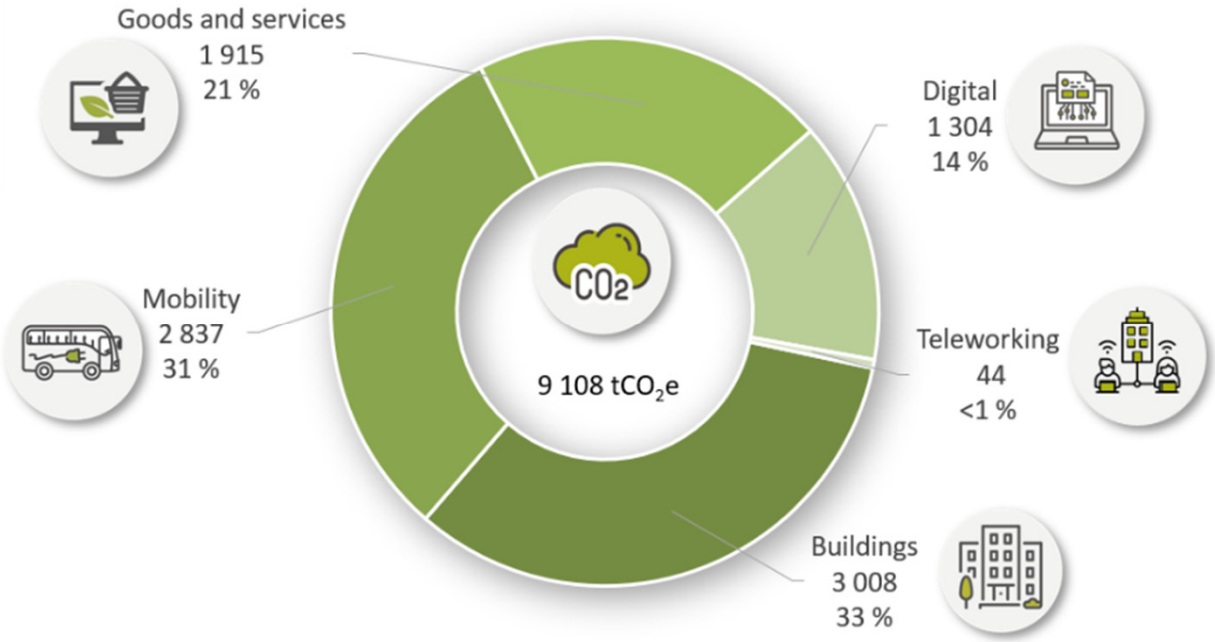
Buildings include office space, basements, underground car parks, two cafeterias, a canteen, archives, a library, walkways between buildings, and other amenities

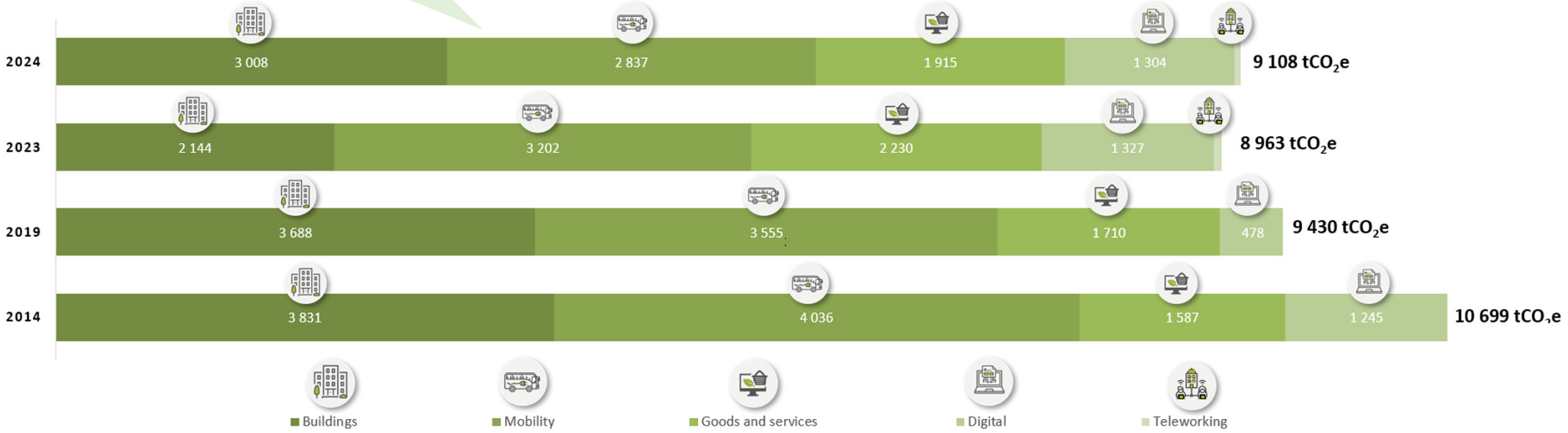
Activities of ECA officials and other staff: **~975** full-time equivalent (FTE) employees as at end of 2024

ECA 2024 carbon footprint report

4 Overall results

78 % of the decrease is a direct consequence of our action plan, while the other 22 % is related to a change in the methodology used to calculate visitor-related emissions.





4 Overall results

Emissions by building

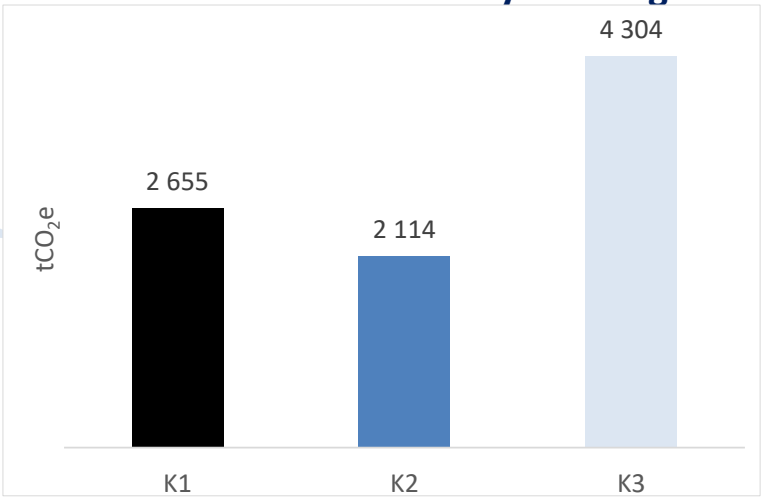
Emissions were divided between the buildings according to staff headcount

Building	FTE	Share (%)
K1	288.7	29 %
K2	214.3	22 %
K3	471.9	49 %
Total	**~ 975**	**100 %**

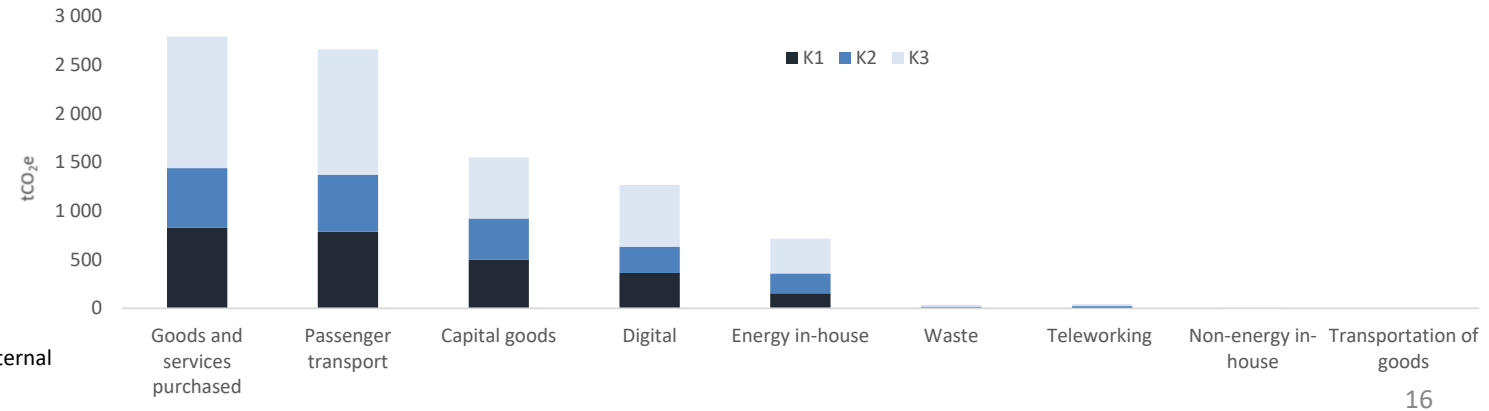
Building	tCO_2e
K1	2 655
K2	2 114
K3	4 304
TOTAL	**9 073**[3]

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

Total GHG emissions by building



Emissions categories by building

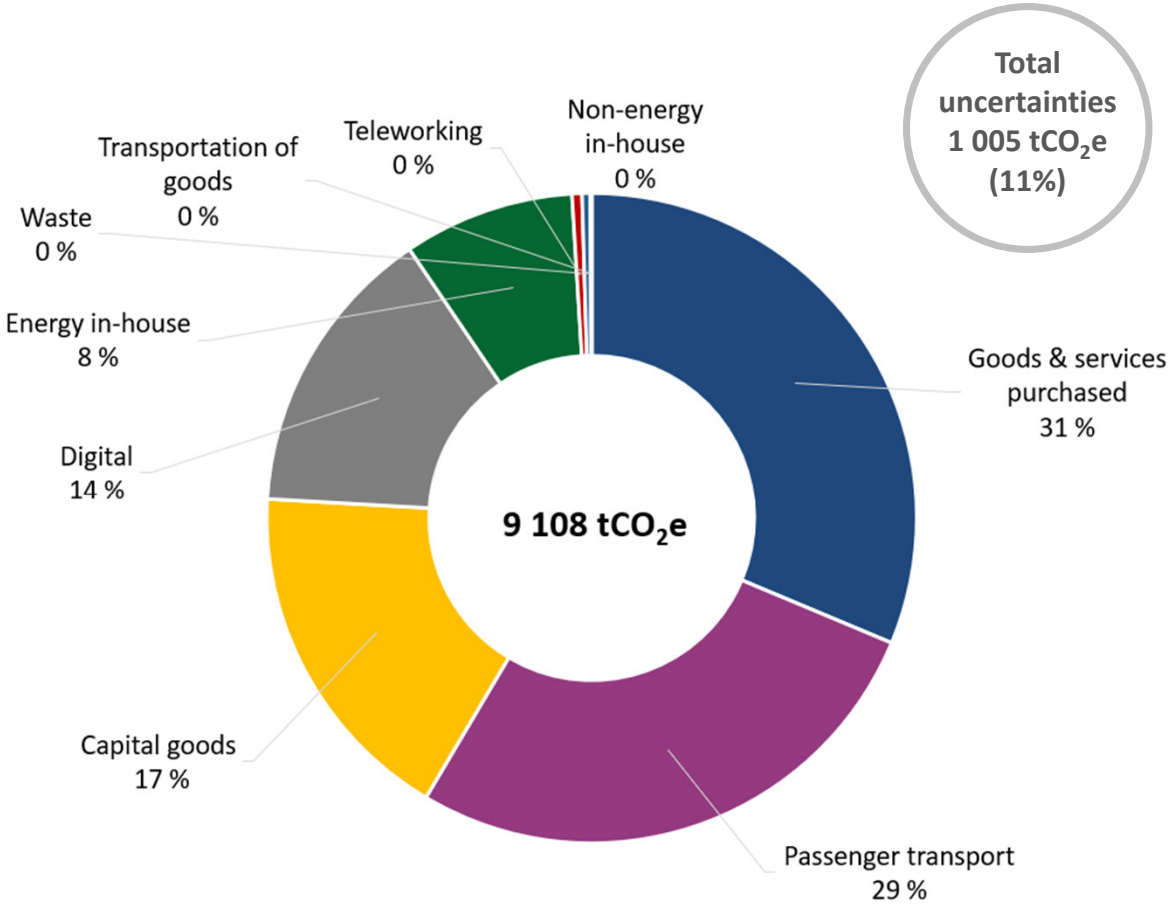


[3] Unassigned FTEs were distributed between the three buildings equally. External data centre in Betzdorf's emissions (36 tCO_2e) are not included in this slide.

4 Overall results

2024 Bilan Carbone® results

- ✓ **Total GHG emissions: 9 108 tCO_2e**
- ✓ Largest sources of emissions:
  - **Goods and services purchased (31 %)**
  - **Passenger transport (29 %)**
  - **Capital goods (17 %)**
  - **Digital (14 %)**
  - **Energy in-house (8 %)**
- ✓ Non-energy in-house, waste, teleworking and transport of goods made up the remaining 1 %

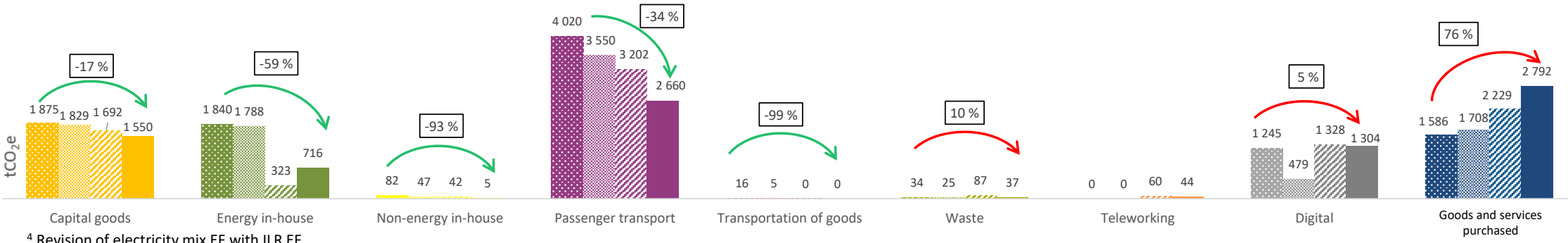


3 Overall results

Comparison with previous years

Overall, emissions have increased by 1.62 % between 2023 and 2024, and have fallen by 15 % since 2014

Emission sources tCO_2e	2014	2019	2023	2024	Change 2014-2024	Change 2019-2024	Change 2023-2024
Capital goods	1 875	1 829	1 692	1 550	-17 % ↘	-15 % ↘	-8 % ↘
Energy in-house	1 840	1 788	323	716[4]	-59 % ↘	-58 % ↘	135 % ↗
Non-energy in-house	82	47	42	5	-93 % ↘	-89 % ↘	-87 % ↘
Passenger transport	4 020	3 550	3 202	2 660[5]	-34 % ↘	-25 % ↘	-17 % ↘
Transportation of goods	16	5	0	0	-99 % ↘	-98 % ↘	-49 % ↘
Waste	34	25	87	37	10 % ↗	51 % ↗	-57 % ↘
Teleworking	0	0	60	44			-27 % ↘
Digital	1 245	479	1 328	1 304	5 % ↗	172 % ↗	-2 % ↘
Goods and services purchased	1 586	1 708	2 229	2 792	76 % ↗	63 % ↗	25 % ↗
TOTAL	**10 699**	**9 430**	**8 964**	**9 108**	**-15 %** ↘	**-3 %** ↘	**+1.6 %** ↗



[4] Revision of electricity mix EF with ILR EF.

[5] No revision of the 2023 data for visitor travel in the 2024 calculation.

ECA 2024 carbon footprint report

5 Results by scope

Goods and services purchased

Goods and services purchased (31 %)

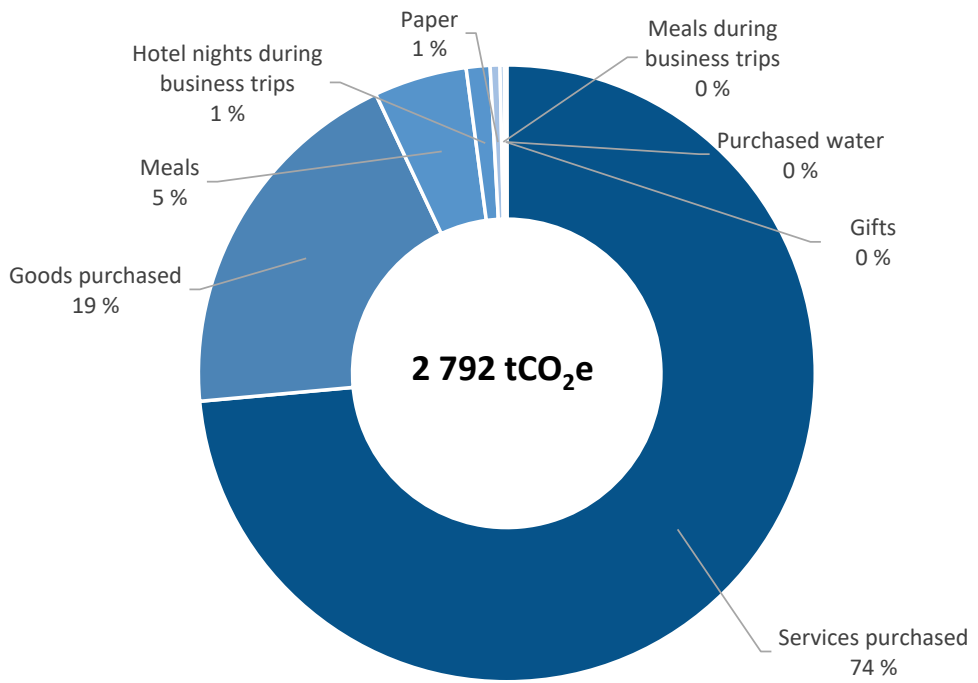
Data and assumptions

- ✓ **Services:** (click here to go to the slide)
- ✓ **Goods:** (click here to go to the slide)
- ✓ **Water purchased:** total water consumed in 2024
- ✓ **Gifts:** number and type of gifts converted to weight by type of material

Results

Type of goods or services	tCO_2e
Services purchased	2 053
Goods purchased	543
Meals	136
Hotel nights during business trips	35
Paper	14
Meals during business trips	6.5
Gifts	2.5
Purchased water	0.9
TOTAL	2 792

Total GHG emissions from goods and services purchased



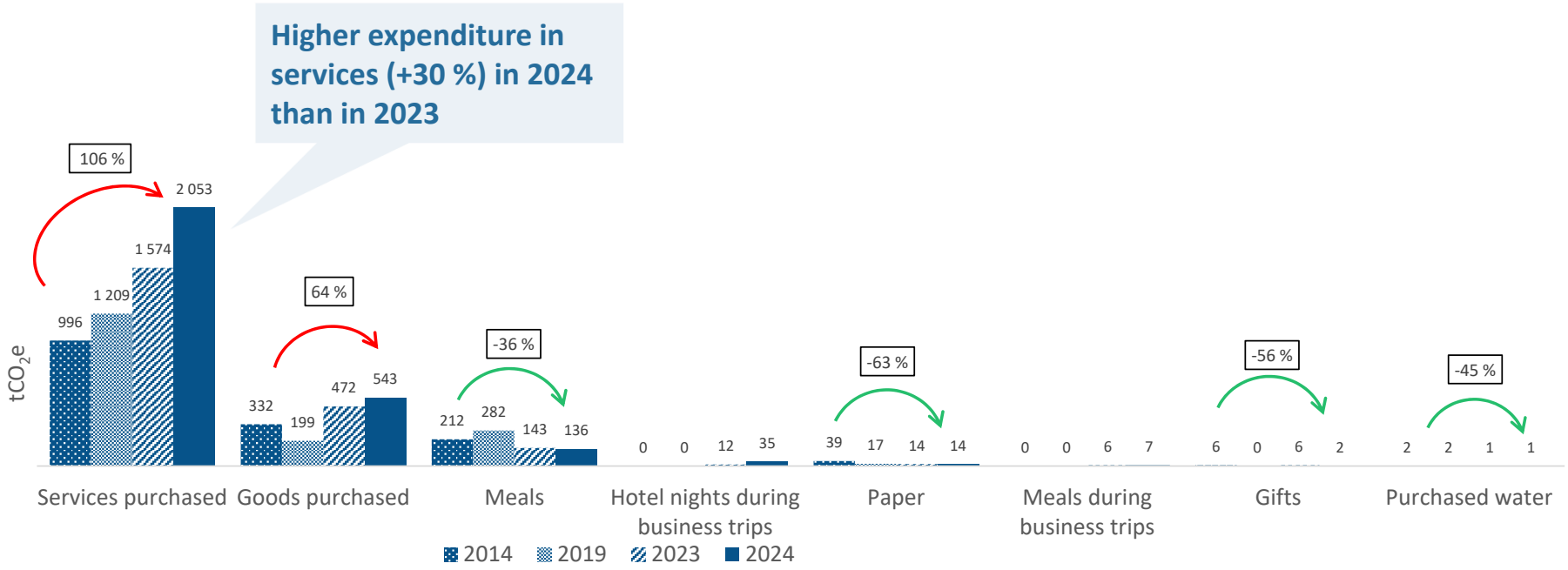
5 Results by scope

Goods and services purchased

Comparison with previous years

GHG emissions (tCO_2e)	2014	2019	2023	2024	Change 2014-2024	Change 2019-2024	Change 2023-2024
Total goods and services purchased	**1 586**	**1 708**	**2 229**	**2 792**	**+76 %** ↗	**+63 %** ↗	**+25 %** ↗

A few categories have been transferred from "Services purchased" to "Digital" since 2020.



Services

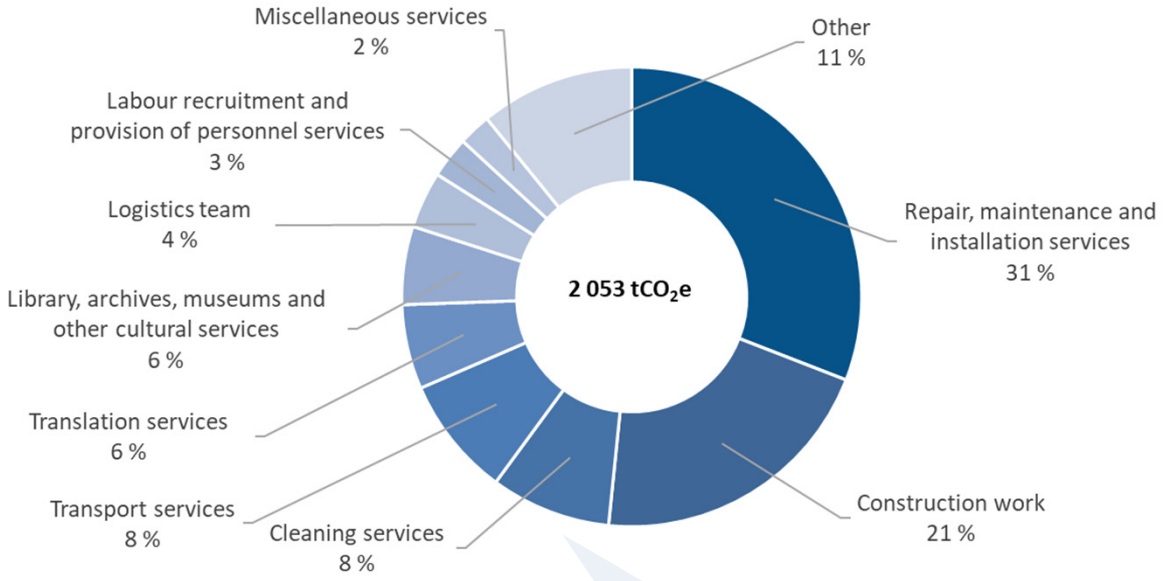
Data and assumptions

Data provided: services purchased by category and amount in €

Results

Type of service	tCO_2e
Repair, maintenance and installation services	621
Construction work	417
Cleaning services	170
Transport services	170
Translation services	120
Library, archives, museums and other cultural services	111
Logistics team	80
Labour recruitment and provision of personnel services	59
Miscellaneous services	46
Travel agencies	43
Other	218
TOTAL	**2 053**

GHG emissions from services purchased



Miscellaneous services were assigned an average services emission factor extrapolated from the Bilan Carbone® database.
These services included equipment rentals for training (e.g. language classes), document destruction, etc.
The "Other" category includes: real estate services; testing, inspection, analysis, monitoring and control services; news-agency services; insurance and pension services; health and social work services; and legal, accounting, auditing, business and management services.

When quantities remain unchanged and monetary factors are used, inflation explains the rise in emissions

5 Results by scope

Goods and services purchased

Goods

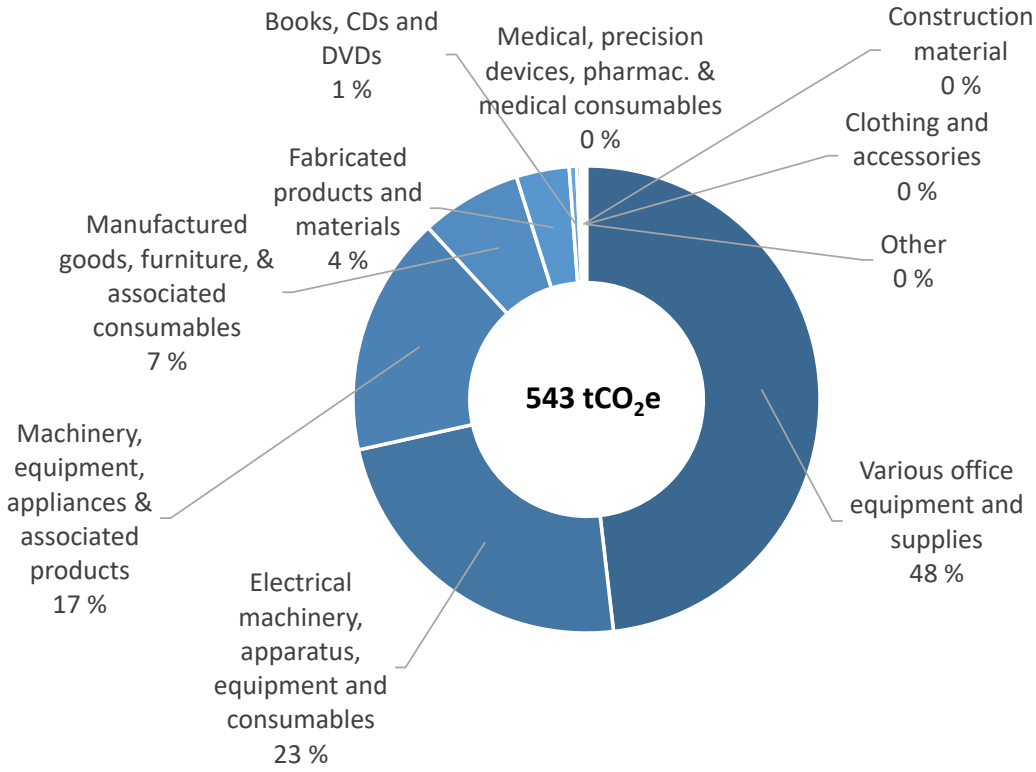
Data and assumptions

Data provided: goods purchased, by category and amount in euros

Results

Type of goods	tCO_2e
Various office equipment and supplies	262
Electrical machinery, apparatus, equipment and consumables	127
Machinery, equipment, appliances and associated products	90
Manufactured goods, furniture and associated consumables	38
Fabricated products and materials	20
Books, CDs and DVDs	3
Medical, precision devices, pharmaceutical and medical consumables	2
Construction material	1
Clothing and accessories	1
Other	0
TOTAL	**543**

GHG emissions from goods purchased



Various office equipment and supplies are mainly linked to costs such as new audiovisual material and an investment for the modernisation of the conference room.

Passenger transport (29 %)

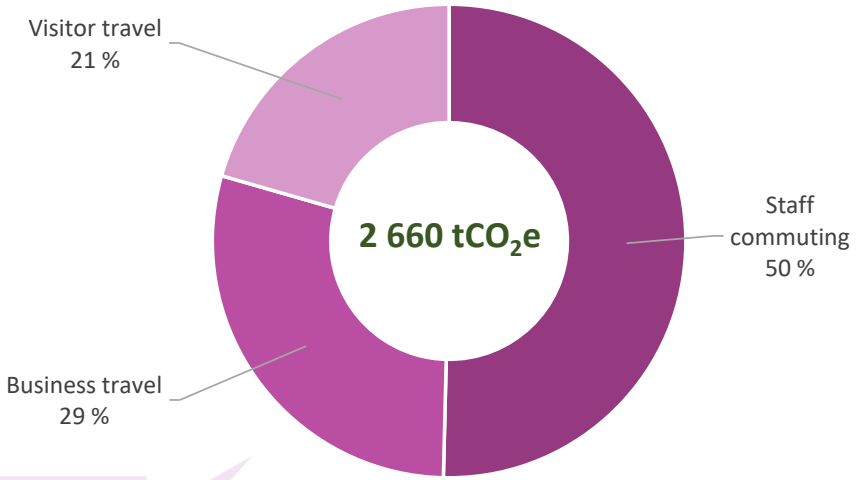
Data and assumptions

- ✓ Staff commuting (2025 mobility survey on 2024 habits) and use of official cars for non-business travel Business travel (including “use of official cars”)
- ✓ Visitor travel: 50 % considered (reviewed assumption for 2024, as visitors may not only be coming to the ECA)

Results

Type of transportation	tCO_2e
Staff commuting	1 340
Business travel	773
Visitor travel[6]	547
TOTAL	**2 660**

Emissions from passenger transport by travel category



With the new assumption for visitor travel, passenger transport is now the second source of emissions and not the first

[6] Revision of the 2024 assumption: count only 50 % of emissions as not all visitors are coming to Luxembourg just to visit the ECA.

5 Results by scope

Passenger transport

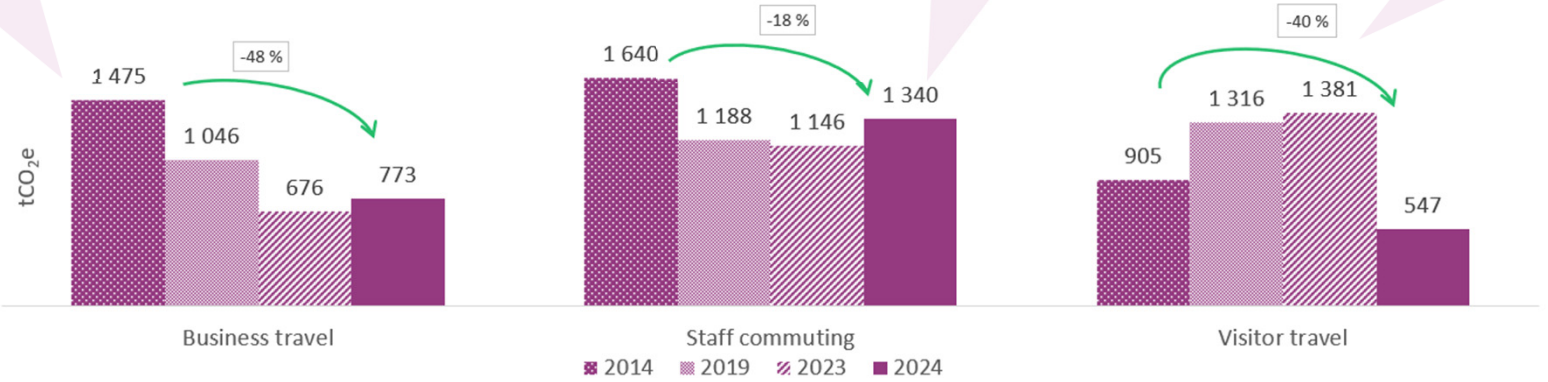
Comparison with previous years (with new visitor travel assumption only applied to 2024 GHG emissions)

GHG emissions (tCO_2e)	2014	2019	2023	2024	Change 2014-2024	Change 2019-2024	Change 2023-2024
TOTAL	**4 020**	**3 550**	**3 202**	**2 660**[9]	**-34 %↘**	**-25 %↘**	**-17 %↘**

Despite an overall decrease by 48 % since 2014, business travel emissions rose in 2024, as the distance travelled for missions has increased.

Since 2014, emissions have fallen by 18 %, but they have risen again in 2024, as the number of kilometres travelled has risen by 27 %.

40 % reduction in GHG emissions from visitor travel GHG emissions in 2024 compared to 2014, mainly due to the new assumption.



[9] The revised assumption has only been applied in 2024: count only 50 % of emissions (as, according to a study, not all visitors are coming to Luxembourg just to visit the ECA).

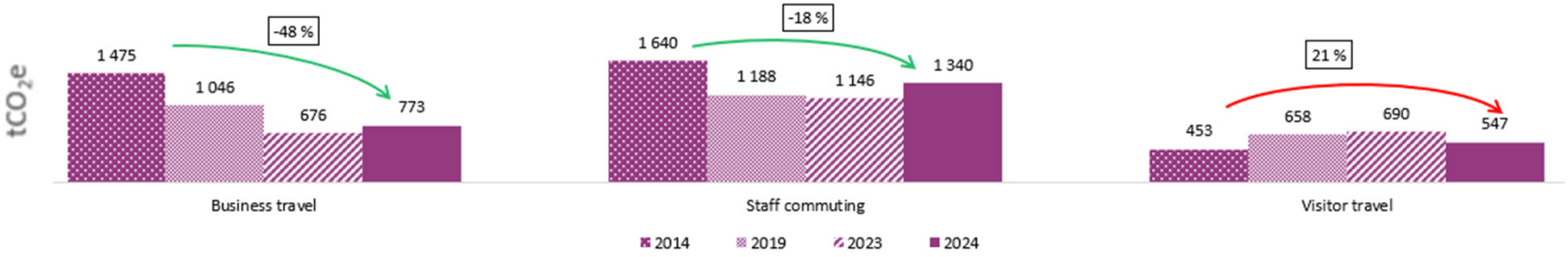
5 Results by scope

Passenger transport

Comparison with previous years (with 50 % visitor travel applied to all previous years)

GHG emissions (tCO_2e)	2014	2019	2023	2024	Change 2014-2024	Change 2019-2024	Change 2023-2024
TOTAL	**3 568[8]**	**2 892[8]**	**2 512[8]**	**2 660[8]**	**-25 %** ↘	**-8 %** ↘	**+6 %** ↗

This table and bar chart are not an official modification of data. Their purpose is simply to understand the evolution of visitor travel GHG emissions based on the same assumption as the one for 2024.
If the calculations had been made based on the same assumption as in previous years, there would be a 21 % increase in emissions related to visitor travel between 2014 and 2024, rather than a 40 % decrease.



[8] Revision of all previous years based on new 2024 assumption: count only 50 % of visitor travel emissions (as, according to a study, not all visitors are coming to Luxembourg just to visit the ECA).

5 Results by scope

Passenger transport

Staff commuting

Data provided

✓ 2025 mobility survey

Assumption

✓ Excluding teleworking days

Extrapolated results

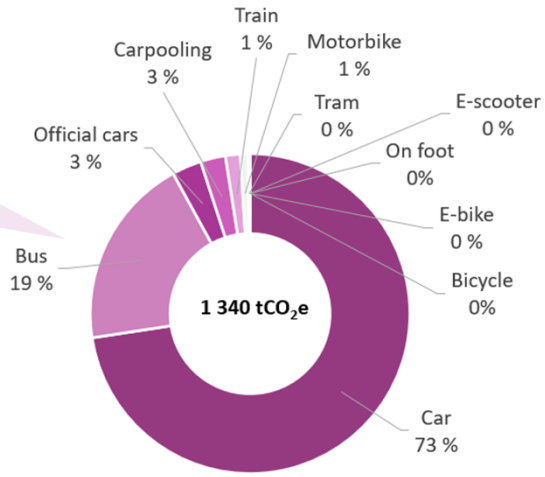
Staff commuting	tCO_2e	km
Car	972	4 824 636
Official cars[7]	41	199 594
Carpooling	34	146 422
Bus	260	1 284 949
Train	20	507 192
Motorbike	10	52 138
Tram	3	548 289
E-bike	0	24 530
E-scooter	0	0
Bicycle	0	203 042
On foot	0	183 772
TOTAL	**1 340**	**7 974 564**

Cars: 78 % of GHG emissions (77 % in 2023); 65 % of distance (km) travelled (69 % in 2023)

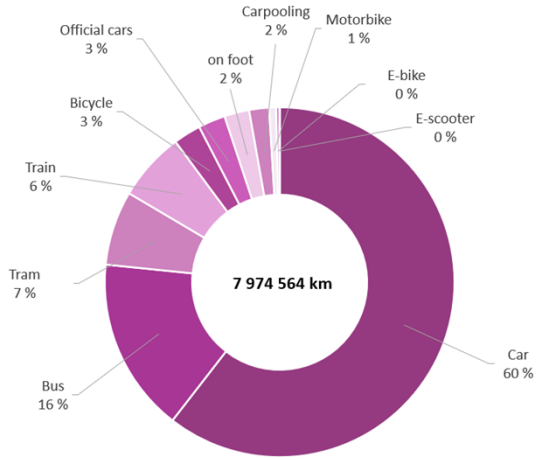
12 % of the distance travelled by car was with a fully electric car (555 748 km)

An increase in public transport but also a significant increase in kilometres travelled

GHG emissions from commuting



Distance (km) travelled for commuting



[7] Carbon footprint calculation for official cars in litres or kWh. Number of litres and kWh consumption transposed to km with average consumption for compa

5 Results by scope

Passenger transport

Business travel

Data provided

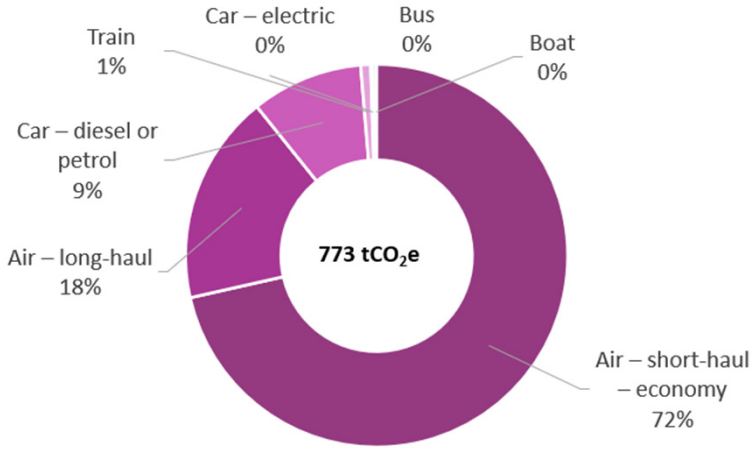
Total kilometres by mode of transport
Car: private, official and rented cars
100 % electric cars are now included in the GHG emissions from business travel

Results

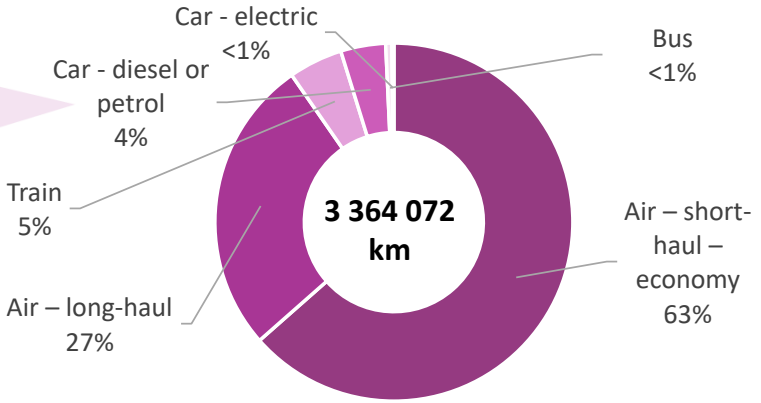
Business travel	tCO_2e	km
Air – short-haul – economy	552	2 136 491
Air – long-haul	137	902 157
Car – diesel or petrol	73	136 723
Train	7	164 138
Car – electric	1	5 990
Bus	3	18 573
Boat	0	0
TOTAL	**773**	**3 364 072**

Air travel remains the main source of emissions, partly because Luxembourg is poorly served by rail

GHG emissions from business travel



Kilometres travelled for business travel



5 Results by scope

Passenger transport

Visitor travel

Revision of the 2024 assumption: : count only 50 % of emissions (as, according to a study, not all visitors are coming to Luxembourg just to visit the ECA)

Data provided

Number of visitors in 2024:

- ✓ 175 visits (+18 %)
- ✓ 2 965 visitors (-4 %)

Assumptions regarding mode of transport

- ✓ Short-haul flight: EU (1 425 km)
- ✓ Car: BE-LU
- ✓ Bus: DE
- ✓ Train: FR

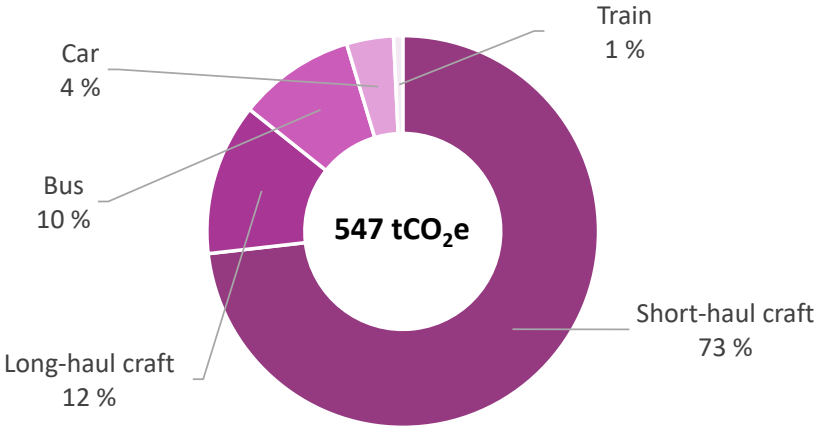
Results

Visitor travel	tCO_2e	km
Short-haul craft	400	1 547 961
Long-haul craft	68	450 460
Bus	53	360 508
Car	21	91 511
Train	4	103 834
TOTAL	**547**	**2 554 274**

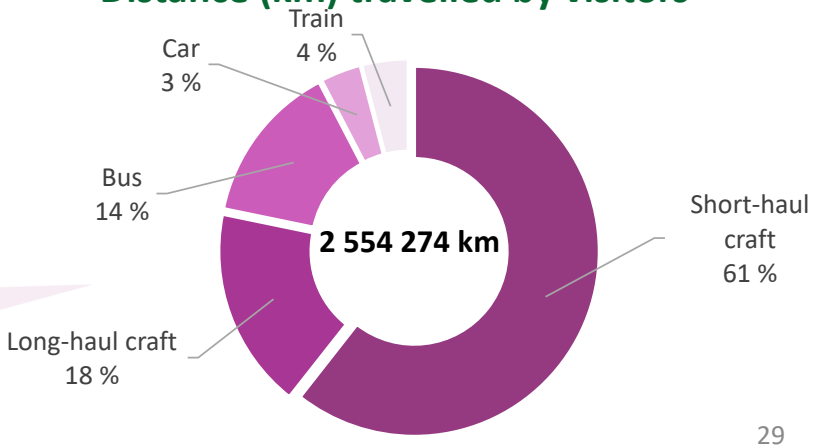
-32 % tCO2e average per visit (3.12 tCO_2e/visit)
-16 % tCO_2e average per visitor (0.18 tCO_2e/visitor)

Flights: 85 % of GHG emissions but only 79 % of distance travelled

GHG emissions from visitor transport



Distance (km) travelled by visitors



Capital goods (17%)

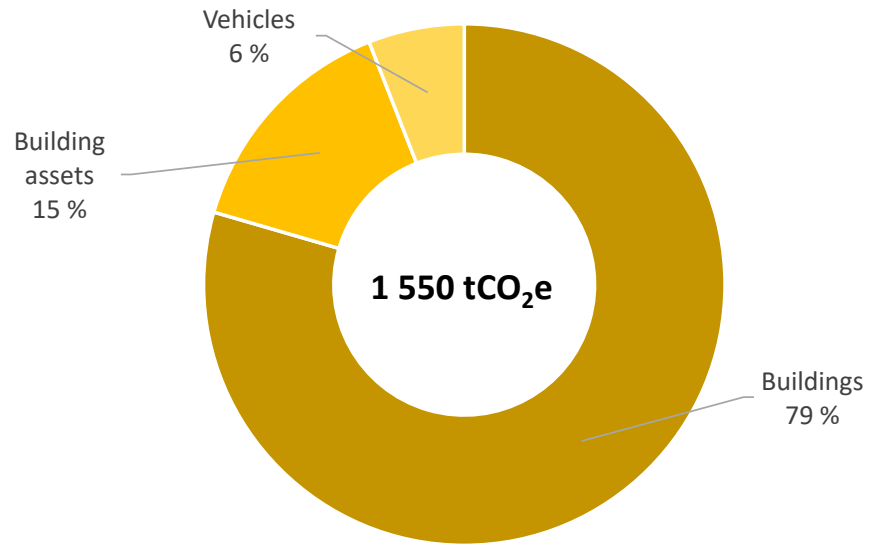
Data and assumptions

- ✓ **Buildings and car parks**: new parking and office space to take into account, as works have been completed (+ 5 085 m^2)
  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

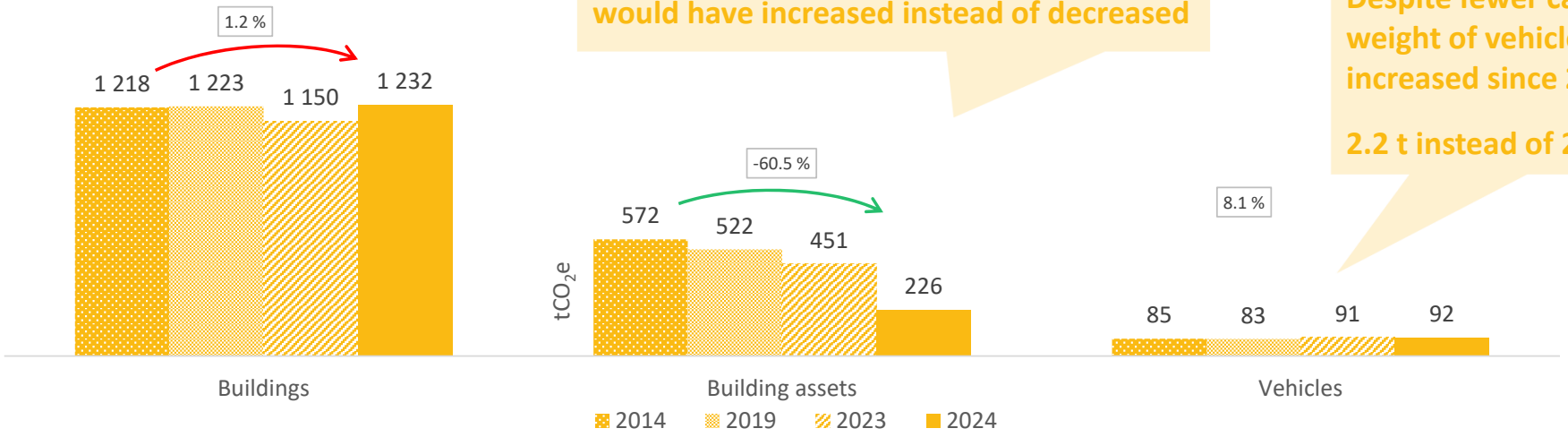
Type of capital goods	tCO_2e
Buildings	1 232
Building assets	226
Vehicles	92
Total	**1 550**

Total GHG emissions from capital goods



Comparison with previous years

GHG emissions (tCO_2e)	2014	2019	2023	2024	Change 2014-2024	Change 2019-2024	Change 2023-2024
Total capital goods	**1 875**	**1 829**	**1 692**	**1 550**	**-17 %** ↘	**-15.2 %** ↘	**-8.4 %** ↘



5 Results by scope

Digital

Digital (14 %)

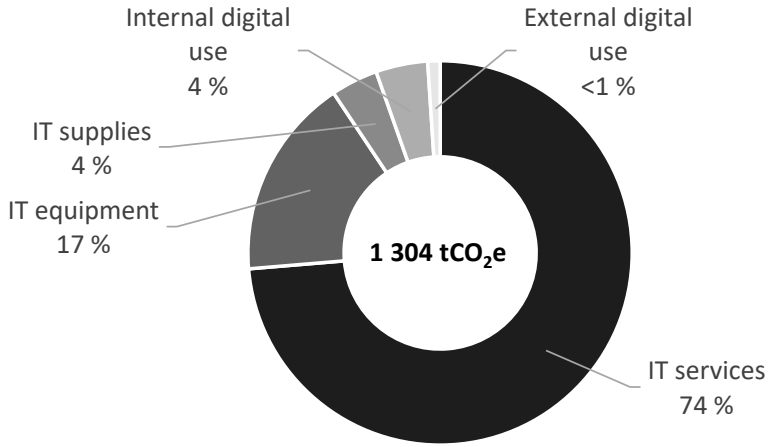
Data and assumptions

- ✓ **Internal digital use**
  Energy emissions related to K3 and Betzdorf data centres
- ✓ **External digital use**
  Emissions related to visits to the ECA website (including viewing of reports and online videos), Facebook, LinkedIn, X, Instagram, and Teams
  Email communication based on 2024 data
- ✓ **IT equipment**
  IT inventory by goods type

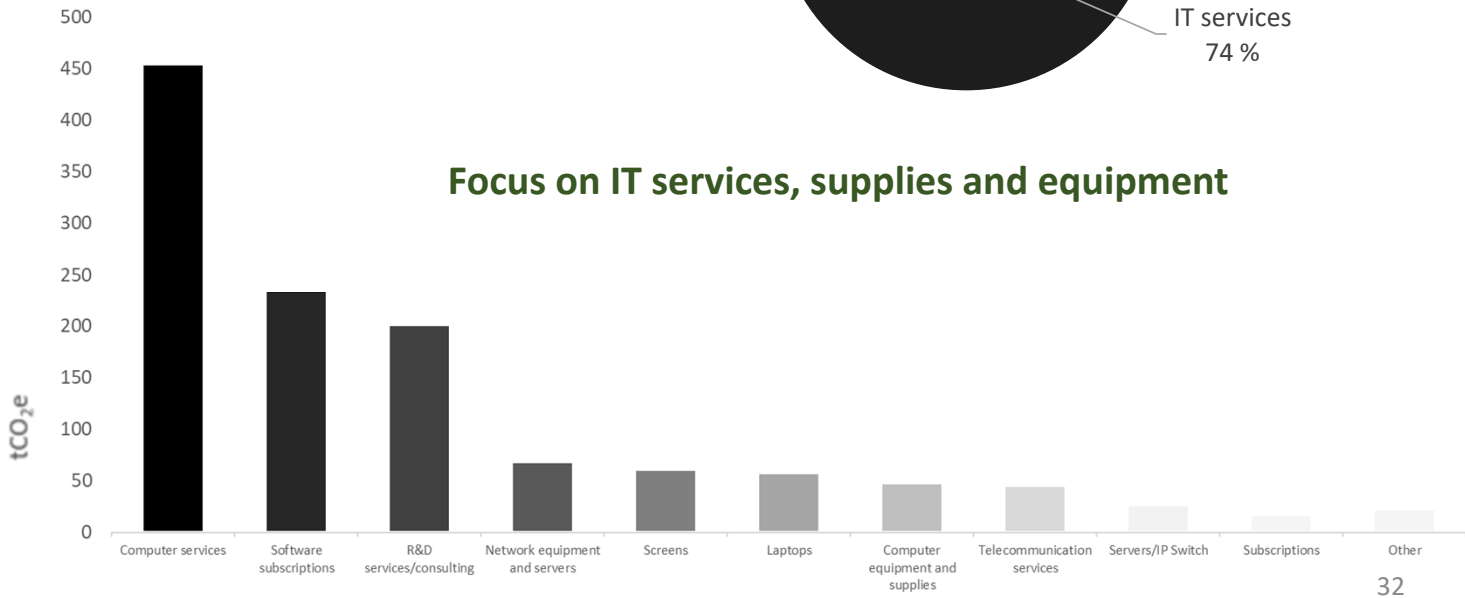
Results

Type of emissions	tCO_2e	
IT services	961	
IT equipment	221	**1 234**
IT supplies	52	
Internal digital use	57	
External digital use	13	
TOTAL	**1 304**	

Total GHG digital emissions



Focus on IT services, supplies and equipment

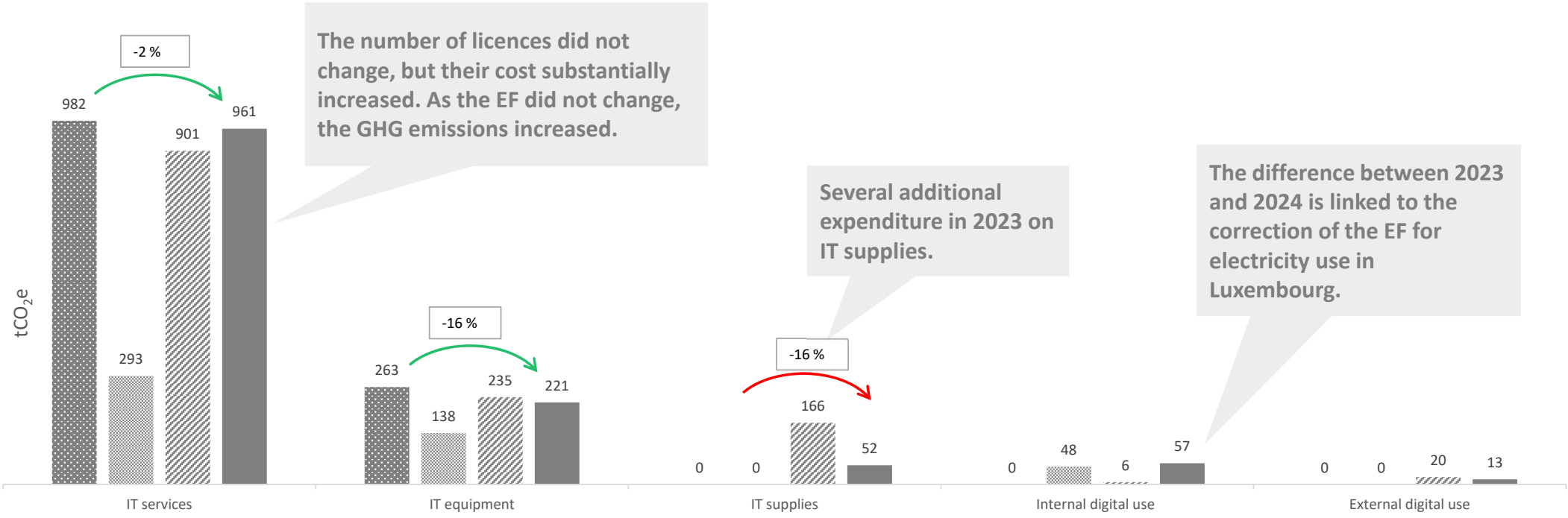


5 Results by scope

Digital

Comparison with previous years

GHG emissions (tCO_2e)	2014	2019	2023	2024	Change 2014-2024	Change 2019-2024	Change 2023-2024
Total digital	**1 245**	**479**	**1 328**	**1 304**	**+5 %** ↗	**+172 %** ↗	**-2 %** ↘



Energy in-house (8 %)

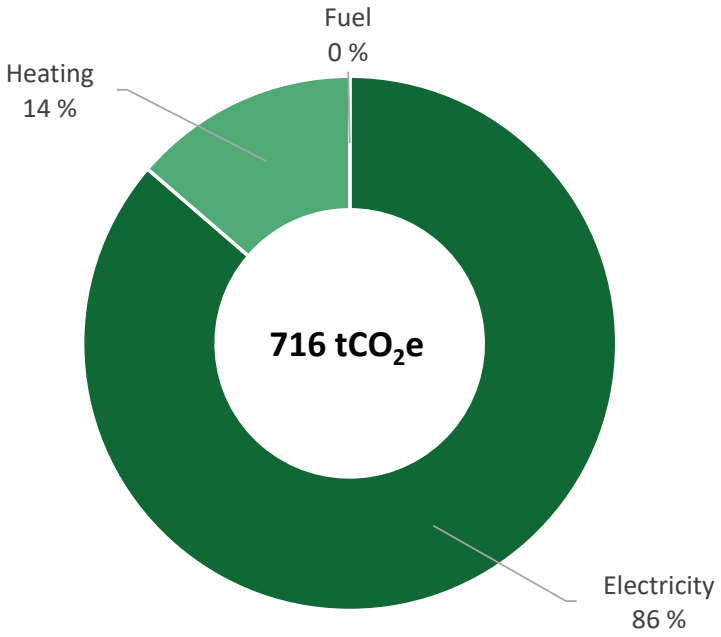
Data and assumptions

- ✓ **Electricity consumption:**
  The ECA purchases guaranteed green electricity, but the Bilan Carbone® method calculates actual electricity consumption from the latest national grid emission factor (location-based).
  The 2023 EF was reviewed and replaced in 2024 with the EF published in the official journal of the Grand Duchy of Luxembourg*
- ✓ **Heat consumption:** 2024 consumption for each building. Energy mix communicated by the heating plant manager

Results

Type of energy source	tCO_2e
Electricity	612
Heating	104
Fuel	0
TOTAL	**716**

Total GHG emissions from energy



Règlement ILR/E25/12 du 14 mai 2025 portant publication de la composition et de l'impact environnemental du mix national pour l'année 2024 - Secteur électricité

5 Results by scope

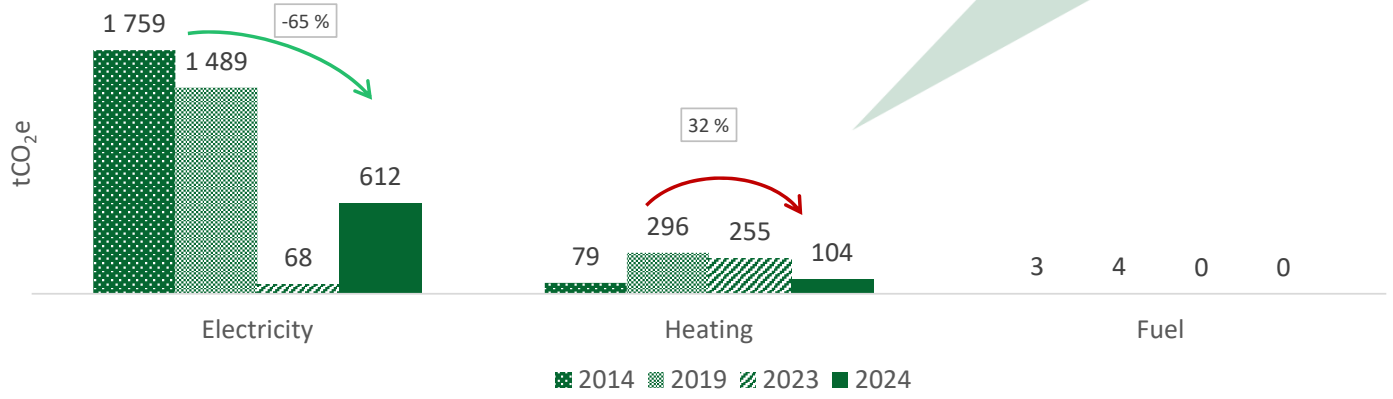
Energy in-house

Comparison with previous years

GHG emissions (tCO_2e)	2014	2019	2023	2024	Change 2014-2024	Change 2019-2024	Change 2022-2024
Total energy	**1 840**	**1 789**	**323**	**716**	**-61 %** ↘	**-60 %** ↘	**+ 122 %** ↗

This year, we decided to use the Emission factor published by the ILR – this is the main reason for the significant increase between 2023 and 2024

The greater proportion of biomass in the energy mix since 2019 has had a positive impact on emissions, particularly since 2023.



Teleworking (<1 %)

Data and assumptions

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

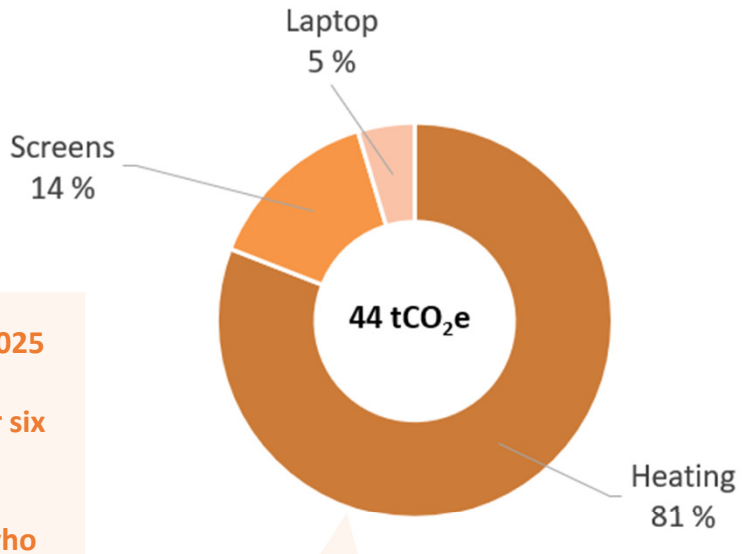
Results

Teleworking	2023 tCO_2e	2024 tCO_2e
Heating	59	36
Screens	0.3	6
Laptops	0.2	2
Total	**60**	**44**

New assumption based on 2025 survey answers

- ✓ **Heating consumption for six months was taken into account**
- ✓ **A ratio based on those who lower or leave the heating on has been considered**

Bilan® Carbone emissions from teleworking



2024: 66.45 teleworked days/FTE
2023: 64.60 teleworked days/FTE

5 Results by scope

Waste

Waste (<1 %)

Data and assumptions

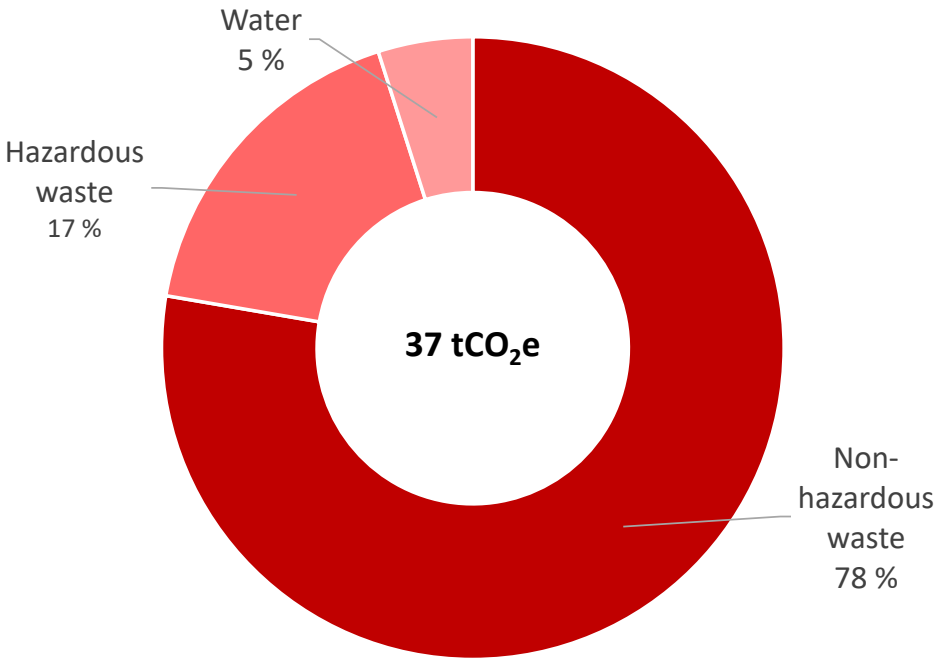
- ✓ **Waste**
  Non-hazardous: food and household waste, plastics, paper, cardboard and glass packaging → Recycling EFs for this type of waste are more accurate but only take into account collection and storage, not treatment (the latter is linked to the plant that will recycle the waste)

  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	2023 tCO_2e	2024 tCO_2e
Hazardous waste	28	6
Non-hazardous waste	57	29
Water	2	2
Total	**87**	**37**

Total GHG emissions from waste



5 Results by scope

Waste

Comparison with previous years

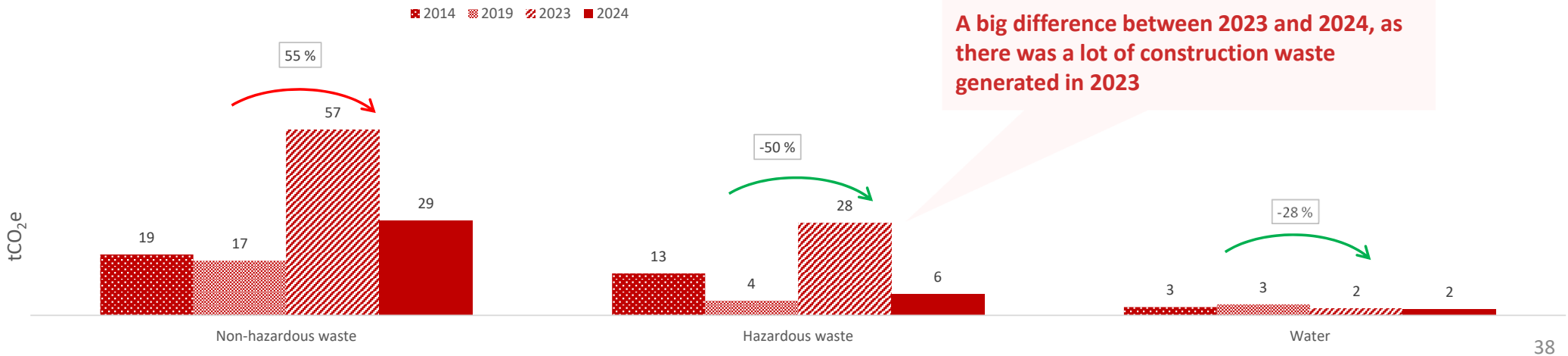
GHG emissions (tCO_2e)	2014	2019	2023	2024	Change 2014-2024	Change 2019-2024	Change 2023-2024
Total waste	34	25	87	37	+10 % ↗	+51 % ↗	-57 % ↘

Scope changed between 2014 and 2020/2021: since then, waste from third parties (service providers and subcontractors) has been included

Data was less accurate than in 2023

Treatment information has a big impact on the emission factor, especially in the Bilan Carbone® tool (version 9.0)

A big difference between 2023 and 2024, as there was a lot of construction waste generated in 2023



Non-energy in-house (<1 %)

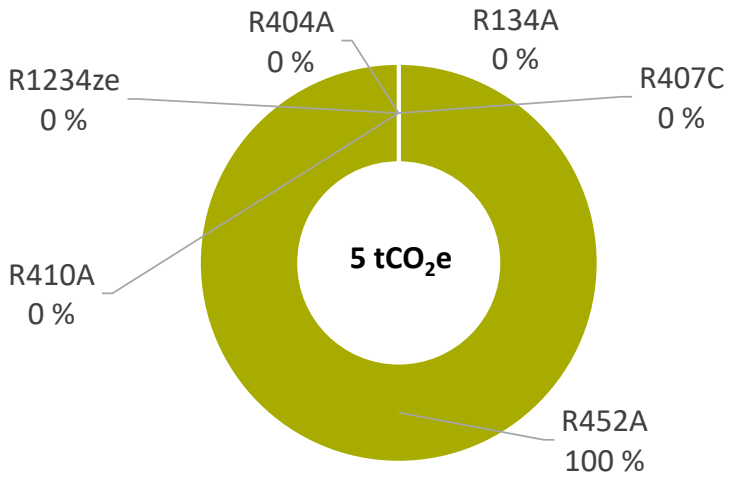
Data and assumptions

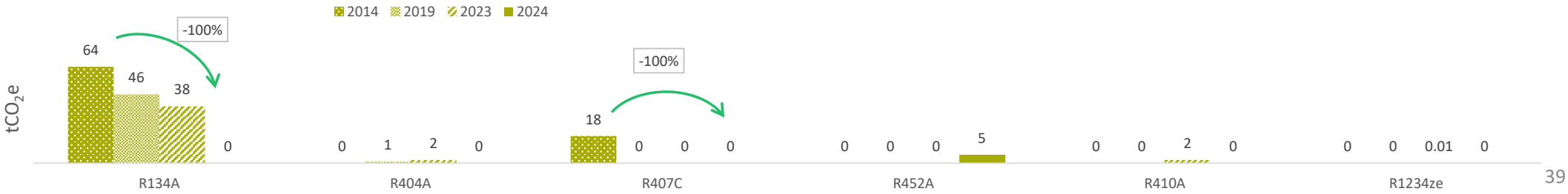
Refrigerant gases: cooling equipment was refilled with refrigerant gases in 2024 (R452A)
Refills were treated as leaks

Results and comparison with previous years

GHG emissions (tCO_2e)	2014	2019	2023	2024	Change 2014-2024	Change 2019-2024	Change 2023-2024
R134A	64	46	38	0	-100 % ↘	-100 % ↘	-100 % ↘
R404A	0	1	2	0	/	-100 % ↘	-100 % ↘
R407C	18	0	0	0	-100 % ↘	/	/
R452A	0	0	0	5	/	/	+100 % ↗
R410A	0	0	2	0	/	/	-100 % ↘
R1234ze	/	/	0.01	0	/	/	-100 % ↘
Total	**82**	**47**	**42**	**5**	-93 % ↘	-89 % ↘	-87 % ↘

Total non-energy GHG emissions





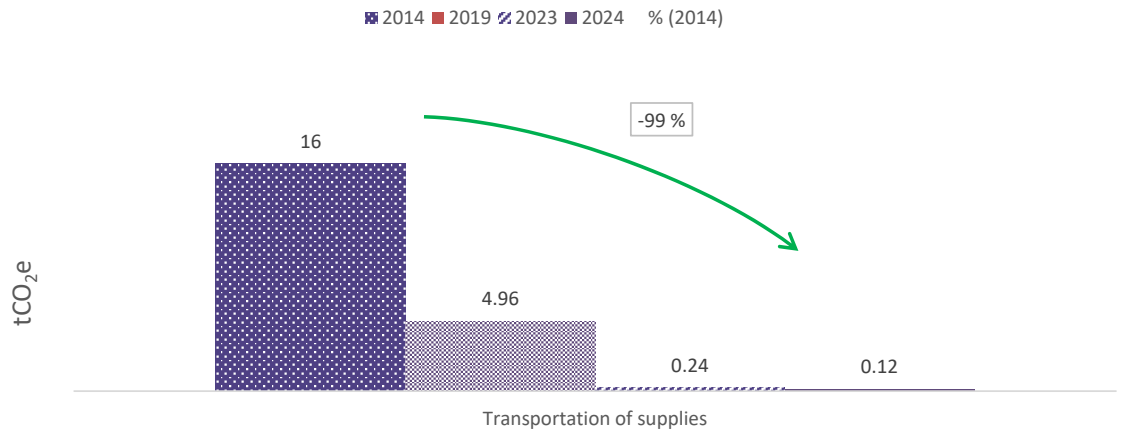
Transport of goods (<1 %)

Data and assumptions

Transport by suppliers: partial data available for 2024

Results

Emission source	km	tCO_2e
Total transport of goods	769	**0.123**



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

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