EUROPEAN COURT OF AUDITORS

Carbon Footprint Report

Calculation of the European Court of Auditors' carbon footprint using Bilan Carbone® methodology

Update on 2018 Results

BC BILAN CARBONE®

This report has been prepared by EcoAct on behalf of the
European Court of Auditors (ECA) using data provided by ECA.

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AGENDA

1. **Context of the study**
2. Overview of the Bilan Carbone® method
3. Overall results
4. Results per scope

1 Context of the study

In 2013, the ECA launched the **eco-management and audit scheme**, or **EMAS** project, and adopted its environmental policy with a view to continuously **improving its environmental performance** and introducing measures to prevent pollution and reduce carbon dioxide emissions.

In order to design measures to reduce its greenhouse gas (GHG) emissions, the ECA first examined its GHG emissions in **2014 using the Bilan Carbone® methodology.**

This initial carbon footprint helped the ECA identify its main emission sources and appropriate reduction measures.

The ECA is committed to monitoring and reporting these emissions each year to track its progress in reducing GHG emissions.

AGENDA

1 Context of the study

2 **Overview of the Bilan Carbone® method**

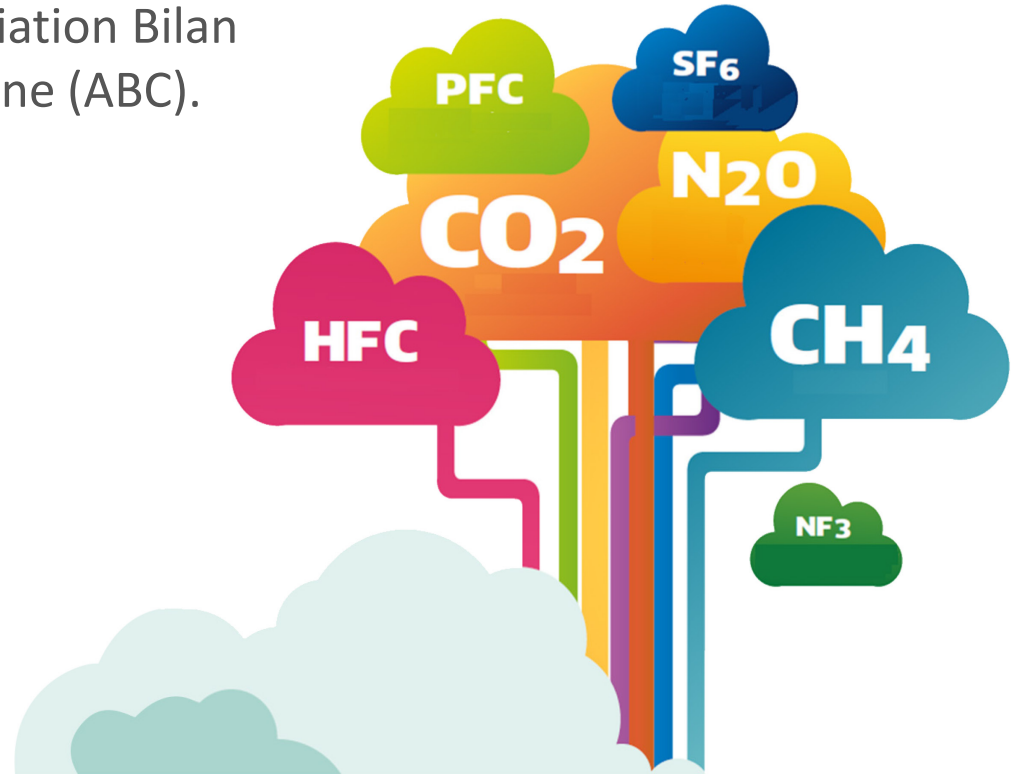
3 Overall results

4 Results per scope

2 Overview of the Bilan Carbone® method

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 (ABC).



The method considers the following gases:

- ✓ Kyoto Protocol gases: CO2, CH4, N2O, SF6 hydrofluorocarbons (CnHmFp), perfluorocarbons (CnF2n+2), NF3
- ✓ Other non-Kyoto Protocol gases (CFCs)
- ✓ Water vapour emitted by planes at the stratospheric level

Since directly measuring GHG emissions is not feasible, the Bilan Carbone® method estimates GHG emissions by multiplying data on an organisation's activity by an emission factor (EF).

Data (unit) × Emission factors (tCO_2e/unit) = GHG emissions (tCO_2e)

Bilan Carbone®: a decision-making tool

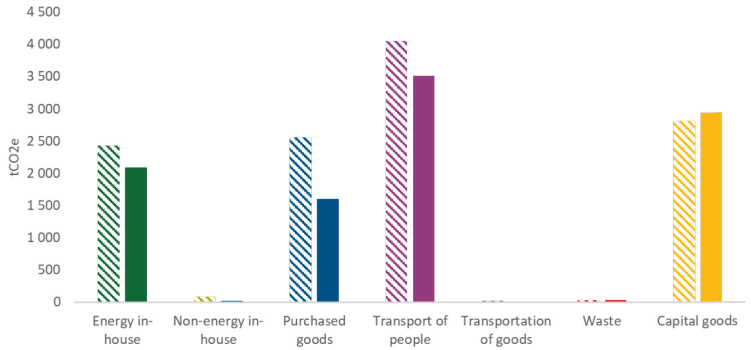
1 Collect activity data

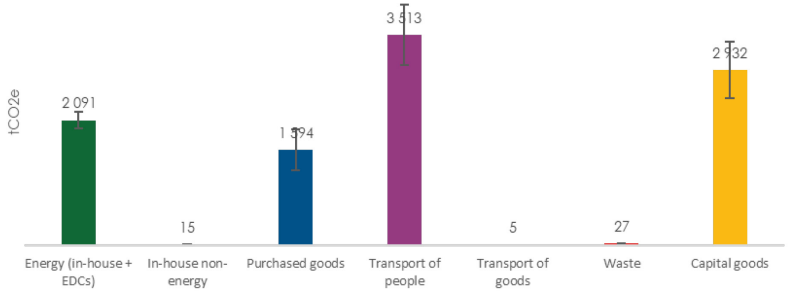
EUROPEAN COURT OF AUDITORS

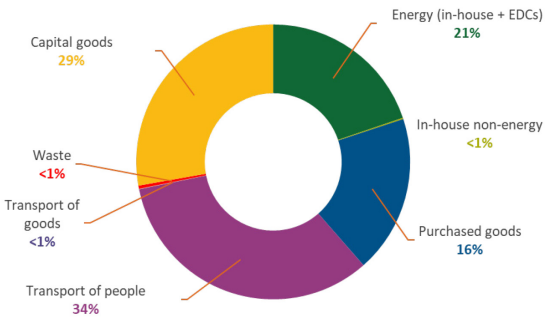
2 Apply the emission factors from the Bilan Carbone® database (version 8.1)

Data (unit) × Emission factors (tCO_2e/unit) = GHG emissions (tCO_2e)

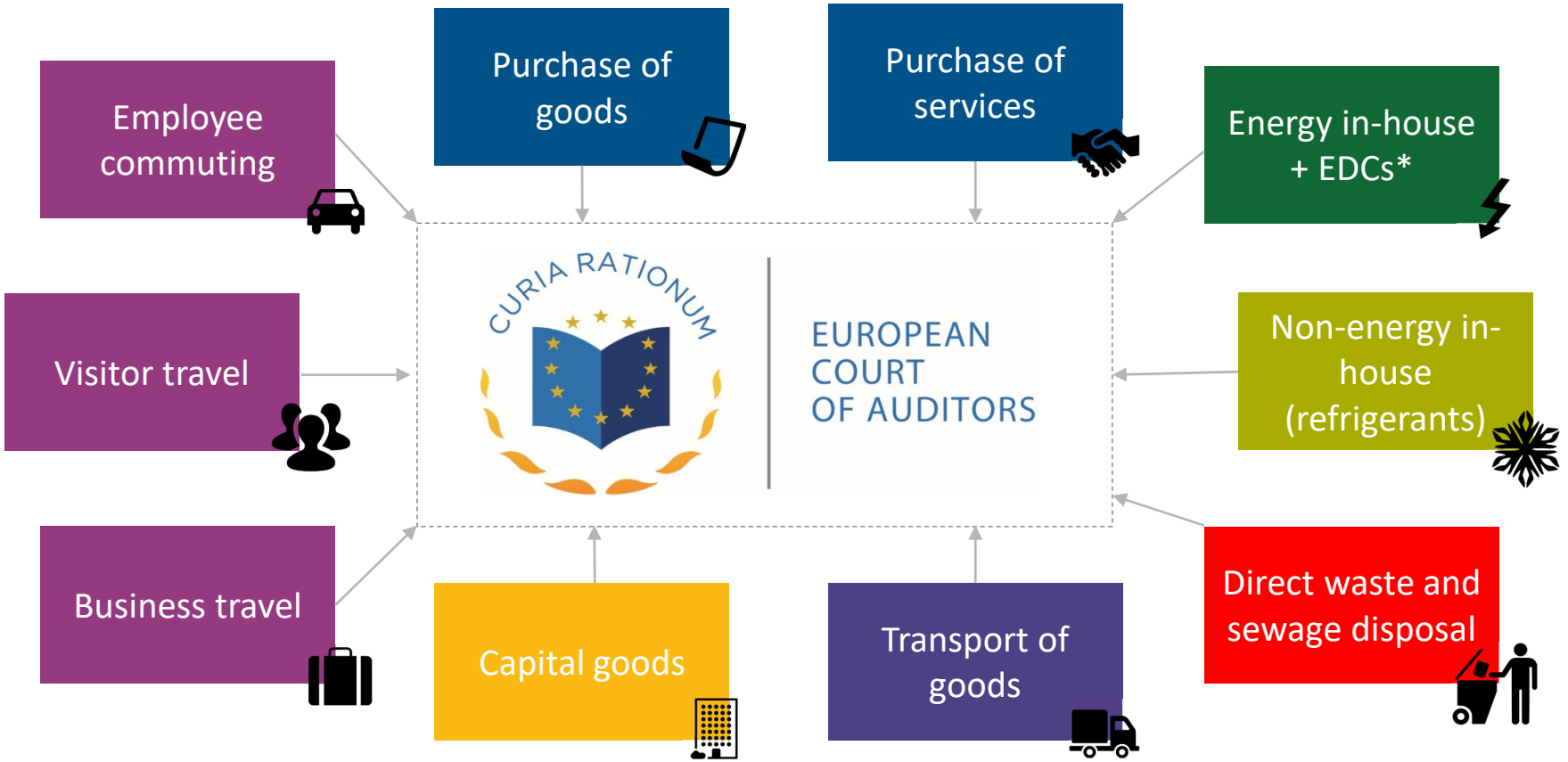
3 Visualise and analyse the results







Operational scope of the 2018 Bilan Carbone® method



The ECA's footprint exercise includes direct and indirect GHG emissions (Bilan Carbone® scopes 1, 2 and 3).

* EDCs – external data centres

Temporal and organisational boundaries

Bilan Carbone® approach: operational control approach

Temporal scope: ECA activities in 2018

Organisational scope:

- Three buildings in Luxembourg (K1, K2, K3)
  - These buildings include basements, underground car parks, two cafeterias and a canteen, archives and a library, walkways between buildings, among other amenities.
- Activities of ECA officials and other employees
  - At the end of 2018, there were **926,95** full-time equivalent employees.

AGENDA

1 Context of the study

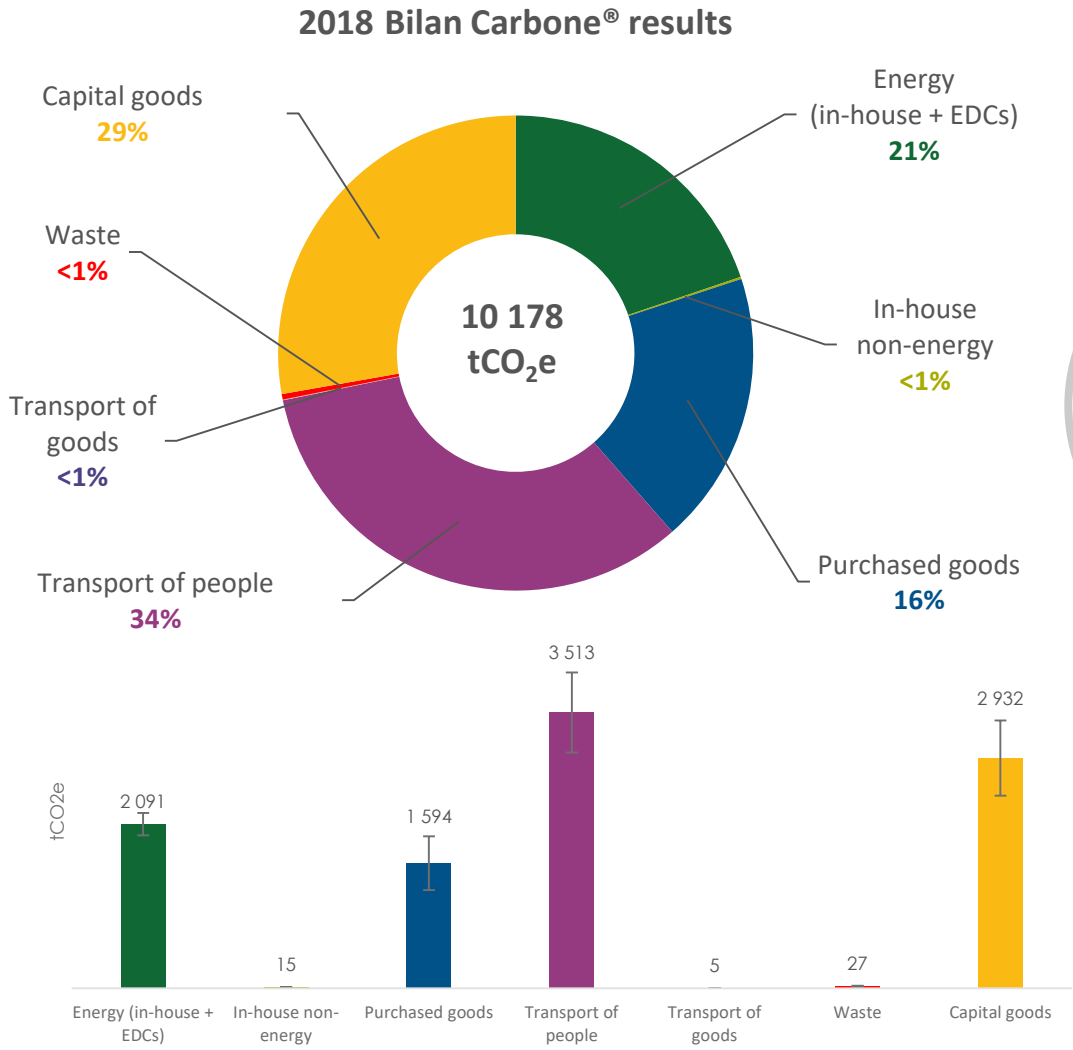
2 Overview of the Bilan Carbone® method

3 **Overall results**

4 Results per scope

3 Overall results for 2018

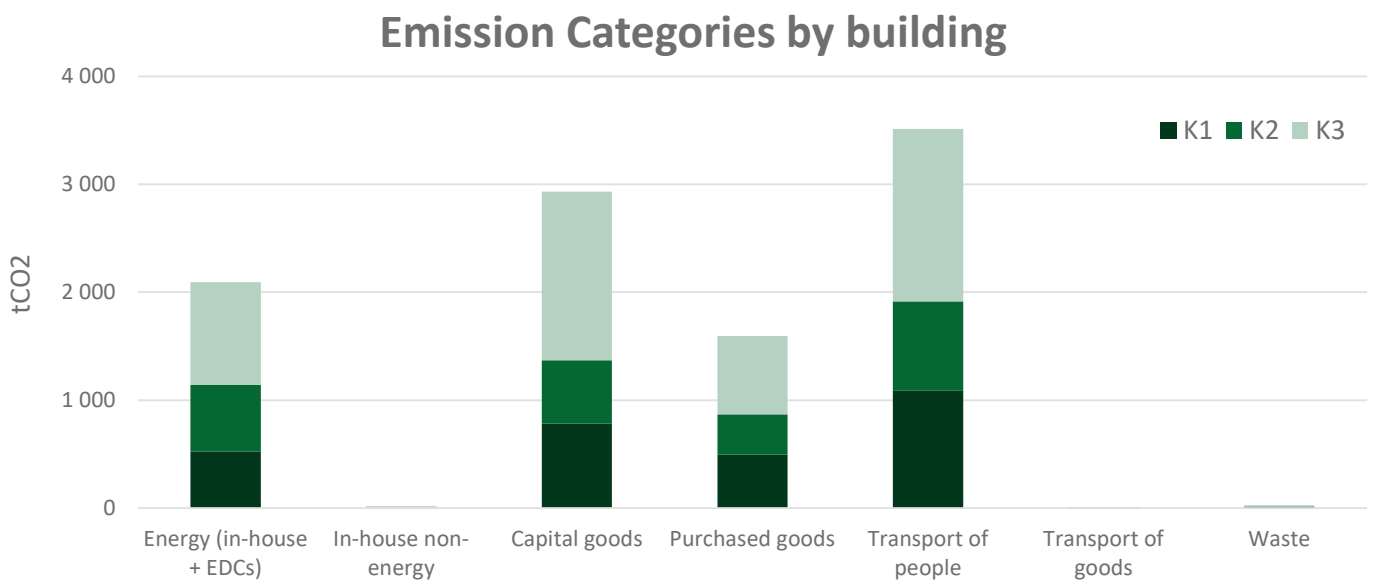
- Total GHG emissions were 10 178 tCO_2e.
- The largest sources of emissions for the 2018 Bilan Carbone® were:
  - Transport of people **(34%)**
  - Capital goods **(29%)**
  - Energy (in-house + EDCs) **(21%)**
  - Purchased goods **(16%)**
- In-house non-energy, waste and transport of goods made up the remaining 1%.

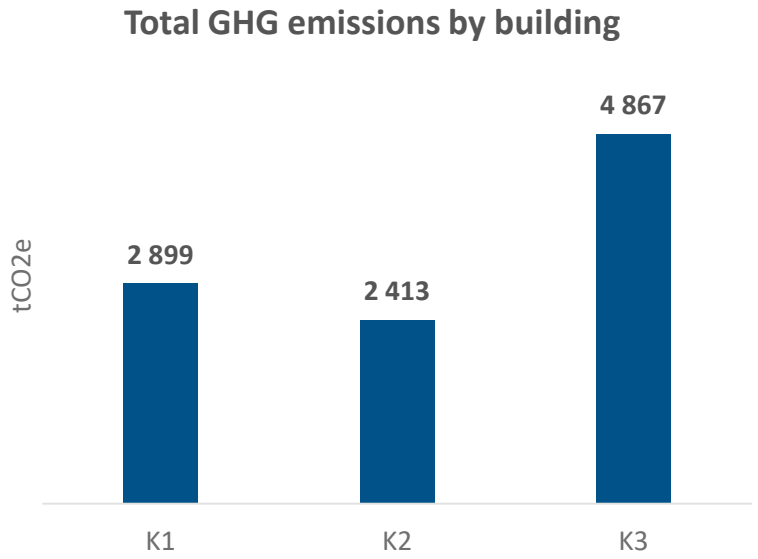


Total uncertainties 1 478 tCO_2e (15%)

Emission results by building

- Emissions were divided between the buildings according to staff headcount in each building.
- Unsurprisingly, then, since K3 houses the most employees, it has the largest share of emissions.





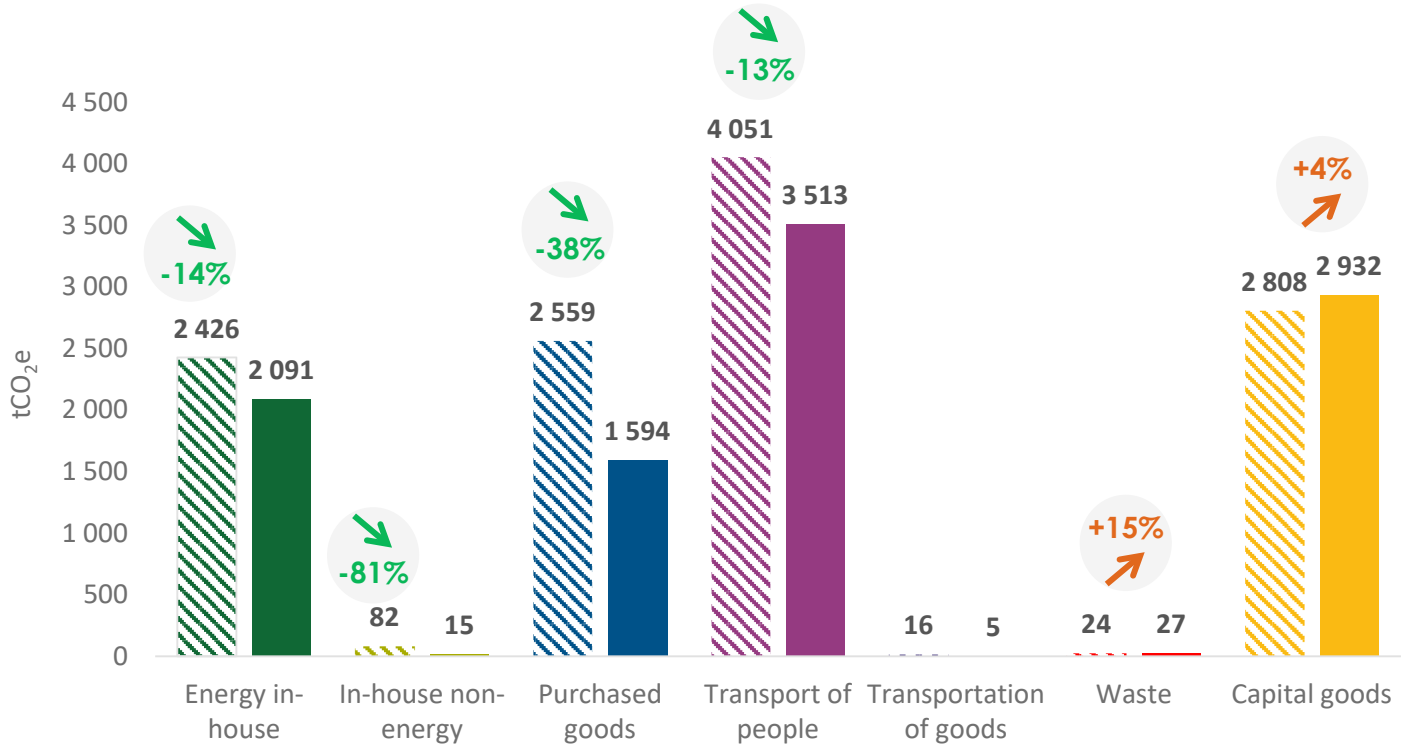
Building	# of employees	Share (%)
K1	332	31%
K2	251	23%
K3	487	46%
Total	1070	100%

3 Overall results for 2018

Bilan Carbone® comparison between 2014 and 2018

Emission sources tCO_2e	2014	2018	Variation 2014-2018
Energy (In-house +EDCs)	2 426	2 091	-14% ↘
In-house non-energy	82	15	-81% ↘
Purchased goods	2 559	1 594	-38% ↘
Transport of people	4 051	3 513	-13% ↘
Transport of goods	16	5	
Waste	24	27	15% ↗
Capital goods	2 808	2 932	4% ↗
Total	**11 966**	**10 178**	**-15%** ↘

This result can not be compared, as metrology used for calculation was different.



Overall, emissions decreased by 15% between 2014 and 2018

	2014	2018	Variation 2014-2018
tCO_2e per FTE	13	11	-15%
FTE	922.9	926.95	

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Transport of people
Data and assumptions

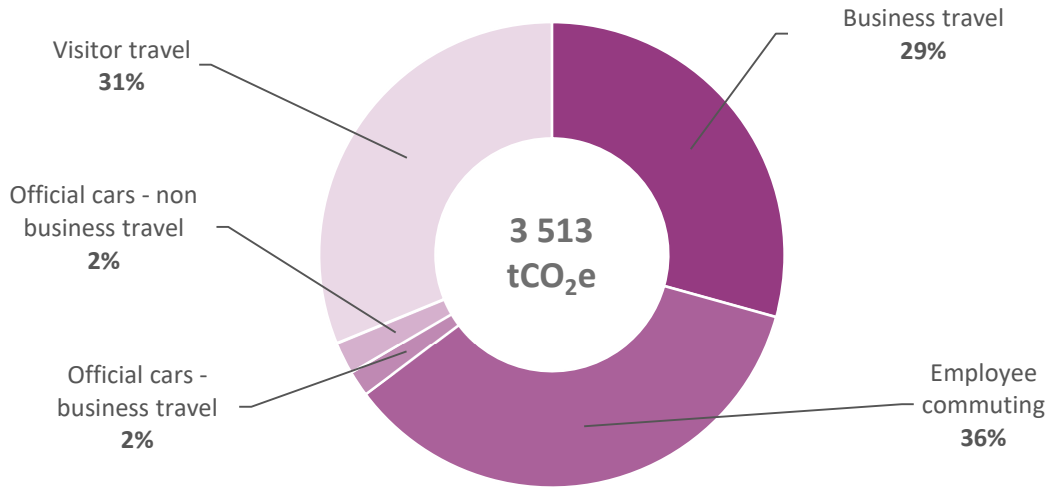
Emission sources

- ✓ Use of official cars (owned and leased)
- ✓ Employee commuting between home and work
- ✓ Business travel
- ✓ Visitor travel

Transport of people	tCO_2e	Kilometres	Litres*
Business travel,	1 030	4 437 877	-
Official cars (business travel)	63	251 188	20 328
Employee commuting,	1 245	5 609 996	-
Official cars (non-business travel)	79	315 055	25 496
Visitor travel	1 096	4 660 210	-
Total	**3 513**	**15 274 326**	**45 824**

**Litres were used for carbon footprint calculation for official car*

2018 GHG emissions from the transport of people by type of travel (with official car breakdown)



Uncertainties
508 tCO_2e
(14%)

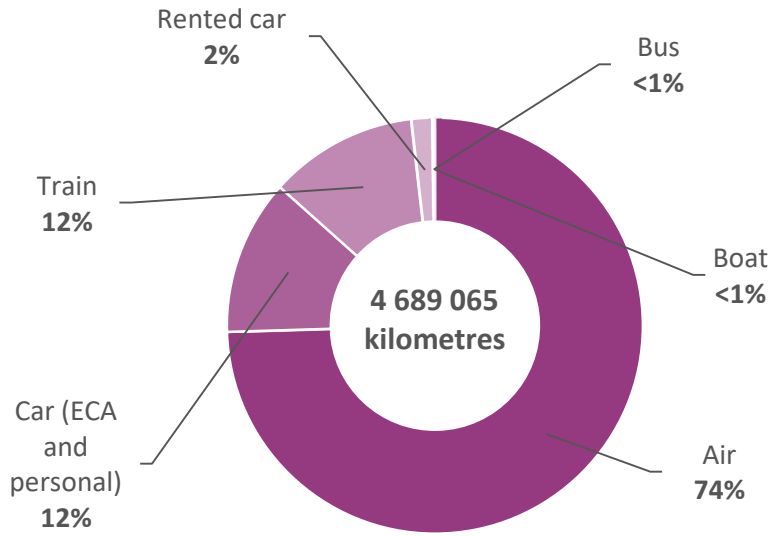
Transport of people

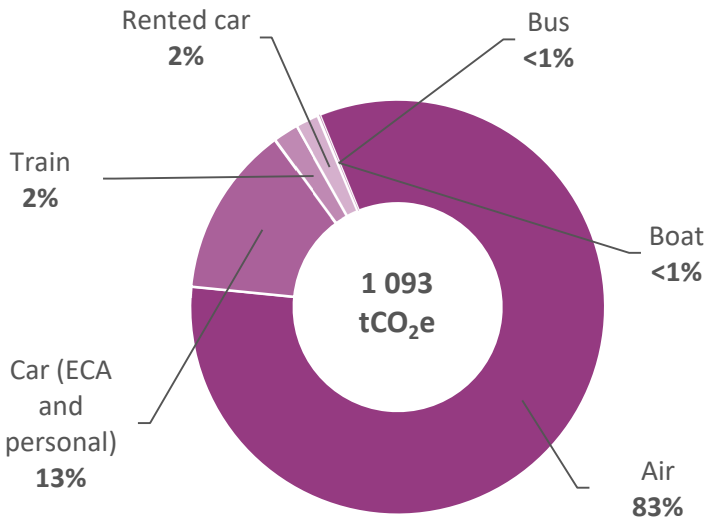
Business travel

- ✓ Business travel
  - Data provided:
    - Total kilometres per mode of transport

Business travel	tCO_2e	kilometres
Air	904	3 494 304
Car (ECA and personal)	146	566 727
Train	22	543 283
Rental car	20	74 754
Bus	1	9 624
Boat	0,4	373
Total	**1 093**	**4 689 065**

The most used mode of transport (in terms of kilometres travelled) is the airplane, followed by the car, train and then the bus.





Transport of people
Employee commuting

✓ Employee commuting

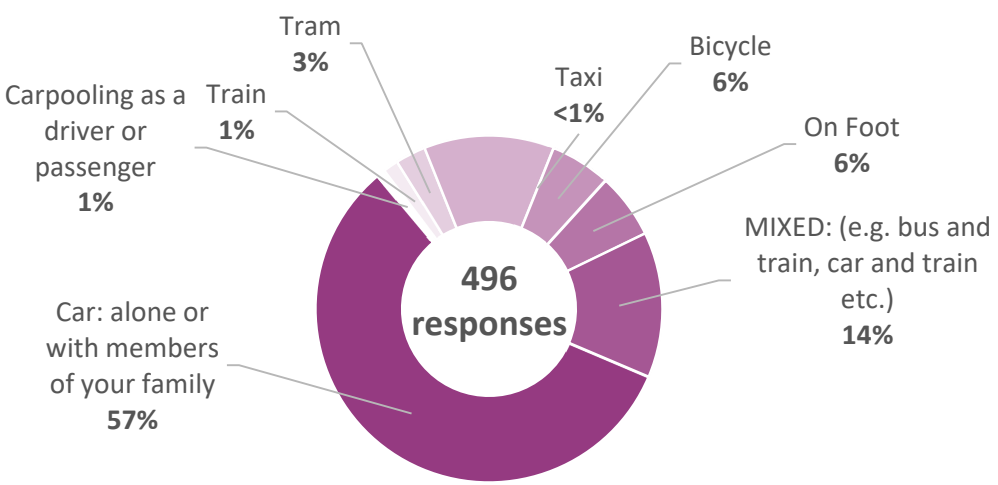
- Data provided:
  - The ECA only conducts an employee commuting survey once every 1.5 years.
  - For this reason, the 2019 results and assumptions were used (although 2018 data was used for ECA fleet).
  - Number of participants : 496

Extrapolated results

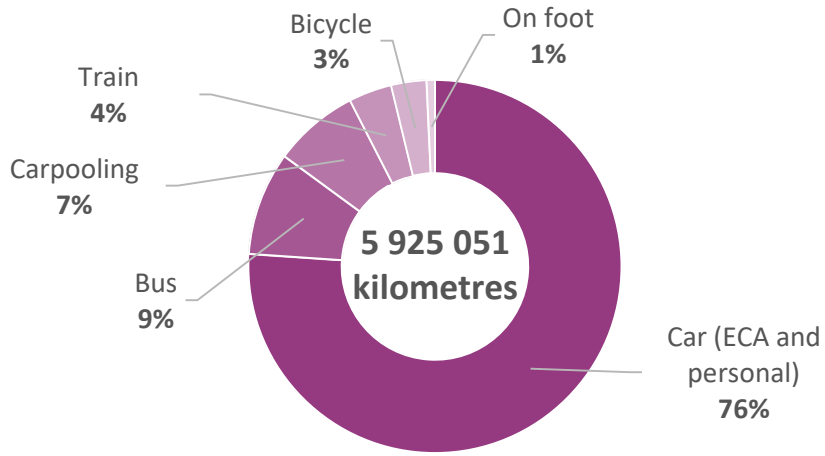
Employee commuting	tCO_2e	Kilometres
Car (ECA fleet and personal)	1 180	4 489 759
Bus	96	530 141
Carpooling	38	437 084
Train	9	220 524
Tram	0,1	23 847
Bicycle	0	181 579
On foot	0	42 116
Total	**1 324**	**5 925 051**

Transport of people
Employee commuting

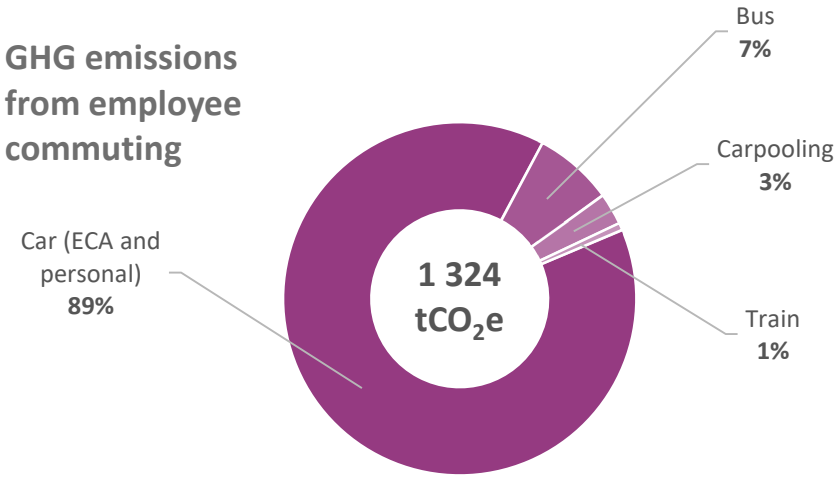
Number of responses



Total kilometres from employee commuting



GHG emissions from employee commuting



Transport of people
Visitor travel

✓ Visitor travel

- Data provided:
  - Number of visitors by country of origin in 2017
    - 107 visits
    - 2238 visitors

- Assumptions regarding mode of transport:
  - Short-haul aircraft
    - Europe: AT/BG/CZ/DK/EE/ES/FI/GR/HR/HU/IE/ IT/LT/ LV/MT/PL/PT/RO/SE/SI/SK/UK Macedonia/ Montenegro/Switzerland/
  - Long-haul aircraft
    - Brazil/Norway/USA/China/Argentina
  - Car
    - BE/LU
  - Bus
    - CZ/DE/NL
  - Train
    - FR

- *EcoAct* used its internal distance calculator tools to estimate the distances between origin countries and Luxembourg, and multiplied this by two to get the round-trip distance.

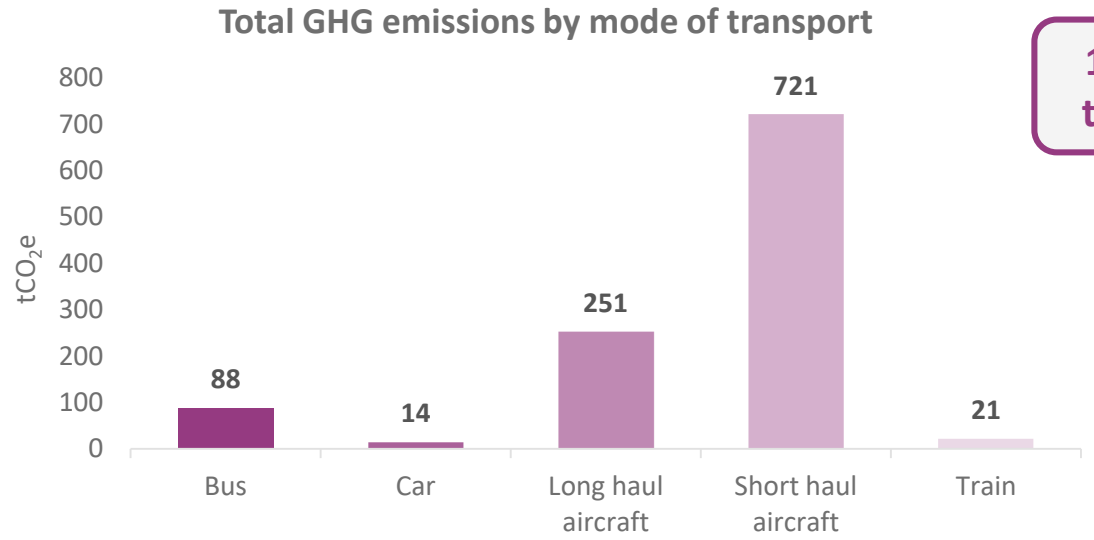
Transport of people

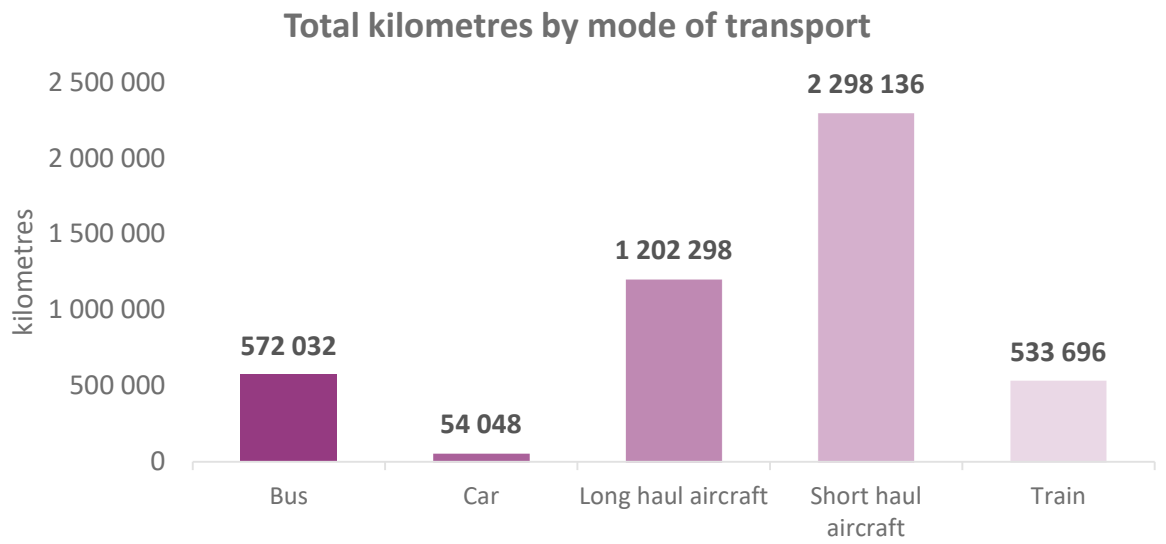
Visitor travel

✓ Visitor travel

Visitor travel	tCO_2e	Kilometres
Bus	88	572 032
Car	14	54 048
Long-haul aircraft	251	1 202 298
Short-haul aircraft	721	2 298 136
Train	21	533 696
Total	**1 096**	**4 660 210**

1 096 tCO_2e

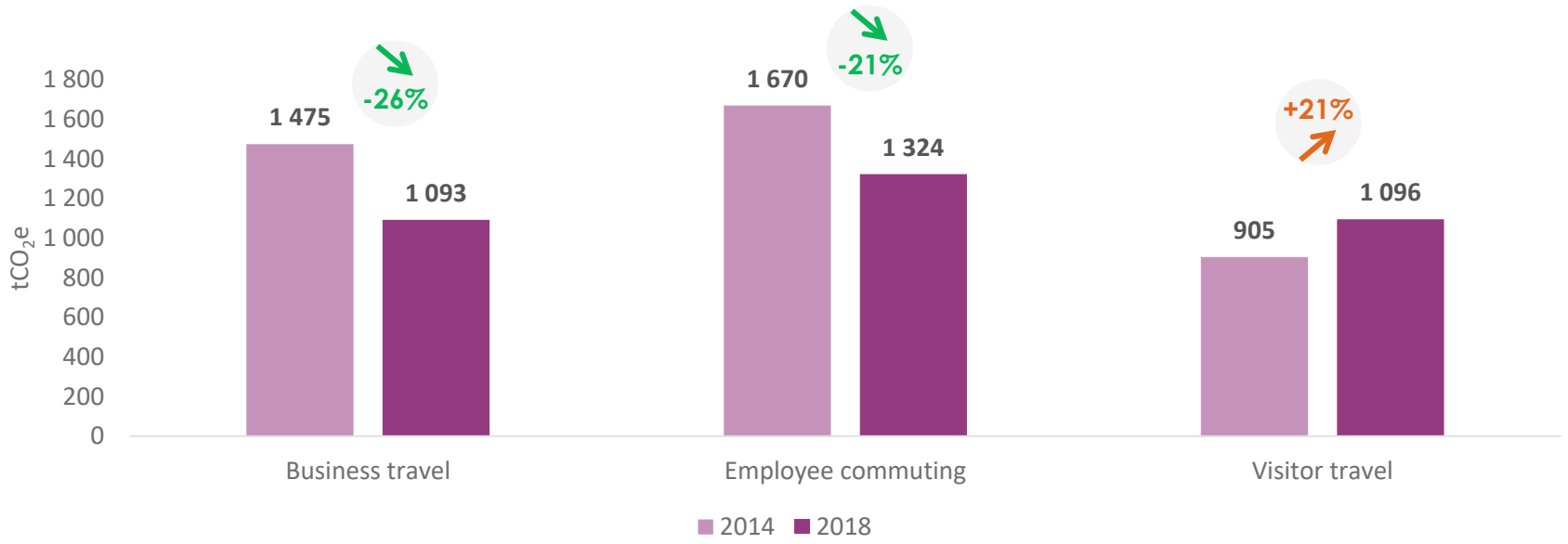




Transport of people

Comparison between 2014 and 2018

GHG emissions tCO_2e	2014	2018	2016-2017 variation
Total transportation	4 051	3 513	-13% ↘



- The GHG emissions of **business travel** decreased as the kilometres travelled decreased for all means of transport.
- The GHG emissions from **employee commuting** decreased, due mainly to the decrease in the kilometres travelled by car and bus.
- Increase in emissions from **visitor travel** - in spite of large decrease registered in the kilometres travelled by bus and car - caused by increase in kilometres travelled by short distance aircraft.

Emission sources

Buildings, car parks, vehicles, IT equipment, office furniture and supplies, machines, tools, building assets and kitchen assets (K3 building)

✓ Buildings and car parks
- Data provided: m2 of parking and office space
- Depreciation: 40 years

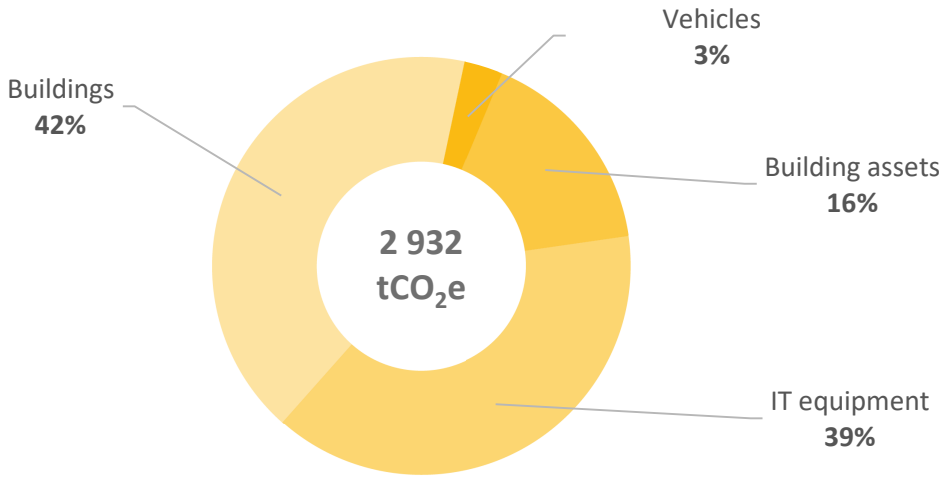
✓ Vehicles
- Data provided: model of leased and owned vehicles across all three buildings
- Depreciation: 4 years

✓ IT
- Data provided: IT inventory by type of good
- Depreciation: 4 years

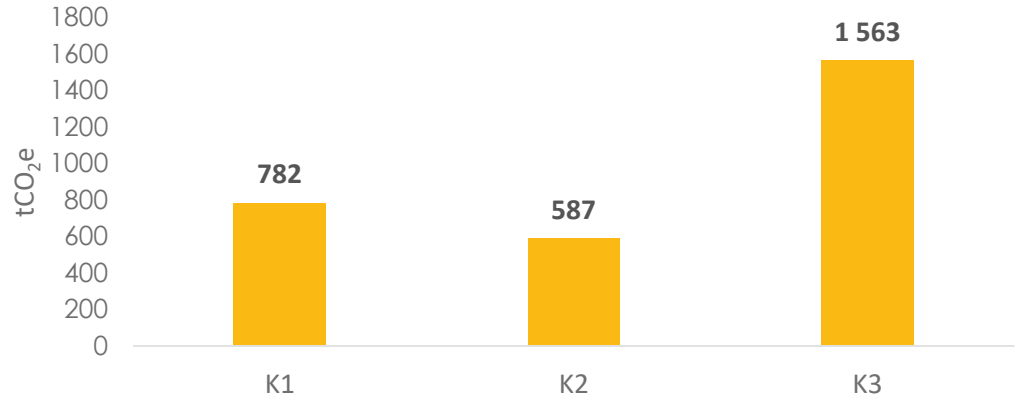
✓ Building assets
- Data provided:
  - Building assets
    - **Generators, refrigerators, air conditioning units, etc.,** in units per building (K1, K2 and K3)
    - **Furniture, equipment, tools** were quoted per building in terms of purchase price
    - **Machinery:** number of units
- Depreciation: 8 years

Capital goods
Results

GHG emissions from capital goods



Capital goods GHG emissions per building



Uncertainties
477 tCO_2e
(16%)

Type of capital good	tCO_2e
Vehicles	86
Building assets	482
IT equipment	1 138
Buildings	1 225
Total	**2932**

Most emissions come from buildings (42%) (car parks and office space).

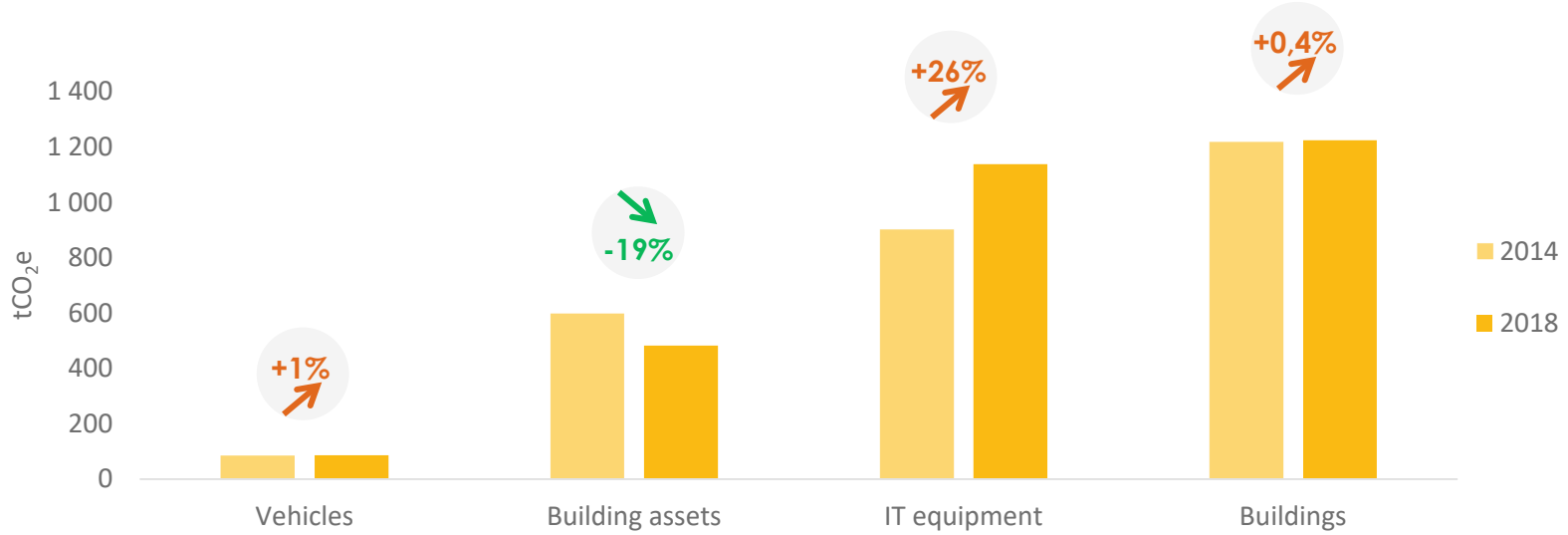
Capital goods

Comparison between 2014 and 2018

GHG emissions tCO_2e	2014	2018	2014-2018 variation
Total capital goods	2 808	2 932	+4% ↗

Decrease in the expenses for machines and equipment.

GHG emissions from capital goods increased by 4% from 2014 to 2018.
This was mainly the result of an increase in the number of: GSMs, monitors, network eq. & servers, portable computers and scanners.



Energy (in-house + EDCs)

Data and assumptions

Emission sources

Electricity consumption and losses, heating and fuel use in buildings (Energy in-house)

Electricity consumption in external data centres CETREL (EDCs)

✓ Electricity consumption and losses

- Data provided: 2018 consumption for each building
  - Electricity losses: 8.54%
  - The ECA purchases “guarantees of origin”. The Bilan Carbone ® method, however, considers the real electricity used from the national grid.

✓ Fuel consumption (by electricity generator)

- Data provided: litres purchased

✓ Heat consumption

- Data provided: 2018 consumption for each building
- Note: In 2017, the Kirchberg heating district changed its fuel sources, with 54% of biomass then in the heating fuel mix. Therefore, the emission factor used in 2018 was 0.0198 kgCO2e/kWh versus 0.043 in 2014.

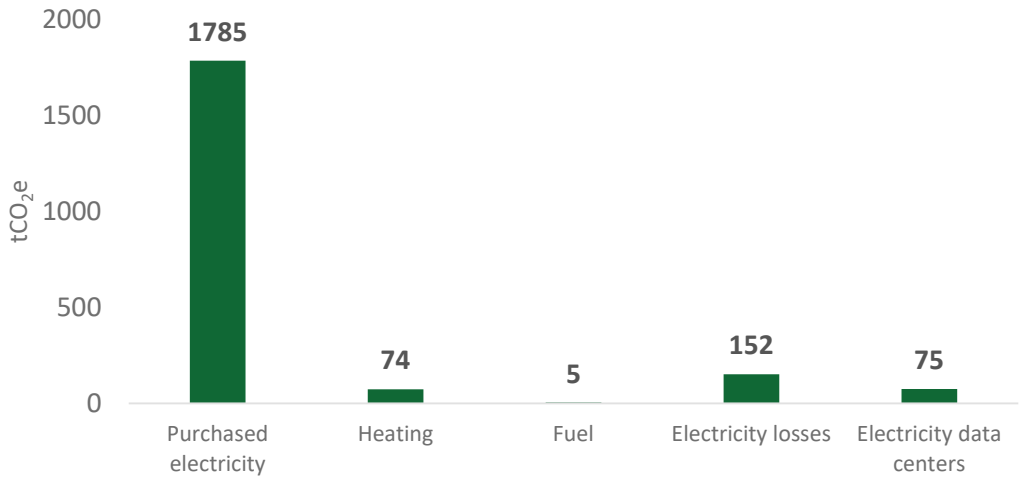
Energy (in-house + EDCs)

Results

	2014		2018		
	kWh	litres	kWh	litres	
Electricity purchased	5 024 031		4 522 220		↘
Electricity losses	452 162		386 198		↘
Heating	3 762 880		3 408 230		↘
Fuel		3 160		1 500	↘
Electricity data centres	**Not available**		166 811		

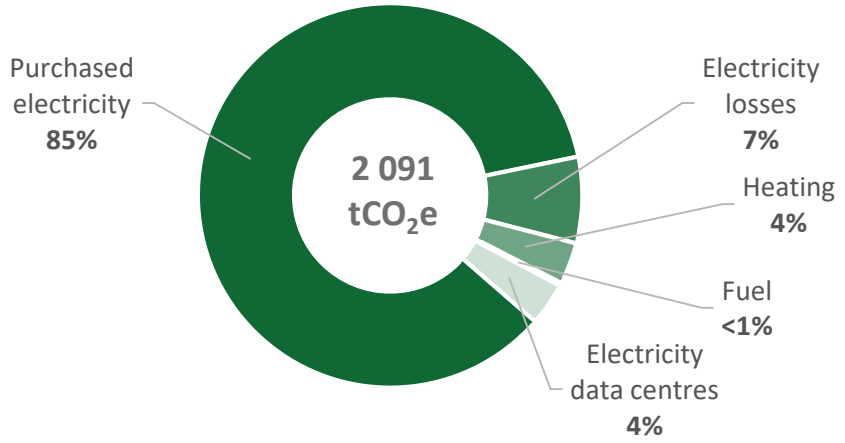
- 4% of emissions come from heating (the emission factor used was 0.0198 $kgCO_2e/kWh$ in 2018 versus 0.043 in 2014)
- 85% of emissions come from electricity use
- 7% from electricity losses
- <1% from fuel
- 4% from electricity used by ECA's external data centres (this parameter was taken into account in 2018)

Total GHG emissions per energy source



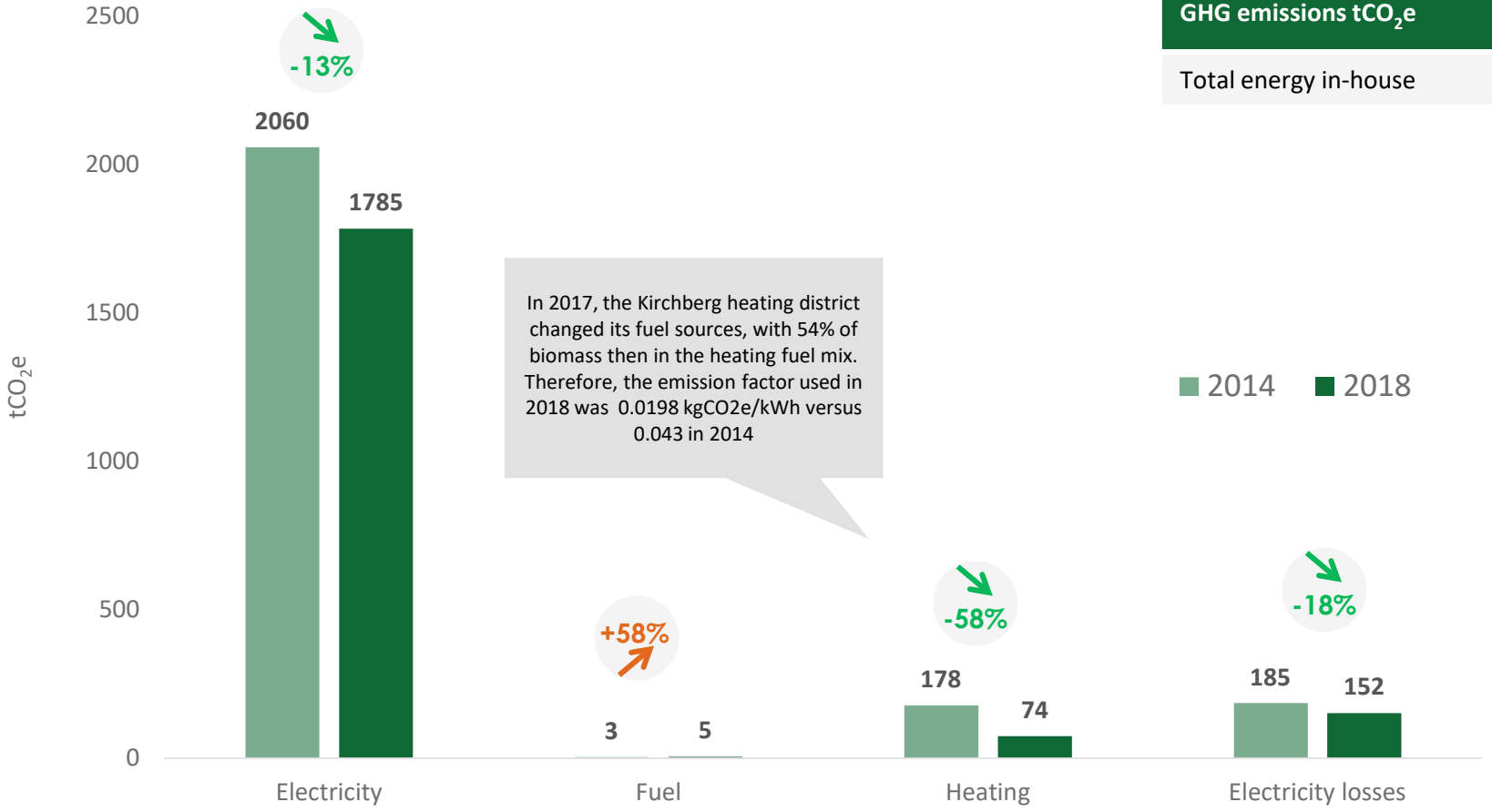
Uncertainties
142 tCO_2e
(7%)

Total GHG emissions per energy source



Energy (in-house only)

Comparison between 2014 and 2018



GHG emissions tCO_2e	2014	2018	2014-2018 variation
Total energy in-house	2 426	2 016	-17% ↘

The fall in GHG emissions reflects the ECA's decreased energy consumption between 2014 and 2018. The fall in emissions from heating comes mainly from an improvement in the related distribution emission factor.

Emission sources

Refrigerant gases

✓ Refrigerant gases

- Data provided: cooling installations refilled with refrigerant gases (R134a and R404a) throughout 2018. Refills were considered leaks.
- Only K2 and K3 are concerned.

Note: GHG emissions from refrigerant leaks decreased by 81% in 2018 compared with 2014. This decrease is linked to fewer leakages detected.

Building	Leaks	tCO_2e
K2	5KG of R134A	7
K2, K3	1,13 kg of 134A and 1,9 kg of R404A	9

Uncertainties 3 tCO_2e (19%)

One tonne of R134a is equivalent to 1300 tonnes of carbon and one tonne of R407A is equivalent to 3 940 tonnes of carbon. This has a large impact.

Purchased goods and services

Data and assumptions

Emission sources:

Paper, water, meals, gifts, goods, services purchased from third parties

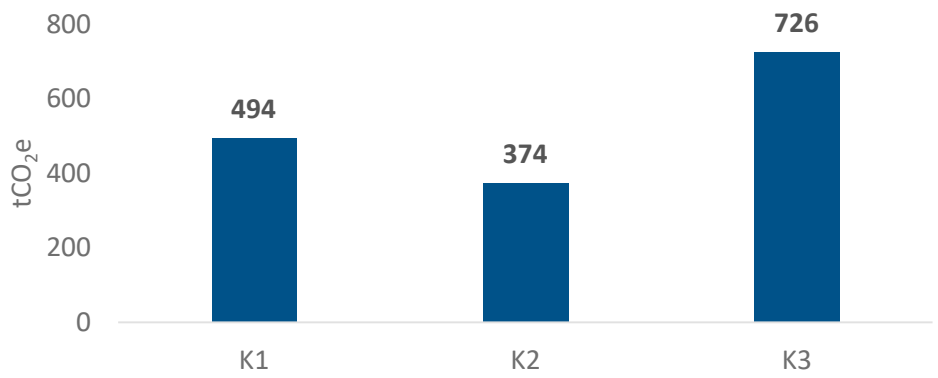
- ✓ Paper
  - Data provided for the ECA Journal/reports in number of pages
    - Assumption, all documents are printed on double-sided A4 paper
  - Data provided for internal printing in number of pages
    - Assumption: A4 80gr (95%), A3 80gr & others (5%)
    - Assumption: 97% recycled paper
  - Method: transformed into weight (5g/page)
- ✓ Water
  - Data provided: total purchased water used in 2018
- ✓ Meals
  - Data provided: number of meals, purchased quantities of meat (fish, pork, beef, chicken), organic versus non-organic
    - Assumptions: 11% vegetarian meals and the remainder distributed according to proportion of the purchased quantities of meat (29% chicken, 21% beef, 20% pork, 29% fish)
- ✓ Gifts
  - Data provided: number and types of gifts purchased in 2018
  - Method: gifts transformed into weight and type of materials
- ✓ Purchased goods and services
  - Data provided: purchased goods and services by category and euros spent

Purchased goods and services

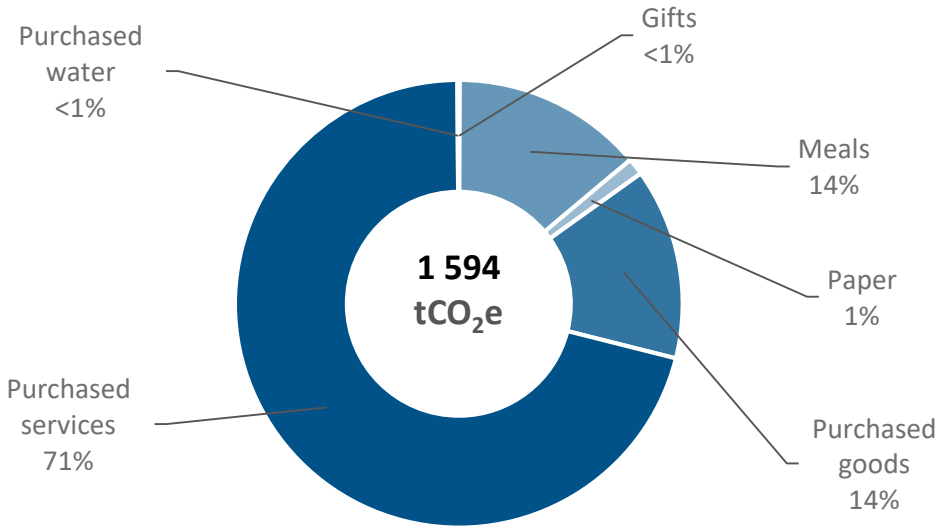
Results

Type	2018 data	tCO_2eq
Gifts	18 700 units	1
Meals	103 276 meals	220
Paper	21 210 kg	19
Purchased goods	278 947 euros	220
Purchased services	6 340 640 euros	1 131
Purchased water	12 425 m3	2
Total	**-**	**1 594**

Total GHG emissions from purchased goods and services per building



Total GHG emissions from purchased goods and services



Uncertainties: 341 tCO_2e (21%)

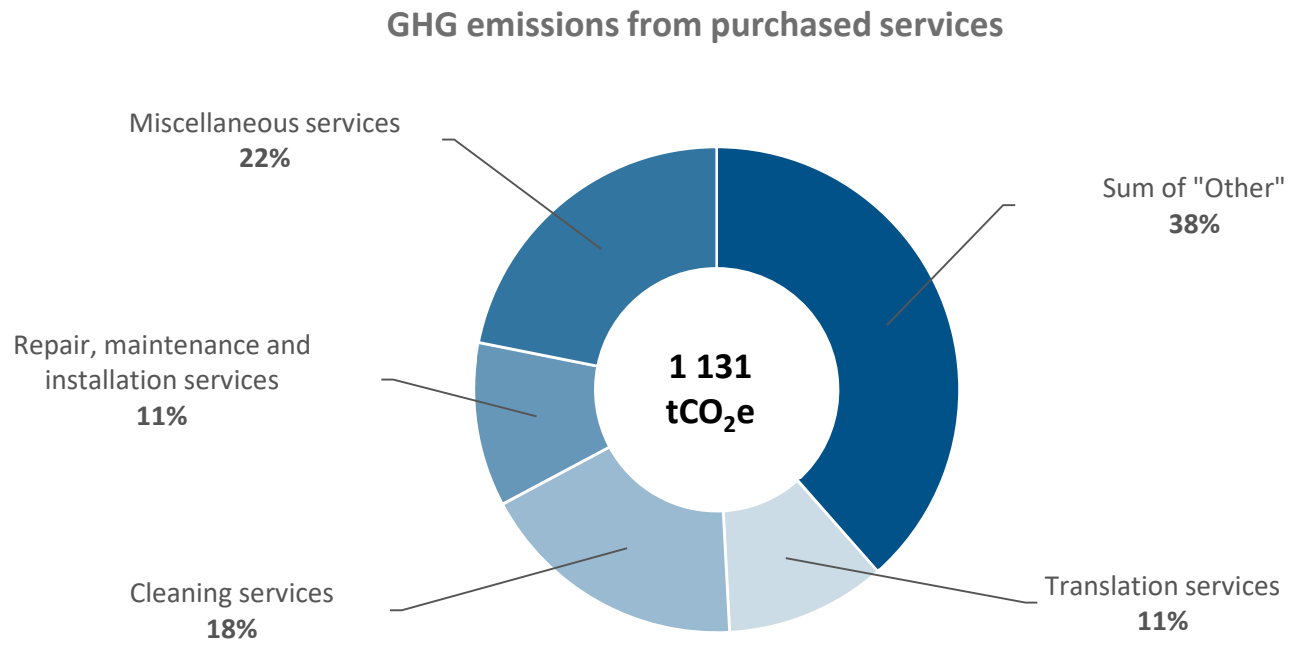
Purchased goods and services

Spotlight on purchased services

Over 40% of purchased services emissions come from:

- miscellaneous services (22%);
- cleaning services (18%);
- repair, maintenance and installation services (11%);
- translation services (11%).

Other services include: legal and accounting, telecommunications, news agency, etc.

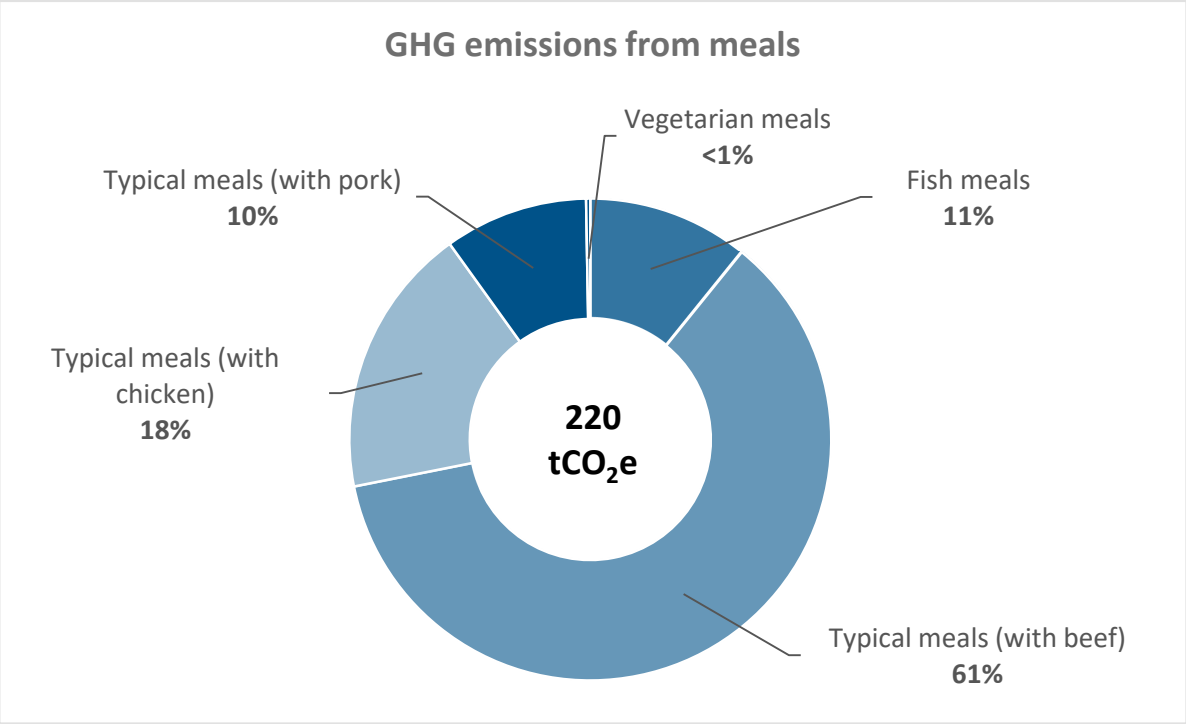


Miscellaneous services were attributed an average services emission factor from the Bilan Carbone ® database. These services ranged from renting material, training (language classes, etc.), painting, document destruction, etc.

Purchased goods and services

Spotlight on meals

- 21% of the meals served at the ECA contain beef.
  - Replacing beef with chicken would reduce a dish's carbon impact by **76%**.
  - Replacing a pork dish with a vegetarian dish would **halve** the meal's carbon impact.
- Organic meals were given the emission factor of an "average meal", as the determinants of a dish's emissions are its ingredients (meat, vegetarian) and whether the ingredients were produced locally or not. There is no conclusive evidence that the average organic meal is less emissive, since each dish can only be considered on a plate-by-plate basis.

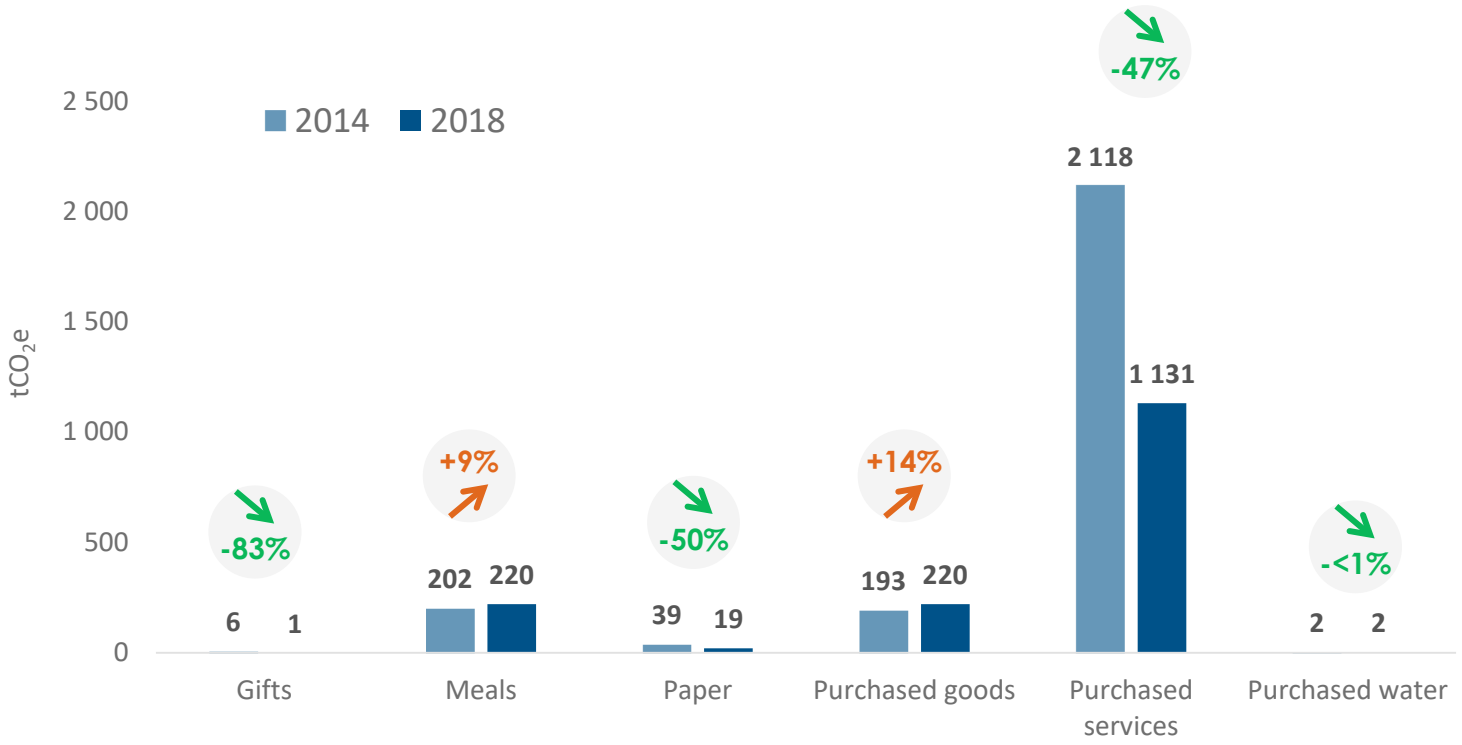


Type of meal	tCO2e	$kgCO_2e$/unit
Vegetarian	1	0,45
Fish	24	0,80
Pork-based	21	1,01
Chicken-based	40	1,32
Beef-based	134	5,66
Total	220	

Purchased goods and services

Comparison between 2014 and 2018

GHG emissions tCO_2e	2014	2018	2014-2018 variation
Total purchased goods and services	2 559	1 594	-38% ↘



GHG emissions from **purchased goods and services** decreased by 38% between 2014 and 2018.

GHG emissions from **meals** increased 9%, while the number of meals served increased as well over the years.

GHG emissions from **purchased services** decreased, due to a 24% decrease in money spent on services. Consequently, GHG emissions from **purchased goods** increased, due to an increase in money spent on office equipment and supplies.

Waste

Data, assumptions and results

Emission sources

Waste and water use (sewage)

✓ Waste

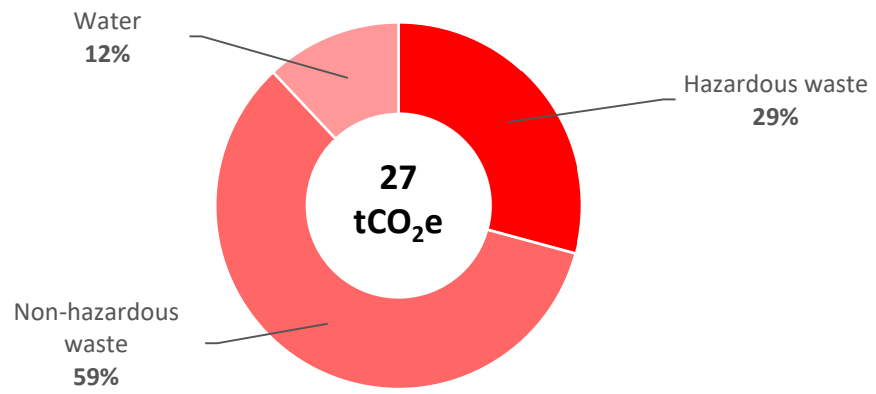
- Data: waste by type (non-hazardous, hazardous) and tonnage
  - Non-hazardous: food waste, household waste, plastics, paper and cardboard, glass packaging
  - Hazardous: mud and sewage water, light and fluorescent tubes, packaging paste with harmful products, scrap metal, batteries and accumulators, electronic waste
- Assumptions: waste treatment largely based on 2016 treatment with slight modifications

✓ Water use (sewage)

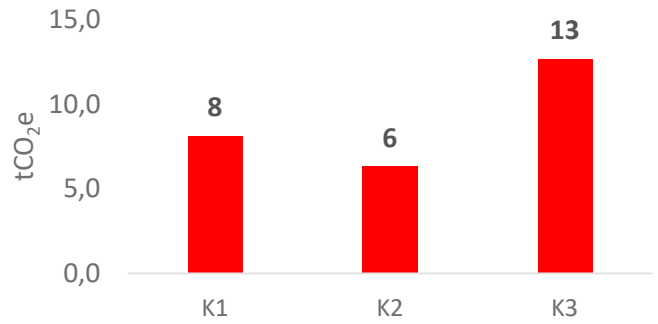
- Data: based on water consumption, allocated to buildings on the basis of building occupancy

Uncertainties
7 tCO_2e
(25%)

2018 GHG emissions from waste by type



GHG emissions from waste per building



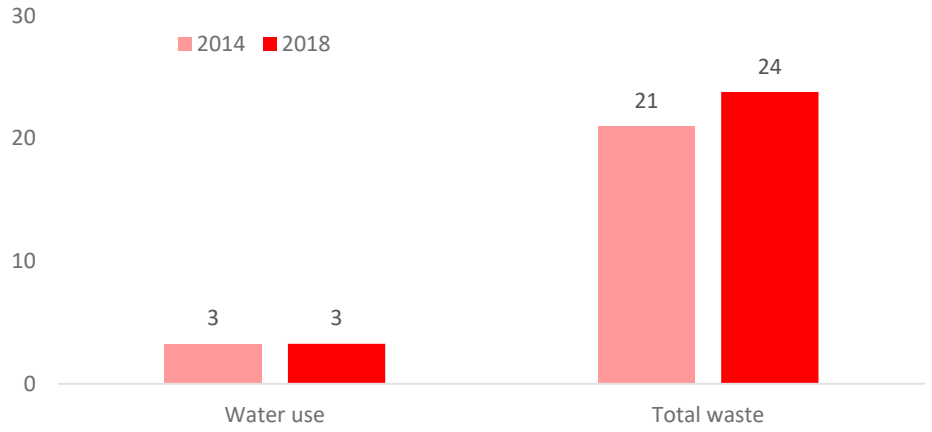
Waste

Results and comparison between 2014 and 2018

2018 GHG emissions of waste by category

Waste	tCO2e	tonnes
Batteries and accumulators	0,01	0,08
Food fats and oils	6,88	53,73
Light and fluorescent tubes	0,02	142
Mud and sewage water with hydrocarbons	0,90	7,00
Packaging waste with harmful products	0,08	0,12
Scrap metal	0,01	0,31
Waste electrical and electronic equipment	0,02	0,19
Food waste	1,10	23,59
Glass packaging waste	0,13	4,00
Household and similar waste	12,48	34,52
Other waste from demolition (non-contaminated)	0,00	0,14
Plastics waste (including packaging)	0,02	0,66
Various packaging waste	0,14	4,22
Paper and cardboard + wooden packaging	2,06	47,73
Water use	**tCO2e**	**m3**
Water	3,26	12 425
Total	**27,11**	

GHG emissions comparison between 2014 and 2018



GHG emissions tCO_2e	2014	2018	2014-2018 variation
Total	24	27	+15% ↗

Food fats, oils and household waste make up 80% of GHG emissions derived from waste.

190 kg of waste per FTE in 2018 versus 164 kg in 2014
Water use stays at similar level

Transport of goods
Data and results

Emission sources

- ✓ Transport from suppliers
  - Data provided
    - Distance (km), number of delivery days per supplier, average delivery weight and type of vehicle
    - 21 suppliers in total

Uncertainties
1 tCO_2e
(23%)

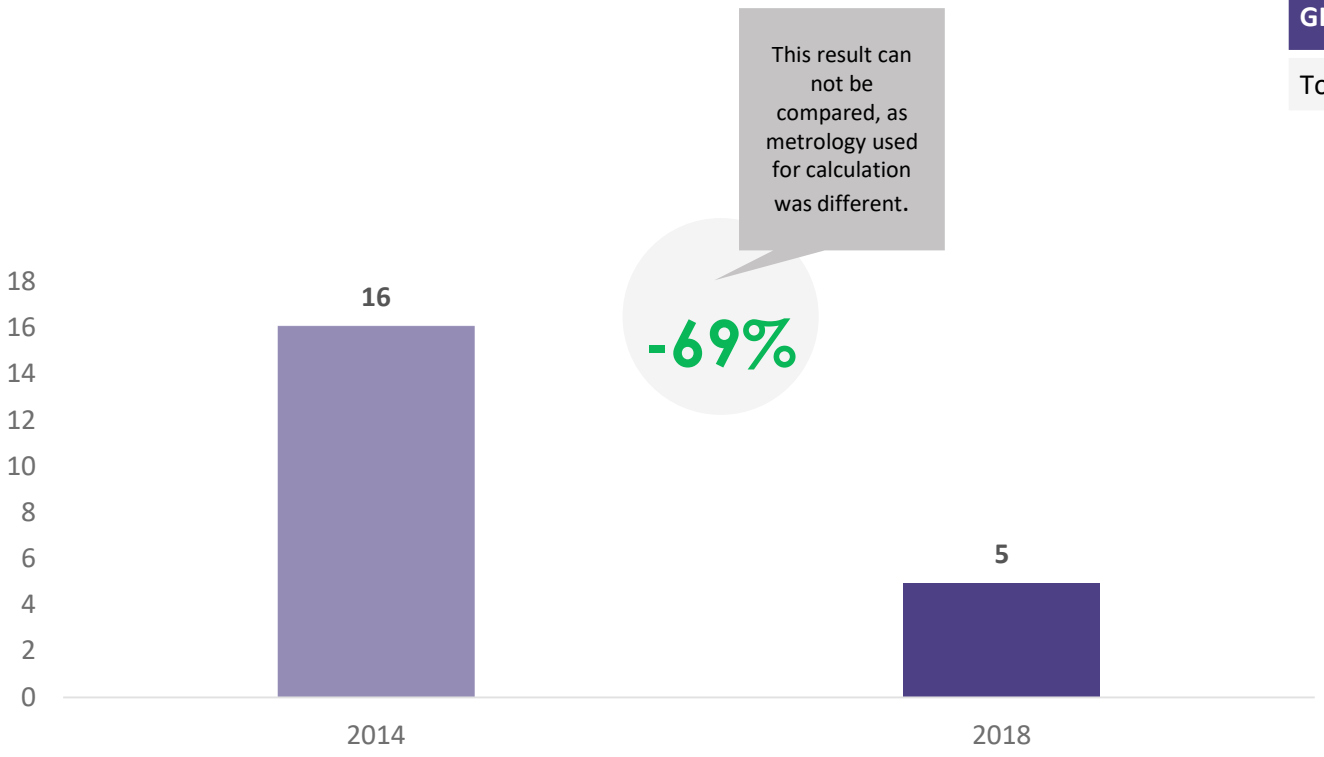
Emission source	Total kilometres	tCO_2eq
Transport of goods	52 767	5

Average distance driven by each supplier per year: 2 513 km

This is equivalent to driving from Luxembourg to Rome and back.

Transport of goods

Comparison between 2014 and 2018



GHG emissions tCO_2e	2014	2018	2014-2018 variation
Total	16	5	-69%

Since 2017, data on transporting goods have been better documented. As a result, GHG emissions from the transportation of goods between 2014 and 2018 decreased by 69% due to improved reporting.

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