University of Copenhagen climate account 2022

June 2023

UNIVERSITY OF COPENHAGEN

Content

1. Purpose, goal and approach

Purpose and approach

- The climate account can be used to:
  - Assess if UCPH is on track for the 2030 sustainability goals.
  - Adjust efforts, including prioritising actions in the main climate footprint categories

To more precisely assess the effects of each sub-action, alternative category-specific and life-cycle-based methods should be applied. There is a particular need for improved data and methods for some of the scope 3 emission categories (procurement).

- Approach
  - The total climate footprint is accounted for using the GHG protocol approach.
  - The methods applied are based on approaches developed by the climate account task force under Universities Denmark.
  - The University develops methods and approaches to improve the climate account year by year. The latest one is therefore the most precise account.
  - The baseline is updated as better methods and more precise data are developed, with a consistent method being applied throughout the period.

Further details on methodology in section 5.

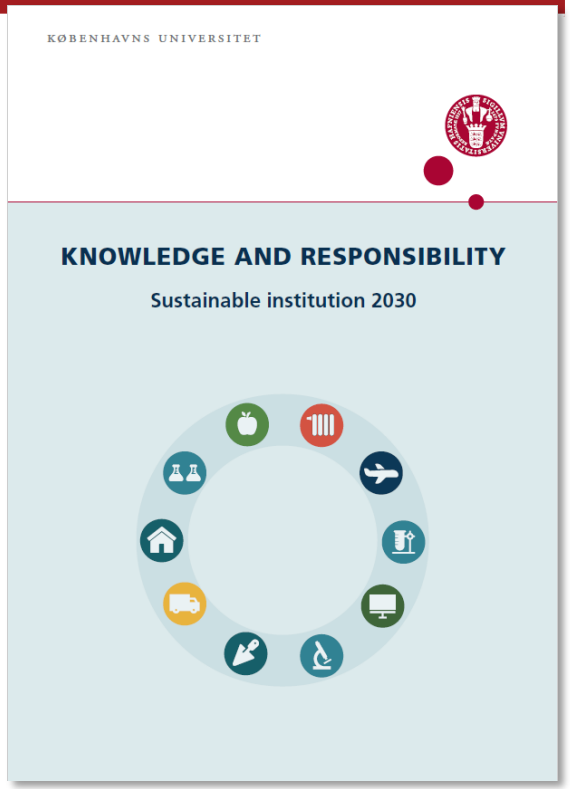
Climate goal 2030

UCPH will reduce its climate footprint (scope 1-3) per full-time equivalent by 50% in 2030 compared to 2018.

The University's climate goals for 2030 are set out in 'Knowledge and Responsibility – Sustainable Institution 2030' Goal for Sustainable Institution 2030 – University of Copenhagen (ku.dk)

The goals were approved by the University Board in December 2020.

Besides the climate goal, UCPH has set 2030 goals for resources, biodiversity, chemistry, participation and collaboration.

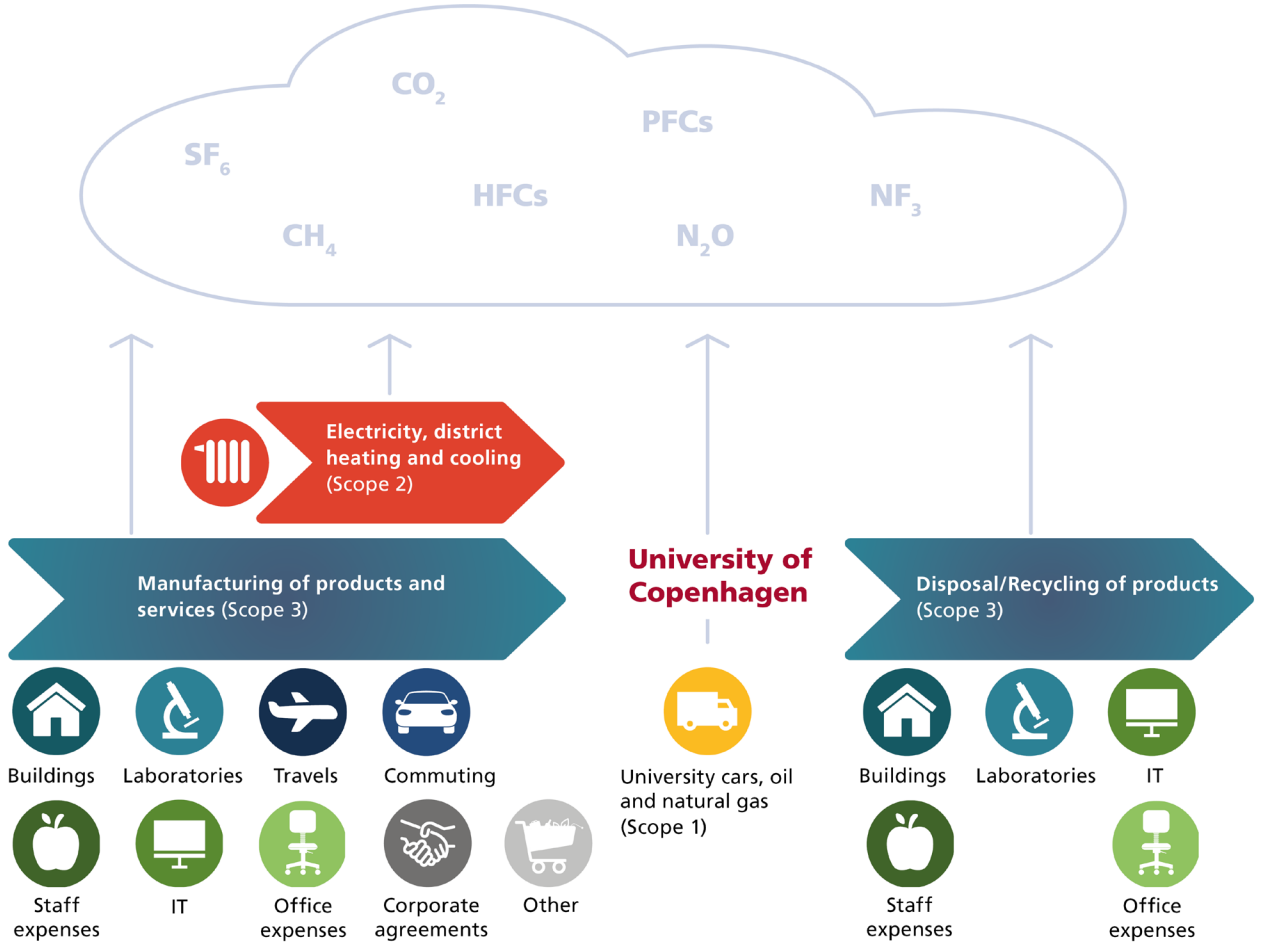


About the GHG protocol

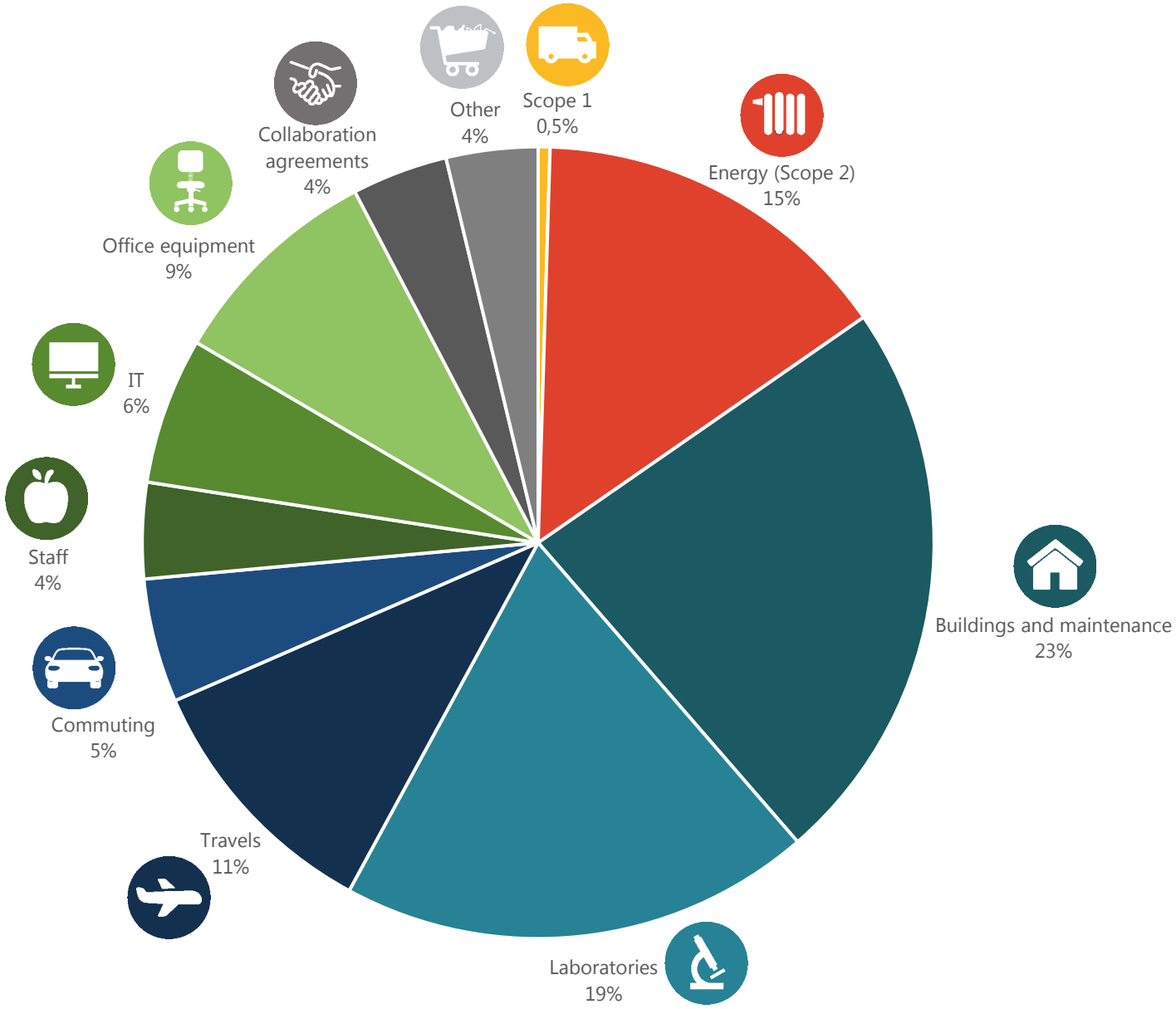
UCPH uses the GHG protocol's internationally recognised approach. Greenhouse Gas Protocol | (ghgprotocol.org).

The approach divides emissions attributable to businesses/institutions into three scopes (sources of emission)

- **Scope 1**: Direct emissions, such as petrol for own vehicles and vessels or for oil or natural gas burners.
- **Scope 2**: Indirect emissions from energy consumption, that is district heating, electricity and district cooling.
- **Scope 3**: Upstream and downstream emissions linked to products and services consumed by UCPH.



CO_2e-emissions 2018 by main categories



2. Main results

Main results - summary

UCPH's total climate footprint per full-time equivalent has been reduced by 20% since 2018.

Scope 2 emissions (electricity, district heating and cooling) fell by 10%, down 63% since 2018. The reduction is mainly due to the green transition of energy supplies, while the University's emergency energy efforts in autumn/winter also contributed to the decrease. For 2022, scope 2 only accounted for 7% of UCPH's total emissions, which means that its contribution to the total reduction will be proportionately smaller in future.

With ever-rising energy costs, energy efficiency remains an important effort.

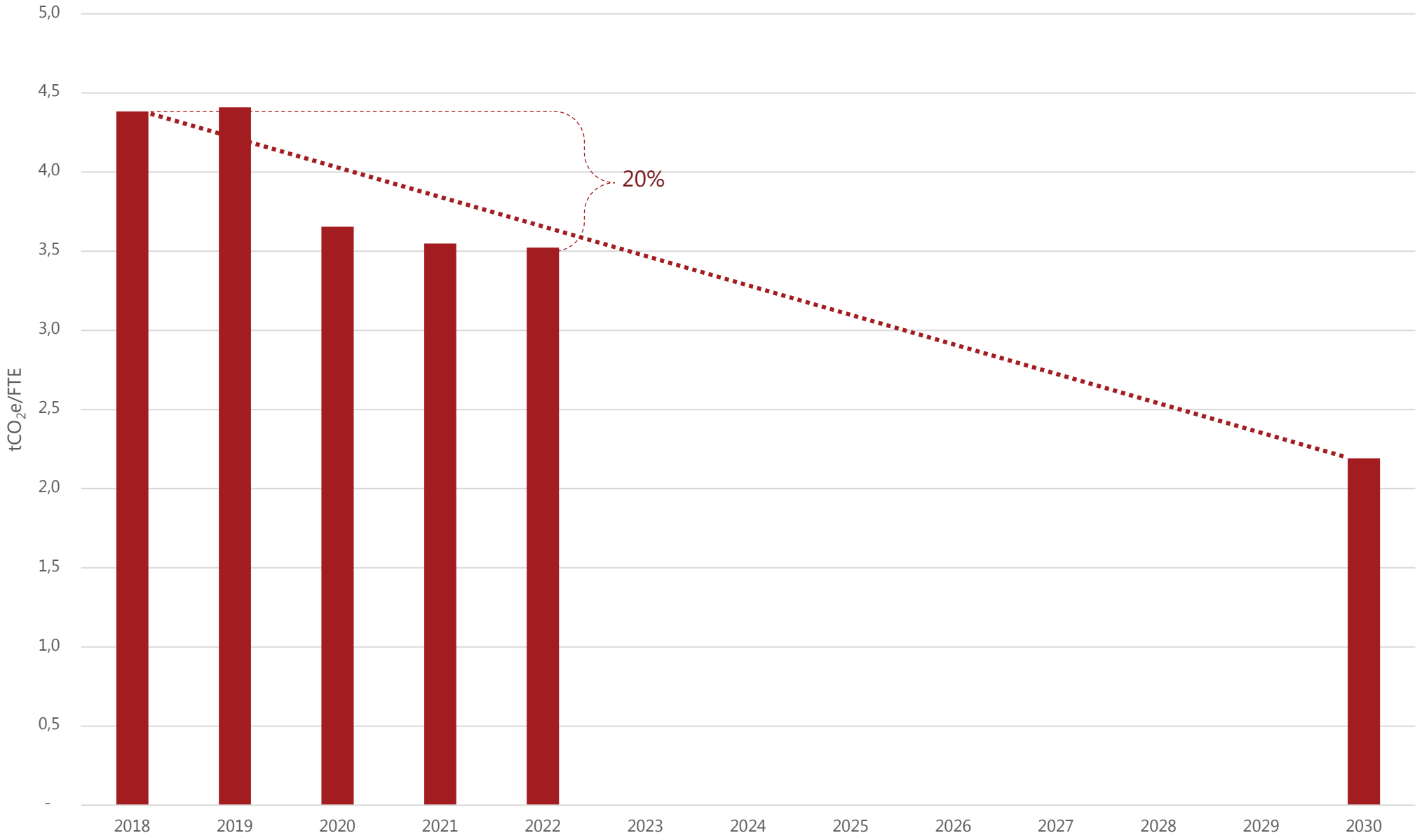
Scope 3 emissions (consumption of services and products) accounted for 93% of total emissions in 2022, and future emission reductions must be achieved in these categories.

The following results are significant:

- Buildings and maintenance fell by 17% from 2021 to 2022, and by 23% since 2018. An analysis of procurement and accounting data will identify explanations for the decrease, which may be due to annual fluctuations.
- Laboratories decreased significantly from 2021 to 2022, which is not accurate. The procurement categorisation will be analysed in detail with a view to data improvement, which could result in a limited increase in the 2022 climate account.
- Air travel increased from 2021 to 2022 but remains 24% below pre-corona levels. However, parts of the world still had restrictions in force in 2022 and international cooperation had not yet normalised.

Data and methods are improved on an ongoing basis, including the baseline assessment, with the latest climate account being the most accurate.

Total CO_2e-emissions per FTE



The goal set by UCPH for a 50% reduction in CO2e per FTE in 2030 against 2018 (4.4 metric tons) will give a total CO2e footprint per FTE of **2.2 tons** in 2030.

The reduction in UCPH's climate footprint per FTE for 2018-2022 was -**20%.**

The number of FTEs grew by **1%** in the period.

In 2022, the total footprint was **3.5 tons CO2e per FTE.**

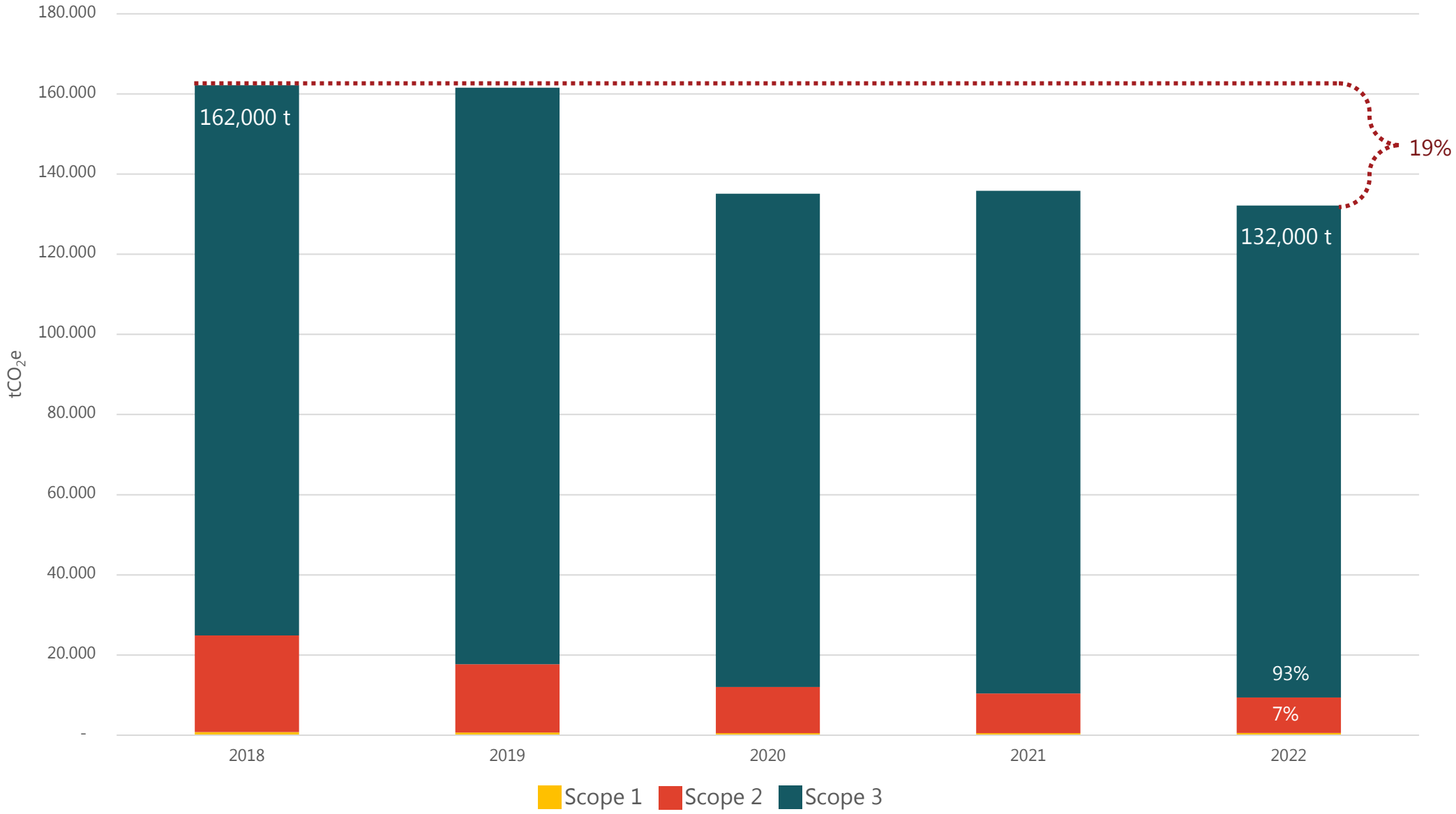
Development in full-time equivalents

UCPH's climate goals are calculated per full-time equivalent/FTE of staff and students. There was a slight increase of 1% in total FTEs from 2018-2022.

	2018	2019	2020	2021	2022	Development 2018 – 2022
FTE – students (STÅ)	27,660	27,238	27,392	28,303	27,450	-1%
FTE – staff (ÅV)	9,348	9,405	9,575	9,982	10,063	+8%
Total	37,008	36,643	36,967	38,285	37,513	+1%

Source: Students - facts and figures – About the University of Copenhagen (about.ku.dk), Staff - facts and figures – About the University of Copenhagen (about.ku.dk)

Total CO_2e emissions by scope 1-3



UCPH's total climate footprint in 2022 came to **132,000 tons.**

- The baseline (2018) was 162,000 tons

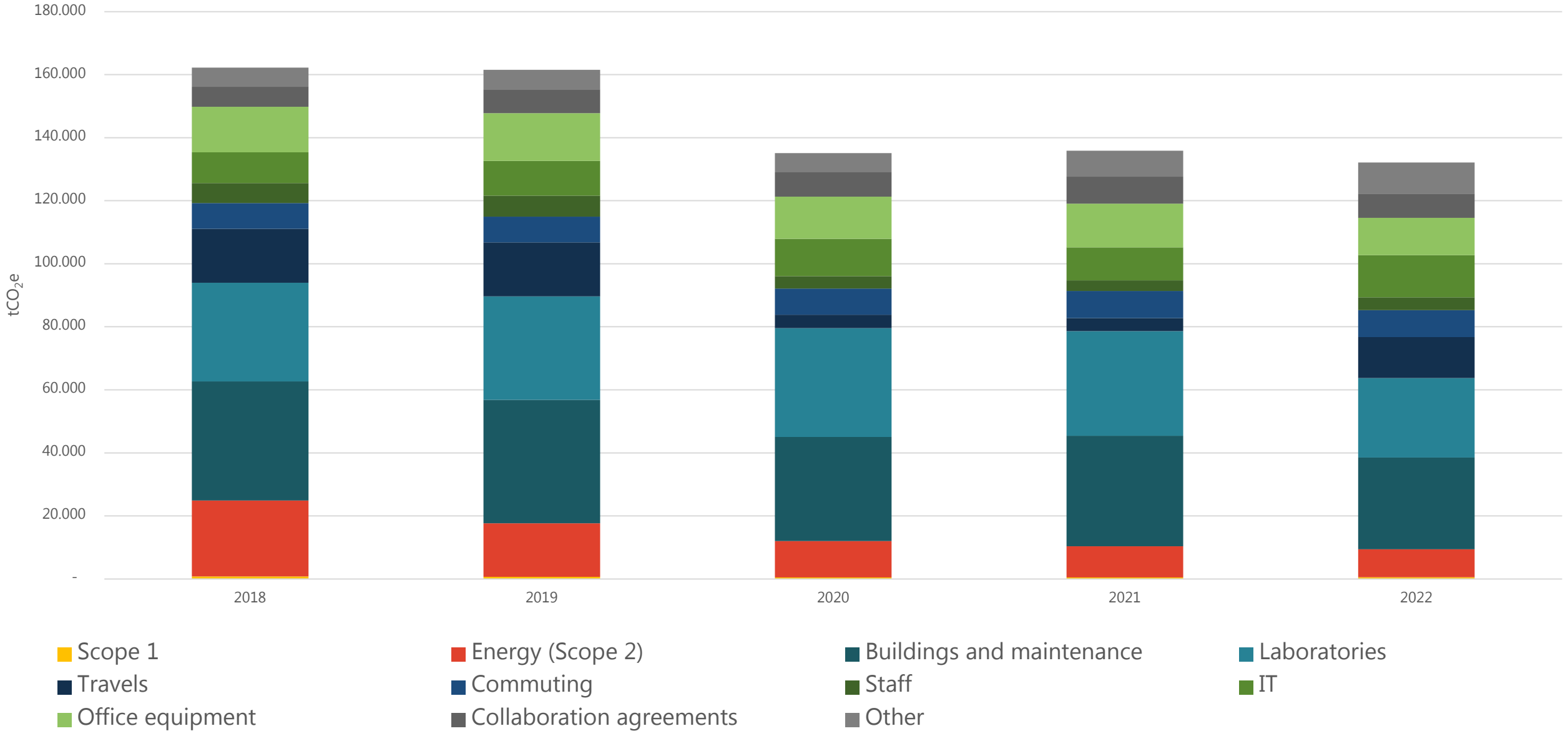
The reduction in footprint from 2018-2022 was -**19%.**

Developments for scope 1-3 from 2018-2022:

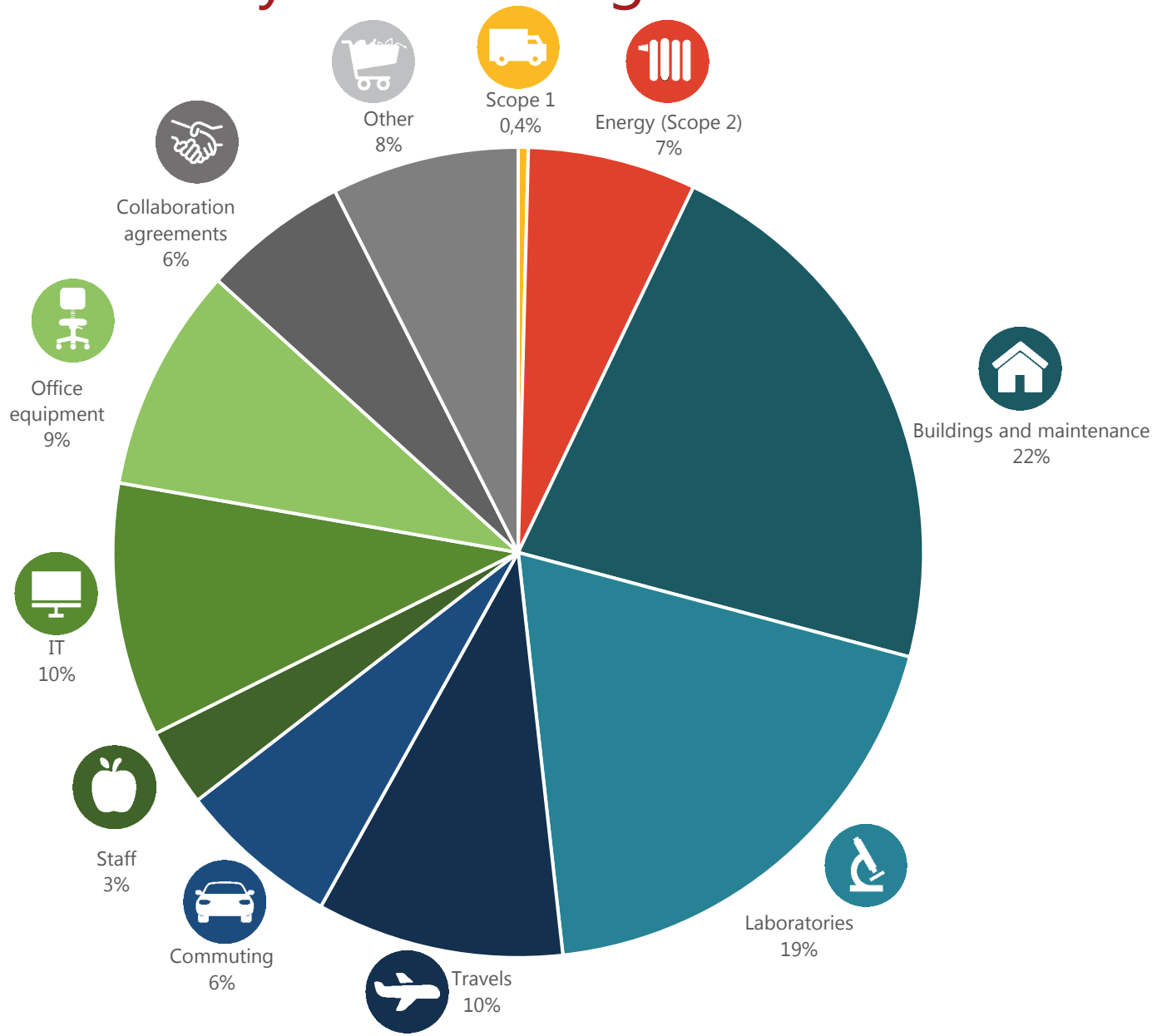
- Scope 1: -32%.
- Scope 2: -63%.
- Scope 3: -11%.

Scope 1 accounted for 0.4% of total emissions in 2022 and is therefore not included as a focal point in this report.

Total CO_2e emissions by categories

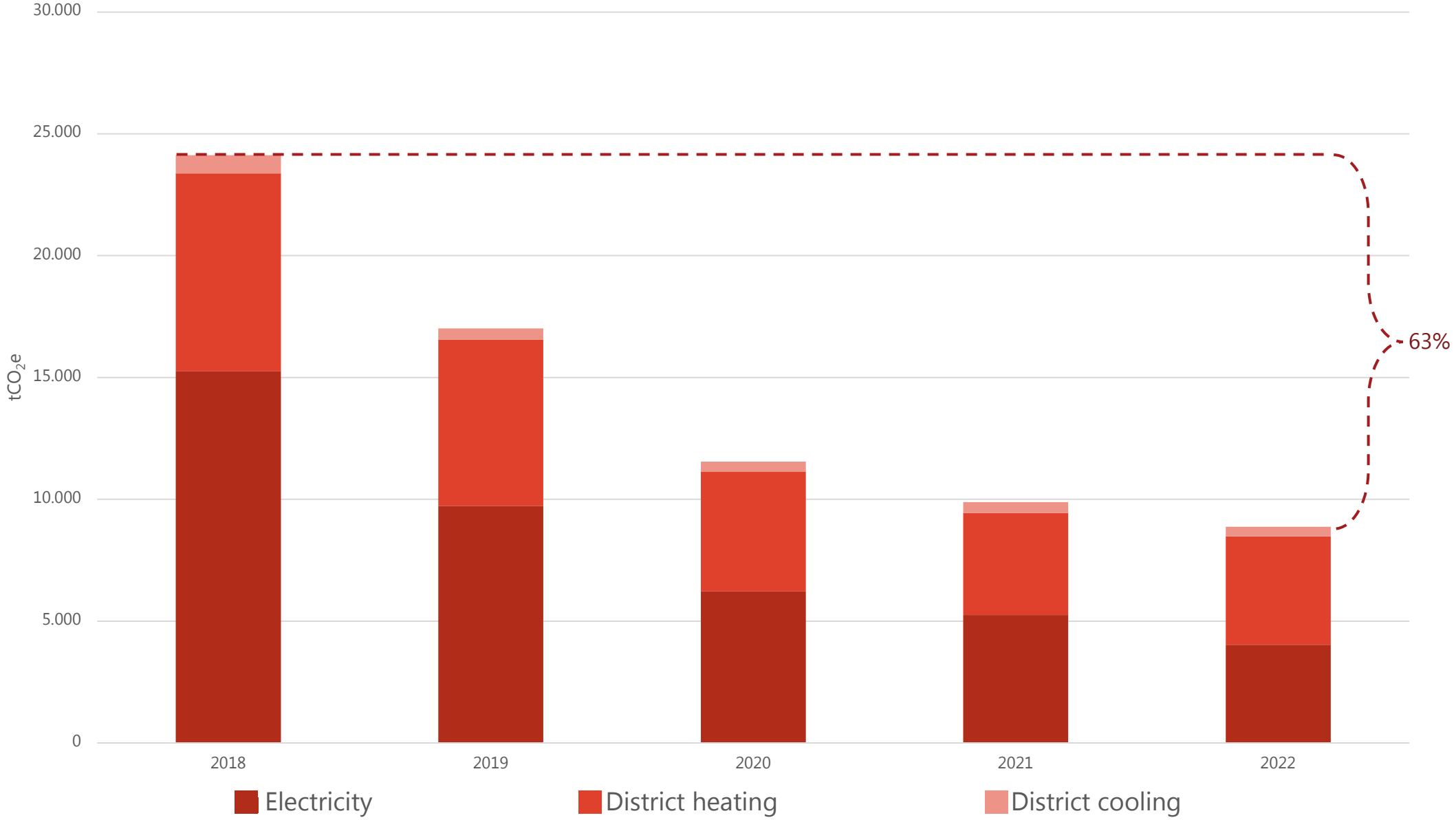


CO_2e emissions 2022 by main categories



3. Scope 2

Scope 2 – distribution of CO_2e emissions on delivered energy



Total CO2e emissions from scope 2 were **8,900 tonnes**

The reduction from 2018-2022 was -**63%**. The development was primarily due to a bigger part of renewable energy in the electricity and district heating supplies.

The reduction is distributed as follows:

- Electricity: -**75%**
- District heating: -**45%**
- District cooling: -**48%**

Development in emission factors and energy consumption

Electricity, district heating and cooling are supplied by external utilities. The transition to more climate-friendly forms of production contributes to a continued reduction in the emission factor per MWh and thereby to a significant reduction in the University's scope 2 emissions.

UCPH has achieved energy savings that have contributed to the reduction of the scope 2 emissions in the period.

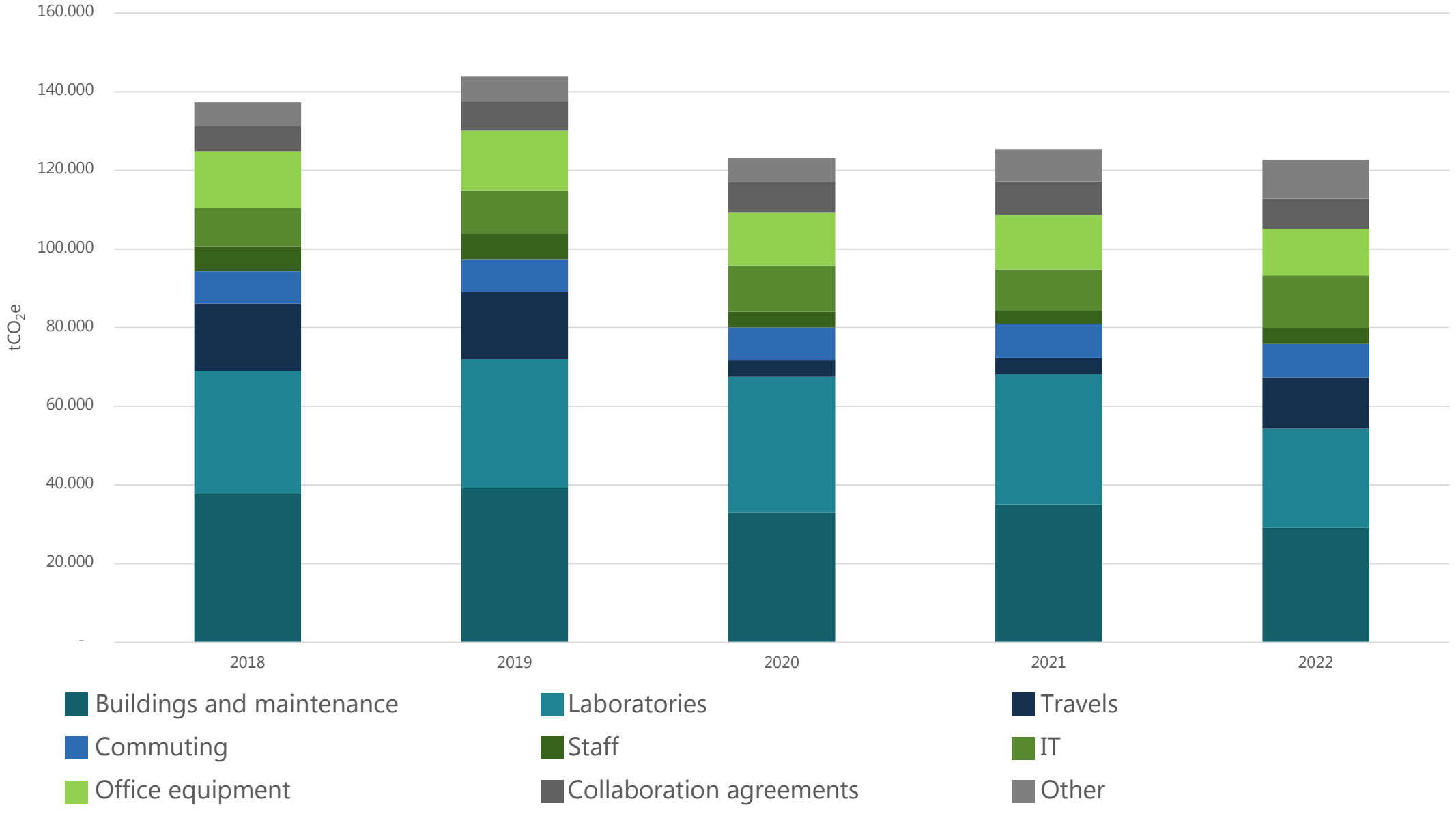
Energy consumption MWh	2018	2019	2020	2021	2022	Development 2018 – 2022
Electricity	73,647	73,248	69,950	72,180	72,528	-2%
District heating	89,631	83,363	76,101	91,068	79,868	-11%
District cooling	12,334	11,932	12,210	12,801	12,911	+5%

Emissions kg CO_2e per MWh	2018	2019	2020	2021	2022	Development 2018 – 2022
Electricity	207	133	89	73	56	-73%
District heating	89	80	64	46	55	-38%
District cooling	61	39	33	35	30	-50%

Biomass is calculated by the utilities according to current international standards such as 0 kg CO2eq. The current research consensus is that this is inaccurate. If it were to be changed, the emission factors would rise significantly and so would UCPH's scope 2 emissions.

4. Scope 3

Scope 3 – Distribution of CO_2e emissions by main categories



The total reduction for scope 3 was -**11%.** from 2018-2022

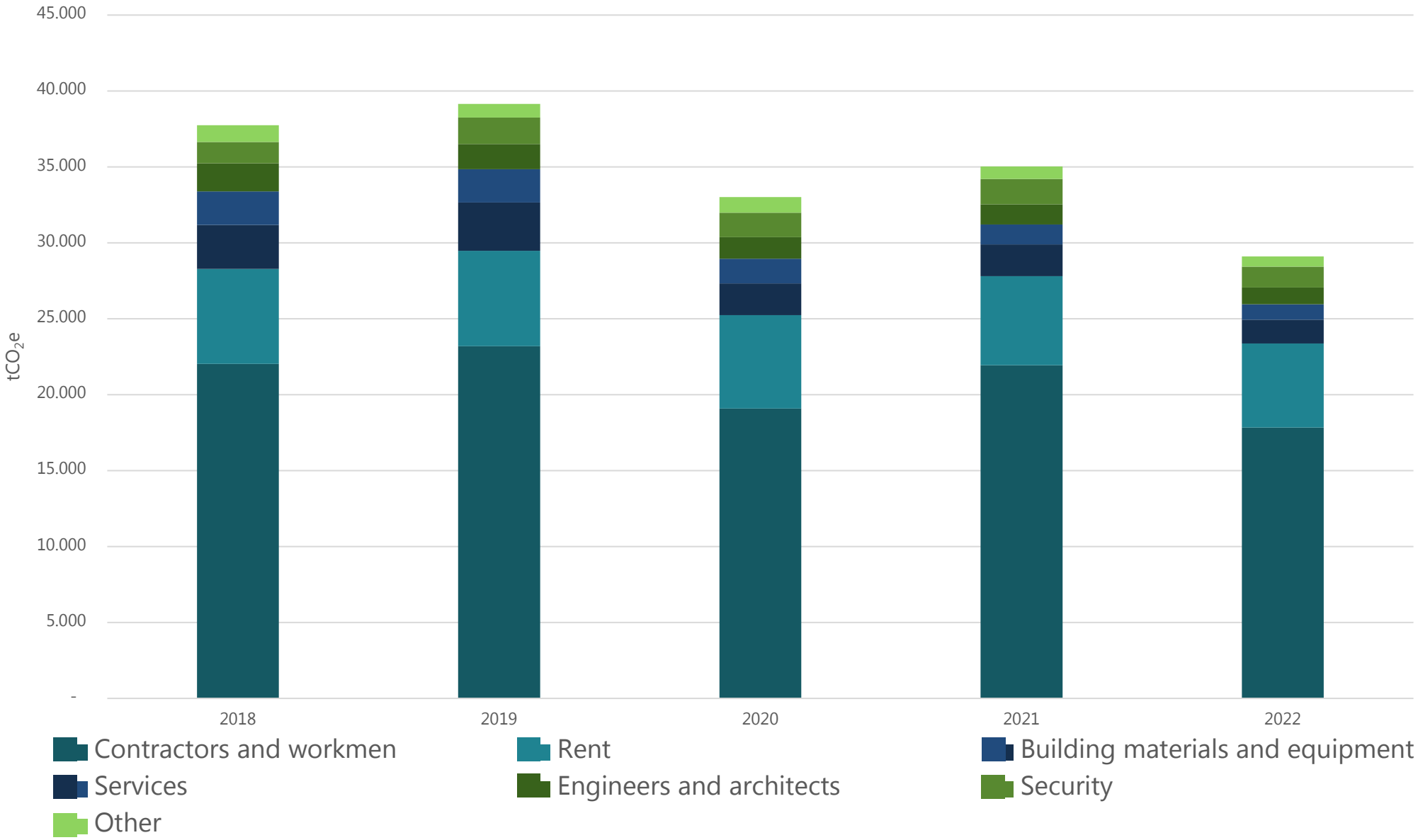
The main reason is lower maintenance and laboratory spending.

Scope 3 categories

List of what the sub-categories under scope 3 emissions comprise.

Sub-category	Content in sub-category	Development 2018-2022
Buildings and maintenance 	Contractors and workmen (externals using building materials), building materials and tools (internals), engineers and architects, security, services (interior decoration, lifts, plumbing and sewer services, etc.), other (e.g., production and construction machinery), buildings (including the total number of rented m2).	-23%
Laboratories 	Machinery and equipment, consumer goods, livestock (feed, litter, animals and equipment), chemicals and gasses, services, other (e.g., furnishings). *The reduction from 2021 to 2022 is assessed to be not accurate and will be analysed in detail.*	*-19%*
Travels 	Travels by air, car, train, taxi, bus and ferry. Hotel accommodation, conferences, meeting facilities, restaurants and travel agency expenses.	-24%
Commuting 	Car, bus and train commuting for work or studying.	+4%
Staff 	Canteen services, food and beverages, education and courses, work environment services, entertainment, etc.	-36%
IT 	Hardware (pc, screens, servers, etc.), AV equipment, printers & multi-purpose equipment, software, counselling, service.	+38%
Office equipment 	Furniture and fixtures, freight and relocation services, cleaning, paper, graphical and brand products, administrative services (consultants, recruitment, insurance and other services).	-18%
Collaboration agreements 	Agreements with other universities, associations and organisations, public-institution settlements, library services.	+21%
Other 	Unspecified procurement, vehicles, exhibitions and museums.	+63%

Scope 3 – Buildings and maintenance

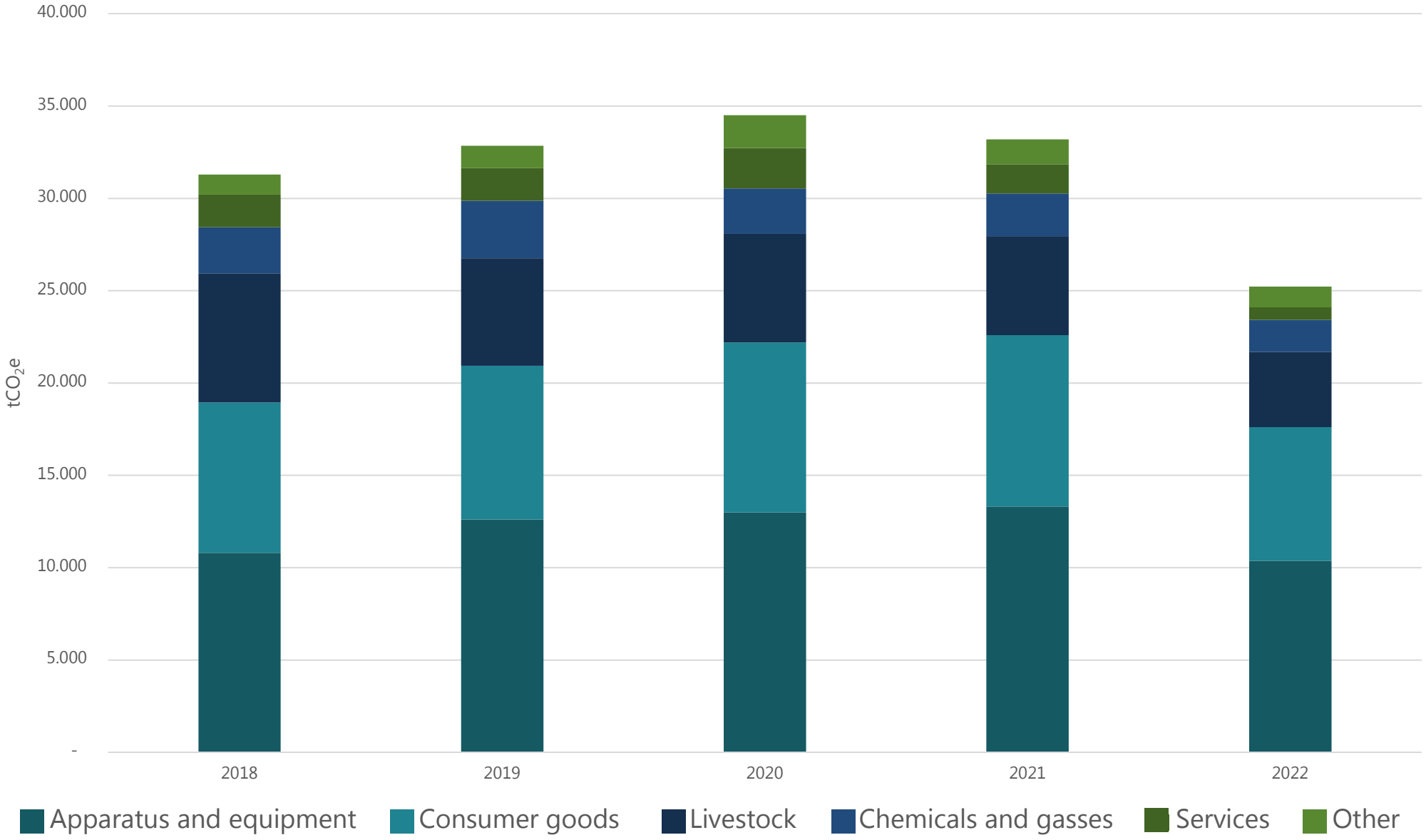


'Buildings and maintenance' was reduced by -**23%** from 2018-2022.

The development in the sub-categories was as follows:

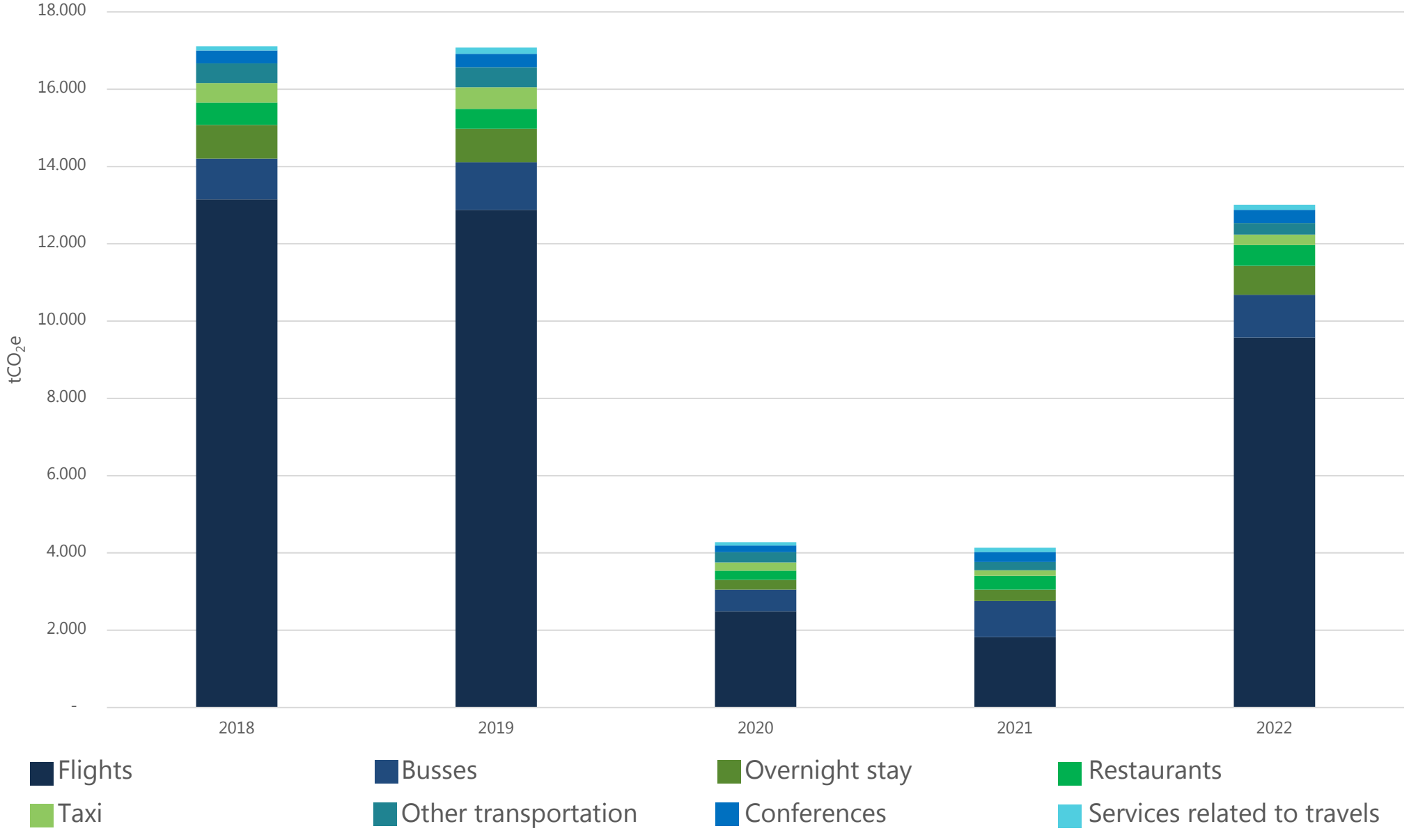
- Contractors and workmen: **-19%**
- Rent: **-12%**
- Building materials and equipment: **-45%**
- Services: **-54%**
- Engineers and architects: **-40%**
- Security: **-3%**
- Other: **-37%**

Scope 3 – Laboratories



The procurement category for laboratories for 2022 and the significant decrease from 2021 is assessed to be not accurate and will be analysed in more detail.

Scope 3 – Travels

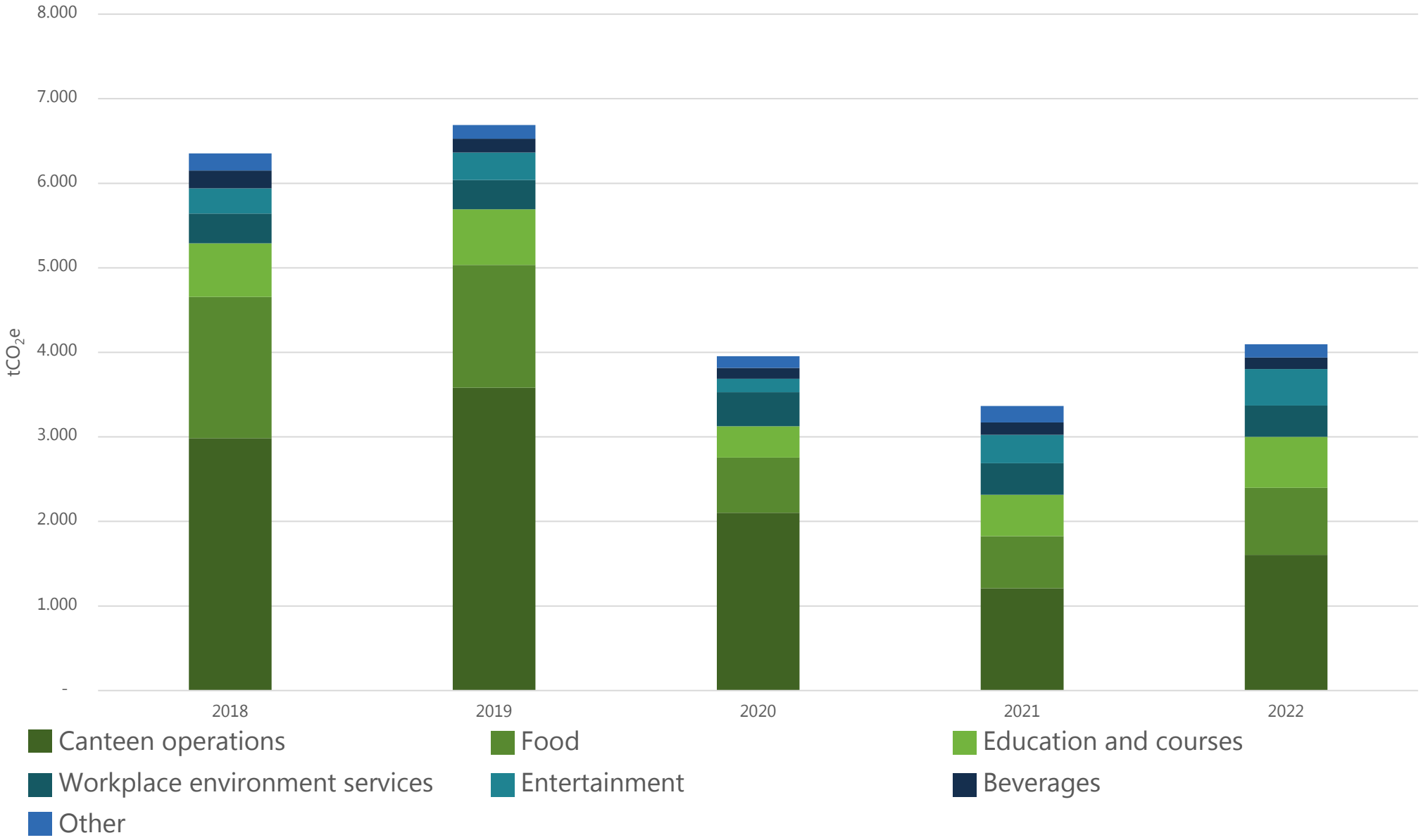


'Travels' was reduced by **24%** from 2018-2022.

The development in the sub-categories was as follows:

- Flights: **-27%**
- Busses: **+5%**
- Overnight stays: **-14%**
- Restaurants: **-8%**
- Taxi: **-46%**
- Other transportation: **-41%**
- Conferences: **+1%**
- Services related to travels: **+ 22%**

Scope 3 – Staff

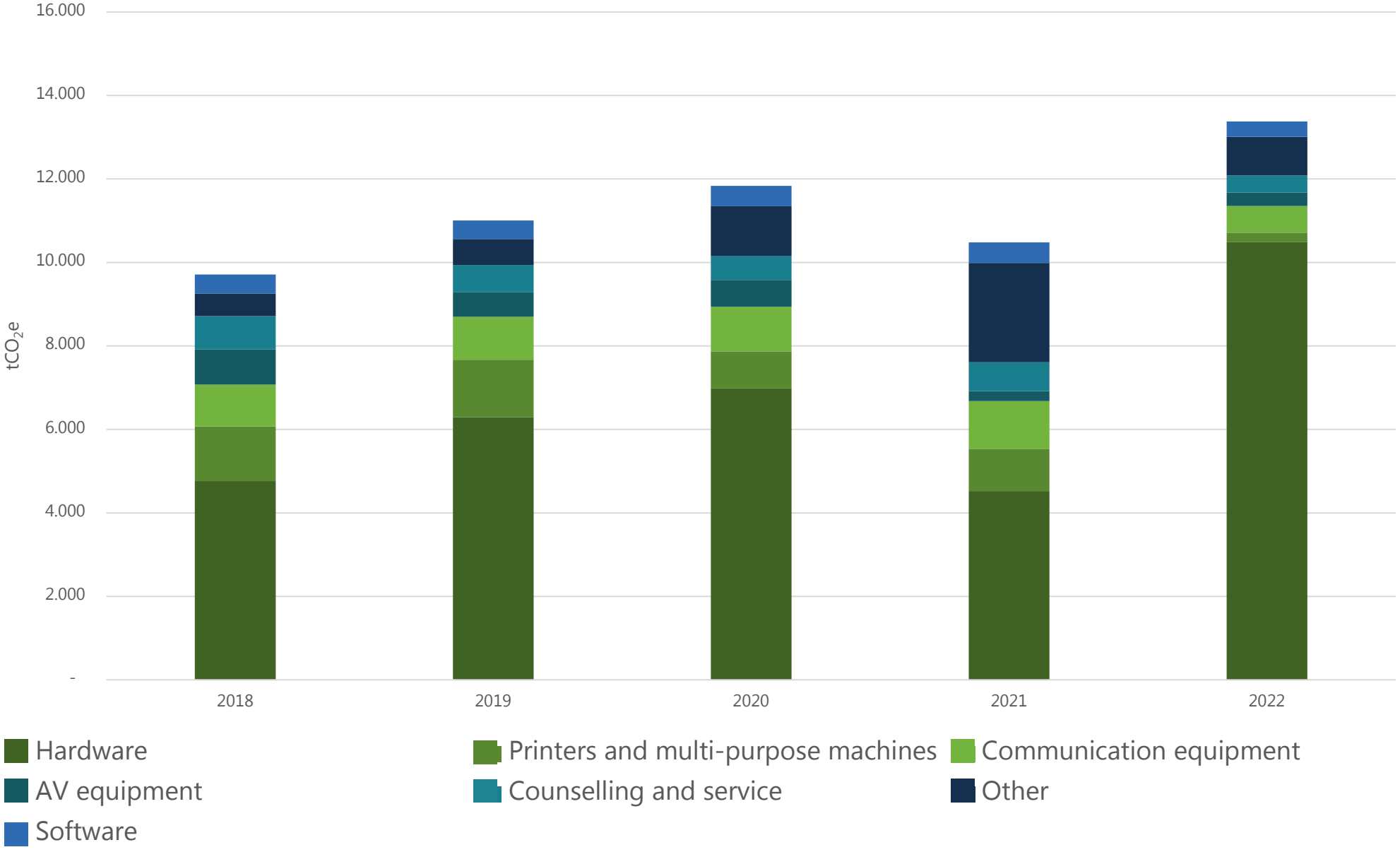


The 'Staff' category was reduced by **36%** from 2018-2022.

The development in the sub-categories was as follows:

- Canteen operations: **-46 %**
- Food: **-52 %**
- Education and courses: **-5 %**
- Work environment services: **+5 %**
- Entertainment: **+45 %**
- Beverages: **-36 %**
- Other: **-22 %**

Scope 3 – IT

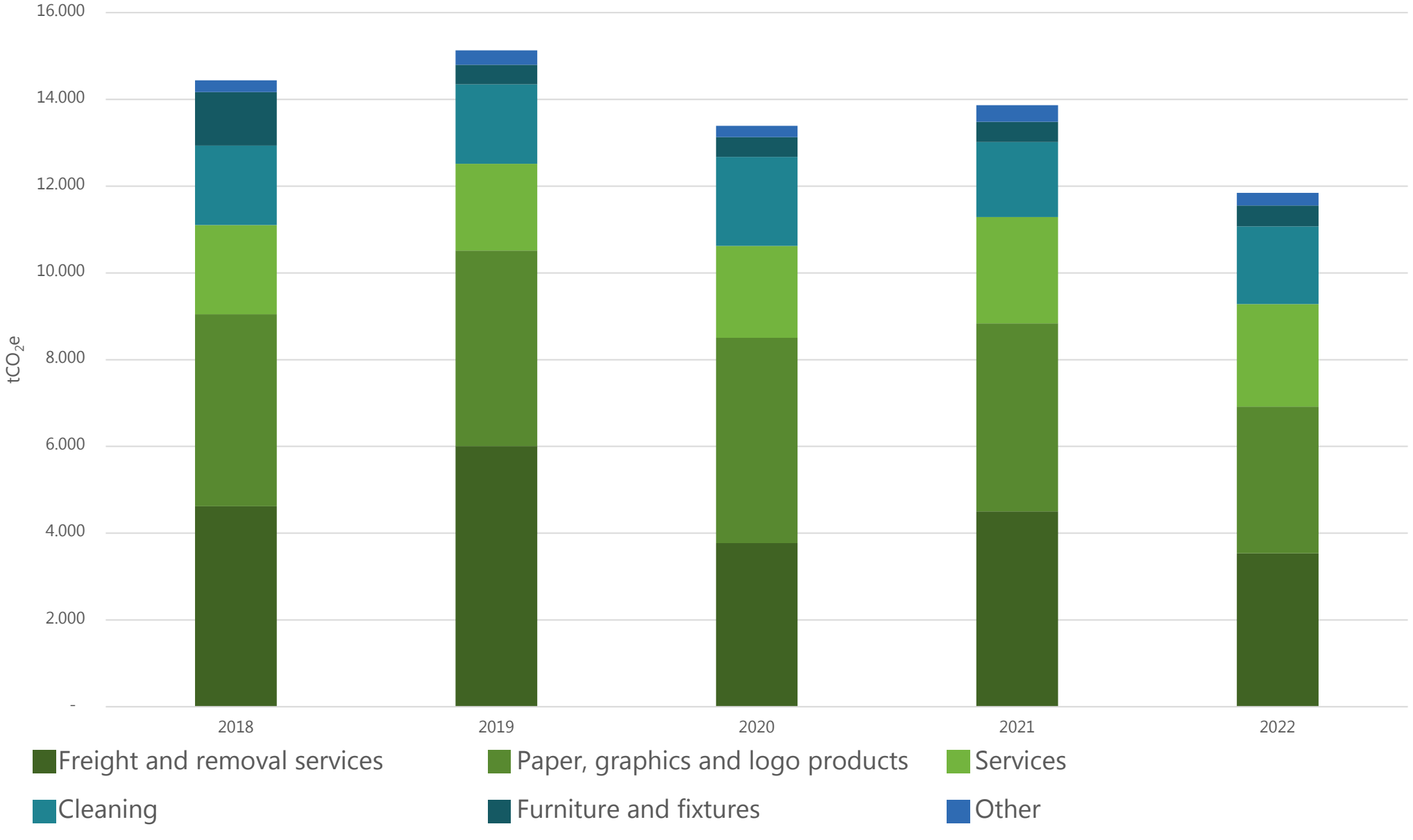


The 'IT' category grew by **38%** from 2018-2022

The development in the sub-categories was as follows:

- Hardware: **+120%**
- Printers and multi-purpose machines: **-83%**
- Communication equipment: **-36%**
- AV equipment: **-62%**
- Counselling and service: **-49%**
- Other: **+72%**
- Software: **-19%**

Scope 3 – Office equipment

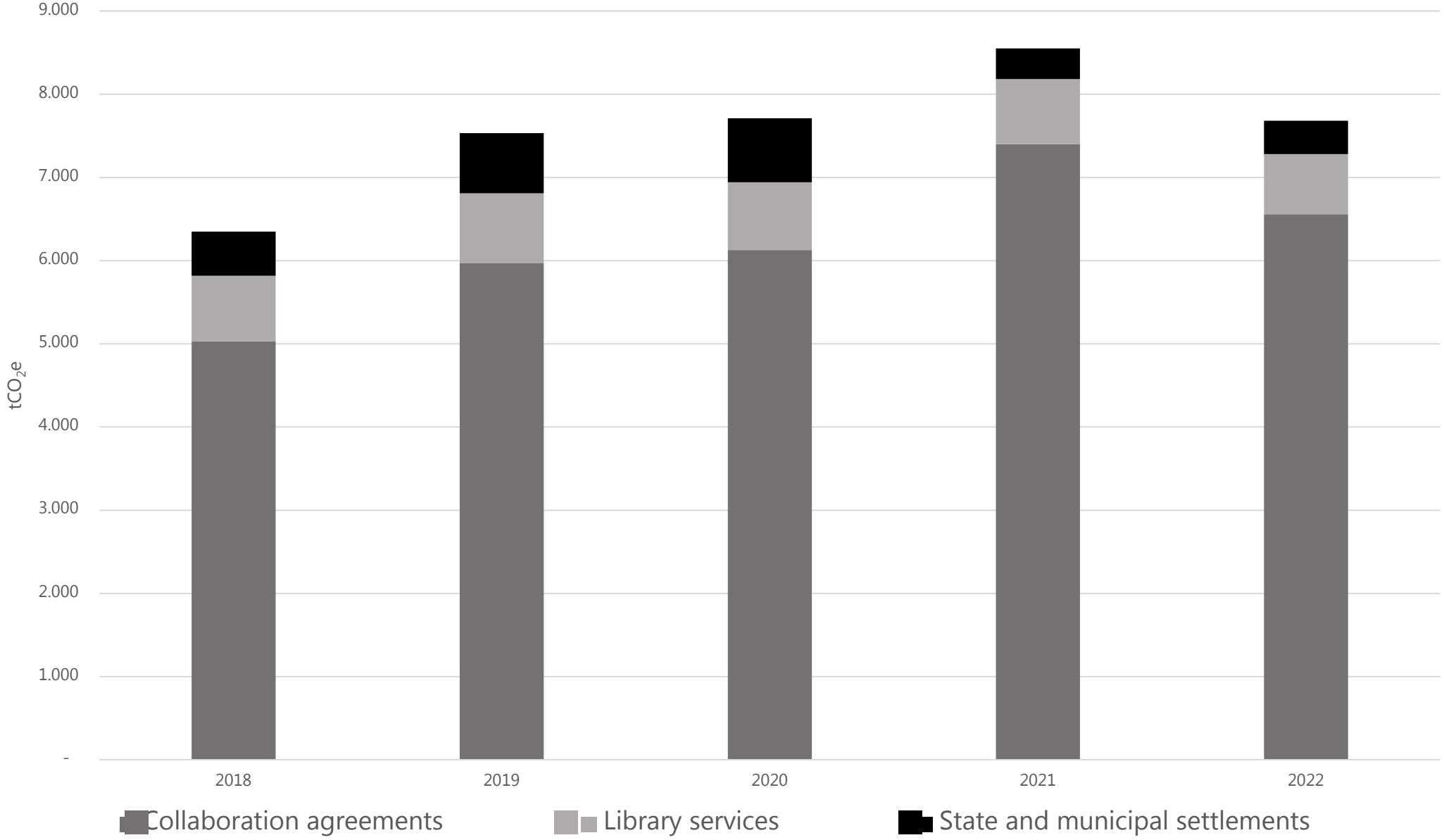


'Office equipment' was reduced by **18%** from 2018-2022.

The development in the sub-categories was as follows:

- Freight and removal services: **-23%**
- Paper, graphics and brand products: **-24%**
- Services: **+15%**
- Cleaning: **-2%**
- Furniture and fixtures: **-61%**
- Other: **+8%**

Scope 3 – Collaboration agreements



'Collaboration agreements" grew by **21%** from 2018-2022.

The development in the sub-categories was as follows:

- Collaboration agreements with universities, associations and other organisations: **+30%**
- Library services: **-8%**
- State and municipal settlements: **-25%**

5. Methodology

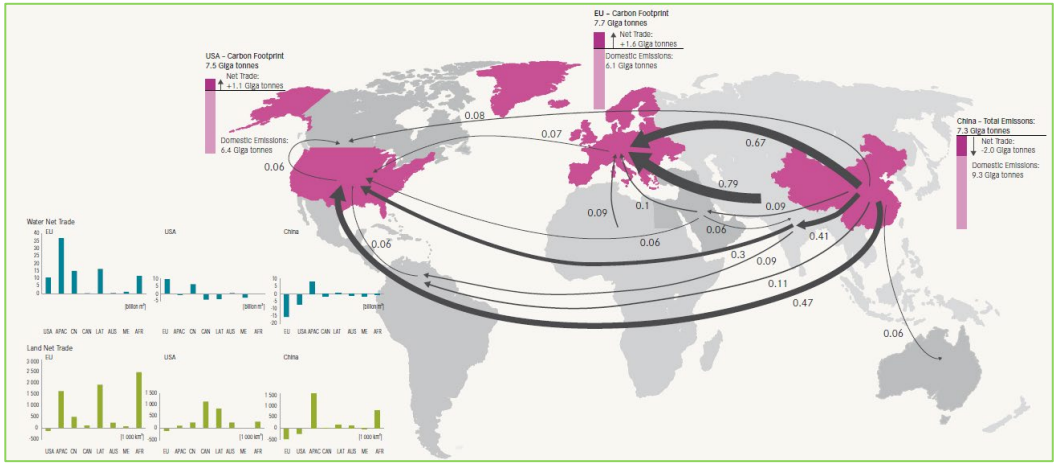
Methodology

- UCPH's approach is based on the GHG protocol, the internationally recognised approach used by companies and organisations across the globe. Greenhouse Gas Protocol | (ghgprotocol.org)
- UCPH participates in a task force under Universities Denmark to develop a joint approach to climate accounting. The approach used by UCPH here is in accordance with this work, which is also based on the GHG protocol.
- In terms of methodology, the area is currently undergoing rapid development both in DK and internationally. There are still major uncertainties, especially on most of the scope 3 categories (upstream).

UCPH consumption data (units)

Methodology

EXIOBASEv4 is used on several scope 3 categories as the best possible database of emission factors.



https://www.exiobase.eu/

Description of EXIOBASEv4:

- Global, detailed, multi-regional climate and environment database.
- The primary tool for total calculations of climate footprint in scope 3 in DK.
  - Nationally (Global Reporting, Klimakompasset, National green purchasing strategy).
  - Used by recognised climate advisors (NIRAS, VMAS, Concito and others).
- Further development supported by the KR Foundation by approx. DKK 39 million, so further improvements are expected in the coming years.
- A new version 4 was developed in 2021-2023 and UCPH is amongst the first to use it. Improvements compared to version 3:
  - Better statistical basis, including global statistics from 2016 in EXIOBASE v3.
  - Multiple product categories (from 164 to +400).

When assessing the effects of the concrete actions within the subcategory's other data/methods than DKK and EXIOBASE are needed. Product-specific LCA accounts are assessed to be the best approach for several scope 3 categories but are not available for several product areas at present.

Methodology - overview

	UCPH data source	Emission factor	Comments
Scope 1	Recorded consumption obtained from UCPH Finance and MinEnergi2	Official factors from utilities (natural gas) and VRI- and GHG Protocol (fuel, natural gas and oil). DK-Uni method	
Scope 2 - electricity - district heating - district cooling	Measured consumption at UCPH (MWh), obtained from MinEnergi2	Official factors from the utilities' environmental declarations. DK-Uni method	National change in the emission factor for biomass from 0 CO2e today. This could mean a considerable increase in UCPH's scope 2 emissions.
Scope 3	Consumption (DKK) from purchasing Units External sources	EXIOBASE v4 DEFRA EcoInvent The Big Climate Database	
Buildings and maintenance	Consumption (DKK)	EXIOBASEv4	Going forward there will be a need to account for UCPH's consumption in physical units, to monitor more precise yearly development.
Laboratories	Consumption (DKK)	EXIOBASEv4	Going forward there will be a need to account for UCPH's consumption in physical units to monitor the yearly development more precisely.
Travels, conferences etc.	Consumption (DKK), and CWT data	EXIOBASEv4 and CWT	
- Flights	CWT data + scaling on account of Economic data	DEFRA, with RF factor	Precise data for purchasing via CWT. Scaling via UCPH's purchasing data.
Staff	Consumption (DKK), and canteen operator data	EXIOBASEv4 and	
- Food	Compass Group (+scaling for other canteen suppliers)	The Big Climate Database (based on EXIOBASEv3)	Going forward there will be a need to account for the climate footprint for the food used by canteen operators.
IT	Purchased units + Consumption (DKK)	EcoInvent + Supplier LCA+ EXIOBASE v3	Done by external advisor
Other	Consumption (DKK)	EXIOBASE v4	
Commuting	The Danish National Travel Survey (DTU)	Danish Energy Agency	Not accounted for in climate account v1 (2019)

Detailed picture of the applied data sources, methods, emission factors and sources for these can be seen in 'Metodebilag for KU's Klimaregnskab 2018-22' (in Danish).

Delimitations

UCPH's climate accounting is undergoing continuous development in terms of methodology, approaches and boundaries.

In accordance with the GHG Protocol, investments (scope 3.15) are not currently accounted for due to statement on the operational approach. In addition, downstream activities are not included, as UCPH, like other universities in Denmark, does not have any significant downstream activities. UCPH rents out buildings to external actors, and these premises have been deducted from the calculation of scope 3.2.

Contact

Developed under the UCPH programme for sustainable transition, February – June 2023

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