Aalto University: Carbon Footprint Calculation for 2024

Aalto University
Aalto University Campus & Real Estate
Granlund Oy

6.2.2025

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Introduction to Carbon Footprint Calculation and Results for 2024

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Aalto Emissions reduction and nature goals

A flourishing community striving towards

- Net-zero GHG emissions for scope 1 and 2 by 2030
- Halving scope 3 GHG emissions by 2035
- Increased space for biodiversity and resilience through nature-oriented design

Connecting our strengths to create solutions for grand challenges by

- Data-centric sustainability impact tracking
- Accelerating green transition through rich collaborations with societal changemakers
- Local and global networks for nature-positive solutions

Pioneering and experimenting sustainable solutions in our operations

- Enabling development of a strong sustainability culture
- Aalto as a community driven living lab

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*Goals exclude investments and non-material procurements. Goals related to these will be added as calculation methods mature

Emissions calculation - Background

- Aalto university calculates its carbon emissions **annually** and has a program in place to set and follow actions to increase sustainability of operations and **reduce GHG emissions**.
- This calculation is for 2024 and presents the total amount of emissions and a comparison to previous years. Emission categories have stayed the same as in 2022 - 2023.
- Operational processes, GHG calculation methods and emissions data are constantly improved. Some emission factors have been changed to more accurate sources. Changes in emissions and emission categories are explained in the report.
- We use the most accurate calculation method possible to calculate emissions from procurement. For example, emissions from meals are based on the number of meals calculated by restaurants and emission factors. If an accurate method is not available, emissions from procurements are calculated using a cost-based method with average emission factors for different goods and expenses in the reporting year. Emissions calculated in this way are more general in nature than those based on specific units, such as prepared meals or consumed electricity.

Emissions calculation - Goals

- Aalto University publishes a comprehensive greenhouse gas footprint according to the GHG protocol.
  - All the emissions are tCO_2e, which cover the emissions of all seven required greenhouse gases(Carbon dioxide, Methane, Nitrous oxide, Hydrofluorocarbons, PFCs, Sulfur hexafluoride and Nitrogen trifluoride).
- The calculation and emission factors used are transparent and listed in the report.
  - The annual GHG results 2022 - 2024 are comparable. I.e. the changes between years result from Aalto University's operations rather than from changes in calculation methods or emission factors.
    - Emissions recalculated for purchased energy (electricity and district heating) for 2022 - 2023 with emission factors that are $kgCO_2e/MWh$, not $kgCO_2/MWh$, which only cover carbon dioxide emissions. Especially in district heating production, significant amount of methane and nitrogen oxides are emitted, which previous emission factors did not cover.

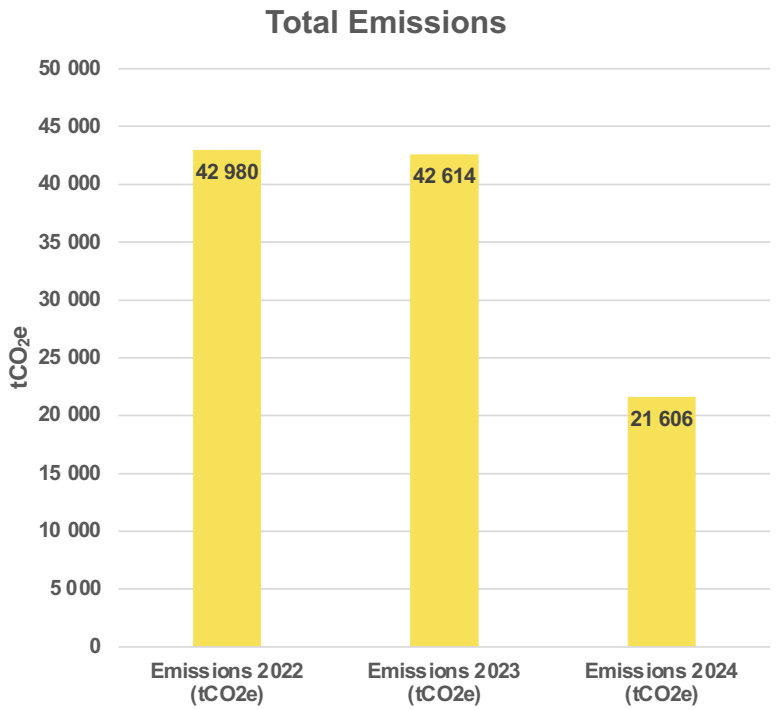
Calculation methods

GHG Protocol

- The calculation has been conducted according to the internationally widely used GHG Protocol method, covering scopes 1 - 3 of the standard.
- Emission categories in the report are divided into scopes 1 - 3. Furthermore, scope 3 emission categories have been divided into 15 subcategories.
  - Subcategory 15 Investments have been excluded from Aalto University's review
- All emission are tons of carbon dioxide equivalent (tCO_2e), i.e. they cover all the seven greenhouse gases determined in the GHG Protocol. Most emission factors are from DEFRA (2024) or Exiobase (2019) databases. District heating emissions are from Paikallisvoima. Emission factors are mainly regional to Finland, but some are European averages.
  - Calculation categories have been kept the same as in the 2022 - 2023 calculations. In all the categories, where emission factors changed, emissions have been calculated retrospectively for 2022 - 2023.

Main results

- **Emissions decreased 49 % in 2024** compared to 2023 mainly due to emission free purchased electricity.
- Main sources of emissions are **energy procurement, business travel, commuting, energy life-cycle emissions and procurements.**
- Emissions/FTE decreased from 2,17 tCO_2e to **1,06 tCO_2e**, while the number of students and staff increased by approximately 700
- The total GHG emissions were **21 606 tCO_2e in 2024**



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Main changes 2024 vs. 2023

Energy procurement: -87 % due to purchase of certified emission-free electricity and district heating products

Construction projects: -84 % due to decrease in amount of construction compared to 2023.

Renovation: -65 % due to less spending on renovation projects

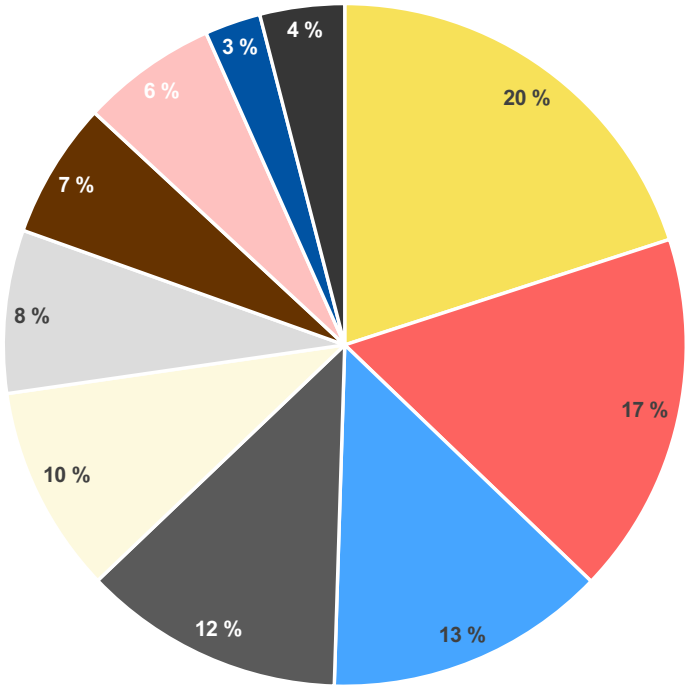
Refrigerants: -43 % due to less leakages in cooling systems

Commuting, students: due to increased amount of students and changed average distances travelled to Aalto campuses

The changes are visualized on the next page.

Total market-based emissions distribution 2024

- **Biggest emission sources** are business travel, procurements, energy procurement, commuting (students) and energy life cycle emissions (well-to-tank emissions of energy generation).
- **Emissions of purchased energy are low** due to the majority of purchased electricity being emission-free and emission-free district heating in most of the properties.



Emission type	%
Procurements*	20 %
Business travel (flights and other travel)	17 %
Energy procurement (Market-based method)	13 %
Commuting, students	12 %
Energy life cycle emissions (electricity and renewable energy)	10 %
Commuting, staff	8 %
ICT devices & infrastucture	7 %
Food (staff and student restaurants)	6 %
Construction projects	3 %
Other Emissions - Municipal waste - Refrigerants - Maintenance project - Renovation and space development projects - Water - Owned and leased vehicle - Energy production	4 %

*Procurements contain purchased products but not purchased services or investments. The emission factors for purchased products and service are spend-based, which is an average, not the most accurate way to evaluate emissions. Procurement emissions will get more accurate in upcoming years, as especially service producers begin to calculate accurate emissions of their operations.

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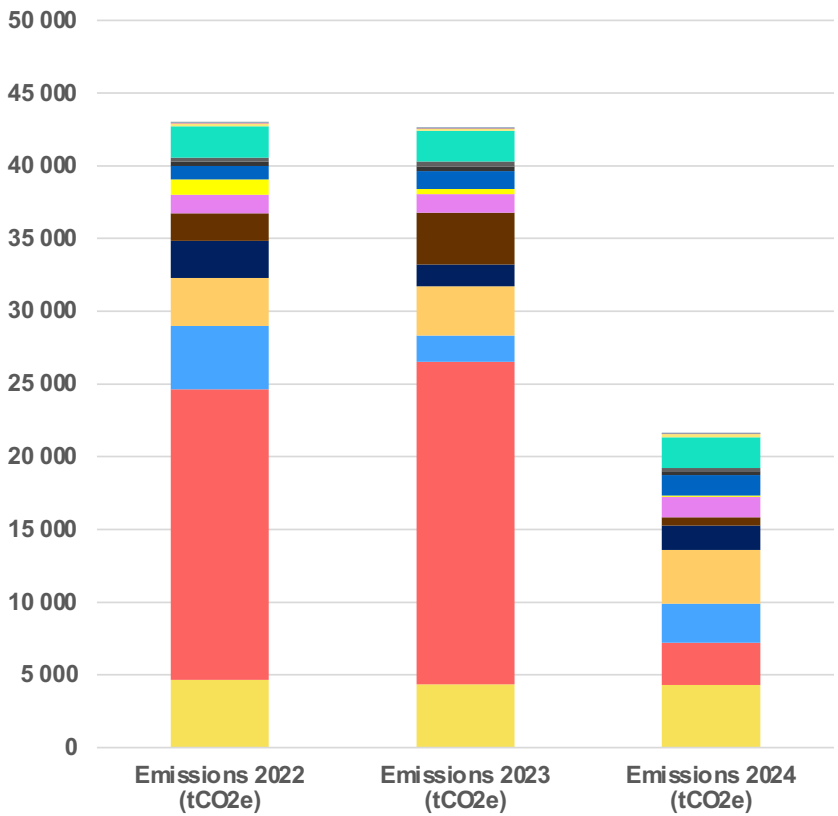
Annual emissions comparison



- Procurements*
- Energy procurement (Market-based method)
- Commuting, students
- Business travel (flights and other travel)
- Commuting, staff
- Construction projects
- ICT devices & infrastucture
- Renovation and space development projects
- Food (staff and student restaurants)
- Municipal waste
- Refrigerants
- Energy life cycle emissions (electricity and renewable energy)
- Maintenance projects
- Water
- Energy production
- Owned and leased vehicles

Contrary to GHG Protocol, Scope 3 category 15 Investments are outside the scope of review.

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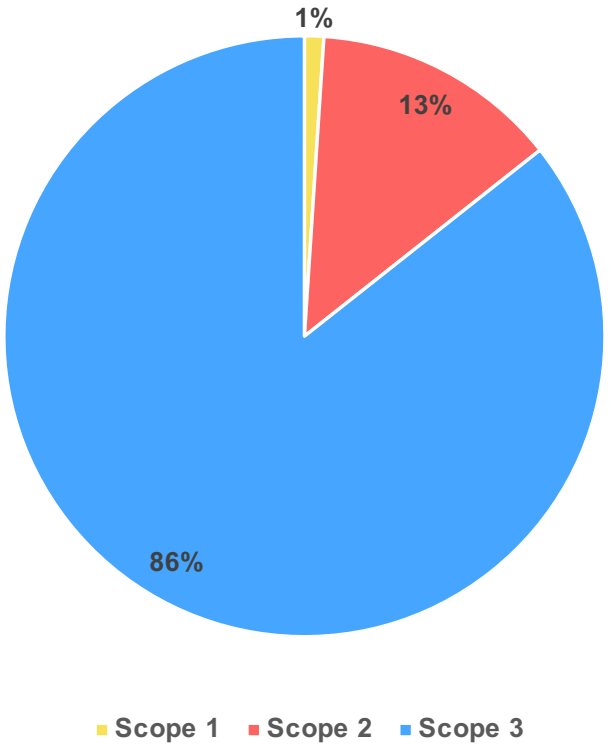
Market-based emissions by scope

86 % of Aalto University's emissions are scope 3 emissions

The distribution is typical for university operations: the number of students and staff using the properties is momentous. Commuting, business travel and necessary products and services in Aalto campuses form significant amount of emissions. Scope 2 emissions are also low due to certified emission-free electricity and district heating products.

- **Scope 1:** Energy production, refrigerants, fuel burning in owned and leased vehicles
- **Scope 2:** Energy procurement (Market-based method)
- **Scope 3:** Construction and renovation projects, Travel, Procurement, Commuting of staff and students, ICT, Food, Indirect energy life cycle emissions, Water consumption, Waste



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Total market-based emissions distribution 2024

Emission type	Emissions (tCO_2e)	Percentage	Scope	Scope 3 category
Procurements*	4 321	20,0 %	3	3.1
Business travel (flights and other travel)	3 710	17,2 %	3	3.6
Energy procurement (Market-based method)	2 877	13,3 %	2	
Commuting, students	2 676	12,4 %	3	3.7
Energy life cycle emissions (electricity and renewable energy)	2 127	9,8 %	3	3.3
Commuting, staff	1 670	7,7 %	3	3.7
ICT devices & infrastucture	1 396	6,5 %	3	3.1
Food (staff and student restaurants)	1 390	6,4 %	3	3.1
Construction projects	572	2,6 %	3	3.1
Municipal waste	268	1,2 %	3	3.5
Refrigerants	202	0,9 %	1	
Maintenance projects	195	0,9 %	3	3.1
Renovation and space development projects	129	0,6 %	3	3.1
Water	51	0,2 %	3	3.5
Owned and leased vehicles	18	0,1 %	1	
Energy production	4	0,0 %	1	
Total	21 606	100,0 %		

*Procurements contain purchased products and excludes purchased services.

Scope 3.1 also includes long-term investments. Some of these investments have been calculated by estimating the investment amounts based on annual depreciation.

The clarificatios of the calculation are presented on pages 32 and 33. Scope 3 category 15 Investments are outside the scope of review.

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Total location-based emissions distribution 2024

Emission type	Emissions (tCO_2e)	Percentage	Scope	Scope 3 category
Procurements*	4 321	20,0 %	3	3.1
Business travel (flights and other travel)	3 710	17,2 %	3	3.6
Energy procurement (Location-based method)	6 480	13,3 %	2	
Commuting, students	2 676	12,4 %	3	3.7
Energy life cycle emissions (electricity and renewable energy)	2 127	9,8 %	3	3.3
Commuting, staff	1 670	7,7 %	3	3.7
ICT devices & infrastucture	1 396	6,5 %	3	3.1
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Renovation and space development projects	129	0,6 %	3	3.1
Water	51	0,2 %	3	3.5
Owned and leased vehicles	18	0,1 %	1	
Energy production	4	0,0 %	1	
Total	25 208	100,0 %		

*Procurements contain purchased products and excludes purchased services.

Scope 3.1 also includes long-term investments. Some of these investments have been calculated by estimating the investment amounts based on annual depreciation.

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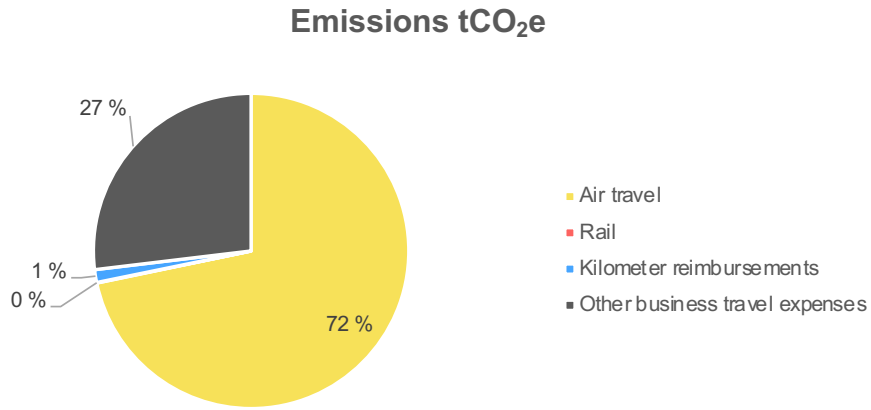
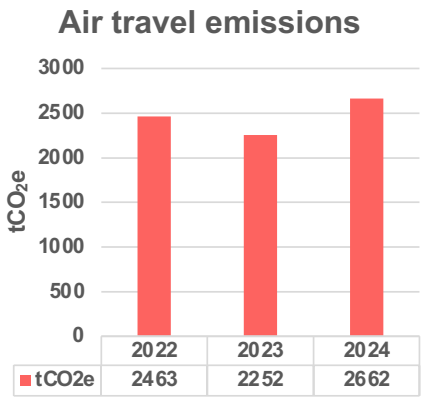
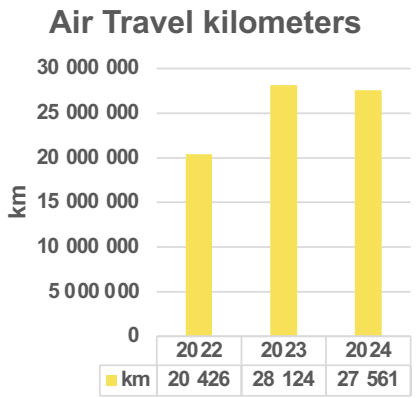
Business travel

- **Business travel is dominated by flight travel**
- **Travel has slightly decreased since 2023.**
- **Air traffic emissions have slightly increased due to an increase in emission factors used by airlines.**
- **Aalto travel policies guide users in evaluating the need for travel, the possibilities to replace the trip with alternative meeting methods. The climate-friendliness of different travel options are evaluated using a decision tree**
- **Other business travel emissions are calculated based on costs. This calculation method is less accurate. The calculation method will be refined in the coming years.**
- **Other business travel emissions also include hotel costs. Accounting for them is recommended but voluntary under the GHG Protocol.**

➢ **Further means to lower emissions include, e.g.: setting carbon quotas to schools, traveling by train domestically, decreasing the number of long-haul flights and participants per event, using only direct flights, putting pressure on academic funders.**







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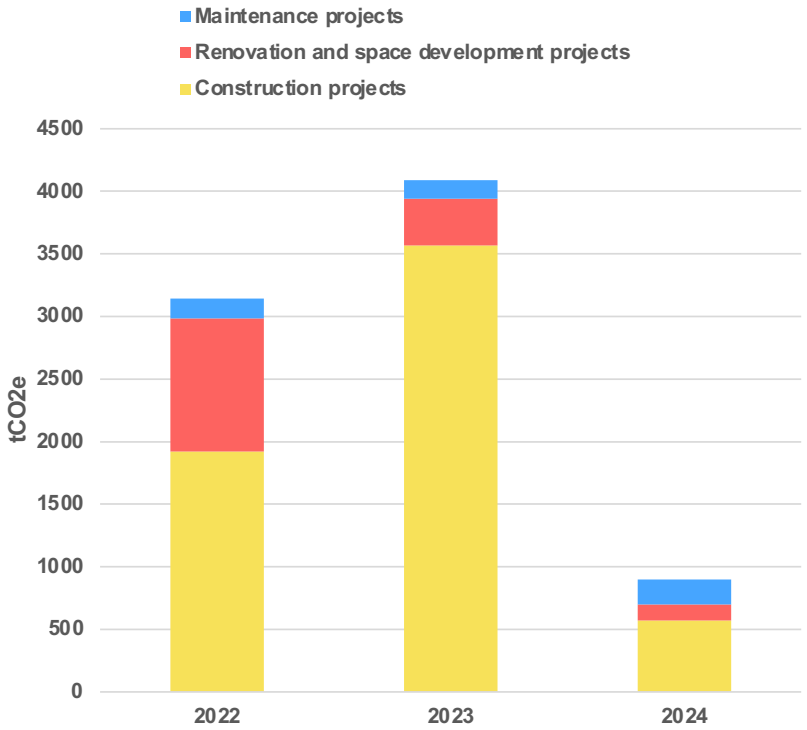
Construction and renovation

- Construction and renovation emissions have decreased significantly.
- The amount of space used for university activities has stayed the same even though the Aalto community has grown.
- Ongoing monitoring and thoughtful improvement of the utilization rate of space increases space efficiency and enables new ways of working and studying on campus.
- Upcoming legislation requires carbon calculation from new construction. Similarly, material listings are required to be produced.
- These advancements generate a basis for future carbon goal-setting as well as recycling of building materials
- Aalto aims for -15 % - 25 % reductions in carbon emissions of construction activities compared to a business as usual scenario
- Evaluation of the impact on nature and actions to increase biodiversity are included in campus development plans.

➢ Further emissions savings can be achieved by increasing life-cycle thinking in renovations and through constant improvement of utilization rates.



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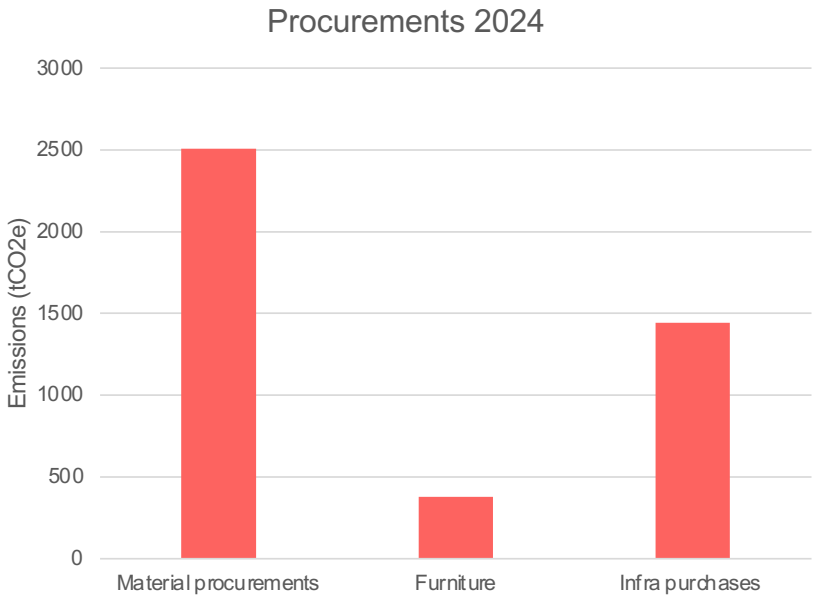
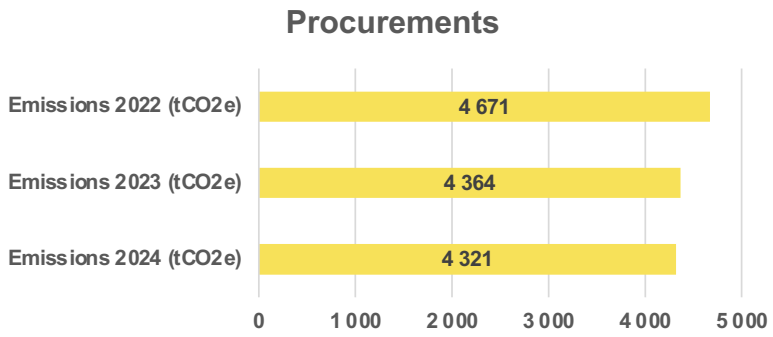
Procurements

- **Sustainability in procurements is driven by legal frameworks, Aalto code of conduct, procurement guidelines, sustainability requirements and sustainability dialogues with suppliers.**
- **Scrutiny of necessity, scope and magnitude of procurements support the achievement of sustainability goals**
- **Effort is put on the development of Aalto procurement and supplier processes, guidelines and sector specific competences. Aalto is also developing sustainability practices in co-operation with Finn-ARMA and other networks.**
- **Emissions of different goods and services are mainly calculated using spend-based method based on accounting data. Emissions are based on average emissions factors, which create a high degree of uncertainty especially in the non-material and service category.**
- **Current emissions calculation includes research infrastructure and furnishings and material procurement. Material procurement includes, among other things, office supplies and equipment, as well as teaching and research equipment.**
- **Reference calculations have also been made for non-material procurements. Emissions factors for non-material procurements include a very high degree of uncertainty and need to be developed before taken into use.**

Emissions can be further reduced through increasing awareness and training, continued scrutiny of procurements, life cycle thinking and stricter sustainability criteria including certificates and ecolabels.





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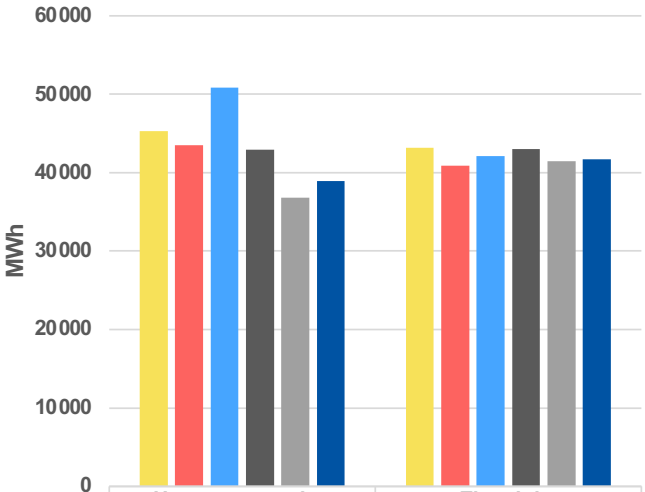
Energy consumption

- Switching to green electricity has enabled significant emissions savings in 2024
- Annual carbon dioxide emissions from energy consumption have been reduced by 97 % since 2012. However, the accuracy and calculation method of energy emissions have changed over the years, so a direct comparison is not entirely possible.
- Energy consumption increased slightly in 2024 compared to 2023.
- Energy savings are done in three broad categories: upgrades on building technology, building automation optimization and through energy-conserving habits of the building users.
- Actions towards carbon neutrality are described in the Aalto University planning guidelines. Most of the purchased electricity is emission-free and similarly properties in Espoo use Fortum's emission-free district heating.

➢ Continuous improvements on the control logics of the buildings gradually increase our energy efficiency

➢ Increasing solar power generation reduces energy bought from the grid



	Heat consumption MWh	Electricity consumption MWh
2019	45258	43195
2020	43513	40862
2021	50868	42153
2022	42939	42994
2023	36812	41449
2024	38932	41722

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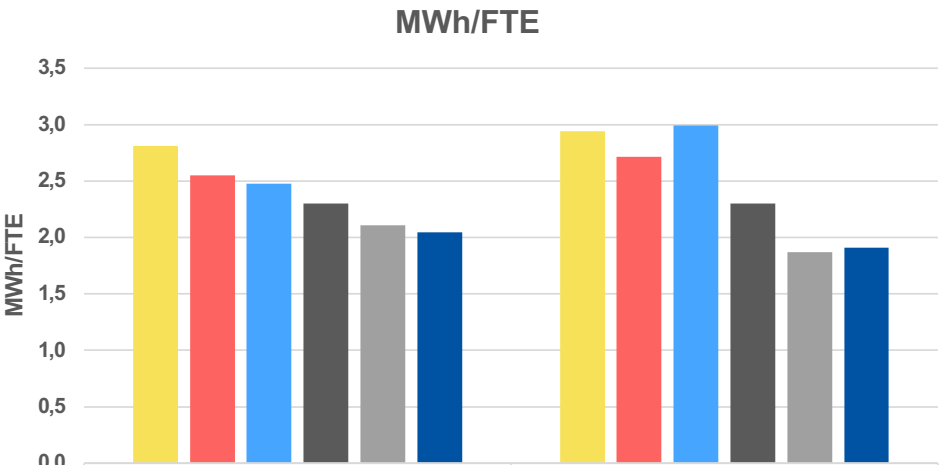
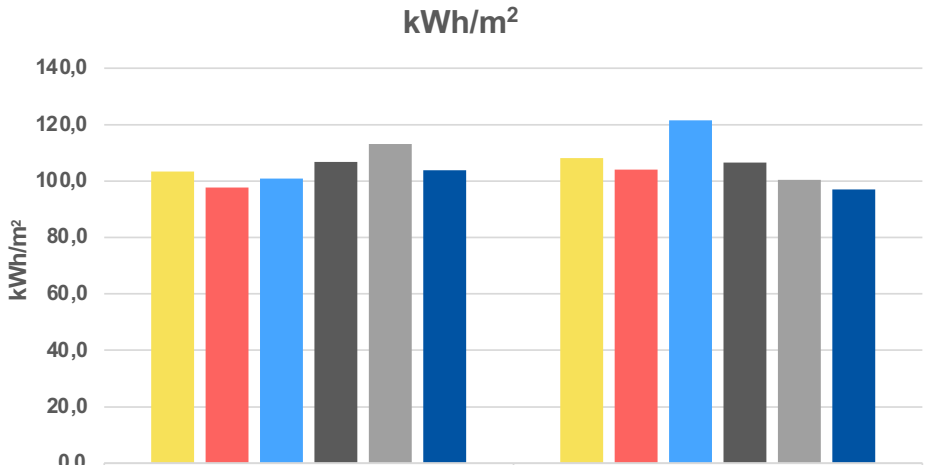
Specific energy consumption



	Electricity MWh/FTE	Heat consumption MWh/FTE
2019	2,8	2,9
2020	2,5	2,7
2021	2,5	3,0
2022	2,3	2,3
2023	2,1	1,9
2024	2,0	1,9



	Electricity kWh/m2	Heat consumption kWh/m2
2019	103,3	108,2
2020	97,7	104,0
2021	100,8	121,6
2022	106,7	106,6
2023	113,1	100,5
2024	103,9	97,0

NOTE It is assumed that the area in 2019 and 2020 was the same as in 2021.

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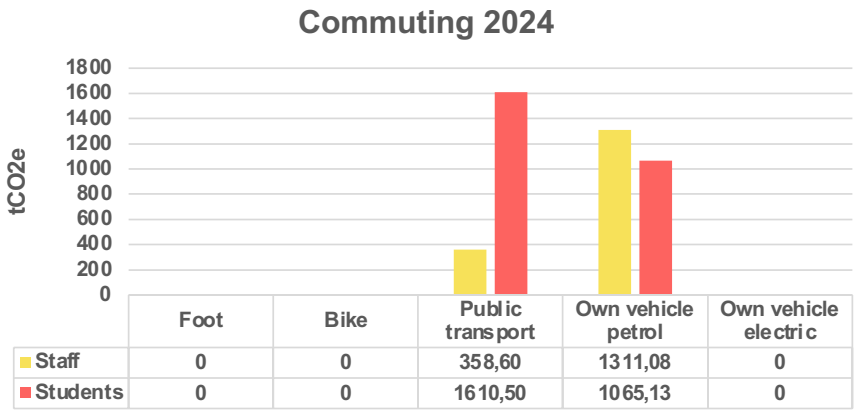
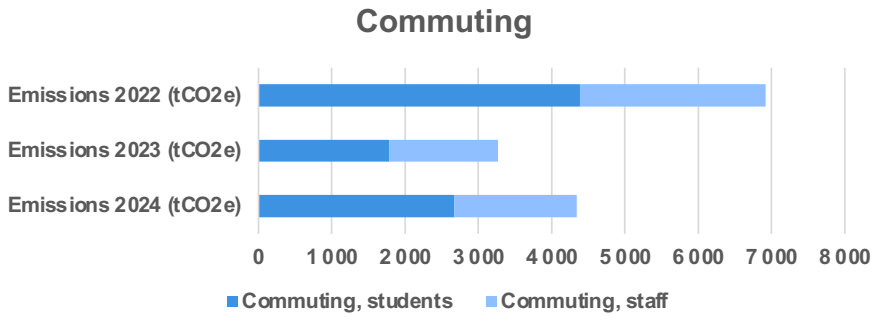
Commuting

- Aalto aims to be a pioneer In sustainable mobility. The campus is easily reached by sustainable means of transport and has easy access to cycling and walking paths. Recreation and wildlife is also taken into consideration in the Aalto sustainable mobility action plan.
- The majority of Aalto community commutes using public transportation
- Emissions of commuting are calculated based on distance, frequency and means of travel (surveyed).
- Staff emissions are higher/FTE mainly due to higher use of cars

➢ Emissions reduction potential: increased public transport benefits, metered parking, electric cycling benefits and increased number of storage facilities



	Foot	Bike	Public transport	Own vehicle petrol	Own vehicle electric
Staff	0	0	358,60	1311,08	0
Students	0	0	1610,50	1065,13	0



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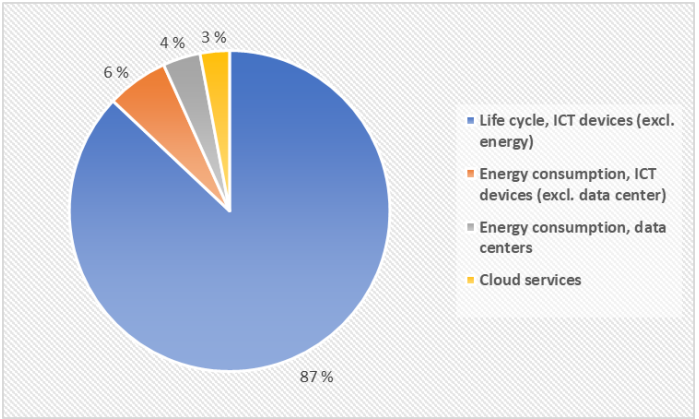
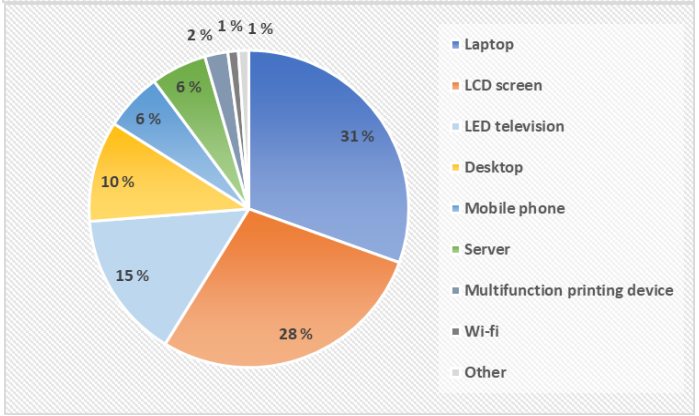
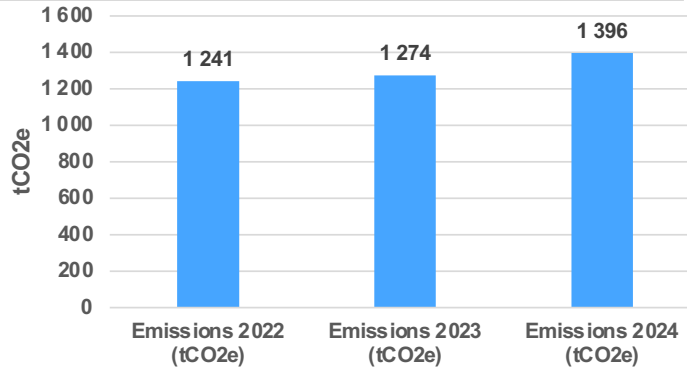
ICT

- Devices make up almost 90 % of the ICT emissions. The biggest emissions categories include laptops, screens, TVs and desktops
- Data centers run mainly on emission free electricity
- Heat recovery is in use in Otakaari 1 data center.
- Utilization rates of data centers managed by Aalto are high.
- Reuse and recycling of devices is actively encouraged
- Energy consumption is measured and optimized
- Methodologies and tools to calculate ICT emissions have been developed in Aalto
- Emissions of cloud services are monitored
- Tools to optimize web site traffic are in use
- Cleaning of storage space is ongoing

➢ **Reductions can be achieved through further optimization of stock, green coding practices and further optimization of heavy processing and storage**







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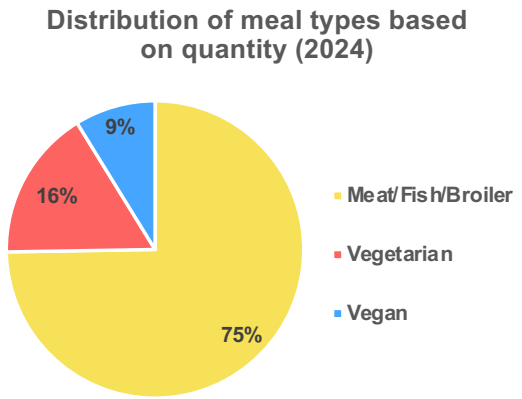
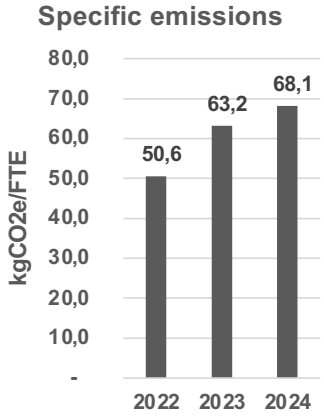
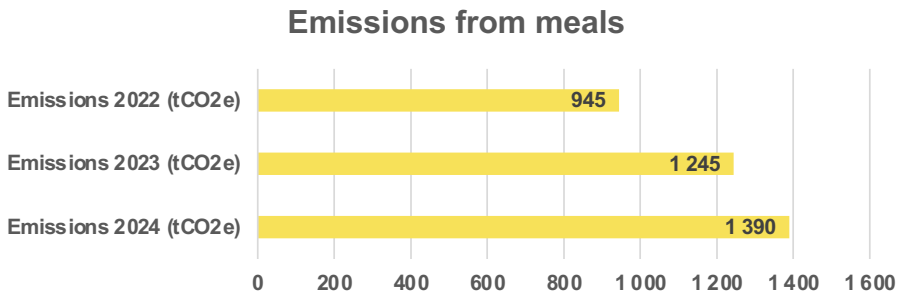
Food

- Emissions have slightly increased due to increased number of sold meals
- The cornerstones of campus restaurants are sustainability, variety of meals and wellbeing. Student restaurants emphasize high sustainability standards and certificates in their operations and supply chains and have set ambitious carbon reduction goals. Operations are guided by the providers' own sustainability programs and the Policy principles of student restaurants on campus | Aalto University.
- Sustainability awareness is promoted through campaigns and restaurant users are guided towards sustainable meal choices. Climate friendly options are marked clearly and information on the carbon footprint of meal options is available.
- Sustainably produced, local and vegetarian ingredients are extensively used. The use of energy and water and the amount of food waste is tracked. Possibility to buy leftover food is available in some restaurants.
- Sustainability is promoted in catering services and guided by the Aalto event planning guideline

➢ **Emissions can further be reduced by increasing user awareness, greening dietary choices, operations and supply chains.**







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Aalto University’s Carbon Footprint process

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Aalto University

Aalto University is a multidisciplinary university, where science and art meet technology and economics. Aalto University builds an innovative society through high-level research, education, and artistic activities. The university's vision is to solve systemic problems and accelerate innovation by combining pioneering science with design expertise and economic thinking.

The development of Aalto University's Otaniemi campus is guided by a campus vision that encourages diverse collaboration and aims for a world-class student experience and cutting-edge research focused on new innovations and their utilization. The impact of Aalto University is primarily linked to high-quality research and education, through which solutions to sustainable development challenges can be brought. Aalto University was the first university in Finland to sign the SDG Accord commitment to promote the UN's Sustainable Development Goals as part of teaching, research, innovation, and campus development.

The Ministry of Education and Culture (OKM) has committed to achieving the UN's Agenda 2030 Sustainable Development Goals in its own administrative sector. In line with its guidelines, OKM takes into account the sustainable development and Agenda 2030 goals in guiding its own sector's actors and monitors and evaluates the achievement of these goals.

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Introduction to carbon footprint calculation

Aalto University aims to significantly reduce its emissions by 2030. To achieve this goal, it is important to review the emission development annually.

This presentation outlines the university’s emission reduction targets, the importance of annual monitoring and reporting, and cooperation with stakeholders to achieve effective emission management.

This calculation presents the total emissions for 2024, but also a comparison with the two previous years. The calculation for 2022 and 2023 was harmonized to correspond to the 2024 emission calculation. The results provide a comprehensive overview of the total emissions and their development. The emission categories have remained the same as in 2022 and 2023. Some emission factors have been changed. All changes to emissions and emission categories have been explained in the report to ensure accuracy and transparency.

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Annual Monitoring and Reporting Processes

Aalto University is continuously developing all aspects of responsibility work, including measurement, reporting, and ways to measure and increase social sustainability impact.

- Aalto University conducts an annual calculation of its carbon footprint, which is an integral part of the university's sustainability efforts.
- Aalto strives to enhance its calculation methods every year, transitioning from basic emission factors to more sophisticated techniques.
- For example, as the scope 3 calculation has developed in the sustainability field, Aalto University has added almost all relevant scope 3 subcategories to its calculations in recent years.
    - Subcategory 15 Investments have been excluded from Aalto University's review
- Additionally, Aalto University has made its calculations more transparent by analyzing the relevance and emissions of each scope 3 subcategory and publishing the calculation methods used.

Calculation Methods: Overview of Scopes 1, 2 and 3

Calculation methods 1/4

GHG Protocol

- The calculation has been conducted according to the internationally widely used GHG Protocol method, covering scopes 1 - 3 of the standard.

- Emission categories in the report are divided into scopes 1 - 3. Furthermore, scope 3 emission categories have been divided into 15 subcategories.

- Calculation methods have been described in more detail in the later parts of the report.

- Unless otherwise mentioned, all emission are tons of carbon dioxide equivalent (tCO2e). Most emission factors are from Defra (2023) or from Exiobase (2019). Emission factors are mainly regional to Finland, but some are European averages.

Calculation methods 2/4

Scope 1

- Energy production
  - Emission calculation is based on the amount of used fuels and fuel specific emission factors.
  - Emission factors are from Polttoaineluokitus 2024 published by the Finnish Statistical Office. As they only publish the emission factor covering carbon dioxide's impact, Granlund has calculated the corresponding methane and nitrogen oxide emissions based on Emission Factors for Cross Sector Tools file Stationary Combustion tab (https://ghgprotocol.org/calculation-tools-and-guidance).
- Refrigerants
  - Emission calculation is based on added refrigerants in 2024 and refrigerant-specific emission factors determined according to global-warming potential. Only fugitive emissions are considered in emission calculation according to GHG protocol.
  - Emission factors are from standard EN15804
- Owned and leased vehicles
  - Emission calculation is based on fuel types and amounts of vehicles and their estimated usage in 2024.
  - Emission factors are from DEFRA.

Scope 2

- Energy procurement (Market-based method)
  - Emission calculation is based on consumed district heating´s and electricity´s emission factors.
  - Scope 2 is calculated market-based and location-based. In the market-based method, the type of purchased electricity and heating are considered. I.e., the emission factors of purchased carbon neutral products are used in the calculation. In the location-based method, average emission factors of used energy grids are used (e.g. the average emissions of Fingrid for electricity).
  - District heating emissions are calculated with emission factors from Paikallisvoima's KL-päästölaskuri. As they only publish the emission factor covering carbon dioxide's impact, Granlund has calculated the corresponding methane and nitrogen oxide emissions based on Emission Factors for Cross Sector Tools file Stationary Combustion tab (https://ghgprotocol.org/calculation-tools-and-guidance).
  - It is recommended for Aalto University, that the report is based on market-based emissions, since it considers the energy products that Aalto University purchases for its properties.

Calculation methods 3/4

Scope 3

- Indirect energy life cycle emissions
  - Scope 3.3, average-data method.
  - Emission calculation is based on the type of used electricity and an estimation for emissions for solar electricity and geothermal heat.
  - Emission factors of well-to-tank electricity is from DEFRA and solar and geothermal emission factors are from GEMIS database.
- Water consumption
  - Scope 3.1 (tap water) and scope 3.5 (wastewater), average-data method.
  - Emission calculation is based on the amount of used water and an emission factor for one cubic meter of water (from Defra). In calculations, it is assumed that the amount of tap and wastewater are equal.
- Waste
  - Scope 3.5, supplier specific method and average-data method.
  - Emission calculation is based on the waste amount produced in the campus and the emission information from waste companies.

Scope 3

- Commuting of staff and students
  - Scope 3.7, distance-based method.
  - Emission calculation is based on employee and student commuting distances based on postal codes and from a survey on commuting methods, and time spent on campus.
  - Emission factors for vehicles are from DEFRA and for public transport from SYKE's Kulkuri counter.
- Traveling
  - Scope 3.6, supplier specific data and spend-based method.
  - Air travel emission amounts have been obtained from the data of travel agencies that are based on DEFRA´s emission factors.
  - Other emissions from traveling have been calculated based on spend euros in procurements. Emission factors are mainly from Exiobase 2019.

Calculation methods 4/4

Scope 3

- Procurements containing research infrastructure, furniture, and other material procurements, such as office and teaching equipment.
  - Scope 3.1 and 3.2, supplier-specific method and spend-based method
  - For other procurements, the emissions were determined using spend-based method. Emission factors are mainly from Exiobase 2019.
- ICT devices
  - Scope 3.1
  - ICT were based on the number of devices in use, device lifetimes and device-specific emission data from suppliers and similar data sources. Calculations were improved in 2022 using more device categories and supplier-specific data. Calculation for 2024 emissions were conducted using same methods as in the previous two years.
- Construction projects
  - Scope 3.1
  - Emission calculation is based on spend-based method and emission factors are based on Granlund's benchmark data.
- Food
  - Scope 3.1
  - Emission calculation is based on average-data method. Calculation is based on campus restaurants' meal amounts and types. Emission factors are provided by Aalto University campus restaurants.

Emission Categories and Their Impact

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Emission Categories and Their Impact 1/2

Upstream/ Downstream	Scope	Category	Calculation methods and assumptions
	1	Direct Emissions (company facilities and company vehicles)	Aalto University's scope 1 emissions include generation of heat, use of fuels in company-controlled vehicles, and use of refrigeration and air conditioning equipment. One of properties (Metsähovintie) uses oil to generate heat. Energy consumption is calculated from the amount of fuel used and its calorific value. Many of Aalto University's properties use refrigerants for cooling. The emissions are determined by the need to replace refrigerants into systems from leakages and by the amounts of renewed refrigerants and their waste treatment.
	2	Indirect Emissions (purchased energy)	Aalto University's scope 2 emissions include purchased energy, e.g. electricity and district heating. Both location- and market-based emissions have been calculated. For location-based electricity emissions, Finland's average emission factor has been used. For market-based electricity, Energiavirasto's jäännösjakauma has been used. For district heating, emission factors of specific district heating companies have been used.
Upstream	3	1: Purchased Goods and Services Category includes all upstream emissions from the products and services purchased or acquired in the reporting year	Aalto University purchases a vast variety of different goods and services each year. They vary from office supplies to occupational health care and education services for the personnel. All the emissions are spend-based and it creates uncertainty as the emission factors are based on average goods and services in Finland. This category includes most Aalto University's emissions. The emission factors are mainly from Exiobase data base from 2019. Inflation between 2024 and the year of emission factors have been taken into account. The inflation has been strong in recent years, and the emissions would seem to increase a lot only based on it. Therefore, all costs have been corrected to the right inflation level. In Finland, Tilastokeskus reports inflation levels based on 12 main categories for goods and services and on numerous subcategories. All the purchased goods and services have been divided into different inflation categories before emission calculations. This category includes construction, maintenance, and renovation projects. In addition to this, food, furniture, material procurements, infra purchases and ICT devices & infrastructure are included.
Upstream	3	2: Capital Goods The category includes all upstream emissions from the production of capital goods in the reporting year. Capital goods are final products that have an extended life and are used by the company to e.g. provide a service	All Aalto University's procurements are presented in scope 3.1 category. No distinction has been made between categories 3.1 and 3.2.
Upstream	3	3: Fuel- and Energy-Related Activities Not Included in Scope 1 or Scope 2 The category includes emission related to the production of fuel and energy purchased and consumed by the reporting company in the reporting year	Aalto University's indirect energy life cycle emissions are included to this category, i.e. the emissions of electricity production depending on the fuel and emissions of own production of renewal energy (solar electricity and geothermal heat). The emissions have been calculated using average-data method.
Upstream	3	4: Upstream Transportation and Distribution The category includes third-party transportation and distribution service purchased in the reporting year	Aalto University's transportation of its procurements is included to spend-based method in categories 1 and 2 in scope 3.
Upstream	3	5: Waste Generated in Operations The category includes emissions from third-party disposal and treatment of waste generated in the company's owned or controlled operations in the reporting year. This category includes emissions from disposal of both solid waste and wastewater	Globes and L&T have calculated emissions from their operations for Aalto University's waste and therefore supplier-specific method for emission calculation have been used. Hazardous waste emissions have been calculated based on average-data method using average waste emissions in Finland for waste different categories. The calculation based on waste firms' own operations is more accurate than calculation based on average emission factors.
Upstream	3	6: Business Travel The category includes emissions from the transportation of employees for business related activities in vehicles owned or operated by third parties	Aalto University's business travel includes air and rail travel. Their emissions have been calculated by the travel operator. In addition, other business travel emissions have been calculated from expenses using spend-based method.

Emission Categories and Their Impact 2/2

Upstream/ Downstream	Scope	Category	Calculation methods and assumptions
Upstream	3	7: Employee Commuting The category includes emissions from the transportation of employees between their homes and worksites	Employee commuting includes commuting of Aalto employees as well as students. Commuting is based on Aalto University's questionnaire on how people commute in winter and in other seasons. The questionnaire also covers the amount of spend in Aalto campuses ranging from always working at the campus to rarely never working in the campus. Based on this information average commuting types and days traveled to the campuses were estimated. Aalto University also has data from 2024 on postal codes (i.e. where staff and students live). The different postal codes where divided into five categories based on distances from the main campus; 5 km, 10 km, 25 km, 50 km, and >50 km. Based on the information, average emissions have been calculated for public transport, own vehicle, biking, and walking.
Upstream	3	8: Upstream Leased Assets The category includes emissions from the operation of assets that are leased by reporting company in the reporting year not included in the reporting company's scope 1 or scope 2 inventories	All Aalto University's emissions from operations of leased assets are covered in scopes 1-2.
Downstream	3	9: Downstream Transportation and Distribution The category includes emissions that occur in the reporting year from transportation and distribution of sold products in vehicles and facilities not ownes or controlled by the reporting company	Aalto University does not transport or distribute its products outside its own facilities.
Downstream	3	10: Processing of Sold Products The category includes from processing of sold intermediate products by third parties subsequent to sale by the reporting company	Aalto University does not produce intermediate products.
Downstream	3	11: Use of Sold Products The category includes emissions from the use of goods and services sold by the reporting company in the reporting year	Aalto University produces some printed textbooks and other publications. Their use is not considered to create emissions.
Downstream	3	12: End-of-Life Treatment of Sold Products The category includes emissions from the waste disposal and treatment of products sold by the reporting company in the reporting year at the end of their life	Aalto University is selling products, as it prints some books used in the university courses and other publications. When compared to other emission sources of the university, their end-of-life treatment is considered to be so insignicant, that it is not taken into account in the carbon footprint calculation.
Downstream	3	13: Downstream Leased Assets	All Aalto University's energy consumption of leased assets is covered in scopes 1-2.
Downstream	3	14: Franchises	Aalto University does not have franchising operations.
Downstream	3	15: Investments	Aalto University's investments have not been considered in the carbon footprint calculation.

2024 Total Emission and Comparisons with Previous Years

Total market-based emission distribution 2024

Emission type	Emissions (tCO_2e)	Percentage	Scope	Scope 3 category
Procurements*	4 321	20,0 %	3	3.1
Business travel (flights and other travel)	3 710	17,2 %	3	3.6
Energy procurement (Market-based method)	2 877	13,3 %	2	
Commuting, students	2 676	12,4 %	3	3.7
Energy life cycle emissions (electricity and renewable energy)	2 127	9,8 %	3	3.3
Commuting, staff	1 670	7,7 %	3	3.7
ICT devices & infrastucture	1 396	6,5 %	3	3.1
Food (staff and student restaurants)	1 390	6,4 %	3	3.1
Construction projects	572	2,6 %	3	3.1
Municipal waste	268	1,2 %	3	3.5
Refrigerants	202	0,9 %	1	
Maintenance projects	195	0,9 %	3	3.1
Renovation and space development projects	129	0,6 %	3	3.1
Water	51	0,2 %	3	3.5
Owned and leased vehicles	18	0,1 %	1	
Energy production	4	0,0 %	1	
Total	21 606	100,0 %		

*Procurements contain purchased products and excludes purchased services.

Scope 3.1 also includes long-term investments. Some of these investments have been calculated by estimating the investment amounts based on annual depreciation.

The clarificatios of the calculation are presented on pages 32 and 33. Scope 3 category 15 Investments are outside the scope of review.

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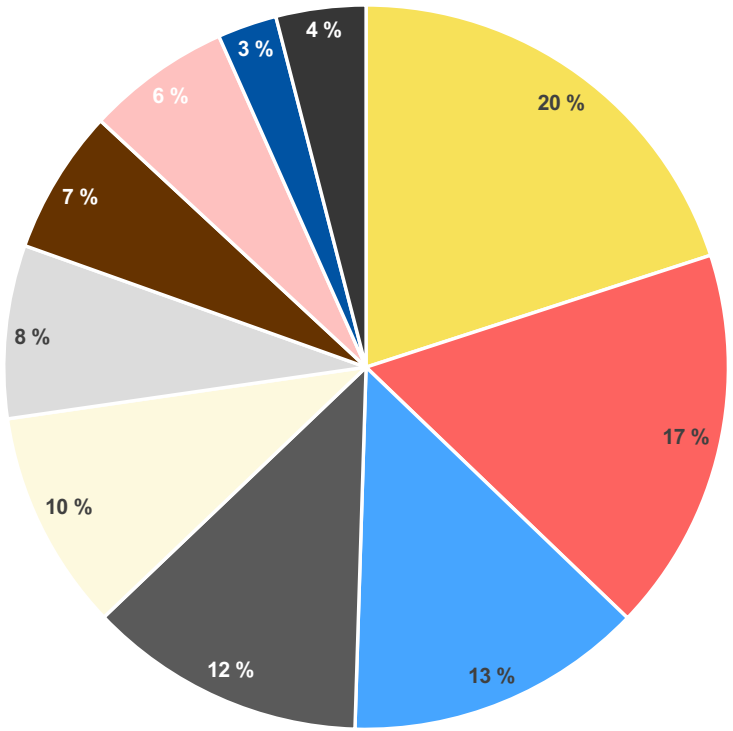
Total market-based emission distribution 2024



Emission type	%
Procurements*	20 %
Business travel (flights and other travel)	17 %
Energy procurement (Market-based method)	13 %
Commuting, students	12 %
Energy life cycle emissions (electricity and renewable energy)	10 %
Commuting, staff	8 %
ICT devices & infrastucture	7 %
Food (staff and student restaurants)	6 %
Construction projects	3 %
Other Emissions - Municipal waste (0,88 %) - Refrigerants (0,67 %) - Maintenance project (0,64 %) - Renovation and space development projects (0,43 %) - Water (0,17 %) - Owned and leased vehicle (0,06 %) - Energy production (0,01 %)	4 %

Contrary to GHG Protocol, Scope 3 category 15 Investments are outside the scope of review.

*Procurements contain purchased products but not purchased services or investments. The emission factors for purchased products and service are spend-based, which is an average, not the most accurate way to evaluate emissions. Procurement emissions will get more accurate in following years, as especially service producers begin to calculate accurate emissions of their operations.

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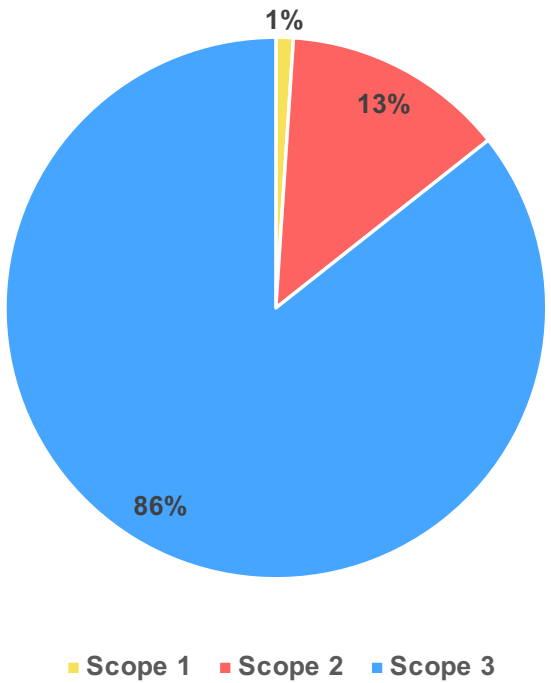
Emission scope distribution 2024

- **86 % of Aalto University's emissions are scope 3 emissions**
- **Scope 2 includes Energy procurement (market-based method).**
- The distribution is typical for university operations: the number of students and staff using the properties is momentous. Their commuting, business travel and necessary products and services in Aalto campuses form significant amount of emissions. Scope 2 emissions are also low due to certified emission-free electricity and district heating products.



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Annual emission comparison

Emission source	Emissions 2022 (tCO2e)	Emissions 2023 (tCO2e)	Emissions 2024 (tCO2e)	Change abs. 2023 cf. 2022 (tCO_2e)	Change 2023 cf. 2022 %	Change abs. 2024 cf. 2023 (tCO_2e)	Change 2024 cf. 2023 %
Procurements*	4 671	4 364	4 321	-307	-7 %	-44	-1 %
Business travel (flights and other travel)	3 294	3 386	3 710	92	3 %	324	10 %
Energy procurement (Market-based method)	19 945	22 174	2 877	2230	11 %	-19297	-87 %
Commuting, students	4 383	1 784	2 676	-2600	-59 %	892	50 %
Energy life cycle emissions (electricity and renewable energy)	2 161	2 111	2 127	-49	-2 %	16	1 %
Commuting, staff	2 536	1 488	1 670	-1048	-41 %	182	12 %
ICT devices & infrastucture	1 241	1 274	1 396	33	3 %	122	10 %
Food (staff and student restaurants)	945	1 245	1 390	300	32 %	146	12 %
Construction projects	1 921	3 570	572	1649	86 %	-2997	-84 %
Municipal waste	305	280	268	-25	-8 %	-12	-4 %
Refrigerants	275	353	202	79	29 %	-151	-43 %
Maintenance projects	160	150	195	-10	-6 %	45	30 %
Renovation and space development projects	1 064	370	129	-694	-65 %	-241	-65 %
Water	56	36	51	-20	-36 %	15	42 %
Owned and leased vehicles	19	18	18	-1	-8 %	0	0 %
Energy production	6	11	4	5	95 %	-7	-63 %
Sum	42 980	42 614	21 606	-366	-2 %	-21008	-49 %

*Procurements contain purchased products and excludes purchased services.

Scope 3.1 also includes long-term investments. Some of these investments have been calculated by estimating the investment amounts based on annual depreciation.

Contrary to GHG Protocol, Scope 3 category 15 Investments are outside the scope of review.

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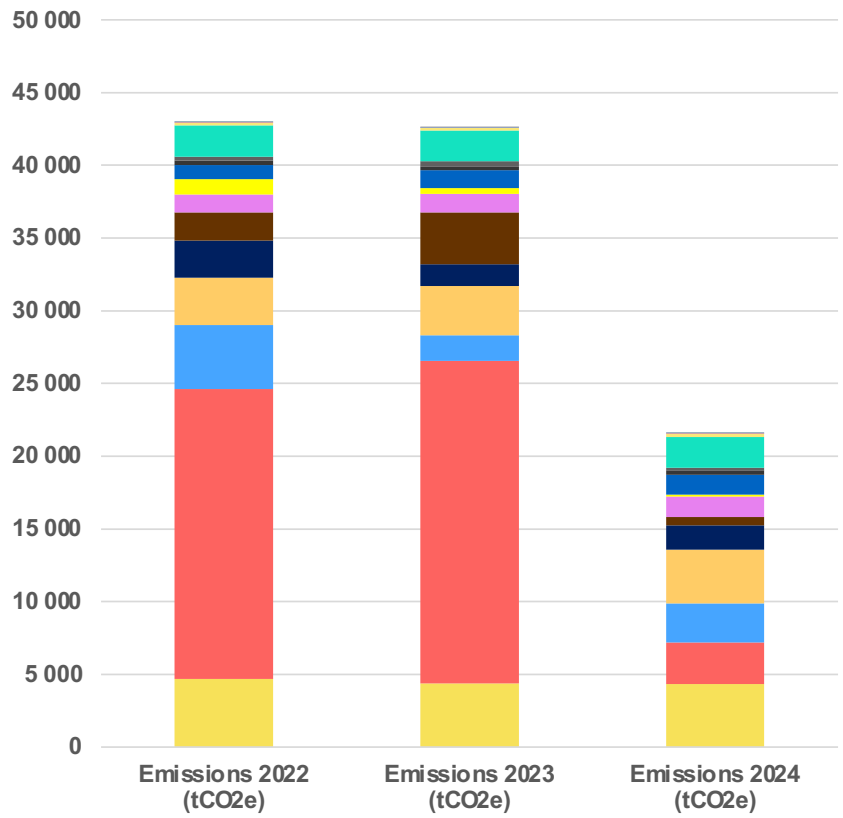
Annual emission comparison



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- Procurements*
- Energy procurement (Market-based method)
- Commuting, students
- Business travel (flights and other travel)
- Commuting, staff
- Construction projects
- ICT devices & infrastucture
- Renovation and space development projects
- Food (staff and student restaurants)
- Municipal waste
- Refrigerants
- Energy life cycle emissions (electricity and renewable energy)
- Maintenance projects
- Water
- Energy production
- Owned and leased vehicles

Contrary to GHG Protocol, Scope 3 category 15 Investments are outside the scope of review.

*Procurements contain purchased products but not purchased services or investments. The emission factors for purchased products and service are spend-based, which is an average, not the most accurate way to evaluate emissions. Procurement emissions will get more accurate in following years, as especially service producers begin to calculate accurate emissions of their operations.

Significant emission changes 2023-2024

Energy procurement: -87 % due to purchasing certified emission-free electricity and district heating products. In 2022 - 2023 emission-free electricity was not purchased. The market-based emission factor was very high. Finnish Energy Authority publishes emission factor from which emissions were calculated

- The end user of electricity has the option to purchase either origin-guaranteed or non-origin-guaranteed electricity. The origin of origin-guaranteed electricity is indicated by origin guarantees, and its production distribution is based on renewable energy sources, nuclear power, or a combination of these.
- The production distribution of non-origin-guaranteed and unknown-origin electricity is indicated by residual distribution. The residual distribution varies annually depending on what production sources are left over from the production and consumption of origin-guaranteed electricity.

Construction projects: -84 % due to finished construction projects in 2023. It is typical for real estate operators that the emissions vary from year to year depending on number of active construction sites.

Renovation: -65 % due to less spending on renovation projects. The varying emissions between years are similar to emissions of construction projects.

Refrigerants: -43 % due to less leakages in cooling systems. The number of leaks is affected by factors such as the age and condition of the equipment. The number of emissions is also affected by the type of refrigerant. Scope 1 emissions are known to vary between years.

Commuting, students: due to changed average distances travelled to Aalto campuses. Distribution of Aalto students changes every year and so do the number of students, travel distances, and modes of transport.

Annual emission comparison

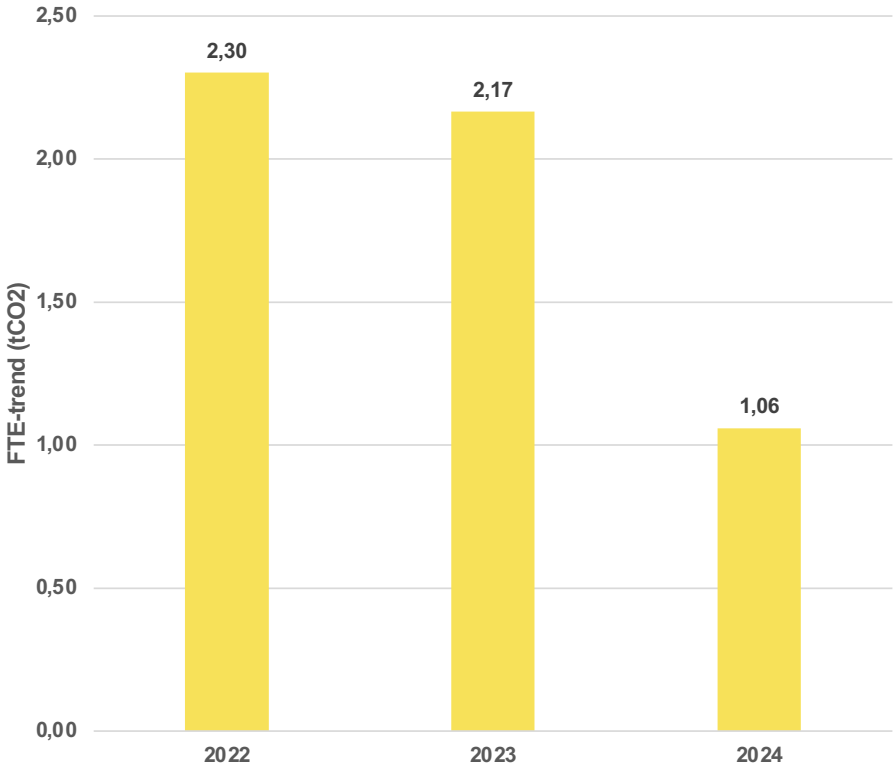
Comparing emissions between years is challenging due to many changes. The main impact of the Covid pandemic was on property usage fees and travel. Emissions from new buildings also vary from year to year. Indirect life cycle emissions from energy and a more comprehensive calculation of procurement emissions have been added to the carbon footprint. In addition, emission factors have been refined to comply with the GHG protocol, taking into account CO_2 equivalents. Emission calculations have been harmonized for 2022, 2023 and 2024 to make the years comparable.

Specific emissions per FTE are:

2024: **1,06** tCO_2e/FTE (2024 FTE = 20 400)

2023: **2,17** tCO_2e/FTE (2023 FTE = 19 681)

2022: **2,30** tCO_2e/FTE (2022 FTE = 18 672)



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Annual specific emission comparison ($kgCO_2e/m^2$)

Emission source	2022 $kgCO_2e/m^2$	2023 $kgCO_2e/m^2$	2024 $kgCO_2e/m^2$
Procurement	11,60	11,91	10,76
Business travel (flights and other travel)	49,51	60,53	7,17
Energy procurement (Market-based method)	10,88	4,87	6,66
Commuting, students	8,18	9,24	9,24
Energy life cycle emissions (electricity and renewable energy)	6,29	4,06	4,16
Commuting, staff	4,77	9,74	1,43
IT procurement	3,08	3,48	3,48
Food (staff and student restaurants)	2,64	1,01	0,32
Construction projects	2,34	3,40	3,46
Municipal waste	0,76	0,76	0,67
Refrigerants	0,68	0,96	0,50
Maintenance projects	5,36	5,76	5,30
Renovation and space development projects	0,40	0,41	0,49
Water	0,14	0,10	0,13
Energy production	0,01	0,03	0,01
Owned and leased vehicles	0,05	0,05	0,04
Sum	106,69	116,33	53,81

*Procurements contain purchased products and excludes purchased services.

Scope 3.1 also includes long-term investments. Some of these investments have been calculated by estimating the investment amounts based on annual depreciation.

Contrary to GHG Protocol, Scope 3 category 15 Investments are outside the scope of review.

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Scope 1 Emissions

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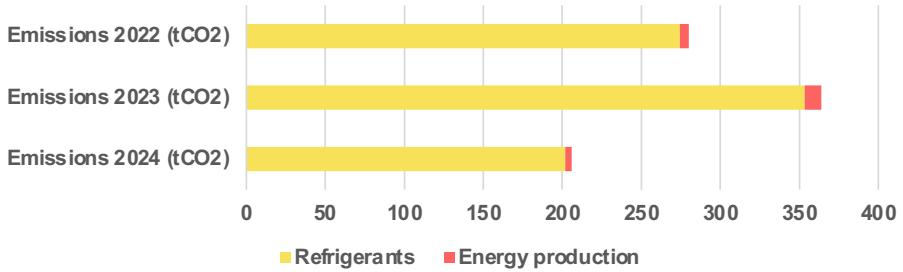
Scope 1

Energy production

- Metsähovintie 114 (Kirkkonummi) produces a part of its own heat energy using fossil energy (light fuel oil). In 2024, amount of produced energy was 17,9 MWh (2023: 48,2 MWh, 2022: 24,8 MWh).
- Emissions of produced energy were in 2024 4,7 tCO_2e (2023: 12,7 tCO_2e, 2022: 6,5 tCO_2e).
- The carbon footprint calculation for 2024 uses Statistics Finland's emission factor, which is 264,5669 $kgCO_2e/MWh$.
- The same emission factor has also been updated for the calculation for 2022 and 2023.
- Other produced energy (geothermal energy and solar power) is taken into account in scope 3 in indirect life cycle emissions of electricity.

Refrigerants

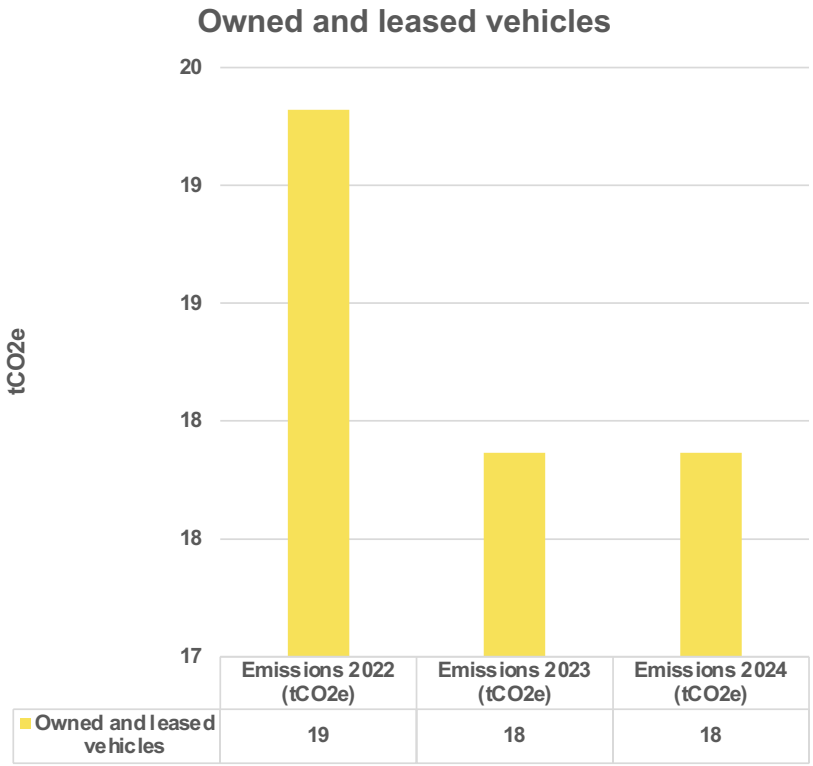
- In 2024 the use of refrigerants were in total 93 kg:
  - R 404A 15 kg
  - R 407C 46,5 kg
  - R 410A 19,5 kg
  - R 134a 8 kg
  - R 452a 4kg.
- Emissions of refrigerants in 2024 were 202 tCO_2e (2023: 353 tCO_2e, 2022: 274 tCO_2e).



Scope 1

Vehicles

- In year 2024 there were in total 20 vehicles. 4 were gasoline vehicles, 10 diesel powered vehicles and 3 electric vehicles. The average mileage of cars was estimated to be around 4,000 km per year. In addition to this, there were one tractor (diesel) and 2 trucks (electricity).
- Total emissions from vehicles in 2024 were 17,9 tCO_2e (2023: 17,9 tCO_2e and 2022: 19,3 tCO_2e).
- The emission factors used in the 2024 carbon footprint calculation are (Defra):
  - Diesel 0,1672 $kgCO_2e/km$
  - Gasoline 0,17819 $kgCO_2e/km$
  - Electricity 0 $kgCO_2e/km$
- Emission factors have also been updated for 2022 and 2023.



Scope 2 Emissions

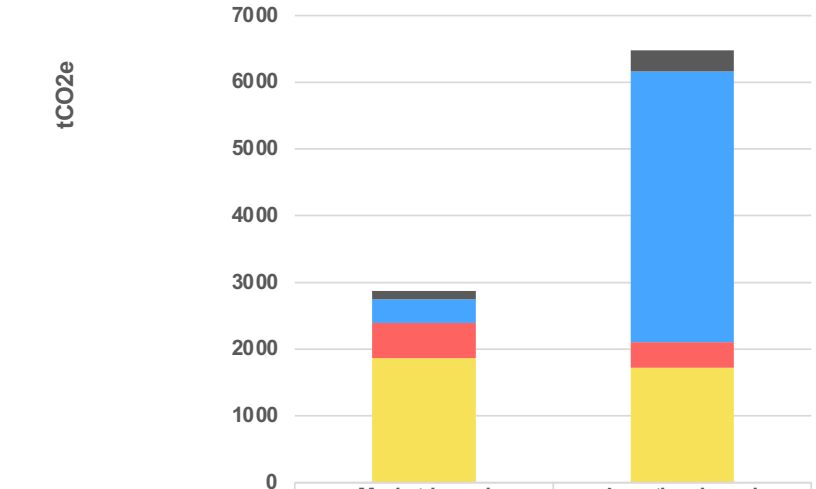
Energy consumption

GHGP Scope 2 includes two different calculation methods; market-based and location-based. Presented below are scope 2 emissions calculated in both ways.

The emission factors for district heating and electricity are expressed in equivalent tons, which allows for the calculation of energy emissions in accordance with the GHG protocol. To facilitate comparison with previous years, the emission factors for 2022 and 2023 have also been updated to the same units.

* The market-based calculation takes into account the quality of the purchased energy product. In this calculation, this mainly means Fortum's Ecoheat product in Espoo's owned properties and renewable energy in some rental properties, and for electricity, emission-free electricity certified with a guarantee of origin. The aim of the calculation is to take into account sustainable development choices in addition to consumption volumes.

** In the location-based method, the emission factors are the average factors of the Finnish energy network. The aim is to describe location-based emissions without market influence. The emission factor for heat varies by district heating company and the emission factor for electricity is 50,5 $kgCO_2$ e/MWh.



	Market-based method*	Location-based method**
Heat, rented property	130	315
Heat, owned property	357	4059
Electricity, rented property	524	382
Electricity, owned property	1866	1725

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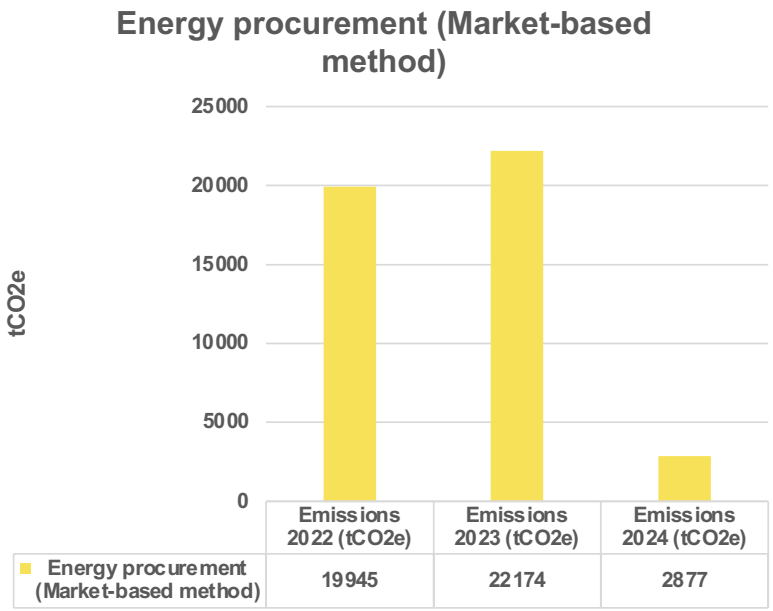
Emissions from energy consumption 2022-2024

- Aalto University started purchasing Fortum's Ecoheat product from Espoo properties in 2022, which significantly reduced heat emissions.
- Aalto University also stopped purchasing emission-free electricity in 2022, which in turn increased electricity emissions. Aalto purchased again most of its electricity with a guarantee of origin in 2024.

The reduction in emissions in 2024 is mainly due to the transition to purchasing electricity certified with a guarantee of origin.



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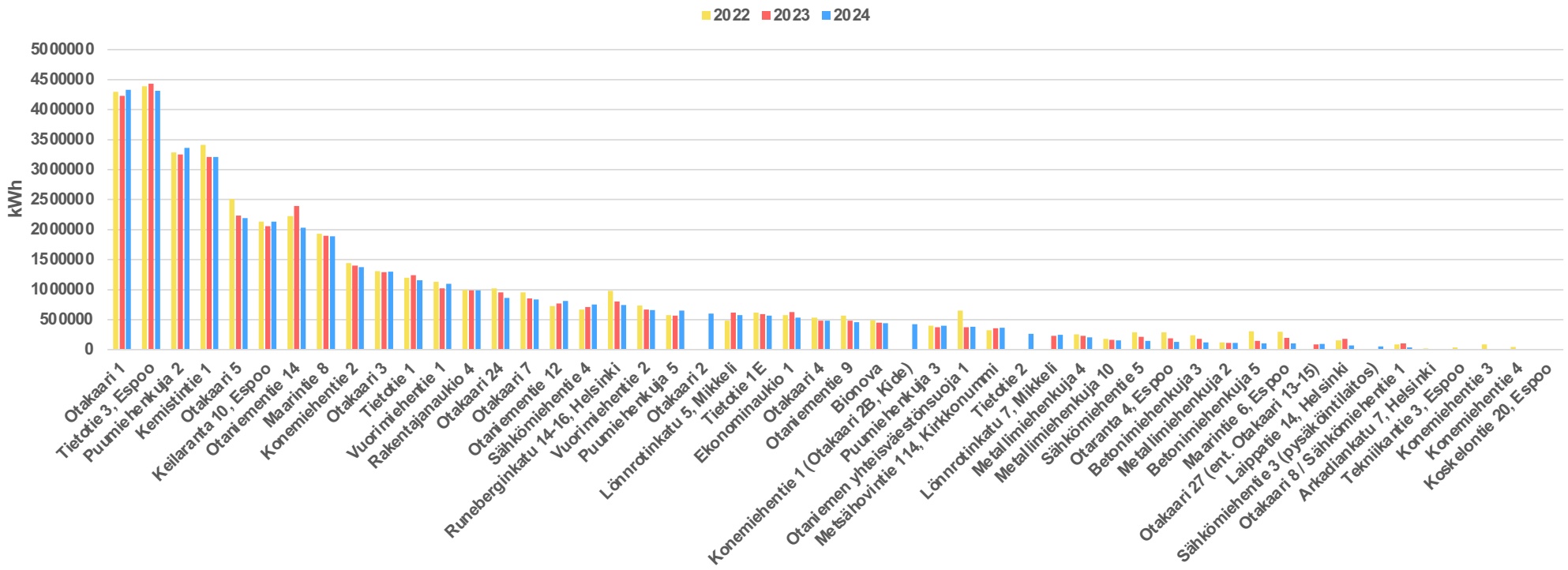
Electricity consumption 2022 - 2024



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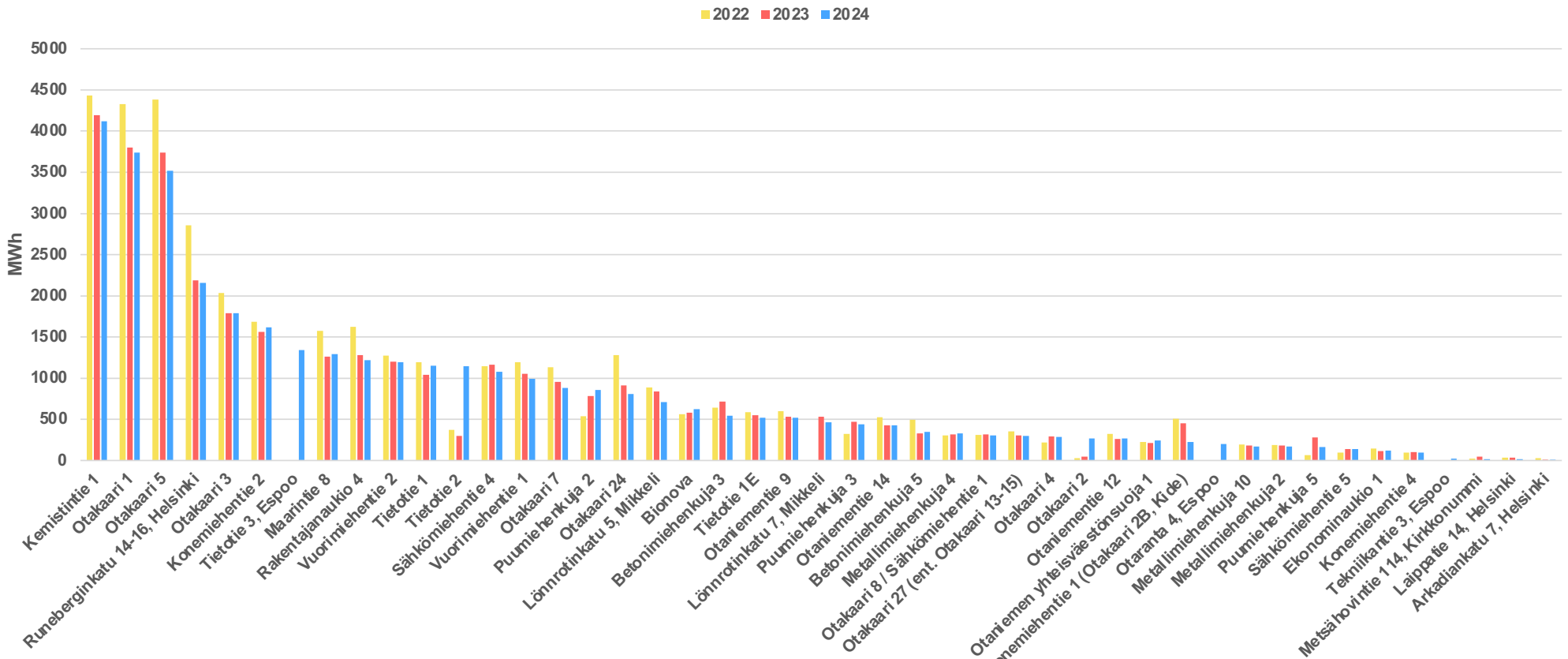
District heat consumption 2022-2024



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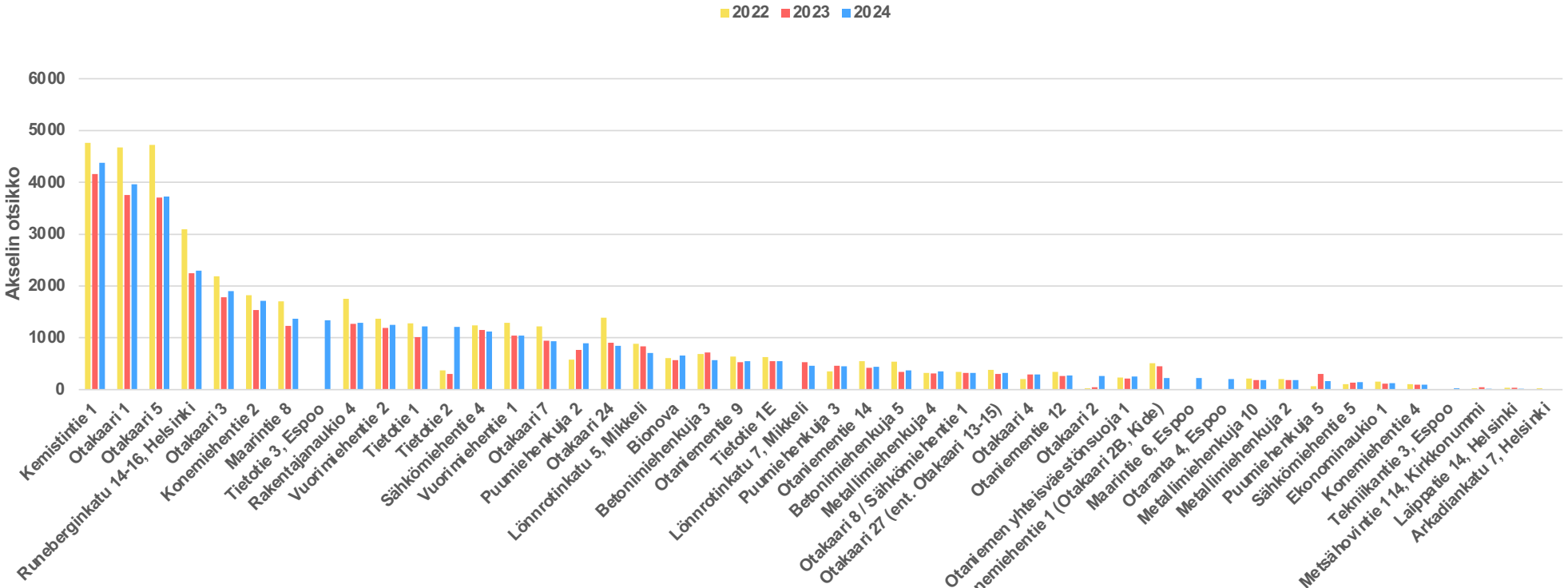
District heat consumption (weather corrected) 2022 - 2024



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Scope 3 Emissions

Scope 3

Indirect life cycle emissions of energy

As a part of the value chain thinking, the scope 3 can include indirect life cycle emissions of energy. Since 2022 the life cycle emissions of electricity from the grid have also been calculated. The emission factor for electricity is 45,9 $kgCO_2e/MWh$ (Defra).

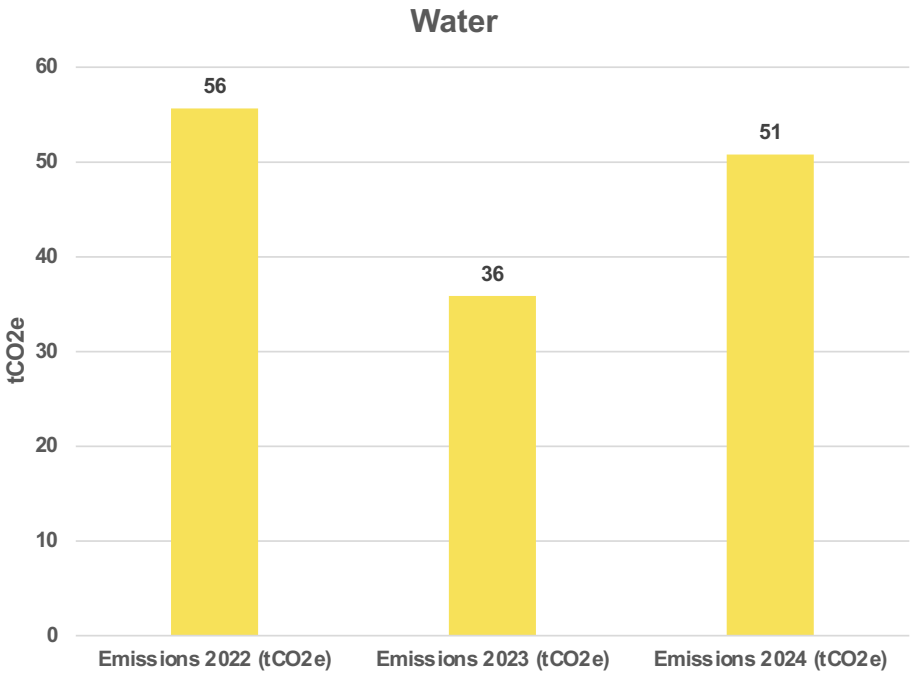
For solar energy, the emission factor is 0,04 $kgCO_2e/kWh$ (GEMIS 2015) and for geothermal heat 0,089 $kgCO_2e/kWh$ (GEMIS 2015).

The calculation of indirect life cycle emissions was also updated to use the same emission factors for the years 2022 and 2023. Indirect life cycle emissions for purchased electricity, solar energy and geothermal heat in 2024 were 2 127 tCO_2e (2023: 2 111 tCO_2e and 2022: 2 161 tCO_2e).

Scope 3

Water emission

- Water emissions have been calculated using emission factors for tap water and wastewater (Defra). Emission factors are in 2024 0,15311 kgCO_2e/kg for tap water and 0,18574 kgCO_2e/m³ for waste water. The amounts of tap water and wastewater have been considered to be the same. Emission factors have been updated to be the same for 2022 and 2023.
- Water consumption in 2024 was 112 742 m³ in Aalto owned properties (2023: 146 319 m³, 2022: 124 407 m³).
- Total emissions from water consumption in 2024 was about 37,3 tCO_2e (2023: 35,8 tCO_2e and 2022: 42,2 tCO_2e).



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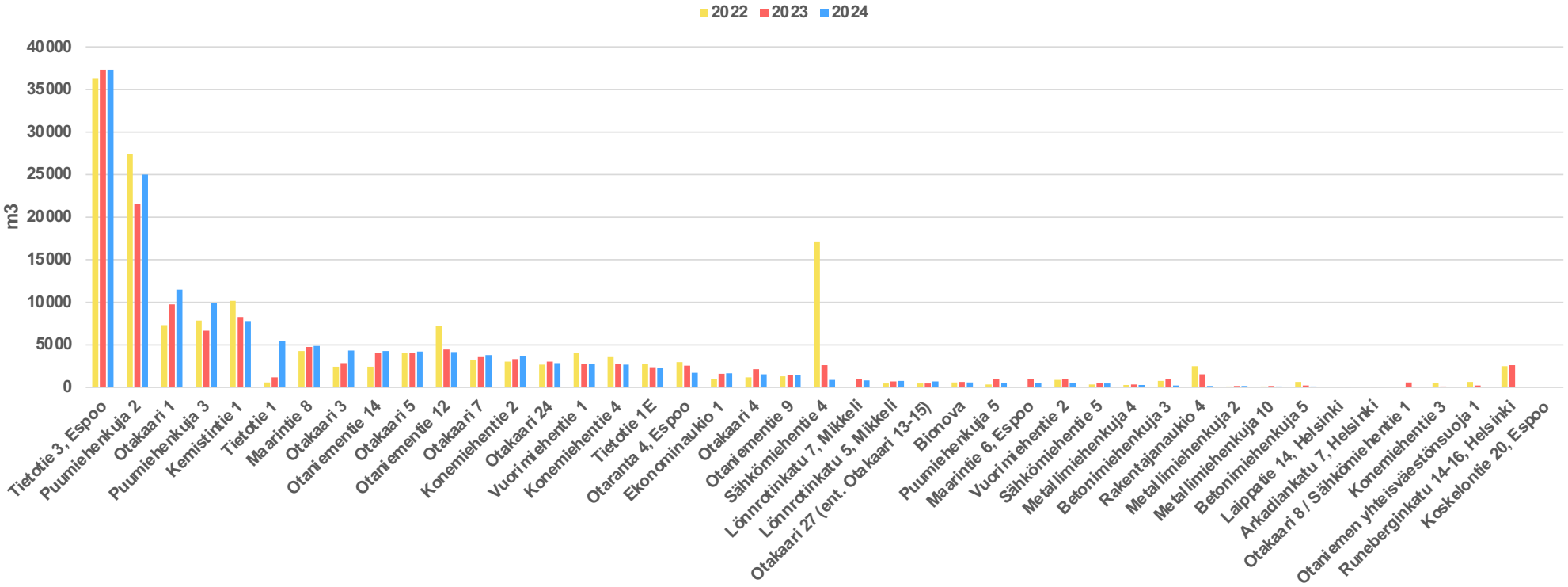
Water consumption 2022 - 2024



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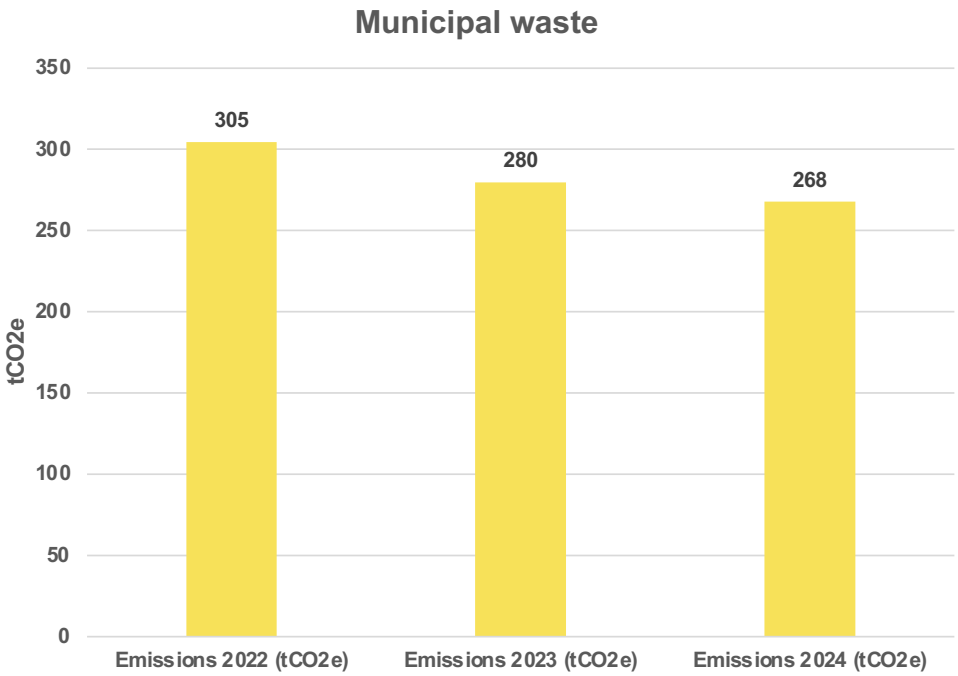
Scope 3

- Waste operators Globes and L&T have provided supplier specific waste data.
- Forsman and HSY provided the amounts of different waste categories (biowaste, municipal solid waste, batteries, waste wood, and metal). Their emissions have been calculated based on average emission factors (SYKE Y-hiilari).
- Emissions from waste were in 2024 267,7 tCO_2e (2023 282,9 tCO_2e, 2022: 304,6 tCO_2e)



Scope 3

Commuting

Emissions from commuting in 2024 were:

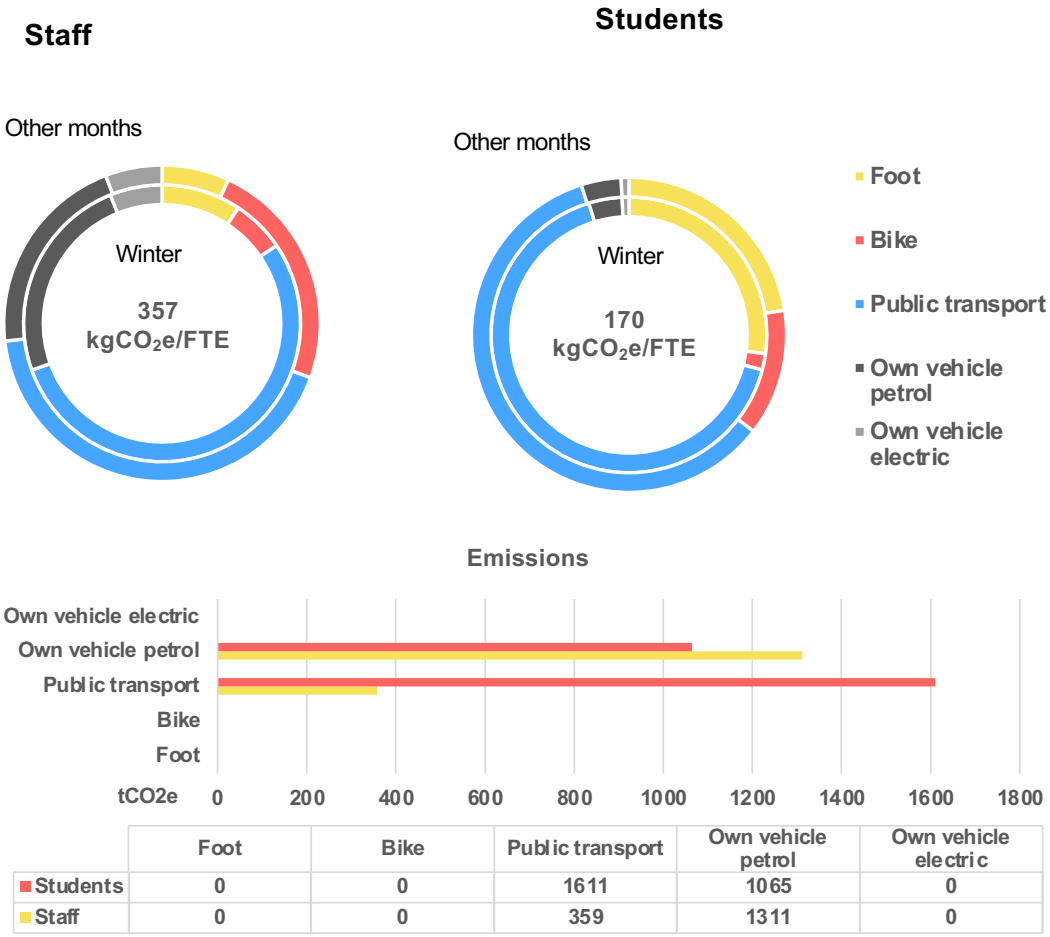
- Staff 1 670 tCO_2e (2023: 1 456 tCO_2e, 2022: 2 536 tCO_2e)
- Students 2 676 tCO_2e (2023: 1 660 tCO_2e, 2022: 4 383 tCO_2e)

The emission factors used for vehicles was 0,1645 $kgCO_2e/km$ (DEFRA) and for the public transport 0,02059 $kgCO_2e/km$ (derived from SYKE Kulkuri calculation for commuting based on the use of different methods of public transport). Since rail travel is a popular transport method for students and staff, the emission factor has decreased.

When calculating emissions, the total amount of students and staff was evaluated by using the FTE-value.

- Students 2024: 15 725 (2023: 15 203, 2022: 14 313)
- Staff 2024: 4 675 (2023: 4 478, 2022: 4 360)

In 2024 there were 245 workdays for staff and 200 days for students used for calculation. Modes of transport and days spent at the campuses are based on Aalto's questionnaires.



	Foot	Bike	Public transport	Own vehicle petrol	Own vehicle electric
Students	0	0	1611	1065	0
Staff	0	0	359	1311	0

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Scope 3

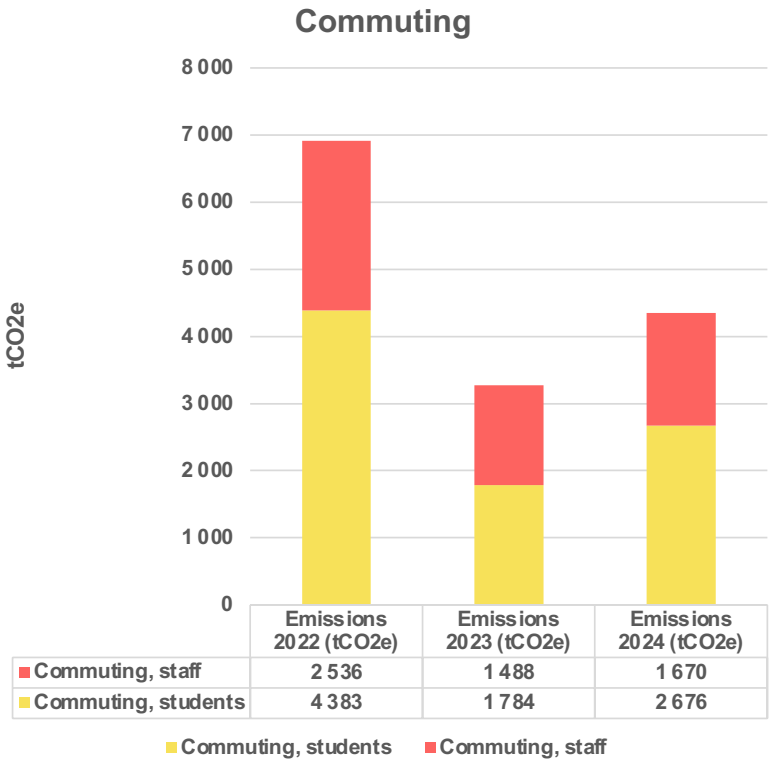
Commuting

To evaluate the average daily commuting distance, information about the postal codes of the staff was used (no identifiable information). Due to the large number of postcodes, commuting trips were divided into the following groups according to distance from postal code area to Aalto University.

- 5 km
- 10 km
- 25 km
- 50 km
- >50 km.

Based on distances and Aalto University's survey on time spent on campus and transport methods, commuting emissions were calculated.

NOTE: The above values are rough estimates based on previous surveys and residence information. It is very important to understand that the figures are best available estimates, not exact results.



	Emissions 2022 (tCO2e)	Emissions 2023 (tCO2e)	Emissions 2024 (tCO2e)
Commuting, staff	2 536	1 488	1 670
Commuting, students	4 383	1 784	2 676

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Scope 3

Business travel – Air and train travel

According to the travel agency accounting, the total travel amount in kilometers in 2024 was 27 561 093 km (2023: 28 141 424 km, 2022: 20 426 814 km).

The calculated total emission amount of those trips in 2024 was 2664 tCO_2e (2023: 2253 tCO_2e, 2022: 2463 tCO_2e)

- Air travel emissions were obtained directly from the travel agencies. The travel agencies have used DEFRA´s emissions factors in the calculation. Emissions calculated by travel agency have increased even though the flight kilometers decreased in 2024. This can happen as the travel agency has updated its calculations. Based on the travel agency's data, the change in the emission factor from 2023 to 2024 is approximately 17 %.
- In addition, the emissions from train travel were estimated to be 2,1 tCO_2e in 2024. The absolute number of train travel is not known. The result of the emission calculation is based on the amount of emissions reported by the train company and an estimate of the proportion of known trips.

Scope 3

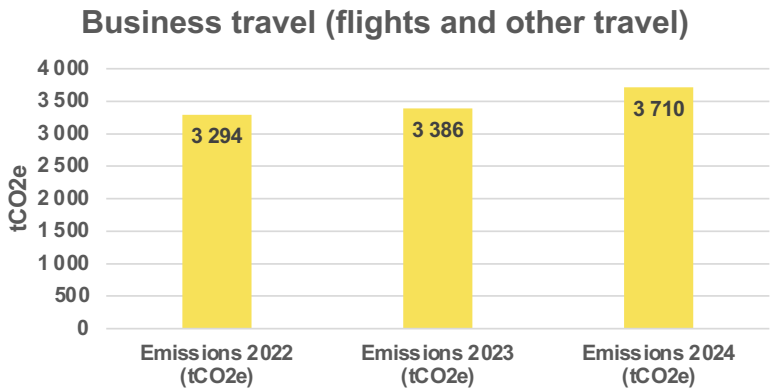
Business travel

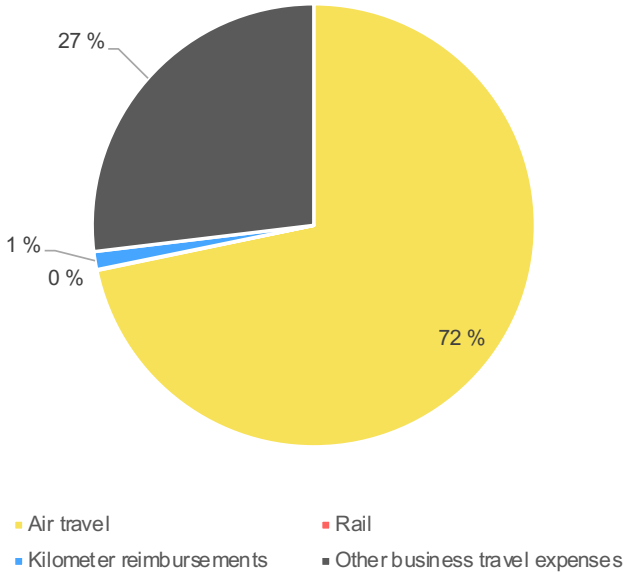
Emissions of other business travel expenses are calculated using the spend-based method.

Emissions are based on average cost-based emissions factors, which creates uncertainty to results.

Reliable calculation of the other travel expenses category would require more accurate input data than currently available.

Other business travel emissions also include hotel costs. Accounting for them is recommended but voluntary under the GHG Protocol.





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Scope 3

Procurements

Procurements of Aalto University covers the following categories; purchased products research devices/infra, furnishing, and other procurements, e.g. teaching and office equipments.

Emissions from furnishing were 377 tCO_2e in 2024

Aalto University collects IT device amounts annually. The calculation is based on the equipment stock and equipments lifespan. Specific number of devices improves the accuracy of emission calculations considerably.

Emissions of research devices and infra purchases and other material purchases were based on depreciation from 2023. Similarly, furnishing emissions were also calculated based on the amount of depreciation.

Emission factor for infra purchases was 0,302 gCO_2e /€ from Exiobase. Other purchases use Exiobase emission factors. Material purchase emissions were combined 2245 tCO_2e (2023: 2587 tCO_2e, 2022: 6713 tCO_2e).

Scope 3

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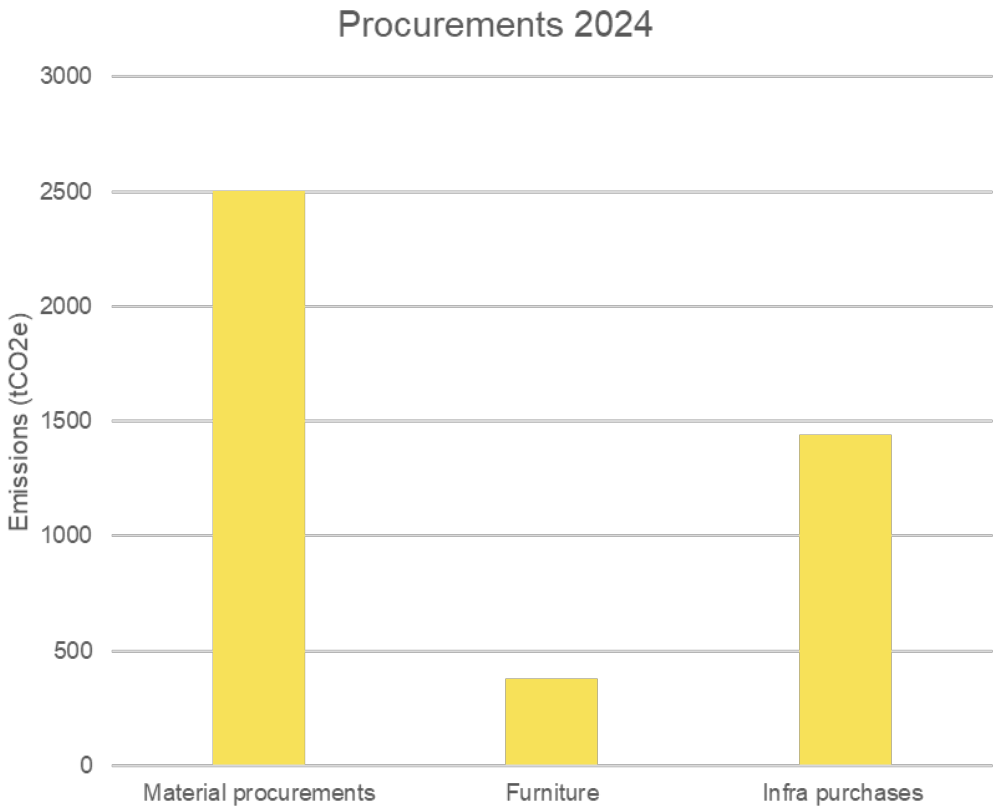

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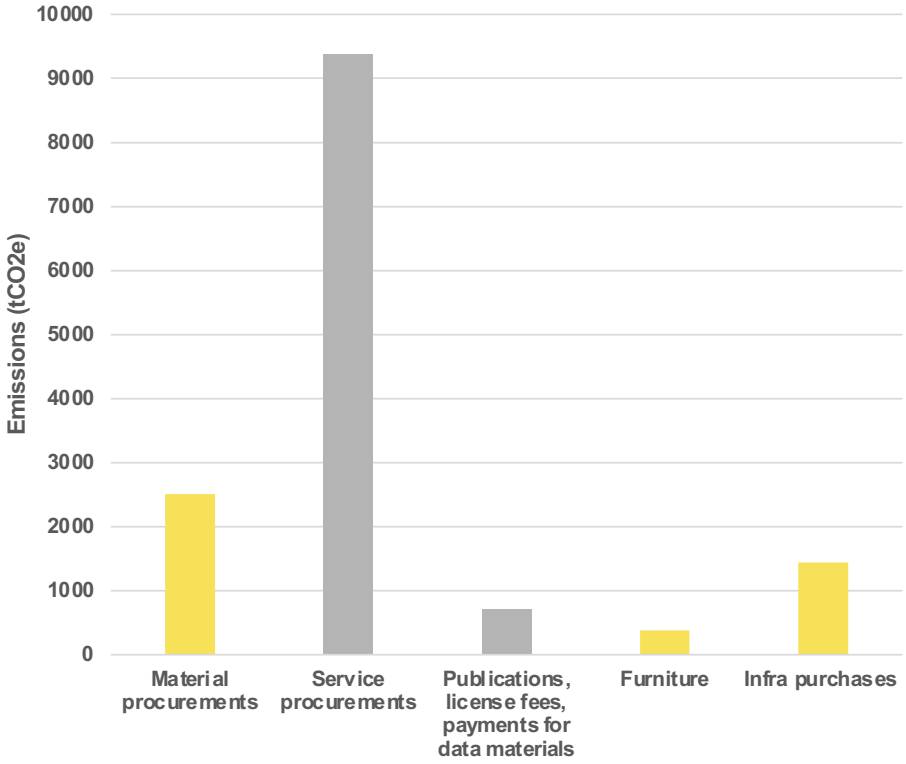
Scope 3

Procurement emissions - all

- Emissions of different goods and services can be calculated using spend-based method.
- Emissions are based on average cost-based emissions factors, which creates uncertainty to results.
- The presented procurement emissions are calculated using emissions factors from Exiobase 2019 (regional emission factors of Finland).

- Service procurements and publications, licence fees, etc. are not included in the total GHG emissions of Aalto University. They have been excluded from the calculation due to the size of the margin of error and uncertainty associated with the calculation.



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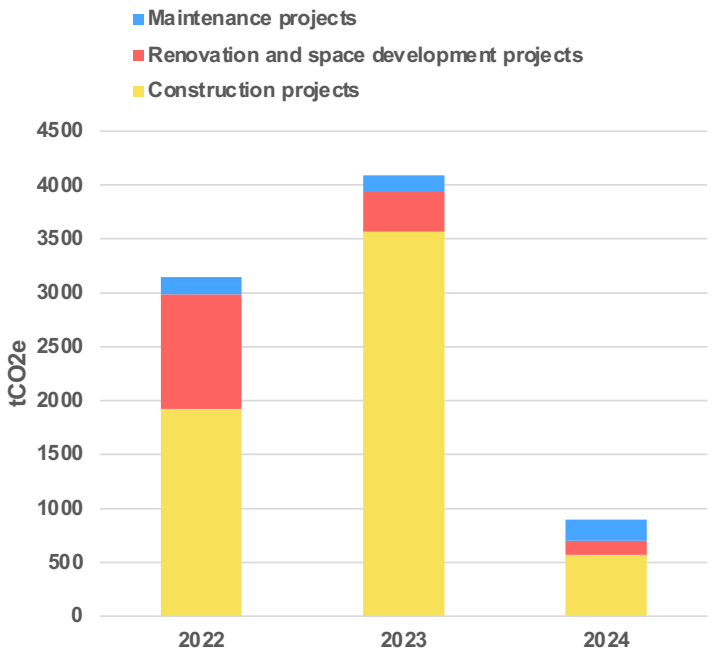
Scope 3

Construction, renovation, and maintenance

Aalto University executes annually several new constructions, renovations, and maintenance projects. Emissions from said projects can be included to Scope 3 calculations (e.g., emissions from material usage). Emission factors for projects were determined by Granlund Oy by comparing projects in similar property portfolio. The calculation method used is the Ministry of the Environment's Low-Carbon Building Assessment Method 2021. The calculation is based on data from the Granlund's benchmark database. The units of emission factors are $kgCO_2e/$(invested euro to project). Investments and emission factors are listed in the table below.

Type	Investment (€)	Emission factor ($kgCO_2e/€$)	Emissions (tCO_2e)
Construction projects	5 900 000	0,097	572,3
Renovation and space development projects	2 300 000	0,056	128,8
Maintenance projects	3 900 000	0,05	195,0
Sum	**12 100 000**		**896,1**



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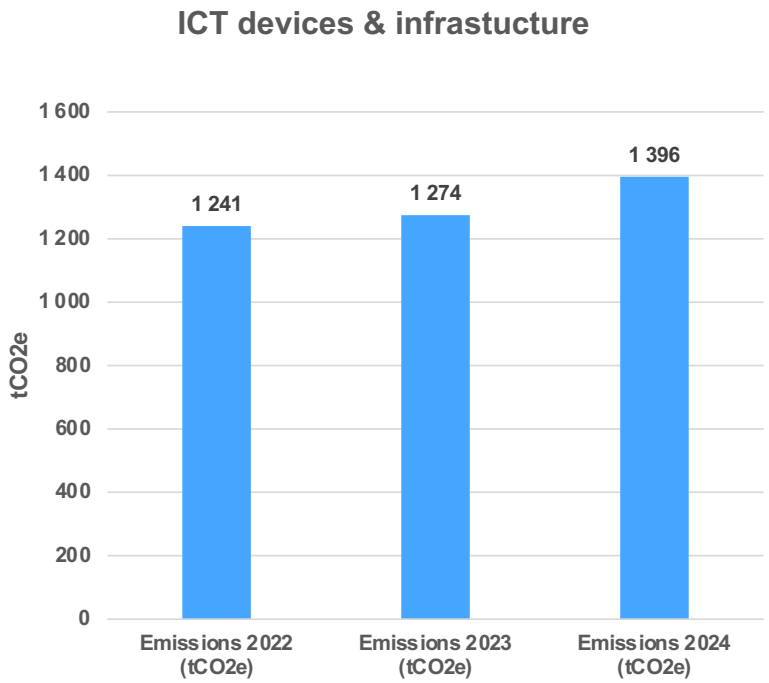
ICT devices and infrastructure

The category covers the ICT infrastructure of Aalto university including desktops, laptops, LCD screens, TVs, mobile phones, tablets, data centers, wi-Fi access points, routers, switches and firewalls and commercial cloud services.

The calculation is product category based and takes into account the amount of devices and their average lifespan. Product based emissions calculation improves the accuracy of emissions calculation compared to spending based calculation.

Emsissions of cloud services are based on service provider reports.

Emissions of IT devices for 2024 were 1396 tCO_2e. (2023: 1274 tCO_2e, 2022: 1241 tCO_2e).



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Scope 3

Food

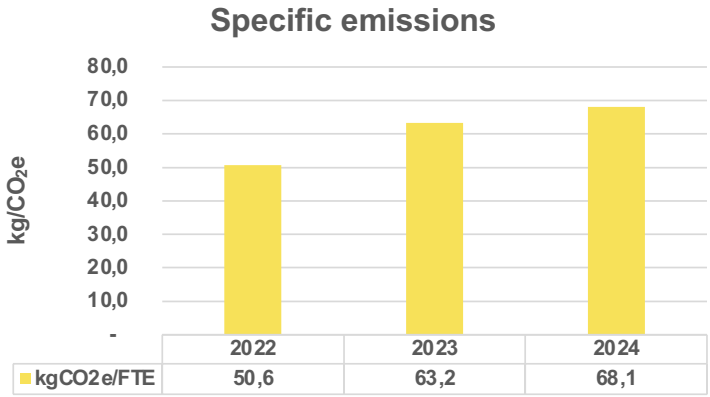
Food emissions were calculated from the number of meals (vegetarian or vegan) sold from restaurants in Otaniemi during 2024. All the personnel and student restaurants were included in the emission calculation. It was determined based on the data collected that the restaurants sold 1,48 million meals. (2023: 1 300 000 meals, 2022: 1 000 000 meals, 2021: 642 000 meals, 2020: approximately 730 000 meals, and 2019: 1,3 million meals). Approximately 16 % were vegetarian meals and 9 % vegan meals (2023: 28 %, 2022: 32 %; 2021: 39 %, 2020: 22 % and 2019: 17 %). Meal quantities were obtained from the following restaurants: Sodexo (Kvarkki, T-Talo, Subway), Täffä, Kipsari and Compass.

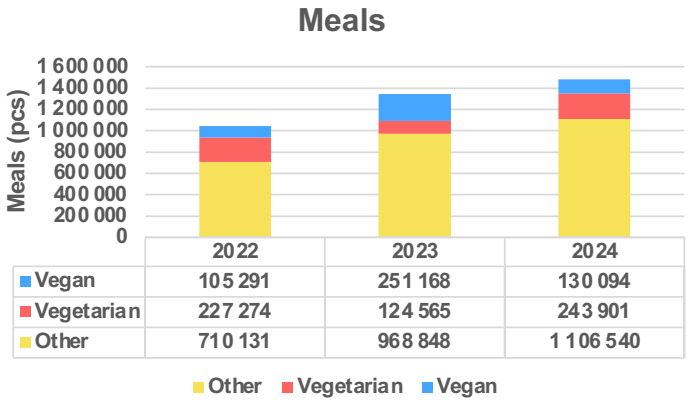
The emissions of meals sold were 2024 1 390 tCO_2e. (2023: 1 245 tCO_2e, 2022: 945 tCO_2e)

Emissions from meals have increased because of the increase in campus attendance.

NOTE: The error margin for a specific meal is quite large, since the size and proportions of meals vary greatly. In the 2022 and 2023 calculation, emission factors used were from Compass Group Finland, which represents a major amount of all meals sold in the Otaniemi campus:

- Meal, other 1,07 $kgCO_2e$/pcs
- Meal, vegetarian 0,6 $kgCO_2e$/pcs
- Meal, vegan 0,46 $kgCO_2e$/pcs





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Summary

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Summary

- Aalto University has made strategy commitments to sustainability and has ongoing efforts to reduce its carbon footprint through various initiatives and strategies.
  - Aalto University calculates its carbon footprint annually and continuously develops its measurement and reporting processes.

Carbon footprint 2024

- Footprint was calculated using GHG Protocol covering scope 1 - 3 and scope 3 subcategories, excluding subcategory 3.15 Investments
- Emissions decreased by 49 % in 2024 compared to 2023, mainly due to the use of emission-free purchased electricity.
  - Most of the electricity consumed in Aalto University's buildings was purchased as an emission-free product in 2024.
- The number of student and staff increased by approximately 700 during the time period and the emissions/FTE decreased from 2,17 tCO2e to 1,06 tCO2e/FTE.
- The total GHG emissions for 2024 were 21 606 tCO_2e.
- Over 80 % of Aalto University's emissions are scope 3 emissions, which include construction projects, travel, procurement, commuting, ICT, food, and waste.
- The biggest sources of emissions are procurement, commuting (students and staff), business travel, energy procurement and energy life cycle emissions.
  - Business travel excluding air travel and most of procurements are calculated using spend-based methods. Emission factors of spend-based methods are rough averages, which gives the best possible estimate of emissions at the moment. In the future, it is expected that product providers will enhance emission calculations of their own operations, and emissions become more accurate in the future
- Aalto University aims to achieve net nero-zero for scope 1 and 2 emissions by 2030 and halve scope 3 emissions by 2035 while increasing resilience and biodiversity on campus.
- Strategies to reduce emissions vary based on the source.. E.g. through travel policies and by promoting sustainable mobility. For energy consumption the first reduction step is to improve energy efficiency. .

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Calculation by
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