Carbon Footprint 2022

UNIVERSITÀ DI TRENTO

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Certificazione
Ⓑ
Corporation

Agenda

- ✓ Purpose and Scope

- ✓ University Carbon footprint

- ✓ Carbon Footprint results – *Market based*

- ✓ Key Performance Indicators (KPIs)

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Purpose and Scope

The document provides a summary of the **Carbon Footprint analysis** conducted for the University of Trento, aiming to quantify greenhouse gas (GHG) emissions for the **year 2022**.

The analysis, conducted **in accordance with the UNI EN ISO 14064-1:2019 standard**, provides a solid foundation for developing effective strategies aimed at reducing climate impact. The results of the analysis can be used for:

- Define GHG **reduction targets**, **measure progress**, and **report on achievements**

- Providing **quantitative information** to transparently report the **university's impacts**, including in public reports such as the **Sustainability Report**

- Identifying **emission hotspots**

- Identifying **mitigation actions**, which often represent cost-reduction opportunities

- Obtaining **certification** from a third-party organization

- Participating in **voluntary** impact reduction **programs**

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University Carbon Footprint

Carbon Footprint methodology

Analysis of the University

- Locations, services, supply chain

Identification of organizational boundaries

- Organizational boundary
- GHG reporting boundary

Identification of emission sources

- Classification of emissions according to ISO 14064-1 categories

GHG Emissions Calculation

- Direct and indirect GHG emissions

Results Processing

- GHG emissions Inventory
- Identification of intervention/improvement areas

EMISSION CATEGORIES UNI EN ISO 14064-1:2019

1. COMBUSTION PROCESSES

2. IMPORTED ENERGY

3. TRANSPORT

4. MATERIALS/ SERVICES

5. USE/END OF LIFE

6. OTHER EMISSIONS

Calculation Scope

Organizational boundaries:

GHG emissions have been determined using the **operational control approach**. This method ensures the inclusion of all emissions from activities and facilities directly managed by UniTrento, providing a comprehensive and accurate assessment of sources under the university's full control.

- P.Molino Vittoria – P.Cavazzani – P.Dit.
- Polo di Mesiano
- Palazzo di Economia
- Palazzo di Giurisprudenza
- Povo Piazza Manci 17
- Unisport
- Palazzo di Sociologia
- Palazzo Sardagna
- Palazzo Paolo Prodi
- BUC
- Palazzo Fedrigotti

- Palazzo Piomarta
- Cittadella studenti
- Res. Bernardo Clesio e Asilo
- Manifattura Edificio 6
- Trade Center
- Others
- Complesso di Mattarello
- Povo Zero
- Polo Ferrari 1, 2
- Manifattura Edificio 14

Carbon Footprint results
Market based

GHG Inventory 2022: category breakdown

Categories	Emission sources	Emissions [tCO$_2$e]	Category emissions [tCO$_2$e]	Category percentage [%]
Category 1	Combustion of stationary plants	3,069	3,084	11.3%
	Mobile combustion	15		
	Fugitive emissions	-		
Category 2	Electricity purchased from the grid	-	452	1.7%
	Thermal energy purchased from the grid	452		
Category 3	Staff and student commuting	10,944	14,262	52.4%
	International inbound/outbound mobility	1,521		
	Business travel of employees	1,787		
	Waste transportation	7		
	Upstream of company fleet	3		
Category 4	Purchased goods and services	5,361	9,380	34.5%
	populationl goods	3,106		
	Waste disposal	81		
	Upstream energy	832		

Total emissions 2022	27,178 tCO$_2$e

Scope 2 emissions calculated according to the Location based approach amount to 5,979 tCO2e

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Carbon Footprint Results

27,178

tCO$_2$e

11.3%

1.7%

34.5%

52.5%

- ■ Category 1: Direct GHG emissions
- ■ Category 2: Indirect GHG emissions from imported energy
- ■ Category 3: Indirect GHG emissions from transportation
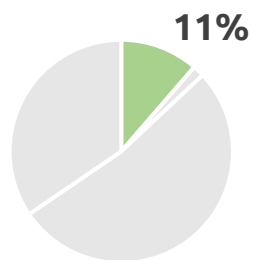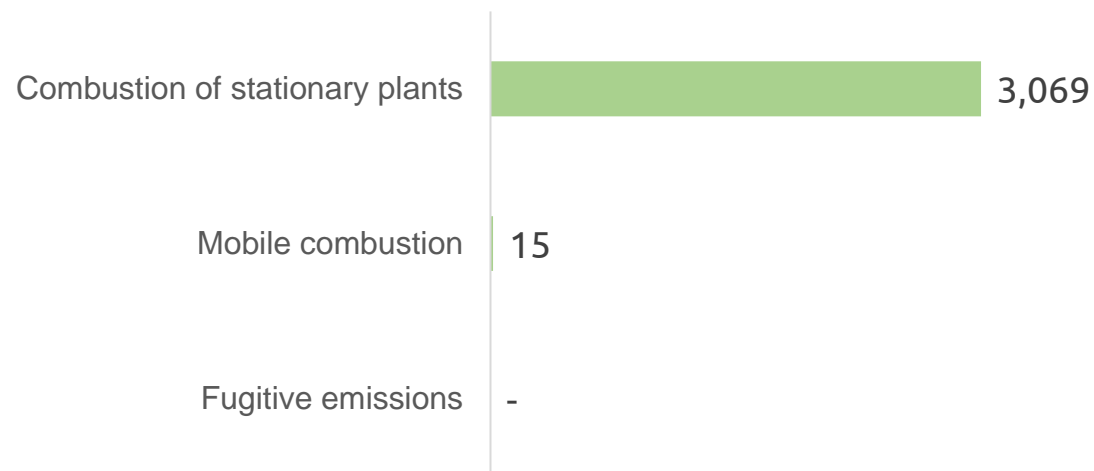- ■ Category 4: Indirect GHG emissions from products used
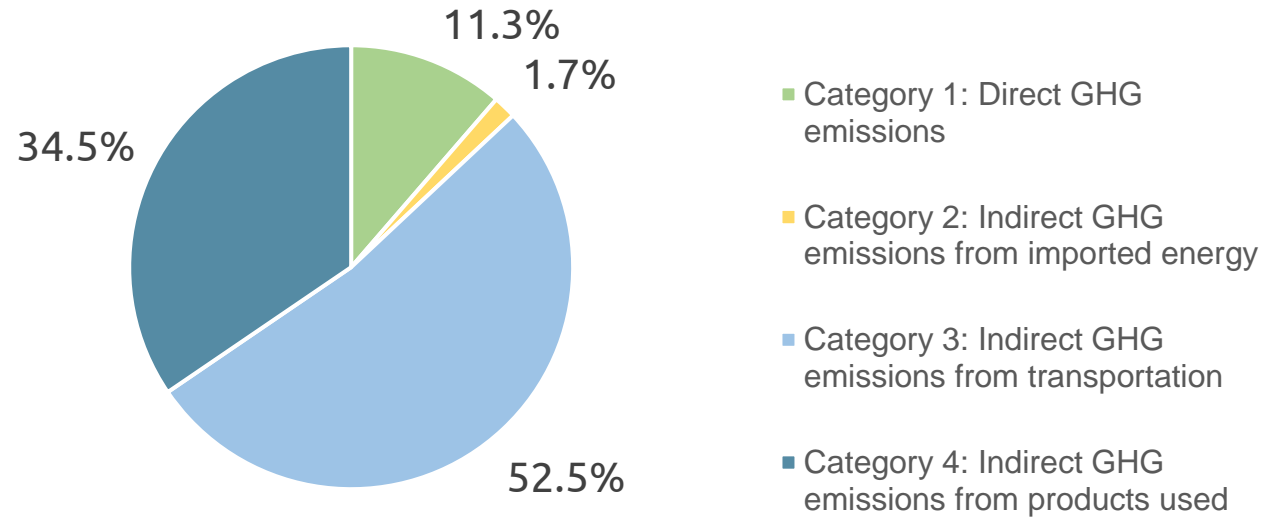
➤ The greatest impacts are associated with **transportation (Category 3)**, accounting for **52%** of total emissions

➤ **13%** of emissions are related to energy consumption, split between Category 1 - fuel use and fugitive emissions and Category 2 - imported energy (calculated using the market-based approach). The electricity purchased from the grid for all university buildings does not contribute to emissions impact due to the purchase of a 100% certified renewable energy with **Guarantees of Origin (GO)**

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Results Analysis – Category 1

3,084

tCO$_2$e

11%

Category 1 [tCO$_2$e]

|	
Combustion of stationary plants	3,069
Mobile combustion	15
Fugitive emissions	-

➤ Category 1 accounts for **11%** of total emissions

➤ The stationary combustion of natural gas for heating is the primary source of emissions in this category, contributing approximately **3,000 tCO$_2$e**. This is based on a total consumption of around 1.5 million Sm³ of natural gas and 1,025 kg of diesel

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Results Analysis – Category 2
Market based

452

tCO$_2$e

2%
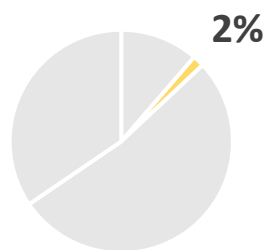
Category 2 [tCO$_2$e]

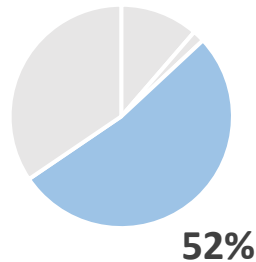|	
Imported electricity (MB)	-
Imported thermal energy	452

➢ **Imported thermal energy** (district heating and cooling) is the only emission source in Category 2

➢ Electricity for all university campuses is purchased as 100% renewable, certified with **Guarantees of Origin (GO)**
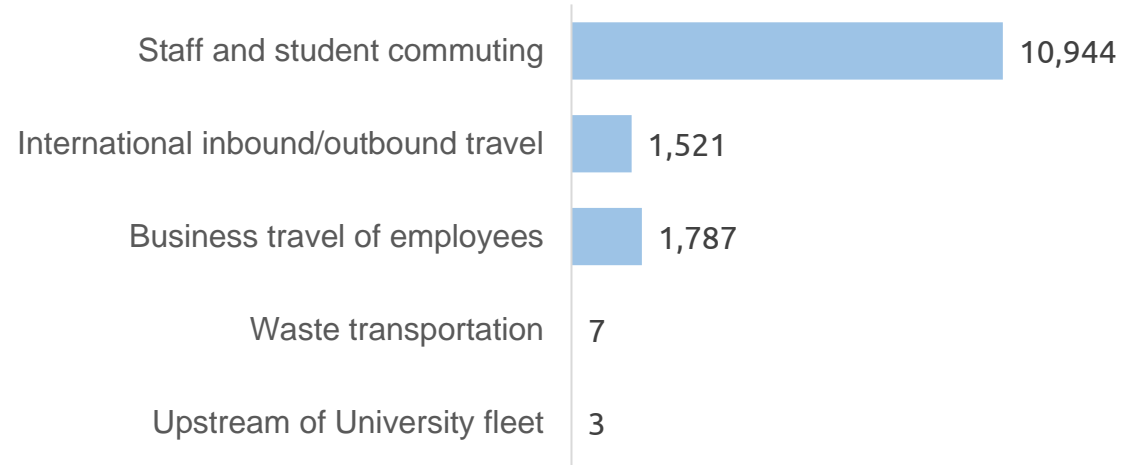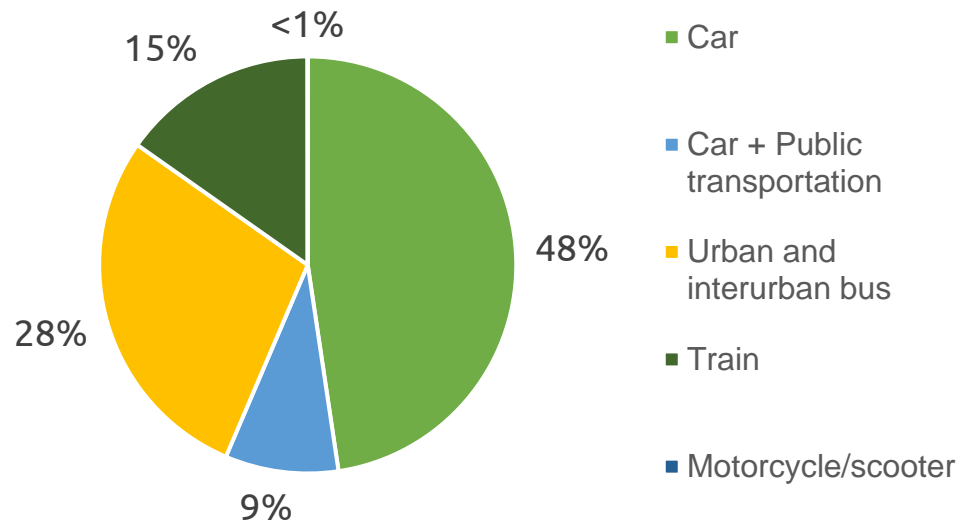
Results Analysis – Category 3

14,262

tCO$_2$e

52%

Category 3 [tCO$_2$e]

Staff and student commuting	10,944
International inbound/outbound travel	1,521
Business travel of employees	1,787
Waste transportation	7
Upstream of University fleet	3

➢ **87%** of Category emissions are attributed to **commuting and international mobility**, with a total of 12,465 tCO$_2$e.

➢ Among the factors contributing to commuting-related emissions, the largest impact comes from **student home-to-university travel**, which accounts for **59%** of Category 3 emissions and **31%** of total emissions
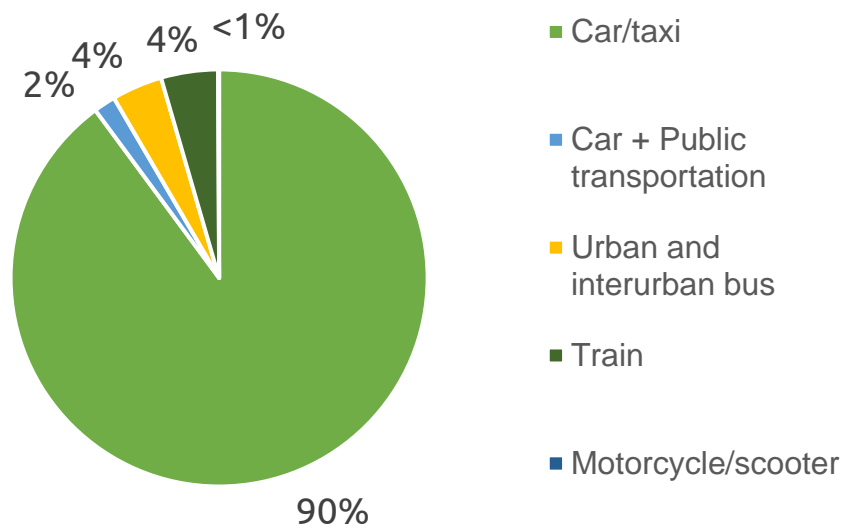
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Category 3 Focus – Student commuting

Pie chart legend:
- Car — 48%
- Car + Public transportation — 9%
- Urban and interurban bus — 28%
- Train — 15%
- Motorcycle/scooter — <1%

8,479 tCO$_2$e
59% Category 3

- Students collectively travel an estimated 68 million kilometres annually to and from university campuses. This figure is based on an estimated 32 weeks of attendance per year (approximately 160 days including lectures and exams)

- **Around 6% of the total distance is travelled on foot or by bicycle**, contributing zero emissions to this category

- **Private cars are the most impactful mode of transport**, despite accounting for only 17% of the kilometres travelled

- In contrast, **trains are the most efficient mode**, covering 41% of the total distance but contributing just 15% of the emissions in this category

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Focus Category 3 – Staff commuting

Pie chart legend:
- Car/taxi
- Car + Public transportation
- Urban and interurban bus
- Train
- Motorcycle/scooter
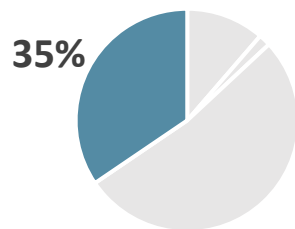
Pie chart values: 90%, 2%, 4%, 4%, <1%

2,465 tCO$_2$e

17% Category 3

- Staff travel an estimated 10 million kilometres annually commuting to and from university sites. This figure is based on an assumed 45 weeks of access per year (approximately 220 working days)

- **Around 3% of the total distance is travelled on foot or by bicycle**, contributing zero emissions to this category

- **Private cars are the most commonly used and highest-impact mode of transport**, accounting for nearly 6 million kilometres (60% of the total commuting distance) and approximately 90% of emissions associated with staff commuting
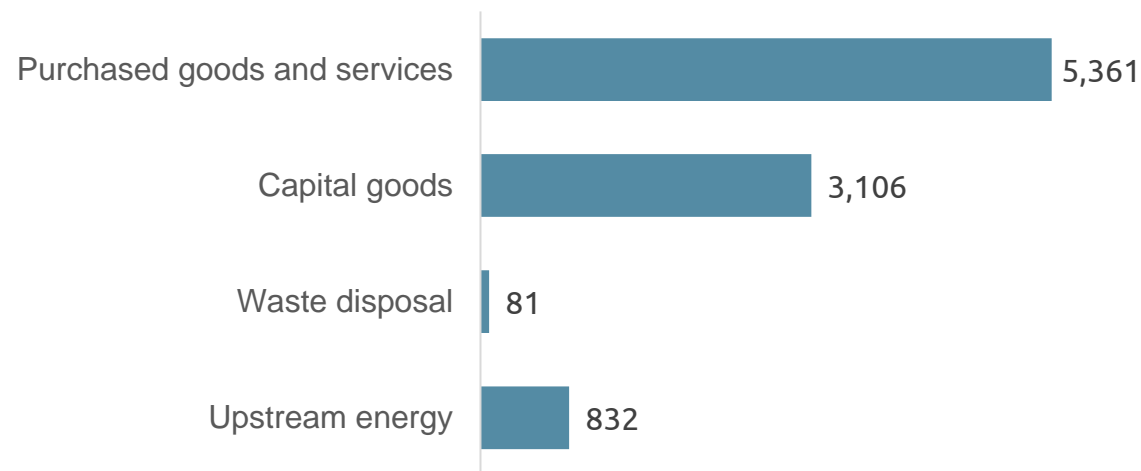
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Results Analysis – Category 4
Market based

9,380

tCO$_2$e

35%

Category 4 [tCO$_2$e]

Purchased goods and services	5,361
Capital goods	3,106
Waste disposal	81
Upstream energy	832

➤ The categories related to the **purchase of goods, services, and populationl goods** account for the largest share of Category 4 emissions, representing **90%** of the total. These impacts have been calculated using the **spend-based approach**, with the largest portion attributed to the University's **construction works**, amounting to approximately €8.8 million

➤ Upstream emissions associated with energy have been calculated based on the **production technology of renewable energy sources**, as detailed in the Cancellation Statement of the GOs

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Key Performance Indicators(KPI)

Key Performance Indicators 2022
Market based

For the purpose of monitoring emissions over time, verifying the outcomes of implemented actions, and making comparisons with other universities, the following indicators have been calculated:

- **University population**: 18,002

- **Area***: 226,699 m^2

	Description	Emissions [tCO$_2$e]	Parameter value	UOM	KPI	UOM
KPI 1	Category 1 and 2 emissions per capita	3,536			0.20	
KPI 2	Category 3 emissions per capita	14,262			0.79	
KPI 3	Commuting emissions per capita	10,944	18,002	person	0.61	tCO$_2$e/person
KPI 4	Total emissions per capita	27,178			1.51	
KPI 5	Category 1 and 2 emissions per unit of area	3,536	226,699	m^2	0.02	tCO$_2$e/m^2

*The square meters included in the perimeter are those considered in the carbon footprint calculation and do not include leased buildings or those not in use