European Commission

Joint Research Centre

GHG Emissions Report

JRC Summer School on Non- Animal Approaches in Science

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2025

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JRC144480

PDF ISBN 978-92-68-34356-2 doi:10.2760/2117950 KJ-01-25-596-EN-N

Luxembourg: Publications Office of the European Union, 2025

Some content was created using ChatGPT.

How to cite this report: Nasi, L., Nasi, E. and Wang, Y., *GHG Emissions Report - JRC Summer School 2025 on Non-Animal Approaches in Science*, Publications Office of the European Union, Luxembourg, 2025, https://data.europa.eu/doi/10.2760/2117950, JRC144480.

Contents

Abstract

This report quantifies the greenhouse gas (GHG) emissions associated with the **JRC Summer School on Non-Animal Approaches in Science** (19–23 May 2025), following the *GHG Protocol Corporate Standard*. The control approach was applied across Scopes 1–3, with gross emissions reported independently of any neutralisation or avoided-emission claims.

Total gross emissions amounted to **11.93 tCO_2e**. Scope 3 dominated the footprint (**11.25 tCO_2e; 94.3%**), primarily driven by *Purchased Goods and Services* (51%), *Business Travel* (17%), and *Upstream Transportation and Distribution* (14%). Scopes 1 and 2 contributed **0.40 tCO_2e (3.4%)** and **0.27 tCO_2e (2.3%)**, respectively. Based on **163 participants**, the per-capita intensity was approximately **0.07 tCO_2e per participant**.

The organisers implemented several low-impact measures, including the use of a low/zero-emission venue; 100% renewable electricity; biogas for heat; optimised HVAC (19°C heating / 27°C cooling, shorter operating hours); shuttle-only transfers (no individual taxis); economy-only speaker travel; 100% vegan menus with surplus-food take-away; app-only programme; no single-use plastics and tap water only.

These measures resulted in **avoided emissions**, bringing the **net balance to 11.08 tCO_2e**.

For comparison, the **average consumption-based per capita footprint** in the EU-27 and Italy is **0.0216 t/day (≈ 21.6 kg/day)** and **0.0238 t/day (≈ 23.8 kg/day)**, respectively. On this basis, the event's per-participant carbon intensity was approximately **28% lower than the EU-27** and **35% lower than Italy** averages.

1. Introduction

This report quantifies the greenhouse gas (GHG) emissions associated with the JRC Summer School on Non-Animal Approaches in Science (19–23 May 2025, JRC Ispra) in accordance with the GHG Protocol Corporate Standard.

The organisational boundary covers the Summer School under the organiser's operational control and contracted suppliers at the Ispra site; the operational boundary includes relevant Scopes 1–3 for an onsite event (onsite fuels/vehicles if any, purchased electricity/heat, supply-chain categories such as catering and materials, staff/business travel, and commuting).

All results are reported as gross emissions, independent of any offsetting or avoided-emissions claims, with comparative benefits disclosed separately.

The reporting boundary follows the GHG Protocol Corporate Standard using the financial Control Approach (Chapter 3, p. 17), applied consistently across Scopes 1–3 relevant to this small onsite/hybrid event. Under the control approach, a company accounts for 100 percent of the GHG emissions from operations over which it has control and excludes operations where it has no such control. This approach aligns with GHG Protocol guidance on organisational boundaries and consolidation and is applied here to ensure consistent, transparent attribution across all scopes.

1.1. Headline results

— **Total gross GHG emissions** (Scopes 1–3): 11.93 tCO_2e.

— **Intensity** (gross):

- 0.07 tCO_2e/participant (163 participants);
- 0.0156 tCO_2e/participant/day (≈765 participant-days).

— **Contextual Benchmark** (consumption-based footprint):

- EU-27 average: 7.88 tCO_2e per capita/year → ≈0.0216 tCO_2e (≈ 21.6 kg)/capita/day.
- Italy average: 8.69 tCO_2e per capita/year → ≈0.0238 tCO_2e (≈ 23.8 kg)/capita/day.
- Event vs. benchmarks: The event's intensity is approximately 28% below the EU-27 benchmark and 35% below the Italy benchmark. Given the event took place in Italy, the latter is particularly pertinent in light of the applicable energy mix and other resources inputs.

— **Emissions by scope**:

- Scope 1: 0.40 tCO_2e (3.4% of total emissions)

  CO_2: 0.40 tCO_2

- Scope 2: 0.27 tCO_2e (2.3% of total emissions)

  CO_2: 0.00 t; CH4: 7.8E-3 t; CH4: 0.23 tCO_2e; N2O: 1.5E-4 t; N2O: 4.2E-2 tCO_2e;

- Scope 3: 11,25 tCO_2e (94.3% of total emissions)

— **Top drivers**:

- Purchased Goods and Services 51%
- Business Travel 17%
- Upstream Transportation and Distribution: 14%

1.2. Key Actions Taken

— **Venue & energy**: Event hosted in a low/zero-emission building; 100% renewable electricity; thermal energy from biogas only. HVAC optimised (shorter operating hours; 19°C heating / 27°C cooling setpoints); ambient-temperature water in restrooms.

— **Mobility**: Shuttle buses only from rail station/airport to Ispra (no organiser-provided taxis or individual transport). Speakers reimbursed economy-class rail/air tickets (11 speakers).

— **Catering**: 100% vegan menus; food-waste prevention with participants allowed to take surplus food.

— **Materials & water**: App-only program (no brochures/posters); no single-use plastics; tap water only (no bottled water).

— **Staff commuting**: ~20% cycled

1.3. Comparative Benefits

Design choices (collective shuttles; renewable electricity and biogas; energy-efficient buildings; low-impact catering; no single-use materials) delivered avoided emissions yielding a net balance of 11,07 tCO_2e.

For context, consumption-based per capita footprints in the EU-27 and Italy are 0.0216 t/day (≈ 21.6 kg/day) and 0.0238 t/day (≈ 23.8 kg/day).

On this basis, the event's CO_2 intensity is approximately 28% lower than the EU-27 and 35% lower than Italy.

In line with the GHG Protocol, these comparative figures are disclosed separately and do not reduce the gross Scope 1–3 totals above.

2. Event & boundaries

2.1. Event

— **Event**: JRC Summer School on Non-Animal Approaches in Science

— **Dates**: 19 to 23 May 2025

— **Venue and Address**: Joint Research Centre of the European Commission, Via Fermi 2749, 21027 Ispra (VA), Italy

— **Type of venue**: Conference Centre

— **Total area used** (m^2): 17628

— **Event days**: 4.5 full days

— **Attendees**: around 160–170 in total

— **Staff/volunteers**: 15-20

2.2. Boundaries

Organisational boundary: The inventory applies the GHG Protocol control approach consistently across Scopes 1–3. This includes all operations under JRC's control during the reporting period and exclude activities outside that control to avoid double-counting.

Operational boundary (scopes): Scopes 1–3 relevant to a small onsite/hybrid event are included and reported as gross emissions (independent of any neutralisation or avoided-emissions claims):

— **Scope 1**: Onsite fuel (e.g., generators/vehicles).

— **Scope 2**: Venue electricity/heat reported location-based by default; market-based also where are data available.

— **Scope 3**: Attendee/staff travel, accommodation, catering, and materials/printing.

Key exclusion: Attendee travel to/from the event was not included due to data limitations. It is flagged for inclusion in the next edition with improved data collection.

3. Methodology

3.1. Framework

Emissions were calculated using the standard activity-data method:

E=EFxG

where E is emissions, EF the emission factor, and G the measured activity (a material or energy flow).

For non-CO_2 gases, EF is multiplied by the relevant GWP (global warming potential) for that gas from the selected factor set, and results are expressed in tCO_2e.

3.2. Scope 1 (direct)

For an event of this nature, the only pertinent Scope 1 source is mobile combustion (GHG Protocol classification). The following were included:

— JRC vehicles used to transport people associated with the event.

Other direct sources (stationary combustion, process emissions, fugitive emissions) are not pertinent for this event. In particular, fugitive emissions from the broader Ispra site were not considered: the buildings form part of a large campus serving ~3,000 people; the Summer School lasted ~4.5 days (~1% of a year) with a small audience relative to site capacity, so any allocation would be immaterial for this inventory.

Method: Distance-based method by vehicle type and distance travelled.

3.3. Scope 2

Scope 2 covers indirect emissions from purchased energy consumed during the event at JRC-owned spaces:

— Electricity consumed during the event

— Thermal energy consumed during the event

— Steam was not relevant and is excluded.

Method and policy: Market-based accounting was applied to both electricity and thermal energy (reflecting the energy mix purposefully chosen). Activity data (kWh for electricity; metered/allocated energy for heat) were provided.

3.4. Scope 3

The following Scope 3 categories were assessed using the GHG Protocol Scope 3 calculation guidance. Unless otherwise noted, the average-data method and/or spend-based method were applied; supplier-specific (LCA) and hybrid methods were not used because suppliers did not have the necessary data.

— **Purchased Goods and Services**

- Accommodation services at the hotels indicated to participants and invited speakers
- Catering services (on-site catering and hotel F&B)
- T-shirts (reused)

Method: Average-data and spend-based, as appropriate to data availability.

— **Fuel and Energy-Related Activities** (not in scopes 1 and 2)

- Upstream emissions of purchased electricity
- Transmission and distribution (T&D) losses

Method: Average-data method per Scope 3 guidance.

Upstream Transportation and Distribution (goods)

— Transport of purchased products from tier-1 suppliers to the event was excluded. For services such as catering, transport is bundled in the service price; activity data (distances, vehicle types) are not known, and inclusion would risk double counting.

Transportation services (people to/from the event)

— Shuttle transport for participants between the rail station/airport and Ispra.

Method: Distance-based method.

Waste Generated in Operations

— Waste treatment handled by third parties is a Scope 3 source; however, no waste data were available from the catering service for this edition.

Business Travel

— Travel by staff and invited speakers that is relevant to the event contributes significantly to scope 3 emissions

Method: Distance-based method (primary). Spend-based was used only where distance data were unavailable.

Employee Commuting (organiser's staff)

— Commuting by organiser staff involved in the event.

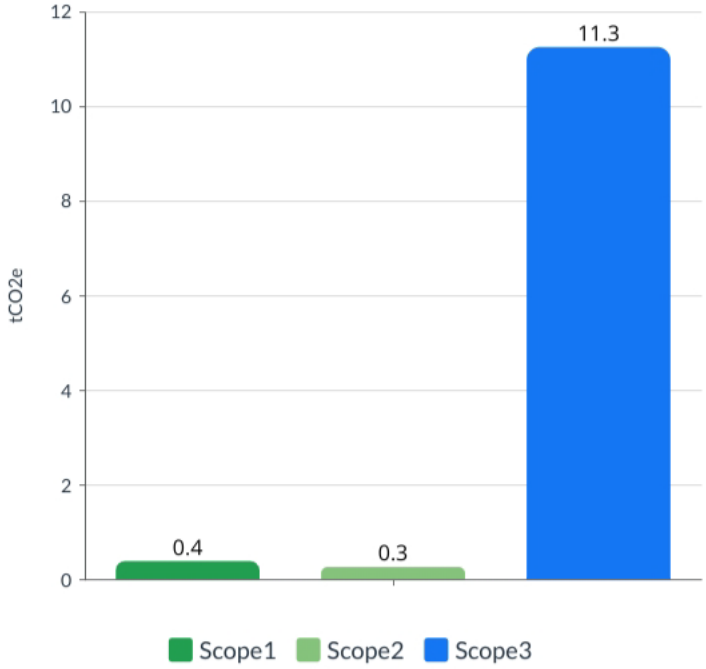
Method: Distance-based method. (While not a large share of Scope 3, it is relevant for the organisers of a small event.)

3.5. Out of scope (biogenic CO_2 disclosure)

Biogenic CO_2 emissions from on-site biogas use are determined separately (i.e., outside Scopes 1–3 totals). Consistent with the GHG Protocol, CH_4 and N_2O associated with biogas combustion are included in Scope 2. (See the Results and Disclosures sections for separate biogenic CO_2 reporting.). Biogenic CO_2 emissions for this event were calculated and where found negligible.

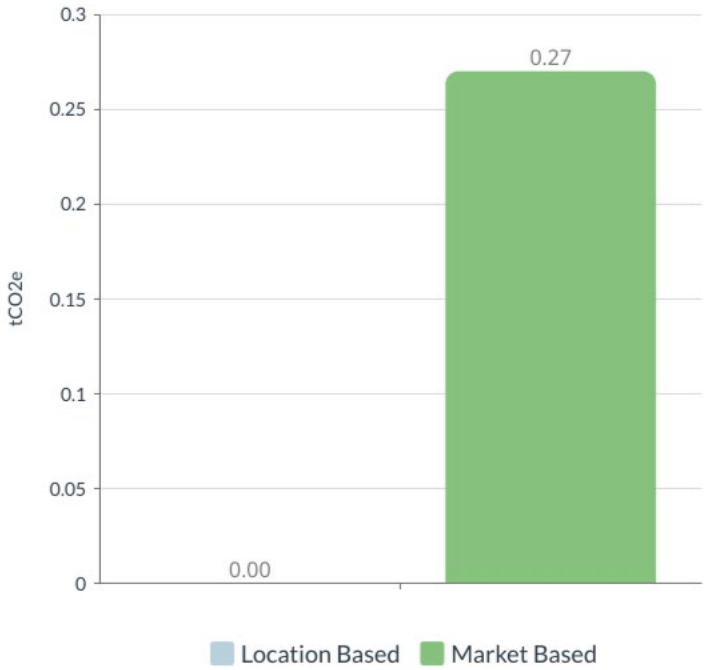
4. Emissions data

Figure 1 - Total Emissions by Scope



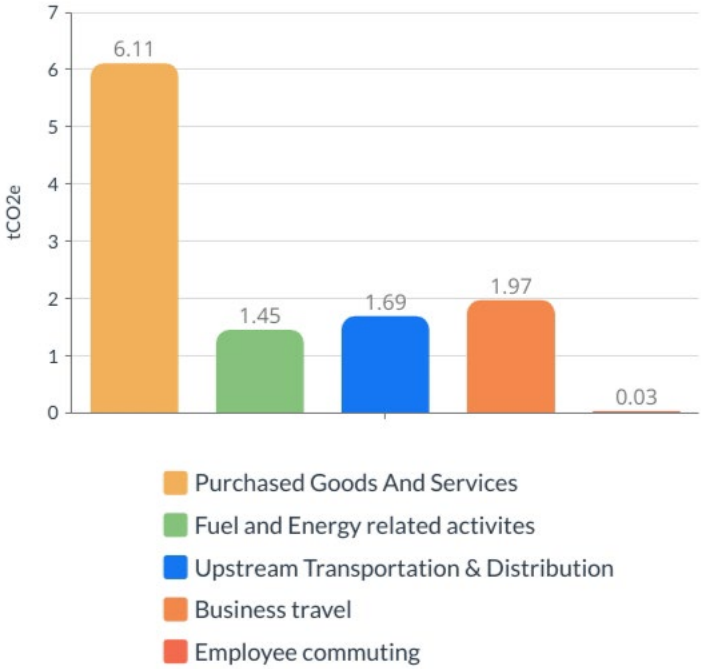
Source: Change2 data analysis based on data provided by EU JRC.

Figure 2 - Scope 3 Emissions



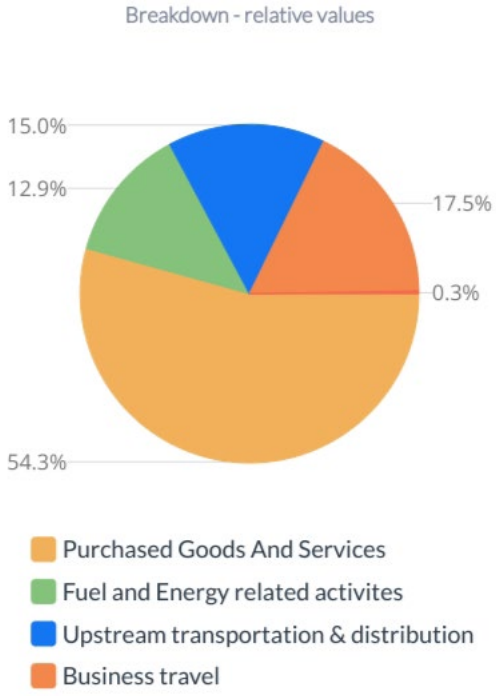
Source: Change2 data analysis based on data provided by EU JRC.

Figure 3 - Scope 3 Emissions



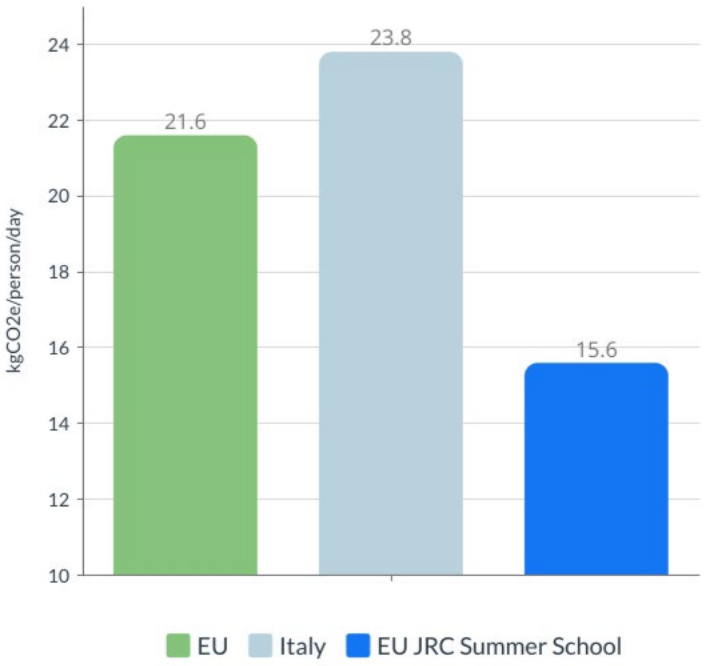
Source: Change2 data analysis based on data provided by EU JRC.

Figure 4 - Scope 3 Emissions: Relative Values



Source: Change2 data analysis based on data provided by EU JRC.

Figure 5 - Individual Average Daily Emissions



Source: Change2 analysis on data of the European Platform on Life Cycle Assessment provided by the EU JRC.

5. Avoided emissions

5.1. Introduction

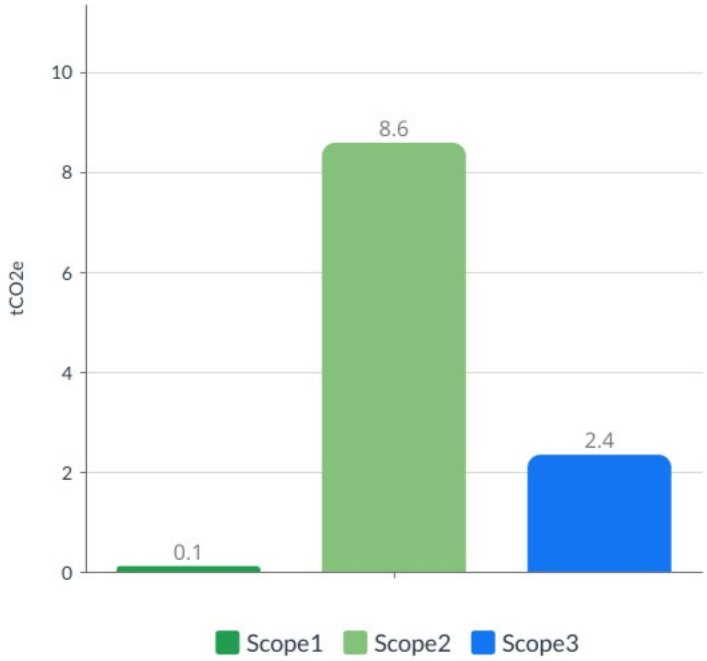
For each scope, projects were chosen to reduce the event's footprint. For each project:

— The primary effect(s) resulting from each project activity

— All significant secondary effects resulting from each project activity

— All barriers that would affect decisions to implement the project activity are reported in the following pages following the performance standard procedure.

Figure 6 - Total Avoided Emissions by Scope



Source: Change2 analysis based on the Scope 1, Scope 2, and Scope 3 reference data found on page 34 of our PDF report.

Table 1 - Scope 1 Baseline Candidates

Project	Project Activity	Performance metrics	Primary Effect	Baseline Candidate
GHG content of People Transport	Increase Vehicle Occupancy	Total distance traveled per vehicle	Reduction in mobile combustion emissions	Average Shuttle Occupancy

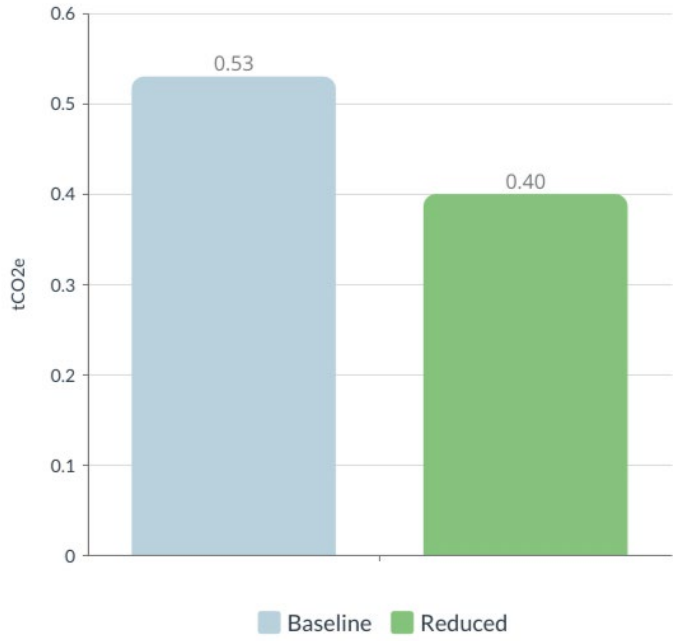
Source: GHG Protocol — https://ghgprotocol.org/sites/default/files/standards/ghg_project_accounting.pdf

Table 2 - Scope 1 Baseline Barriers

Project	Project Activity	Barrier 1	Barrier 2	Other Barriers
GHG content of People Transport	Increase Vehicle Occupancy	Social/Cultural	-	-

Source: GHG Protocol — https://ghgprotocol.org/sites/default/files/standards/ghg_project_accounting.pdf

Figure 7 - Scope 1 Avoided Emissions



Source: Change2 analysis based on the Scope 1 reference data found on page 34 of our PDF report.

Table 3 - Scope 2 Baseline Candidates

Project	Project Activity	Performance metrics	Primary Effect	Baseline Candidate
GHG content of Electricity	Switch to green electricity	kWh of electricity	Reduction in combustion emissions from generating energy	Fossil-fuel electricity-generating technologies
GHG content of Heat	Change from fossil fuel to biofuel	kWh of Heat	Reduction in combustion emissions from generating energy	Methane
Buildings Temperature	Reduce temperature intervals	kWh of thermal energy	Reduced energy consumption	Average temperatures

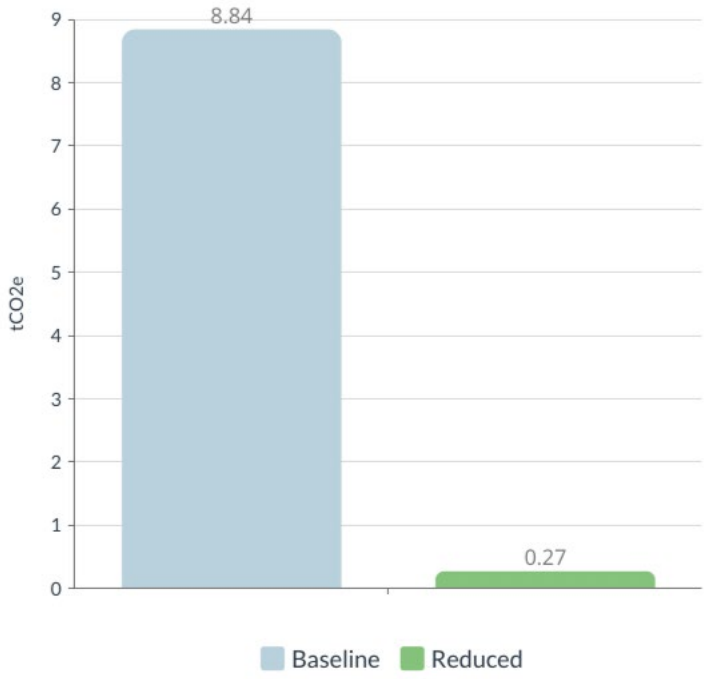
Source: GHG Protocol — https://ghgprotocol.org/sites/default/files/standards/ghg_project_accounting.pdf

Table 4 - Scope 2 Baseline Barriers

Project	Project Activity	Barrier 1	Barrier 2	Other Barriers
GHG content of Electricity	Switch to green electricity	Financial and Budgetary	-	-
GHG content of Heat	Change from fossil fuel to biofuel	Financial and Budgetary	Technology Operation and Maintenance	Infrastructure, Resource Availability
Buildings Temperature	Reduce temperature intervals	Social/Cultural	-	-

Source: GHG Protocol — https://ghgprotocol.org/sites/default/files/standards/ghg_project_accounting.pdf

Figure 8 - Scope 2 Avoided Emissions



Source: Change2 analysis based on the Scope 2 reference data found on page 34 of our PDF report.

Table 5 - Scope 3 Baseline Candidates

Project	Project Activity	Performance metrics	Primary Effect	Baseline Candidate
Single-use items	Ban on non-food single-use products	Kg of reused T-shirts	Reduction in resource use	Single use
Tap water	Tap water only	kgCO2e reduction	Reduction in emissions from plastic water	Conservative scenario: plastic water during the event
Food footprint	Serve vegan meals	kgCO2e of meals	Reduced food footprint	Conservative scenario: average meals with red meat
Airplane cabin class	Economy class only	kgCO2e	Reduced food footprint	Premium class
Bike to work	Bike to work	kgCO2e	Reduced food footprint	Small car for commuting

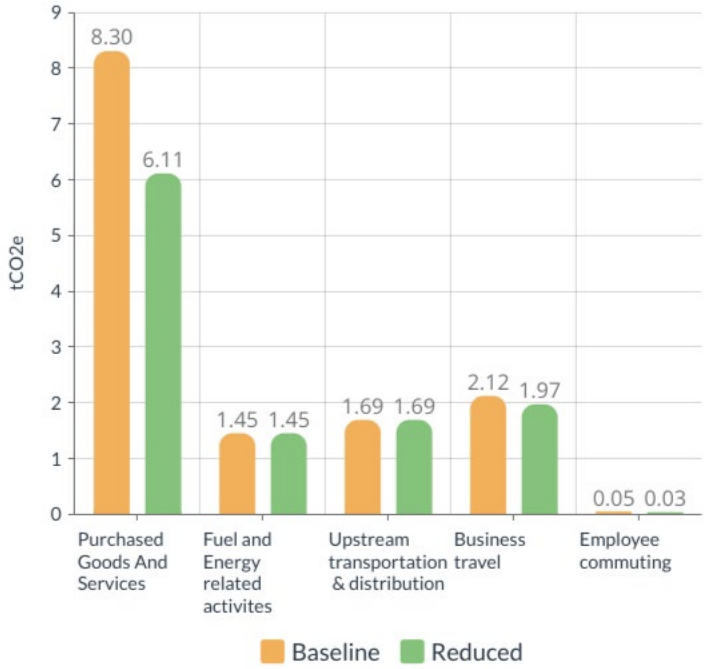
Source: GHG Protocol — https://ghgprotocol.org/sites/default/files/standards/ghg_project_accounting.pdf

Table 6 - Scope 3 Baseline Barriers

Project	Project Activity	Barrier 1	Barrier 2
Single-use items	Ban on non-food single-use products	Social & Cultural	-
Tap water	Food waste reduction	Social & Cultural	Technology operation and maintenance
Food footprint	Serve vegan meals	Social & Cultural	-
Airplane cabin class	Economy class only	Social & Cultural	-
Bike to work	Bike to work	Social & Cultural	Infrastructure, resource availability

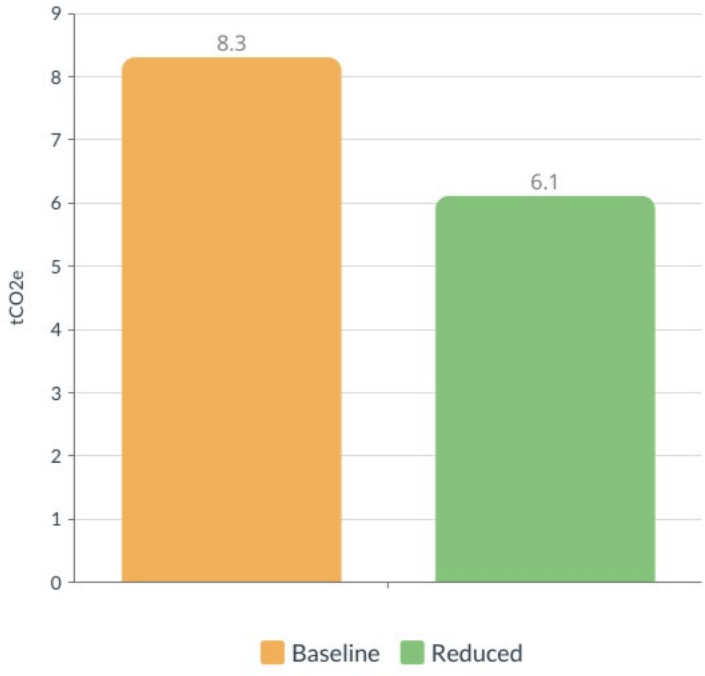
Source: GHG Protocol — https://ghgprotocol.org/sites/default/files/standards/ghg_project_accounting.pdf

Figure 9 - Scope 3 Avoided Emissions Emissions



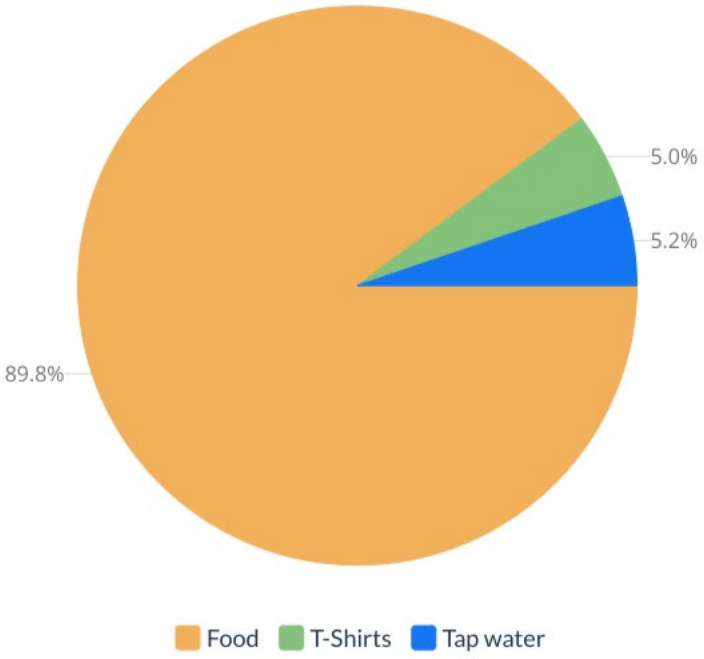
Source: Change2 analysis based on the Scope 3 reference data found on page 34 of our PDF report.

Figure 10 - Scope 3.1 Avoided Emissions: Purchased Goods and Services



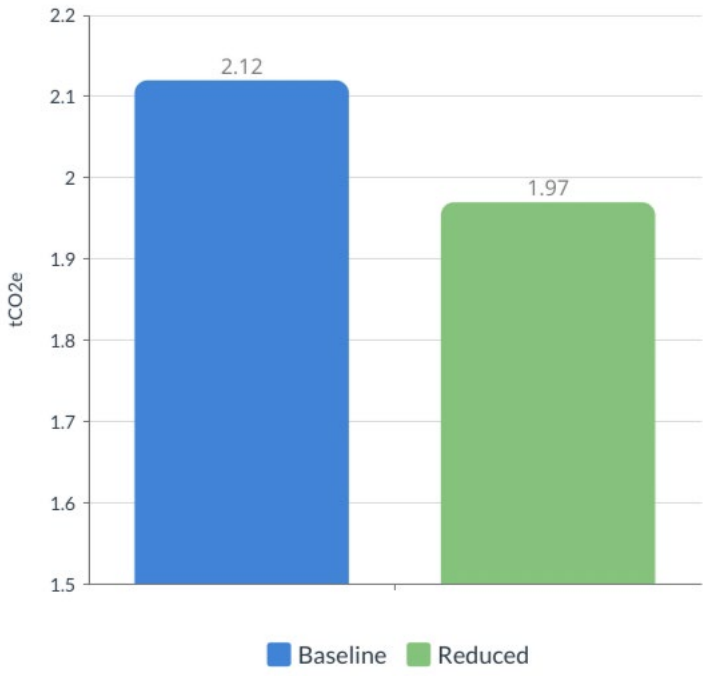
Source: Change2 analysis based on the first five Scope 3 reference data points found on page 34 of our PDF report.

Figure 11 - Scope 3.1 Avoided Emissions: Relative Values, 3 Projects



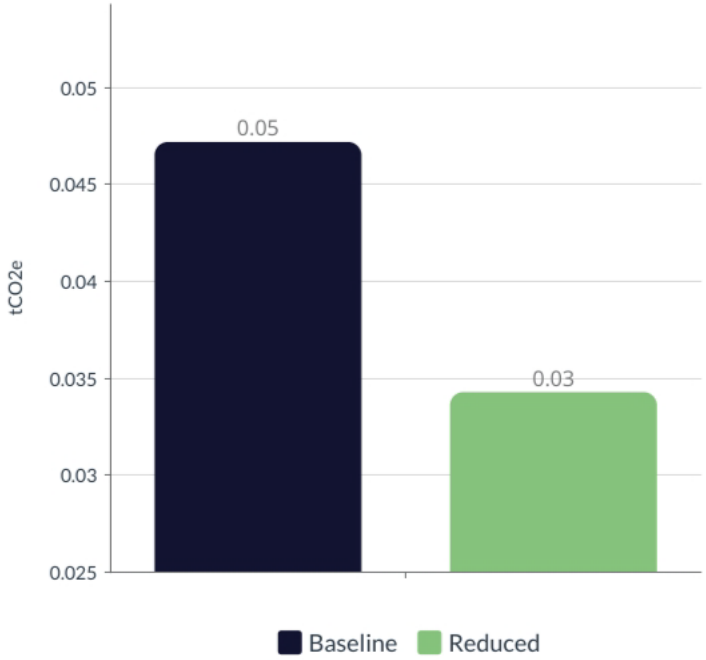
Source: Change2 analysis based on the first five Scope 3 reference data points found on page 34 of our PDF report.

Figure 12 - Scope 3 Avoided Emissions: Business Travel



Source: Change2 analysis based on the first four and last two Scope 3 reference data points found on page 34 of our PDF report.

Figure 13 - Scope 3 Avoided Emissions: Employee commuting



Source: Change2 analysis based on the first four and last two Scope 3 reference data points found on page 34 of our PDF report.

6. Priority actions for next editions

The roadmap for the next edition focuses on the most material hotspots identified in this inventory and translates them into contractable measures (registration, RFPs, supplier agreements).

Consistent with the GHG Protocol, any comparative/avoided emissions from these choices are reported separately from gross Scope 1–3 totals. In addition to the following points, it will be necessary to collect as much supplier-specific data as possible.

1. Include attendee travel (Scope 3) and provide rail-first guidance; enable hybrid participation for long-haul.
2. Speaker travel: train-only where feasible, particularly within Europe; economy-only reimbursement for any necessary flights.
3. Catering: require local, seasonal menus and exclude nonorganic items unless justified; prioritise agroecological and agroforestry suppliers, in particular for tea and coffee served during breaks.
4. Accommodation: promote sustainability-labelled hotels (e.g., EU Ecolabel) near the venue and public transport.
5. Waste: measure waste by stream (residual/recycling/organics); keep app-only materials and surplus-food take-away; maintain tap-water-only and no single-use plastics.

7. Conclusions

This assessment quantified the GHG emissions of the JRC Summer School on Non-Animal Approaches in Science (19–23 May 2025, JRC Ispra) in line with the GHG Protocol Corporate Standard, applying the control approach across Scopes 1–3 and reporting gross emissions independently of any neutralisation or avoided-emissions claims.

The organisational boundary covered activities under JRC's control at Ispra; operationally, relevant event sources were included across Scopes 1–3 as defined in this report.

Total gross emissions were 11.93 tCO_2e. Scope 3 dominated the footprint (11.25 tCO_2e; 94.3%), with Purchased Goods and Services (51%), Business Travel (17%), and Upstream Transportation and Distribution (14%) as the top drivers. Scope 1 and Scope 2 contributed 0.40 tCO_2e (3.4%) and 0.27 tCO_2e (2.3%), respectively. On a per-participant basis (163 attendees), the intensity was ~0.07 tCO_2e per participant.

The organiser implemented multiple low-impact measures: hosting in a low/zero-emission building; 100% renewable electricity; biogas for heat; optimised HVAC (19°C heating / 27°C cooling, shorter operating hours); shuttle-only transfers (no individual taxis); economy-only speaker travel; 100% vegan menus with surplus-food take-away; app-only programme; no single-use plastics and tap water only. These design choices yielded avoided emissions such that the net balance equals 11,08 tCO_2e.

A material exclusion this year is attendee travel to/from the event due to data constraints. For the next edition, we recommend including attendee travel in Scope 3 with rail-first guidance, prioritising train-only speaker travel within Europe, strengthening local/seasonal/organic (agroecological/agroforestry) sourcing—especially for tea and coffee—promoting sustainability-labelled hotels, and measuring waste by stream. These steps will improve completeness and comparability while targeting the main reduction levers identified in this inventory.

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