CARBON FOOTPRINT ACCOUNTING REPORT

2025

Project Brief:

This project was commissioned to provide an estimation of the CO2 emissions of eLTER Science Conference 2025 that was held in Finland, Tampere Hall in Tampere at 23-27.6.2025. Greenhouse gas emissions have been estimated and calculated according to the international standard, the Greenhouse Gas Protocol Initiative, including all emissions from Scope 1, 2 and selected scope 3 categories. All greenhouse gas emissions are converted into CO2 equivalents.

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INTRODUCTION

eLTER (Integrated European Long-Term Ecosystem, critical zone, and socio-ecological Research network) is dedicated to advancing high-impact research on the compounded effects of climate change, biodiversity loss, pollution, and unsustainable resource use in Europe's terrestrial, freshwater, and transitional water ecosystems. The network operates hundreds of sites across Europe that monitor and gather long-term ecological, hydrological, atmospheric, and socio-ecological data, providing unique insights to help address today's most pressing environmental challenges.

The first eLTER Science Conference will bring together an extensive network of 350+ researchers, stakeholders, site managers, and policymakers, all working at the forefront of biogeoscience, biodiversity research, social ecology, and environmental monitoring.

The aim of this report is to present the greenhouse gas (GHG) emissions of eLTER conference based on the emission data.

METHODS

The carbon accounting gives a general overview of exhibitions greenhouse gas emissions, converted into CO2 – equivalents, based on reported data from internal and external systems. The analysis facilitates the identification of possible measures to reduce energy consumption as well as the overall carbon footprint.

Carbon accounting has been measured using best practice standards and guidelines, such as the Greenhouse Gas Protocol. The international standard, the Greenhouse Gas Protocol Initiative (GHG-protocol) is an accounting tool to manage greenhouse gas emissions. Today, hundreds of companies and organizations around the world are using GHG Protocol standards and tools to manage their emissions. The standard was developed through a decade-long partnership between the World Resources Institute and the World Business Council for Sustainable Development. The Greenhouse Gas Protocol Initiative is working with businesses, governments, and environmental groups around the world. The methodology considers the six most important greenhouse gases: carbon dioxide (CO2), nitrous oxide (N2O), methane (CH4), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF6). These are converted into CO2 equivalents based on their global warming potential.

Established emissions factors have been derived from reliable references for each emissions source such as bought electricity and wastes from Finnish Environmental institute (SYKE). The recent emission factors (2024 October) for travel were taken from United Kingdom government released database (link in reference) Emission factors for Finnish hotel stays were taken updated database at hotelfootprints.org.

SCOPE 1: DIRECT EMISSIONS FROM PRODUCTION (MANDATORY REPORTING)

This scope consists of all direct emissions from company-controlled sources, such as mobile combustion of company-controlled vehicles, own energy generation and Fugitive emissions which result from unintentional releases, e.g., equipment leaks, for example hydrofluorocarbon (HFC) emissions during the use of refrigeration and air conditioning equipment.

SCOPE 2: INDIRECT EMISSIONS FROM PURCHASED ENERGY (MANDATORY REPORTING)

This scope includes all emissions from purchased energy.

SCOPE 3: INDIRECT EMISSIONS FROM VALUE CHAIN (VOLUNTARY REPORTING)

While Scope 1 and 2 are mandatory according to the GHG protocol, emissions under Scope 3 are reported on a voluntary basis. The relevant categories for eLTER conference were chosen to be participant travel, accommodation and food.

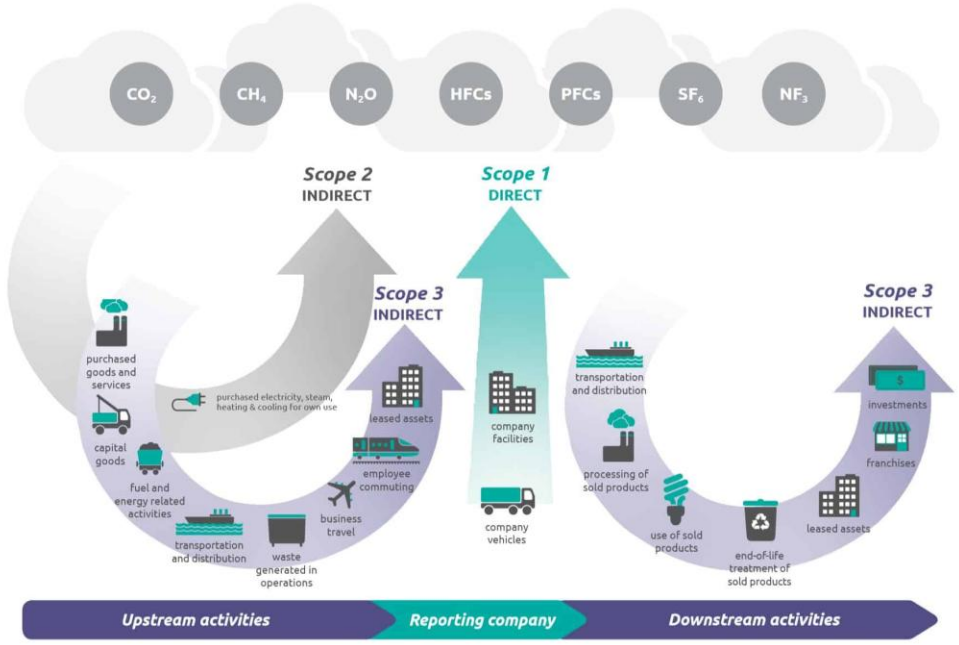

Figure 1. Reporting boundaries of GHG Protocol

RESULTS

Carbon footprint of eLTER Science Conference 2025 withing determined boundary was **436,5tn CO2eq**.

eLTER Science Conference 2025 total emissions	
	tnCO2eq
Scope 1	0
Scope 2	0
Scope 3	436,5
Total tnCO2eq:	436,5

Table 1. eLTER Science Conference 2025 total carbon emissions.

SCOPE 1, DIRECT EMISSIONS FROM PRODUCTION

The direct emission from the Tampere Hall (the event place) owned vehicles during event assembly and disassembly is not relevant due to very little mileage. Same applies to fugitive emissions from freezers and air conditioners. Hence no scope 1 emissions.

SCOPE 2, INDIRECT EMISSIONS FROM PURCHASED ENERGY

The Tampere Hall has been purchasing hydropower since 2011 and district cooling since 2015. Both are carbon dioxide-free. District heating was switched to renewable energy sources (wood) on November 1, 2019.

District heating, known as district heating wood, is mainly district heating produced from logging waste in the forests of Pirkanmaa. It is produced at the certified Naistenlahti power plant in Tampere.

Local cooling: The Tampere Hall is cooled in an environmentally friendly way directly from the depths of Lake Näsijärvi. The cold is extracted from the water at the Kaupinoja cooling plant. Tampereen Sähkölaitos is the largest supplier of lake water cooling in Finland and Europe.

Electricity is produced by hydropower at the Tammerkoski power plant. In addition, the Tampere Hall Group has its own rooftop solar panels, which produce emission-free energy for its own use. Hence no scope 2 emissions.

SCOPE 3, INDIRECT EMISSIONS FROM THE VALUE CHAIN:

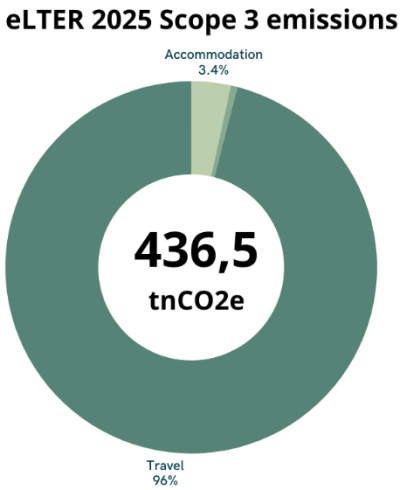

Figure 2. Scope 3 emissions

eLTER 2025 Science Conference 2025 Scope 3 emissions	
	tnCO2eq
Accommodation	15,0
Food and cafe	2,5
Participant travel	419
Total tnCO2eq:	436,5

Table 2. Emissions from Scope 3

Accommodation

approximately 335 participants stayed in a hotel for four nights each. Emission factor for a hotel night in Finland is 11,3 kgCO2eqv. https://www.hotelfootprints.org/

Food

The organizers decided to offer only vegetarian/vegan menu with low carbon footprint 1005gCO2/portion (Saarinen et al. 2012). Lunch + Café and fruit/bunny for each four days for each 352 participants resulted in **2,5tnCO2eq** emissions.

Participant travel

Fifty participants originated from Finland, and it was estimated that half of them used a car with average 300km mileage. This resulted in **1,3 tnCO2eq** emissions from car mileage. The emissions of a train travel were considered irrelevant since 94% of Finnish electricity is CO2-neutral (https://energia.fi/en/energy-sector-in-finland/energy-production/electricity-generation/)

There were no domestic flights. 250 European flights and 43 intercontinental flights resulted altogether in **417,5 tnCO2eq** emissions (Emission factors: 320g CO2eqv/personkm for European flights and 215 gCO2eqv/personkm for intercontinental flights were used) UK.gov

COMPENSATION

The venue carbon footprint without flights was roughly evaluated in advance to be **85tnCO2eq** which was significantly more than calculated (accommodation, food, mileage) **19 tnCO2eq.** This was due to updated emission factors, especially concerning hotel stays.
The evaluated amounts of emissions were offset by planting 179 trees in City of Mikkeli owned Kovalansuo carbon sink on 27 May 2025.

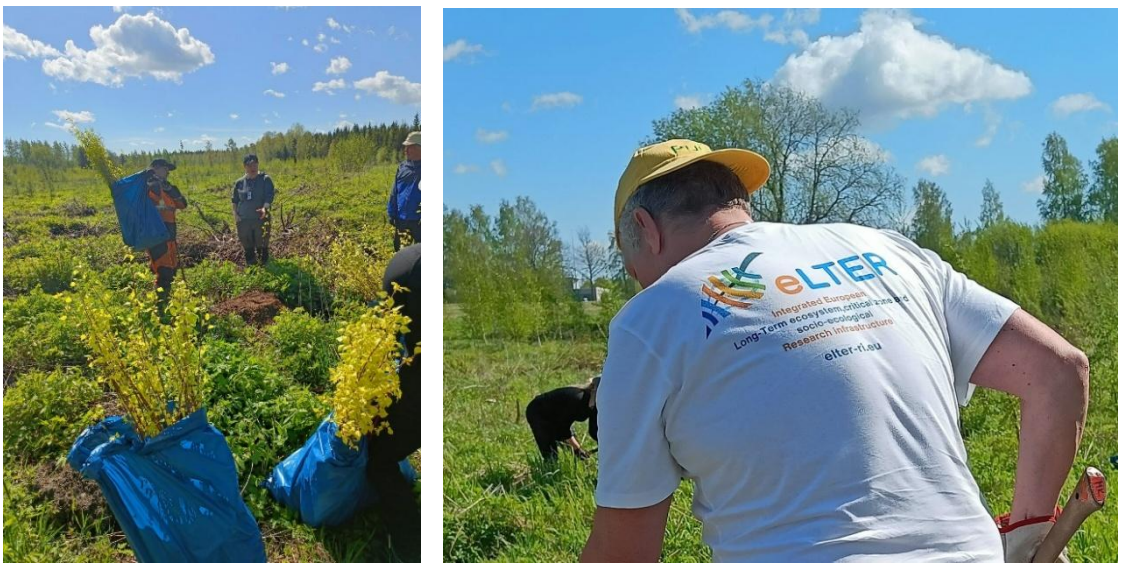

Figure 3,4. The Puuni planting event (2025) of Kovalansuo carbon sink.

The sink is former peat bog which acidity prevents natural forestation. After rising PH additional carbon sequestration is achieved. According to LUKE (Natural Resources Institute Finland) calculations Kovalansuo carbon sink will offset the emissions during next hundred years. The detailed information about the Kovalansuo Carbon sink can be found here:

Figure 5. QR-code for additional Carbon sink information.

REFERENCES

Standards : http://ghgprotocol.org/standards

WBCSD/WRI (2004). **The greenhouse gas protocol. A corporate accounting and reporting standard** (revised edition). World Business Council on Sustainable Development (WBCSD), Geneva, Switzerland /World Resource Institute (WRI), Washington DC, USA, 116 pp.

WBCSD/WRI (2011). **Corporate value chain (Scope 3) accounting and reporting standard:** Supplement to the GHG Protocol corporate accounting and reporting standard. World Business Council on Sustainable Development (WBCSD), Geneva, Switzerland/World Resource Institute (WRI), Washington DC, USA, 149 pp.

WBCSD/WRI (2013). **Technical Guidance for Calculating Scope 3 Emissions**: Supplement to the Corporate Value Chain (vaikutusalue3) Accounting & reporting Standard World Business Council on Sustainable Development (WBCSD), Geneva, Switzerland /World Resource Institute (WRI), Washington DC, USA, 182 pp.

Accommodation
Hotel night: 11,3kg CO2eqv/night
https://www.hotelfootprints.org/

Food
Hartikainen & Pulkkinen 2016
(Emission factor, 1005g CO2eqv, vegetarian lunch)
(Emission factor, 283g CO2eqv, coffee + bun)

Traveling:
Car mileage:
https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2024
(Emission factor, 167g CO2eqv/km, unknown fuel source)

Air travel:
https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2024
(Emission factor, 320g CO2eqv/km, European flight range)
(Emission factor, 215g CO2eqv/km, intercontinental flight range)