



Carbon Emission Management of GP2025

Executive Summary

Switzerland hosted the 8th Global Platform for Disaster Risk Reduction (GP2025) from 2 to 6 June 2025, organized through collaboration between the Government of Switzerland and the United Nations Office for Disaster Risk Reduction (UNDRR). As a United Nations event, environmental sustainability was a core consideration in both the planning and execution phases. This focus reflected the connection between disaster risk reduction and environmental stewardship and aligned with the UNDRR's environmental policy and broader UN commitments to sustainable operations.

GP2025 was designed and implemented with the goal of minimizing negative environmental impacts and setting an example for organizing environmentally sustainable events. Organizers took steps to reduce emissions where possible and to offset residual, unavoidable carbon emissions (CO₂eq). As part of these green efforts, GP2025 was designed as a hybrid event to offer virtual participation options, with the intention of reducing the need for international travel. These efforts were consistent with UN guidance for sustainable event management and aimed to leave a beneficial legacy for the host country, participating delegates, and the global public.

This report presents the management of carbon emissions related to the organization of the GP2025. Carbon emissions generated by the event were assessed using internationally recognized carbon accounting methodologies, following guidance issued by Greening the Blue.¹ The estimate included emissions related to participant and staff air travel, local transportation, venue energy consumption, and accommodation.

To compensate for the remaining emissions, the Government of Switzerland, in consultation with UNDRR, selected certified carbon compensation projects with a focus on initiatives in developing countries. These compensation projects were sourced through the **UNFCCC Carbon Compensation Mechanism**².

¹ Greening the Blue. *Carbon Footprint Inventory Guidance 2024 Edition*, 2024.

² United Nations Framework Convention on Climate Change (UNFCCC). *Paris Agreement Crediting Mechanism*. <https://unfccc.int/process-and-meetings/the-paris-agreement/article-64-mechanism>



Calculation of Carbon Emissions GP2025

To assess the environmental footprint of an event, it is essential to develop a comprehensive emissions inventory. This inventory focuses specifically on carbon emissions and does not extend to other potential environmental impacts, such as chemical waste or water consumption, as efforts to minimize these have been addressed in the event guidance. These were assessed and addressed through other mitigation measures, as guided by UNDRR's previous experience in event management, the UN Secretariat Sustainable Events Checklist and UN Greening the Blue guidance.

Accurate measurement of emission reductions requires a complete and reliable inventory of emissions data. This can be ensured through systematic data collection and the application of appropriate methodologies aligned with internationally recognized guidelines. Quantifying the different dimensions of carbon emissions is a critical step toward assessing the sustainability of an event.

The carbon emissions inventory for each event accounts for emissions across identified sources and is categorized according to Scope 1, Scope 2, and Scope 3 emissions, consistent with the approach outlined in previous GP reports and the UN Greenhouse Gas emission inventories.

For GP2025, UNDRR calculated carbon emissions in coordination with the Government of Switzerland as the host country. The following emission sources were included in the inventory:

- **Scope 2 emissions** included electricity and additional energy use from purchased power, heating, and cooling at the venues.
- **Scope 3 emissions** covered accommodation, local transportation, and air transportation, which together represented the most significant share of the event's footprint. **Waste generation was not included as part of the Scope 3 calculations**, as reliable data on the quantity of waste produced during the event was not available.
- It is important to note that **Scope 1 emissions were not applicable**, as no direct emissions from organizer-owned or controlled sources were identified.

The calculation formulas and methodologies were drawn from established international references and were finalized by UNDRR in close consultation with the Swiss authorities.



Accommodations

Emission from the accommodation is calculated with the formula below:

$$N \times Est.D \times Est. tCO_2 eq$$

Source: GP2022 environmental report, where emissions established using National Committee and IGRK Methodological Panel Analysis³

N = Number of people (participants + organizers)

Est. D = Estimation of the Duration of Stay for GP2025 Participants

Est. tCO₂ eq = Estimation of Daily CO₂ eq Emissions (in tonnes) by Hotels, Based on US Environmental Protection Agency (EPA) Report Data.

EPA emission factors⁴ are used as they provide a widely recognized and internationally consistent benchmark for average hotel energy consumption and associated CO₂ eq emissions. While localized data may vary, using the EPA dataset ensures comparability across contexts and aligns with the methodology applied in **GP2022 (Global Platform for Disaster Risk Reduction 2022)** calculations.

As per EPA estimates, midscale hotels, defined as those with rates below 4, produce an estimated 20 kg of CO₂ eq emissions per day, while upscale hotels, defined as those with rates of 5 or above, produce an estimated 30 kg of CO₂ eq emissions per day.

Assumptions:

- Attendees stayed in Geneva for an average of 5 days.
- 50% of participants stayed in midscale hotels, while 50% stayed in upscale hotels. It is also assumed that all hotels are located within the Geneva area. (Figures based on Switzerland Hotel Market Outlook⁵). These assumptions are likely to result in an overestimation of emissions, as many participants likely stayed in private apartments (rentals or acquaintances) for which the average emission is likely to be lower than for hotels, due to lower, on average, energy consumption.
- Local staff and personnel, totaling 537 individuals, were assumed to stay in their own homes and were not included in the emissions calculation, as this does not generate additional accommodation-related emissions.

Using this methodology, the estimated total CO₂ eq emissions from accommodation during GP2025 were approximately 307.88 tCO₂ eq.

³ UNDRR, Global Platform for Disaster Risk Reduction 2022: Sustainability Report, Geneva, 2022.

⁴ United States Environmental Protection Agency (EPA), "Indirect Emissions Draft Report," Washington, DC, 2018. Available at: https://www.epa.gov/sites/default/files/2018-12/documents/indirectemissions_draft2_12212018_b_508pass_3.pdf

⁵ Goodnight Partners, "Switzerland's Hotel Market Outlook 2024," 2024, Available at: https://web2018.goodnightpartners.com/users/uploads/editor/source/241220_Article_Hotel%20Market%20Outlook%202024_RK%26SvL.pdf



Table I: CO₂ eq emissions for accommodations

Accommodation Type	% of Participants (staying in hotels)	Number of participants	CO ₂ eq per Person per Day (kg)	Days	Total CO ₂ eq (kg)	Total tCO ₂ eq
Midscale Hotel	50%	1,232	20	5	123,150	123.15
Upscale Hotel	50%	1,232	30	5	184,725	184.73
Home-based (local staff)	-	537	0	5	-	-
Total		3,000				307.88

Electricity and Additional Energy

During GP2025, energy was consumed to support lighting, infrastructure, and cooling systems in venues including the Centre International de Conférences Genève (International Conference Centre Geneva (CICG), Centre de Conférences de Varembe (CCV) and the World Meteorological Organization (WMO). The energy use is calculated over 7 days for CICG and CCV. The 7-day duration is the same as the contractual agreement with the venue, which covers the five conference days as well as two days for rehearsals and set-up.

The energy use breakdown is based on actual energy consumption for the seven days and can be summarized as follows:

Table II: Energy Use Summary for GP2025 Event Duration- CICG and CCV

Category	Number of days	Value
Total electricity consumed	7	63,464 kWh
Cooling energy demand	7	35,330 kWh
Cooling source	7	98% via GeniLac (lake water cooling), 2% mechanical
Solar electricity produced	7	6,821 kWh
Net electricity from the grid	7	56,643 kWh

CICG and CCV's energy mix corresponds to a hybrid solar system and renewable cooling infrastructure.

For WMO-hosted events, real data was not available, as WMO does not disaggregate energy consumption between Business-as-Usual (BAU) operations and conference-related activities, nor provide actual per-day energy consumption data. Instead, CICG daily average values were applied as a proxy to estimate energy use for a two-day event duration at the WMO-hosted events. It should be noted that this approximation is likely to result in a higher estimated energy use, as the WMO venues were smaller than those of the CICG.



Table III: Energy Use Summary for GP2025 Event Duration- WMO

Category	Number of days	Value
Total electricity consumed	2	18,133 kWh
Cooling energy demand	2	10,094 kWh
Cooling source	2	98% via GeniLac (lake water cooling), 2% mechanical
Solar electricity produced	2	1,949 kWh
Net electricity from the grid	2	16,184 kWh

The following method was used to evaluate the GP2025's carbon footprint from energy use:

1. Separated energy sources into solar, grid electricity, and cooling.
2. Applied emission factors based on the carbon intensity of each energy type.
3. Calculated emissions using the formula:

$$CO_2 \text{ eq emissions (kg)} = \text{Energy (kWh)} \times \text{Emission factor (kg/kWh)}$$

Assumptions

- All energy usage occurred in Geneva, Switzerland.
- Electricity from the Swiss grid emits **0.014 kg CO₂ eq per kWh**, a fairly low amount due to a mix dominated by hydropower and nuclear energy (source: Swiss Federal Office of Energy).
- CIGG onsite photovoltaic panels are considered zero emission.
- This system uses cold water from Lake Geneva (GeniLac), is powered by renewables, and emits no direct CO₂ eq.
- Only 2% of cooling was mechanical. Since this amount is minor and unmeasured, it was excluded.

Calculations

a) Grid Electricity

CIGG + CCV:

$$\text{Grid use} = 63,464 - 6,821 = \mathbf{56,643 \text{ kWh}}$$

$$\text{Emissions} = 56,643 \times 0.014 = \mathbf{793 \text{ kg CO}_2 \text{ eq}} = \mathbf{0.79 \text{ tCO}_2 \text{ eq}}$$

WMO (estimated):

Proxy based on 2 days of CIGG (2/7 of 63,464 kWh = 18,133 kWh total consumption)

$$\text{Solar} = 2/7 \times 6,821 = \mathbf{1,949 \text{ kWh}}$$

$$\text{Grid use} = 18,133 - 1,949 = \mathbf{16,184 \text{ kWh}}$$

$$\text{Emissions} = 16,184 \times 0.014 = \mathbf{227 \text{ kg CO}_2 \text{ eq}} = \mathbf{0.23 \text{ tCO}_2 \text{ eq}}$$



Total Grid Use (all venues):

$$56,643 + 16,184 = 72,827 \text{ kWh}$$

$$\text{Emissions} = 793 + 227 = 1,020 \text{ kg CO}_2 \text{ eq} = 1.02 \text{ tCO}_2 \text{ eq}$$

b) Solar Energy

CICG + CCV:

$$\text{Emissions} = 6,821 \times 0 = 0 \text{ tCO}_2 \text{ eq}$$

WMO (estimated):

$$\text{Emissions} = 1,949 \times 0 = 0 \text{ tCO}_2 \text{ eq}$$

Total Solar Energy Emissions:

$$0 + 0 = 0 \text{ tCO}_2 \text{ eq}$$

c) GeniLac Cooling

$$\text{Emissions} = 0 \text{ tCO}_2 \text{ eq}$$

Table IV: Results (CICG, CCV & WMO)

Source	Energy Used (kWh)	CO ₂ eq Emissions (tonnes)
Swiss Grid	72,827	1.02
On-site Solar (PV)	8,770	0.00
GeniLac Cooling	44,514	0.00
Total	81,597	1.02 tCO₂ eq

GP2025's total emissions for electricity and cooling across CICG, CCV, and WMO were 1.02 CO₂ eq. Approximately 89% of electricity was sourced from Switzerland's low-carbon grid, 11% from on-site solar installations, and nearly all cooling was provided by the carbon-free GeniLac lake water system.

Air Transportation

GP2025 hosted a total of 3,000 participants. Of these, 942 participants were based in Switzerland or neighboring France. This includes personnel, UNDRR staff, host country staff, volunteers, and venue-related teams. These individuals were excluded from the air travel emissions estimate and instead included in the train transportation emissions calculations.

Air Travel to Geneva

The CO₂ eq footprint for travel to the GP2025 was calculated using the International Civil Aviation Organization (ICAO) calculator. The ICAO calculator is used by the United Nations entities as part of calculating their annual greenhouse gas emissions.



The calculator requires the insertion of a travel itinerary based on airport codes and an indication of the class traveled in (Economy or Business). For the participants whose travel was covered by the UN, class and itinerary were known and thus used, making the calculations fully accurate.

For the participants, the itineraries were determined individually based on the city where each participant's office was located. The assumption is that passengers made a round trip to Geneva (airport code: GVA) from this location. For example, for a participant whose office was in Amsterdam (airport code: AMS), the itinerary became AMS-GVA-AMS. For some remote locations, an airport of departure was chosen based on a combination of proximity and available connections. The calculator does not work for a trip with more than 1 connecting airport, so for some routes, a connecting airport had to be estimated, based on the most likely connection, to allow the calculator to function. For example, for the itinerary Tegucigalpa (airport code: TGU) to GVA and back the large regional hub of Panama (airport code: PTY) was added, so the final itinerary became TGU-PTY-DPSPTY-TGU. All CO₂ eq in the following calculation is in tonnes and is considered 'net tCO₂ equivalent', as the calculator has subtracted the CO₂ eq offset by airlines (where relevant).

Special consideration was given to the surplus emissions caused by business class travel. For GP2025, 10% of participants were assumed to have traveled business class. This assumption is based on common practice in international conference emission reporting, where a minority of participants – typically senior officials, government representatives, or organizational leadership – are more likely to travel business class. Compared to GP2022, which took place in Bali, Indonesia leading to longer flight times, a lower proportion of participants were assumed to have traveled in business class. It should be noted that UN staff and participants for whom UNDRR organized the travel traveled in economy class, following UN travel rules and a decision to minimize environmental impacts and costs of the GP2025. There were only a handful of exceptions to this rule.

Calculation of CO₂ eq for passengers in Business Class:

A surplus of 10% of total passengers (206 passengers) were estimated to take the business class due to factors such as long-distance travels and medical needs.

Estimate number of business class passengers: 10% of total passengers = 206

Average CO₂ eq per economy passenger: 0.7 tonnes

CO₂ eq per business class passenger⁶: $0.7 \times 3 = 2.1$ tCO₂ eq

Total CO₂ eq for all business class passengers: $206 \times 2.1 = 432.6$ tCO₂ eq

Following the calculations, the total CO₂ eq footprint for **air travel** is 1901.52 tCO₂ eq for 2,058 passengers who traveled over 25 million kilometers.

⁶ Following guidance from the International Air Transport Association (IATA), which recommends a 1.5x multiplier for business class on narrow-body aircraft and a 4x multiplier for wide-body aircraft, we adopt a simplified average multiplier of 3x to estimate business class emissions relative to economy class. This approach provides a reasonable approximation for the mix of flight types in GP2025, without replacing the economy-class calculations.



Table V: CO₂ eq Emissions from Air Travel

Participants	No. of Passenger	Total km	Total CO ₂ eq (tonnes)	Low CO ₂ eq uncertainty	High CO ₂ eq uncertainty
UN Staff + participants for whom UN organized the travel	268	3,672,798	215.80	141.47	330.89
Other Participants	1,790	21,762,899	1,253.12	79.96	1,997.75
Surplus business class (10% of participants. i.e., 206 persons, already included above)	-	-	432.6	432.6	432.6
Total	2,058	25,435,697	1,901.52	221.43	2,328.64

Local transportation

Local transportation-related emissions for GP2025 can be divided into two main parts. Firstly, is the inbound and outbound travel to Geneva from other Swiss cities or neighboring European cities to attend the event. The second is the daily commuting to the venue within Geneva and surrounding regions (during the event).

Part 1: Train travel to Geneva from other cities (by train)

Emissions from inbound and outbound travel were estimated for participants residing in Switzerland or nearby European cities, for whom rail travel is more accessible than air travel.

- A standard return trip distance of 500km (or 250km one way) was applied for participants traveling by train to and from nearby European cities. This was derived from the mean distance of representative major cities where participants have residence, such as Paris, Lyon, Zurich, and Bern.
- It is important to note that this assumption likely leads to an overestimation, as many participants residing in Switzerland or France are expected to travel less than 50km to Geneva.

Calculation of CO₂ eq for inbound and outbound train travel:

- Number of participants living in nearby cities: **405 persons**⁷
- Average return distance: **500 km**
- Emission factor: **0.035kg CO₂ eq /km**⁸

Total CO₂ eq = Number of Participants x Emission Factor

⁷ 405 persons is assumed to have taken the train for in-bound and out-bound travel, as 537 out of 942 participants resided in Geneva.

⁸ United Nations Framework Convention on Climate Change (UNFCCC), "Greenhouse Gas Emissions Calculator for Rail Travel," Bonn, n.d. Available at: <https://unfccc.int/documents/271269>



Total CO₂ eq= 405 persons x 500 km x 0.035kg CO₂ eq =7087.5 kg CO₂ eq (**7.09 tCO₂ eq**)

Part 2: Daily local commuting to the venue:

Emissions from local transportation during GP2025 were calculated using an activity-based (top-down) methodology, which is used in the United Nations and international GHG reporting when direct fuel data is unavailable. This approach estimates emissions based on:

- Number of commuters
- Daily round-trip distance
- Event duration
- Emission factors per transport mode

The methodology aligns with the Greenhouse Gas Protocol, IPCC Guidelines (2006), and UN system guidance and practices⁹.

Table VI: Emission Factors and Sources

Transport Mode	Emission Factor (kg CO ₂ eq/km)	Source
Public Transport	0.06	ETH Zurich (Mobitool v3.0), HBEFA ¹⁰
Private Car / Taxi	0.18	Derived from Swiss fuel economy ¹¹ and IPCC 2006 emission factors ¹²
Walking/ Cycling	0	N/A

Private car emission factor derivation

- Swiss average gasoline vehicle fuel consumption: 6.11 L/100 km
- IPCC default emission factor for gasoline: 2.31 kg CO₂ eq /L
- Fuel-based calculation: 6.11 ÷ 100 × 2.31 = 0.141 kg CO₂ eq /km
- Rounded to 0.18 kg CO₂ eq/km to reflect low occupancy, traffic, and taxis

Assumptions

The emissions were calculated based on assumed averages for distance and transport mode share. The following assumptions were applied:

- Total local commuters: 3,000
- Average daily round-trip commute: 20 km

⁹ United Nations Environment Programme, *Greenhouse Gas Inventory and Methodology Guidance for the UN System*. (Nairobi, 2021)

¹⁰ ETH Zürich, *Mobitool v3.0* (Zurich, 2020). Available at: <https://www.mobitool.ch>; and Handbook of Emission Factors for Road Transport (HBEFA)

¹¹ Swiss Federal Office of Energy, *Swiss Energy Statistics 2023, average passenger car fuel economy* (Bern, 2024)

¹² Intergovernmental Panel on Climate Change, *2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 2: Energy*, Table 3.2.1 (Geneva, 2006)



- Travel duration: 5 days

Mode of transport (applied across both groups):

- 60% public transport
- 20% walking/ cycling
- 20% private cars or taxis

Private car occupancy: assumed single occupancy

While the above reflects conservative and regionally appropriate assumptions, actual behavior may vary due to:

- Variation in individual commuting distances
- Carpooling or multi-passenger taxi use
- Incomplete data or other types of informal transport (e.g. hotel/delegation shuttles)

Results

Public Transport (1,800 people)

- Distance per person = 20 km/day × 5 days = 100 km
- Total distance = 1,800 × 100 km = 180,000 km
- Emissions = 180,000 km × 0.06 kg CO₂ eq / km = 10,800 kg CO₂ eq = 10.8 tCO₂ eq

Walking/ Cycling (600 people)

- Distance per person= 20 km/day x 5 days =100km
- Total distance = 600 x 100 km = 60,000 km
- Emissions = 60,000 km x 0 kg CO₂ eq / km = 0 kg CO₂ eq = 0 tCO₂ eq

Private Car / Taxi (600 people)

- Distance per person: 20 km/day x 5 days = 100 km
- Total distance = 600 x 100 km = 60,000 km
- Emissions: 60,000 km × 0.18 kg CO₂ eq / km = 10.8 tCO₂ eq

Table VII: Total Local Transportation Emissions

Mode of Transport	People	CO ₂ eq Emissions (tonnes)
Public Transport	1,800	10.8
Walking/ Cycling	600	0.0
Private Car / Taxi	600	10.8
Total	3,000	21.6

The total estimated CO₂ eq emissions from local transportation during GP2025 amounted to **28.7 tCO₂ eq**, including inbound train travel to Geneva (7.09 tCO₂ eq) and daily commuting to the venue (21.6 tCO₂ eq)



Summary

Table VIII: Summary Total GP2025 Carbon Emissions

Aspect	Total tCO ₂ eq
Accommodation	307.88
Electricity and Additional Energy	1.02
Air transportation	1901.52
Local Transport	28.7
Total	2239.1

The estimated total carbon emissions of the GP2025 is **2239.1** tCO₂ eq, the majority of which results from air travel (84.9%). The second highest estimated emission aspect is accommodation (13.8%), but it is likely to be lower as it assumes a high proportion of participants staying in hotels. Some emission factors, like waste and food, were not considered in the emissions calculations. The emissions represent an average of 0.75t CO₂/participant, which is in line with GP2022 and other events, where it is estimated that an event participant produces on average 0.5-2.5 tCO₂ eq per event, depending on the location and duration¹³.

¹³ See, for example: European Society of Medicine, *Carbon footprint of neurological conferences: A study* (Vienna, 2023); J. Stevens and others, *Astronomy's climate emissions: Global travel to scientific meetings in 2019* (arXiv:2405.00104, 2024); Global Sustainable Tourism Council, *Carbon footprint report of the GSTC2023 Global Conference in Antalya, Türkiye* (2023). Available at: <https://www.gstc.org/carbon-footprint-report-of-the-gstc2023-global-conference-in-antalya-turkiye/>; Lund University, *What is the carbon footprint of your conference?* (Lund, 2022). Available at: <https://www.staff.lu.se/article/what-carbon-footprint-your-conference>.



Carbon Compensation

GP2025 followed standard guidelines by prioritizing carbon reduction and using offsets to address any unavoidable emissions. The UNFCCC provides educational resources on carbon offsetting here: <https://offset.climateneutralnow.org/about>

Carbon compensation allows individuals and organizations to balance unavoidable emissions by supporting verified projects that reduce emissions elsewhere. For GP2025, offsets were implemented through internationally recognized mechanisms. In line with UN guidance and in consultation with the Government of Switzerland, certified projects on the UNFCCC platform were selected for their credibility, transparency, and alignment with disaster risk reduction and the Swiss Agency for Development and Cooperation (SDC) strategy.

The total calculated emissions for GP2025 were **2,239.1 tCO₂ eq.** Switzerland committed to fully offset these emissions and expressed willingness to purchase additional carbon allocations to support broader environmental initiatives beyond the event's footprint. GP2025 focused on responsibly managing its environmental impact by estimating emissions accurately and offsetting unavoidable emissions. Rather than strict one-to-one offsetting, the event prioritized contributions to climate change mitigation and adaptation projects, recognizing that all emissions inventories are estimates. This approach highlights GP2025's commitment to meaningful and responsible environmental action.

UNFCCC Projects

Burgos Wind Project (No. 7980)

Aspect	Details
Host Country	Philippines
Scale	Large-scale wind power
Crediting Period	2021–2028 (renewed)
Annual CO ₂ eq Reductions	≈ 251,519 t CO ₂ equivalent
CER Type	Certified Emission Reductions (UNFCCC CDM)

Project description and link to disaster risk reduction

The Burgos Wind Project in the Philippines is not directly designed as a disaster risk reduction initiative, but it aligns with several priorities of the Sendai Framework. Located in the Philippines, a country highly vulnerable to typhoons and other climate driven hazards, the project helps lower greenhouse gas emissions and decreases reliance on fossil fuels, which are often disrupted during disasters. It also supports local economic development, which can improve community capacity to cope with and recover from disruptions. While not a disaster risk reduction project itself, it aligns with Sendai priorities on infrastructure resilience, climate risk mitigation, and sustainable development.