FIS Events Emission Estimation Summary

2024/25 Season

Executive Summary

Data collection approach

Operational emissions for regular World Cup (WC) events were calculated from detailed data on 47 events using the FIS CO_2 Calculator (with ≥50 data entries) and dedicated questionnaires. Events were grouped into three macro-disciplines. Emission data was normalised per accredited person and scaled to all events using corrected accreditation figures from IT.

World Ski Championships (WSC) were assessed separately, using Trondheim 2025 as a reference, with adjustments for energy sources and national grid factors.

Participant travel emissions were estimated using discipline-specific travel data from the Norwegian Ski Federation and applied to both World Cups and World Ski Championships.

Spectator Travel Emissions:

- WC events: Same methodology as 2023/24, based on attendance, transport mode, and average travel distances.
- WSC events: Estimated using a report by students at the Norwegian University of Science and Technology for Trondheim 2025, then used as a proxy for spectator numbers in Austria and Switzerland.

Reporting Year:

The events analysed refer to the 2024/25 ski season.

Reporting Boundary:

159 FIS World Cup events were included in the analysis, alongside three World Ski Championships. These represent all global events in which FIS is directly involved during the season.

Emissions Measured:

Scope 1, Scope 2, Scope 3.

Event Types:

Alpine, Nordic, Freestyle & Snowboard, Telemark, Para disciplines, Grass Skiing, Speed Skiing.

Aim of the Project:

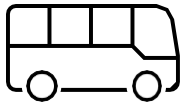
To estimate the carbon emissions associated with FIS events during the 2024/25 ski season, using a combination of reported data from the FIS CO_2 Calculator and credible proxies to produce a consistent and transparent season-wide estimate.

Estimated Carbon Emissions for WC Events

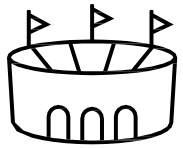
63,547.9
tCO_2e Total Emissions

399.6
tCO_2e per event

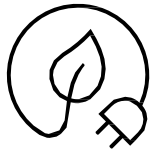
Transport
39,724.8
tCO_2e



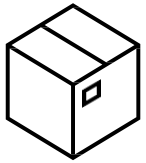
Arena
10,143.6
tCO_2e



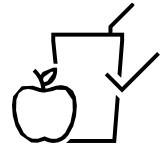
Energy
4,799.8
tCO_2e



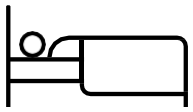
Purchases
3,555.5
tCO_2e



Food
3,069.7
tCO_2e

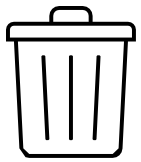


Accomodation
1,315.1
tCO_2e



Equipment
582.1
tCO_2e

Waste
321.6
tCO_2e



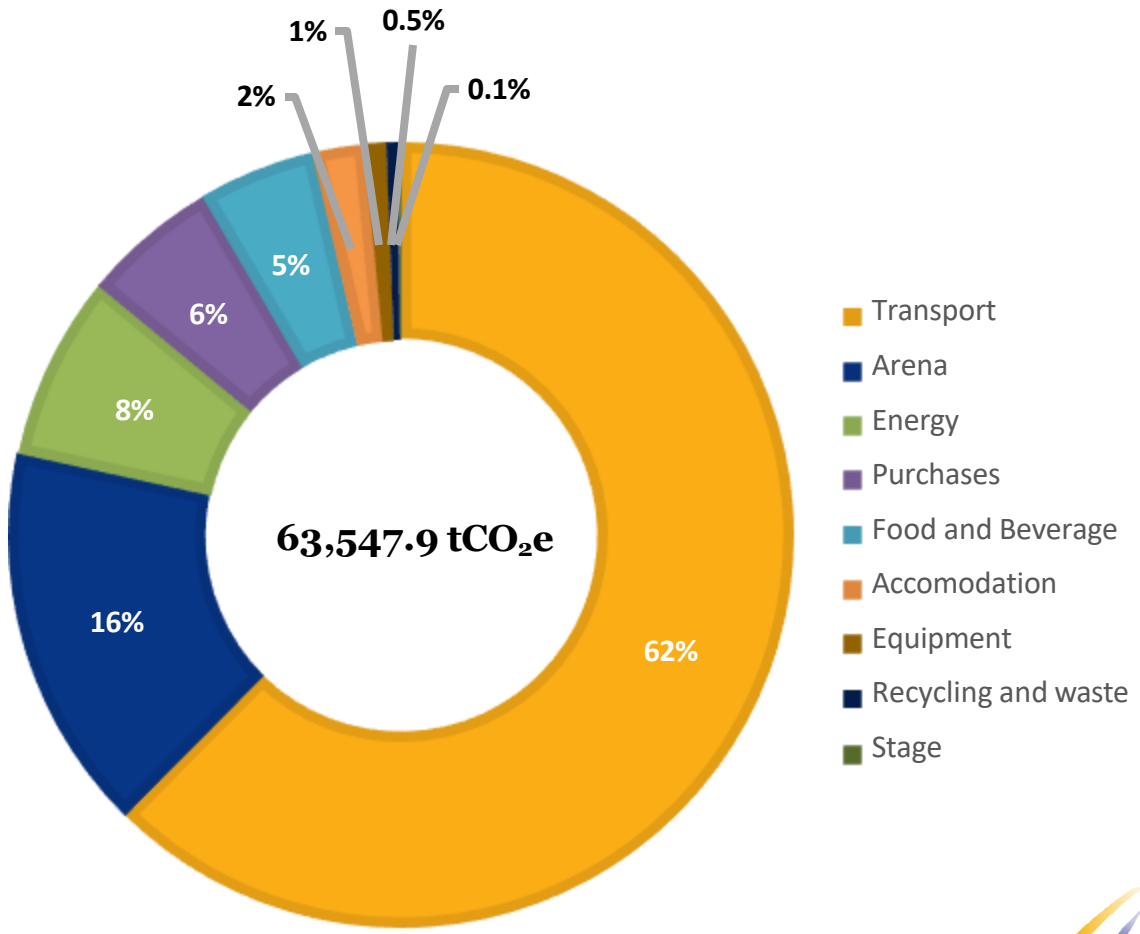
Stage
35.9
tCO_2e

Estimated Carbon Emissions for WC Events

The greatest source of estimated emissions was the transportation of goods and people, which makes up **62.5%** of the total estimated emissions.

Emission source	tCO_2e	%
Transport	39,72.8	62.5
Arena	10,143.6	16
Energy	4,799.8	7.6
Purchases	3,555.5	5.6
Food and Beverage	3,069.7	4.8
Accomodation	1,315.1	2.1
Equipment	582.1	0.9
Recycling and Waste	321.6	0.5
Stage	35.9	0.1
Total	**63,547.9**	**100**

Emissions sources for ski season 2024 - 2025, tCO_2e

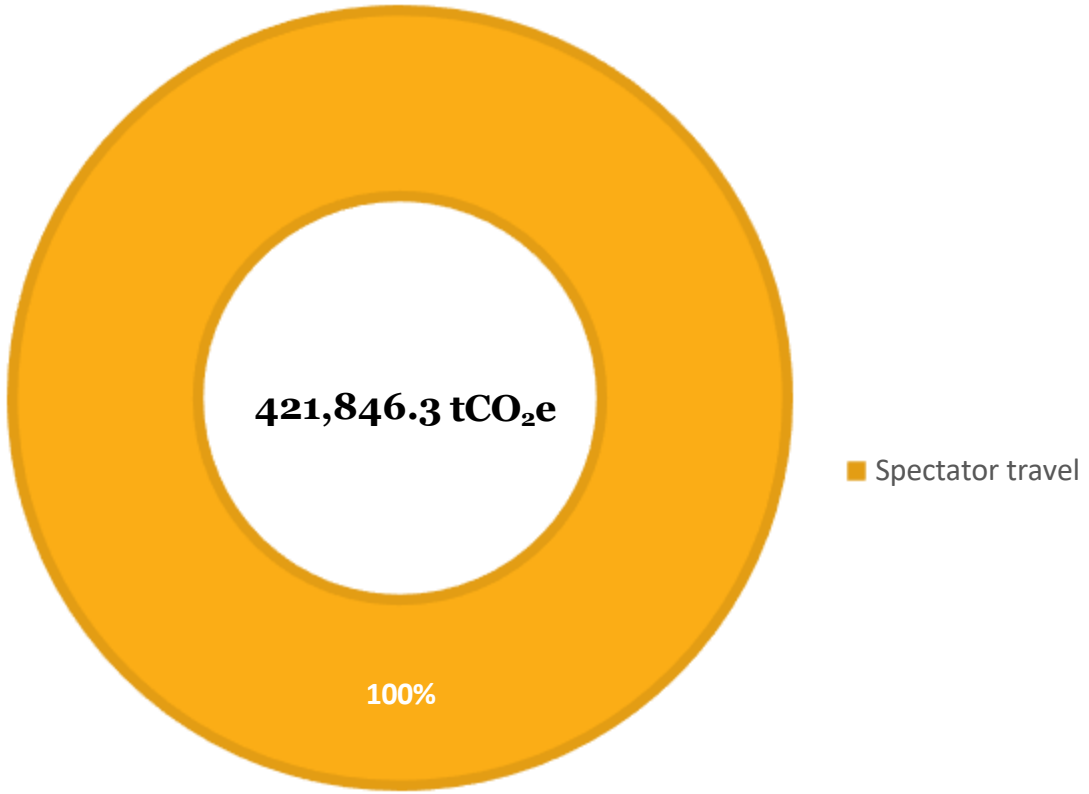


Estimated Carbon Emissions for WC Events

Assumptions around spectator travel have the largest influence on an event's total estimated emissions, so their impact is reported separately, in line with the Climate Action Framework guidance.

Emission source	tCO_2e	%
Spectator travel	421,846.3	100
Total	**421,846.3**	**100**

Emissions sources for ski season 2024 - 2025, tCO_2e

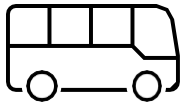


Estimated Carbon Emissions for WSC Events

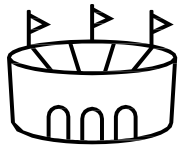
6,030
tCO_2e Total Emissions

2,010
tCO_2e Per Event

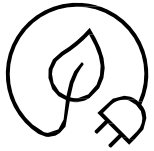
Transport
3,538.5
tCO_2e



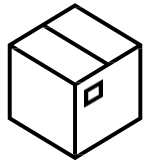
Arena
741.1
tCO_2e



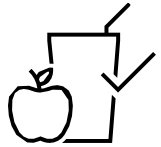
Energy
286.1
tCO_2e



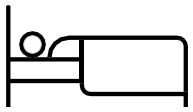
Purchases
286.6
tCO_2e



Food
860.8
tCO_2e

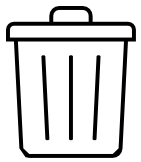


Accomodation
132
tCO_2e



Equipment
25.9
tCO_2e

Waste
40.6
tCO_2e



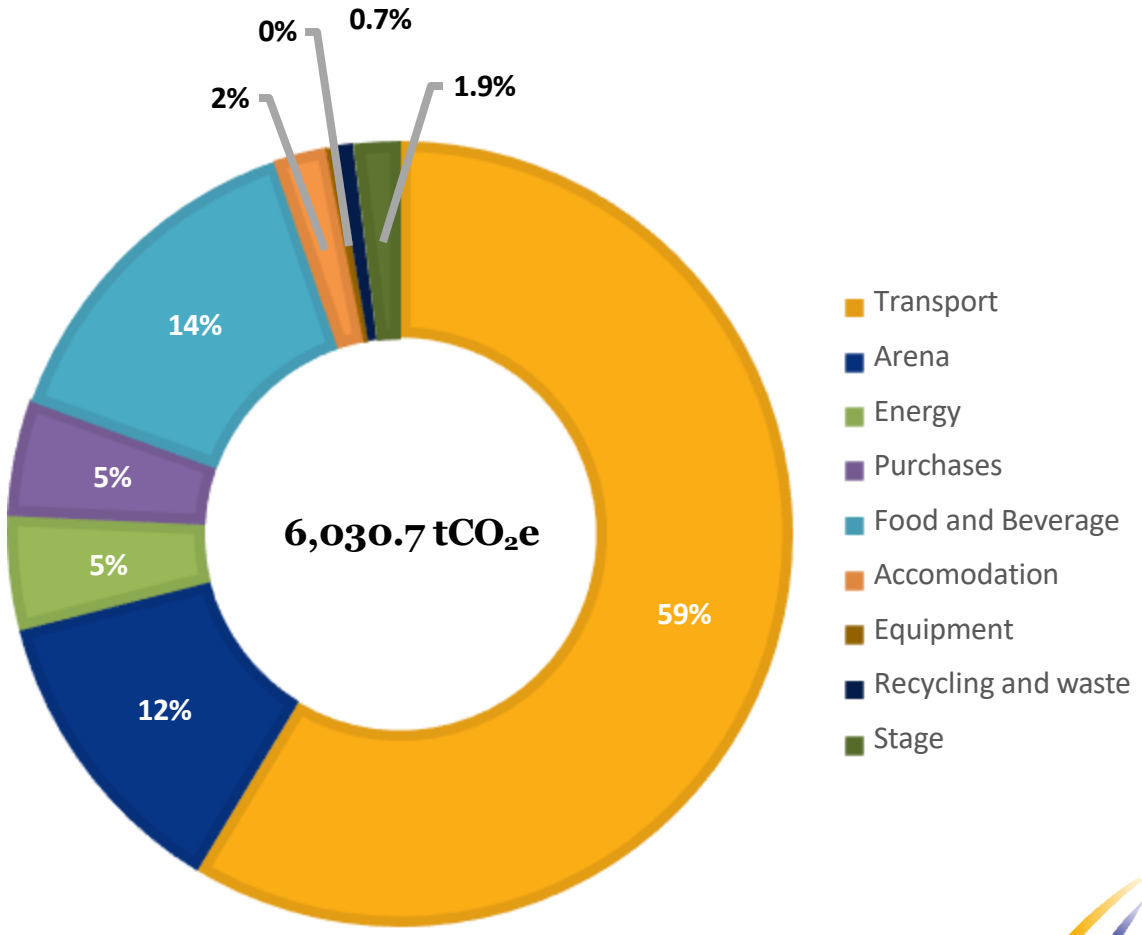
Stage
112.3
tCO_2e

Estimated Carbon Emissions for WSC Events

The greatest source of estimated emissions were down to transportation of goods and people which make up 58,7% of the total estimated emissions.

Emission source	tCO_2e	%
Transport	3,539.5	58.7
Arena	747.1	12.4
Energy	286.1	4.7
Purchases	286.6	4.8
Food and Beverage	860.8	14.3
Accomodation	132.0	2.2
Equipment	25.9	0.4
Recycling and Waste	40.6	0.7
Stage	112.3	1.9
Total	**6,030.7**	**100**

Emissions sources for WSC 2024 - 2025, tCO_2e

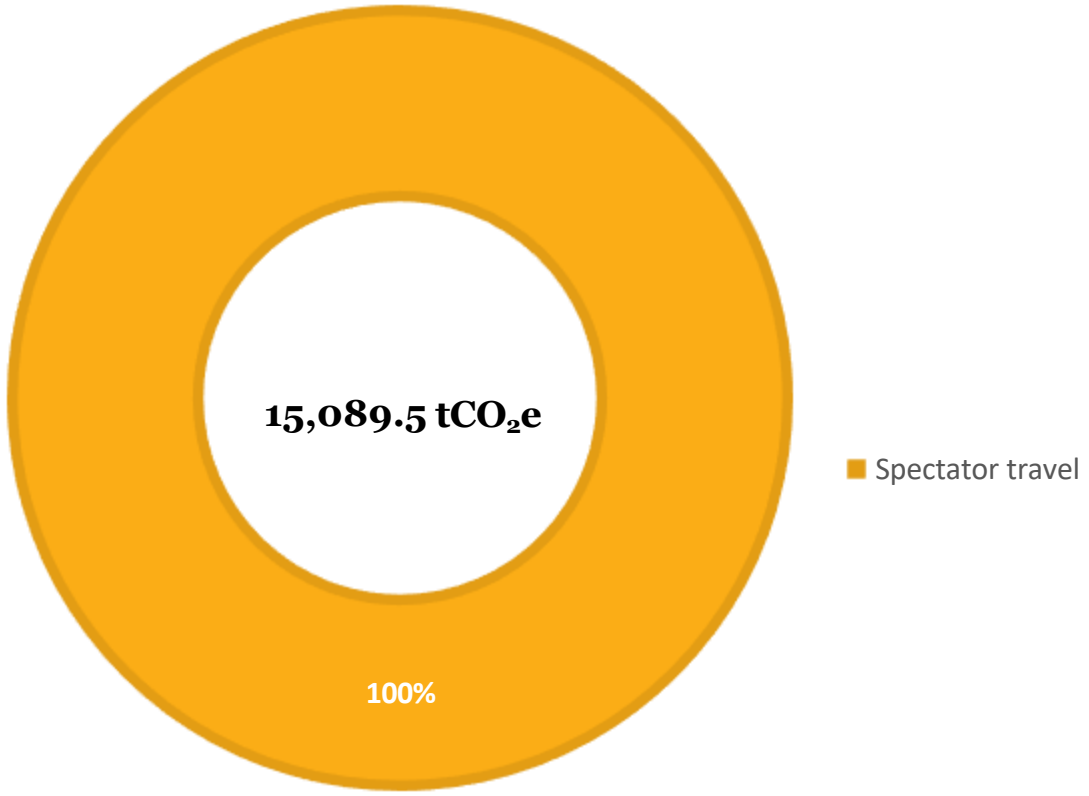


Estimated Carbon Emissions for WSC Events

Spectator travel emissions for the World Ski Championships were estimated using the **«Estimation of the Total Greenhouse Gas Footprint Caused by Spectator Travel in Connection with the FIS Nordic World Ski Championships 2025 in Trondheim[1]»** as a reference, and then adapted for the Austrian and Swiss events.

Emission source	tCO_2e	%
Spectator travel	15,089.5	100
Total	**15,089.5**	**100**

Emissions sources for WSC 2024 - 2025, tCO_2e



[1] Angelsen, F.J., Rapp, K.E., Härmä, M., Kvamen, O., Bjelland, O.M.F. & Lund, V.S. (2025). Estimation of the Total Greenhouse Gas Footprint Caused by Spectator Travel in Connection with the FIS Nordic World Ski Championships 2025 in Trondheim. NTNU.

Methodology

2024/25 Season

General Considerations

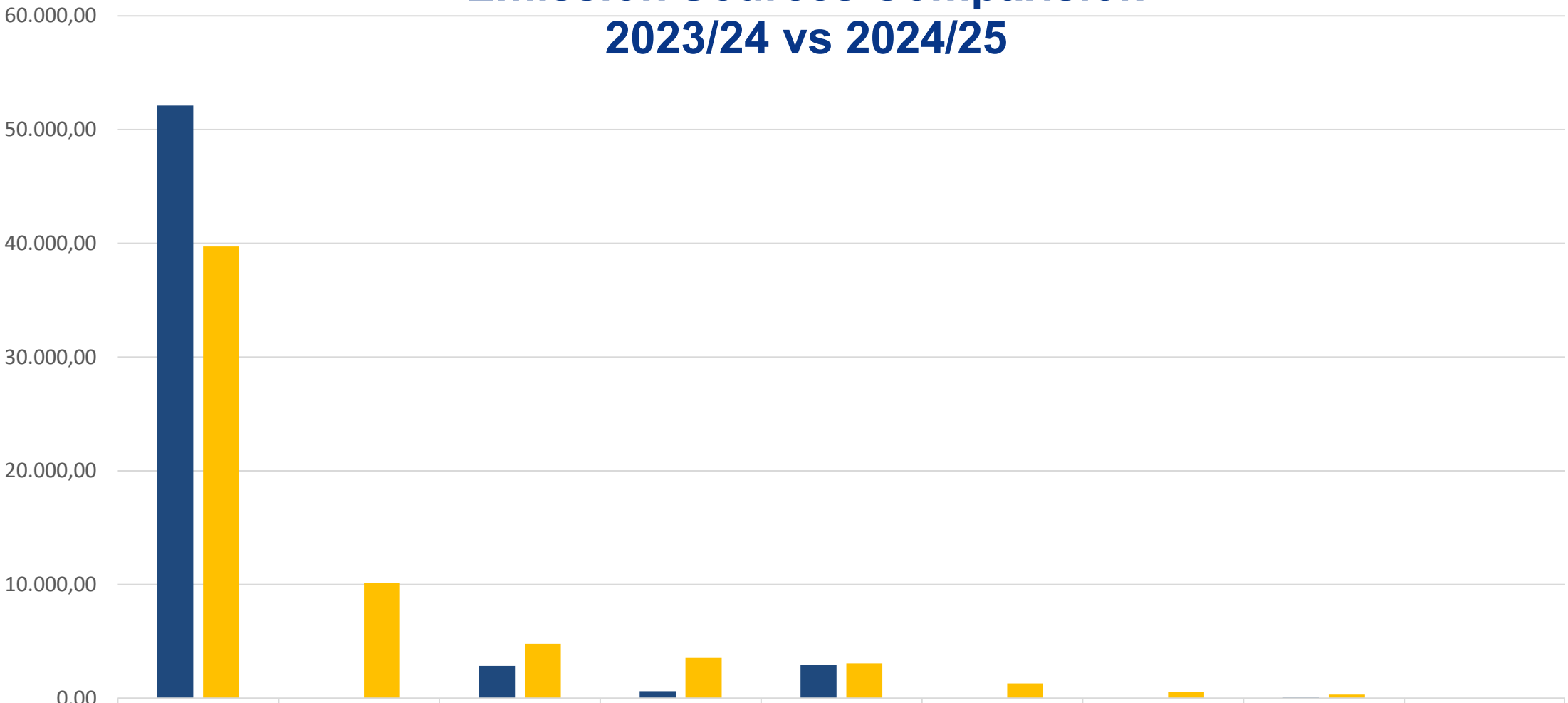
For the **2025** season, operational emissions were assessed using a more detailed and comprehensive dataset than in 2024. This was made possible by the **FIS CO_2 Calculator**, which standardises and simplifies data collection across all events.

In 2024, the analysis was limited to a few broad categories, such as **Transport**, **Energy**, **Waste**, **Food**, and **Others**. In 2025, the methodology covers a wider range of sources, including **Arena**, **Equipment**, **Stage**, and **Accommodation**, providing a more complete picture of emissions.

For example, in the **Food & Beverage** category, 2024 calculations were based on the average cost of a meal. The Calculator now allows input on the type of food consumed (vegan, vegetarian, meat), producing a more accurate estimate. Similarly, categories such as **Arena**, which were previously underrepresented due to limited data, are now fully included.

Looking ahead, the **mandatory use of the FIS CO_2 Calculator** by all **Local Organizing Committees** (LOCs) will continue to improve data quality and detail, ensuring more reliable and consistent emission estimates in future seasons.

Emission Sources Comparision
2023/24 vs 2024/25



	Transport	Arena	Energy	Purchases	Food and Beverage	Accomodation	Equipment	Recycling and Waste	Stage
2023/24	52.107,70		2.856,10	626,4	2.938,50			71,4	
2024/25	39.724,80	10.143,60	4.799,80	3.555,50	3.069,70	1.315,10	582,1	321,6	35,9

Operational Emissions

- World Cup Events

For the **2024/25 season**, operational emissions were calculated for **47 events** using the **FIS CO_2 Calculator** (including only events with ≥50 valid data entries) and dedicated questionnaires. Events were grouped by macro-discipline.

Emissions from electricity, diesel, waste, and water were divided by the number of **accredited participants** to create discipline-specific emission factors. Accreditation data from the **FIS IT system** was then adjusted using the questionnaire results, which showed that IT figures were, on average, **5.6 times lower**. This correction factor was applied to estimate total operational emissions consistently across all events.

- World Ski Championships

World Championships were assessed separately from World Cups. The **2025 Nordic World Ski Championships** in Trondheim were used as a reference, as they provided the most detailed CO_2 data to date (covering **1,400+ activities**). Two adjustments were made: **+1,000 tCO_2e** to account for Trondheim's low-emission wood-chip energy, and a **×8 factor** to adjust for Norway's energy low national emission factor.

The corrected total emissions were then divided by the number of accredited participants to calculate a **per-person emission factor**. This factor was applied to all World Championships to estimate operational emissions.

Participant Travel

- World Cup Events + World Ski Championships

To estimate participant travel emissions for the **2024/25 season** (World Cup and World Championship events), we used detailed, **discipline-specific travel data** from the **Norwegian Ski Federation** as a reference. For each discipline, total emissions were divided by the number of athletes and events to create a standard **per-athlete-per-event emission factor.**

This factor was then combined with **FIS accreditation data** on athlete numbers (treating men's and women's Alpine circuits separately) and multiplied by the **total number of events** in each discipline to calculate overall travel emissions.

Spectator Travel

- World Cup Events

Spectator travel emissions for **World Cup** events in **2024/25** were estimated using the same methodology as in 2023/24. Calculations combined projected attendance, assumed modes of transport, and average travel distances.

Spectators were distributed as: **1%** on-site, **59%** local (≤100 km), **10%** using public transport, and **30%** by plane (two-thirds European, one-third international). For air travel, **round-trips** were assumed but reduced by **30%** to better reflect realistic onward travel. Distances were based on each event's location and multiplied by **emission factors** specific to each mode of transport.

- World Ski Championships

The methodology is based on the **NTNU study** of the **2025 Trondheim Championships**, which estimated **8,347 tCO_2e** from spectator travel. The analysis combined a survey of **216 spectators** with ticketing data from **230,000 entries**. Travel distances were geolocated and converted into CO_2-equivalents using the **Green Producer Tool**. An **IDW model** linked distance to the likelihood of using different transport modes. Travel frequency assumptions were: spectators within 200 km were assumed to commute daily, and spectators beyond 200 km were assumed to make one return trip.

FIS used this data to calculate a **per-spectator emission factor** and estimate travel emissions for the WSC in Austria and Switzerland.