Carbon Footprint

Billie Jean King Cup
Seville, Spain
December 2023

Undertaken by The International Tennis Federation (ITF)
and assisted by AQ Green TeC (AQGT)

Contents

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Approach and emissions overview

Approach

- The approach used to measure greenhouse gas (GHG) emissions (emissions) resulting from the Billie Jean King Cup event held in December 2023, combined direct data collection from the ITF and event service providers and estimations based on internally developed assumptions or externally sourced data
- The approach was designed to ensure that all material sources of emissions associated with the event were accounted for, aligning with standard practices for event-based carbon footprint assessments
- The methodologies used to assess and calculate greenhouse gas emissions associated with the event were aligned with the principles of the GHG Protocol
- Emissions were calculated for electricity usage, purchased goods, transport of event equipment, and waste generation. Travel-related emissions for attendees (Business Travel category), including air and ground travel, were also calculated using provided data and assumptions based on travel distances. Accommodation emissions were determined using country-specific emission factors for hotel stays in Spain

Emissions overview

- Total emissions: 1,800.578 tCO_2e
- Emissions per spectator*: 106 $kgCO_2e$

GHG categories included in measurement

- Electricity consumption
- Purchased goods and services
- Upstream transport and distribution
- Waste generated in operations
- Business travel

* Based on 17,000 spectators (estimated)

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Emissions by category

GHG emissions categories	tCO_2e
Business travel	1,525.341
Upstream transportation and distribution	144.853
Purchased goods and services	120.798
Waste generated in operations	6.338
Electricity consumption	3.248
Total	**1,800.578**

Table 1

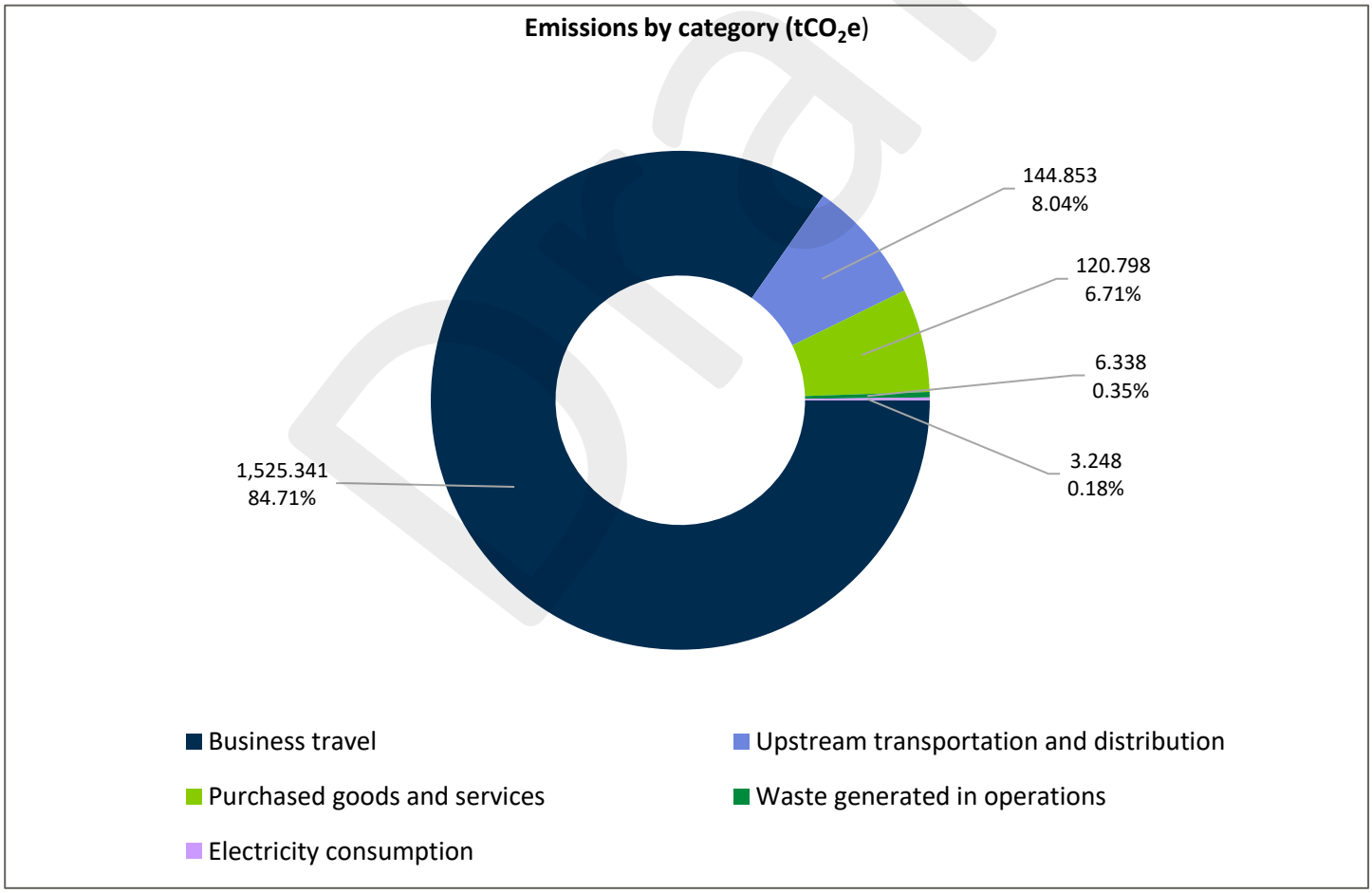

Figure 1

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Emissions by stakeholder group

Stakeholder groups	tCO_2e
Spectators	1,015.090
Players & VIPs*	267.543
Venue	253.555
Staff	197.434
Coaches & Physios	49.632
Players	12.212
Hospitality	5.112
	1,800.578

Table 2

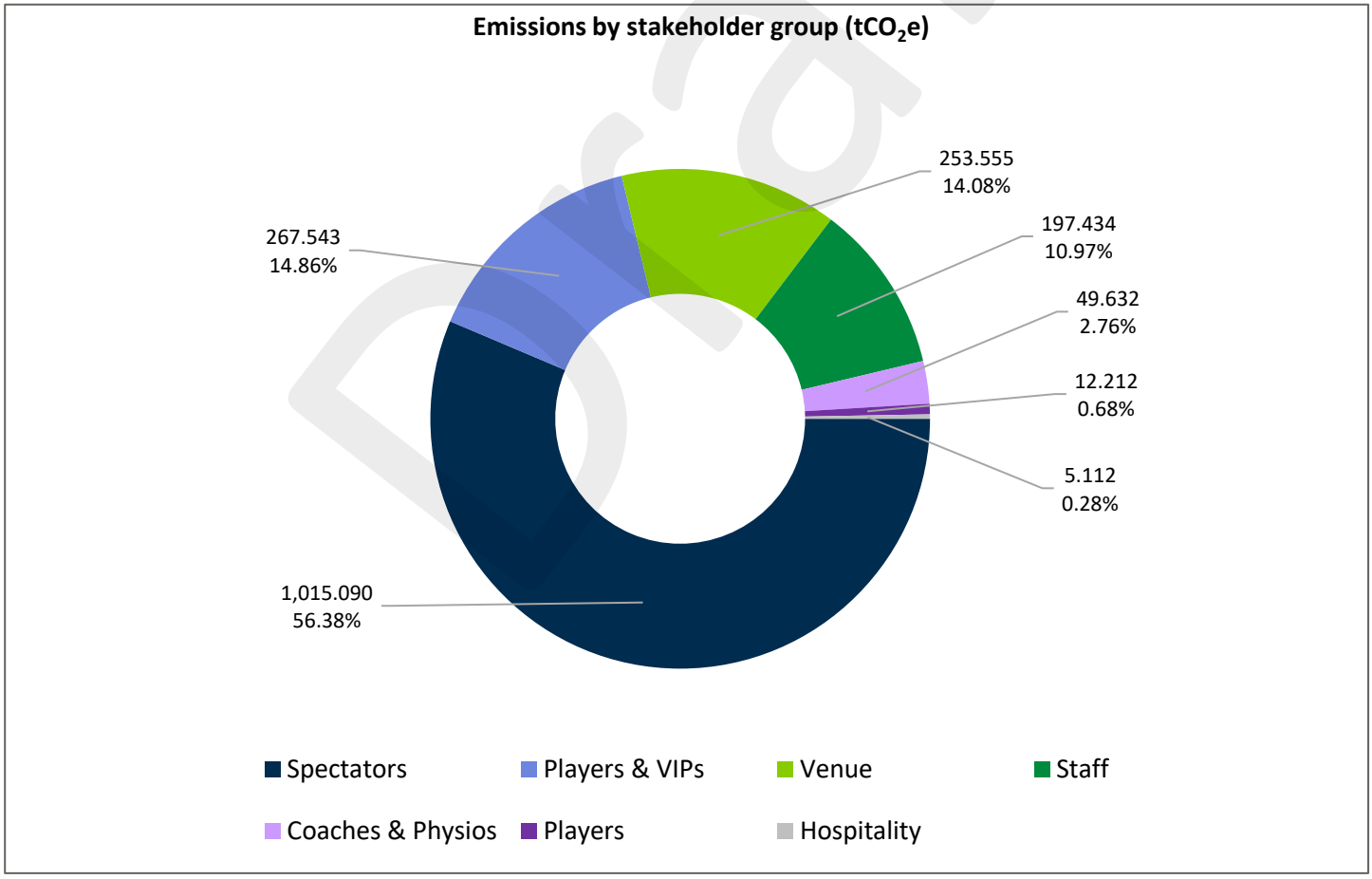

Figure 2

* For certain activities (e.g., flights), aggregated data was provided for players and VIPs.

Business travel: emissions breakdown

Travel and accommodation	tCO_2e
Air travel	1,290.686
Ground travel	180.468
Hotel stay	54.187
	1,525.341

Table 3

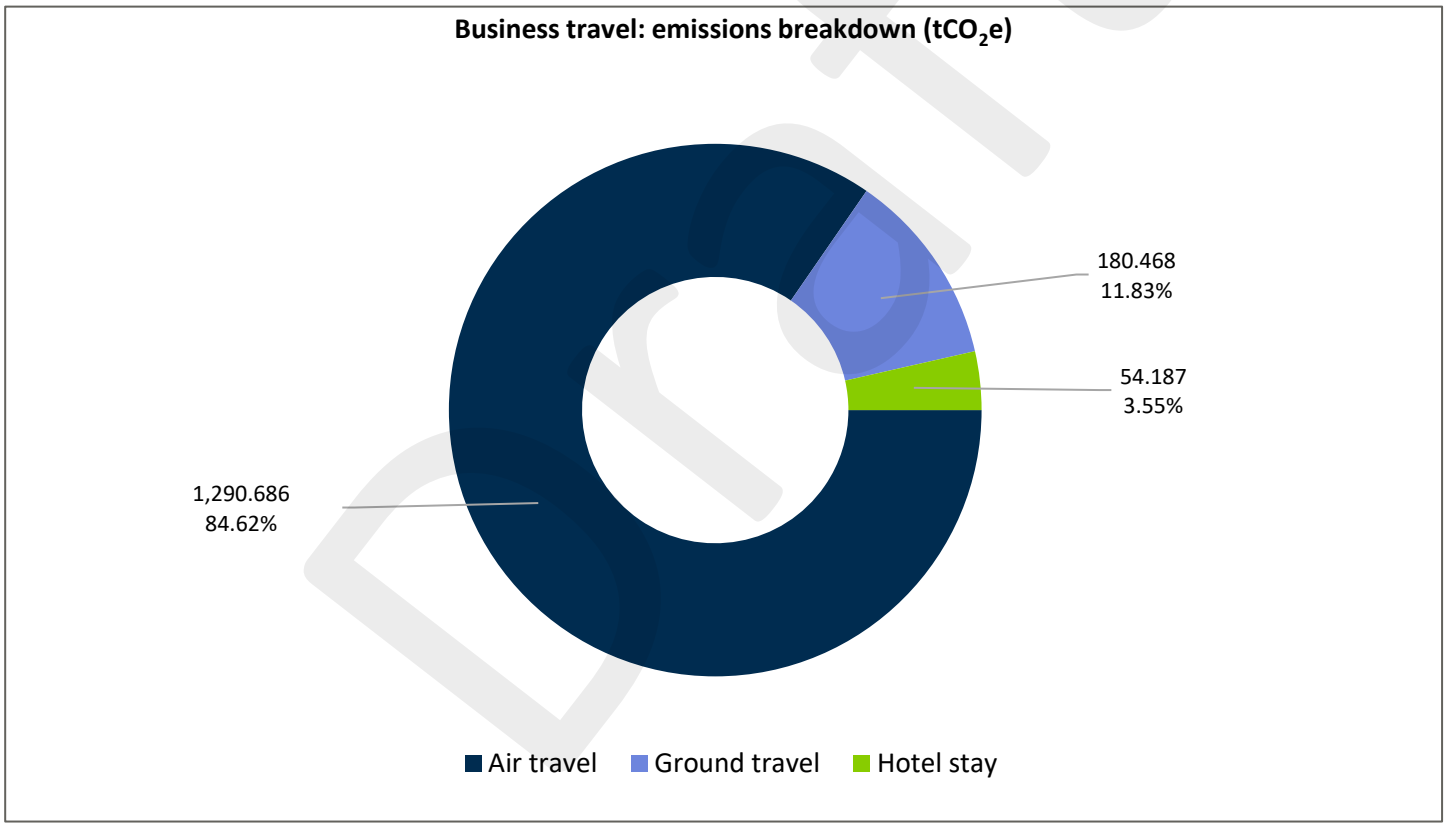

Figure 3

Upstream transport and distribution: emissions breakdown

Upstream transport and distribution	tCO_2e
Transport of structures: event facilities	123.526
Transport of event-related equipment	17.661
Transport of structures: corporate hospitality	3.206
Transport of catering and hospitality equipment	0.460
	144.852

Table 4

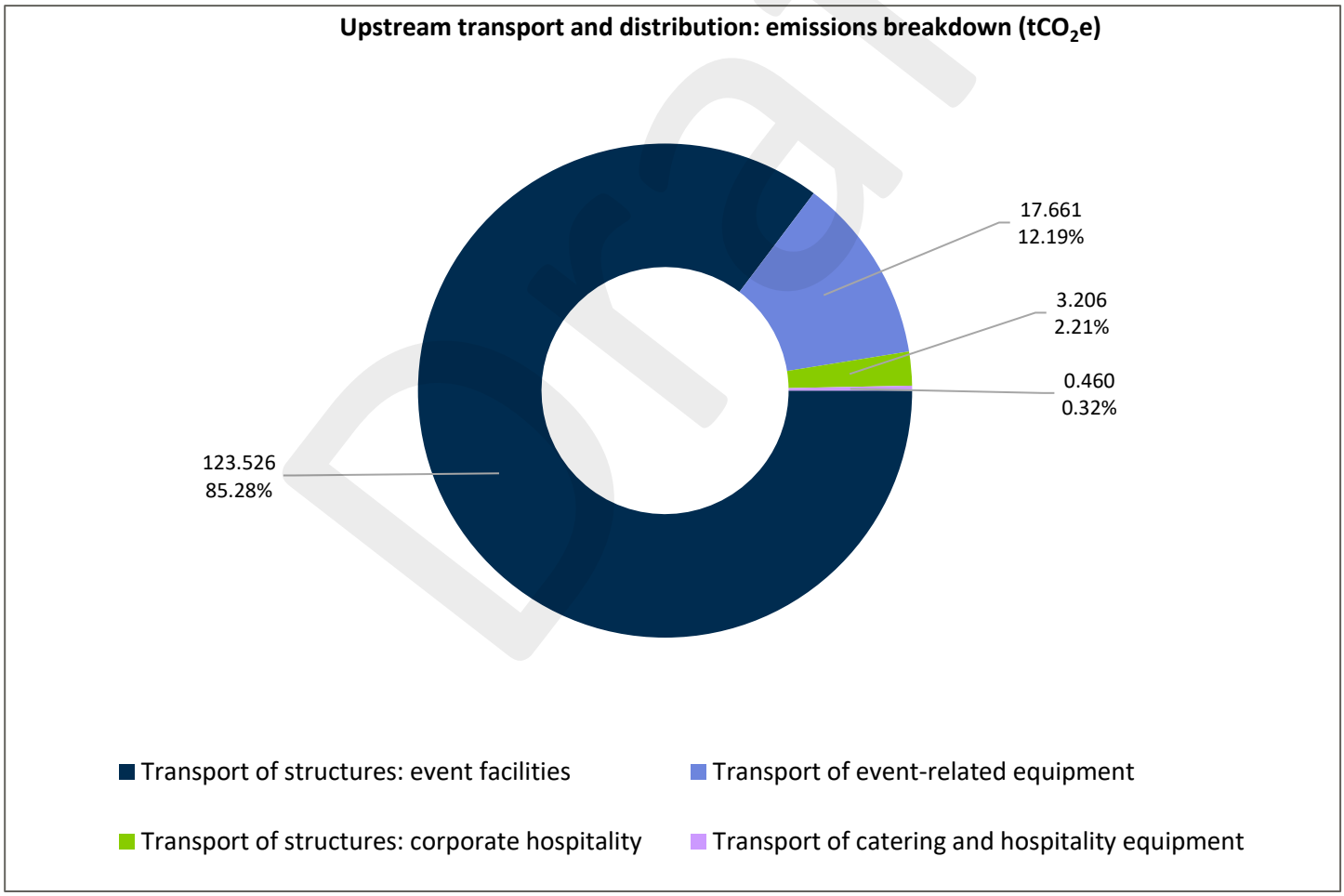

Figure 4

Purchased goods and services: emissions breakdown

Purchased goods and services	tCO_2e
Materials	87.152
Catering	25.976
Staff clothing and merchandise	7.643
Water consumption	0.027
	120.798

Table 5

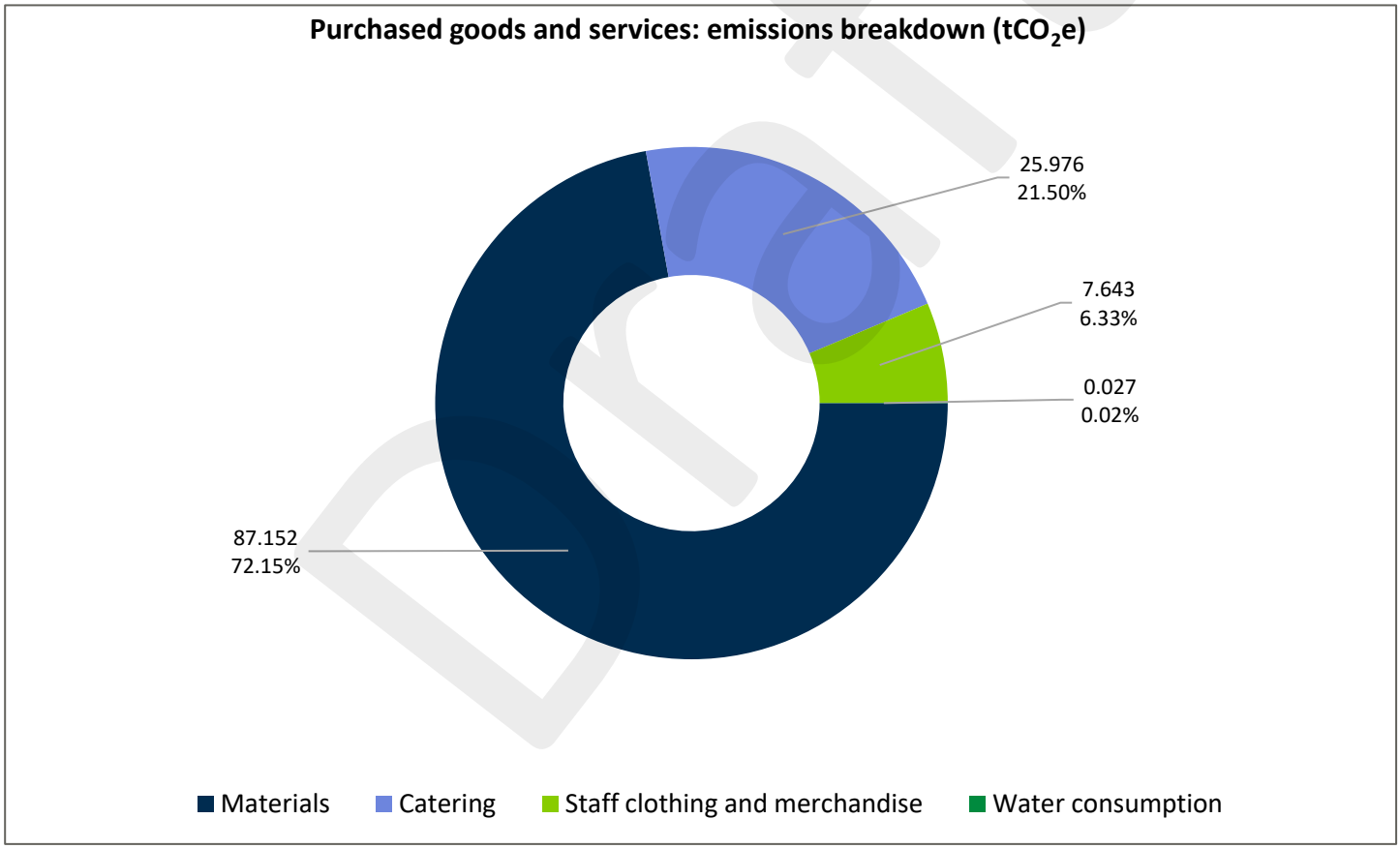

Figure 5

Recommendations

Improve data collection

- Aim to increase engagement with suppliers and service providers to discuss and implement plans that will improve the accuracy and availability of emissions-related data

Expand data sources and be pro-active

- Incorporate more tools and systems at events and liaise with stakeholders in advance to collect data on electricity usage, waste generation, and water consumption

Travel data

- Request more detailed travel data from attendees via surveys, including mode of transportation and travel routes, if possible
- Expand the scope of data collected in the registration process and communicate requirements with travel agents where applicable
- Consider using a fan engagement tool as a means of improving travel data collection

Methodology

Mobile and stationary fuels

- No data was provided for direct (mobile or stationary) fuel consumption, including for heating and cooling activities

Electricity consumption

- The event utilised standard grid-supplied electricity and grid and well-to-tank (WTT) emission factors were applied

Purchased goods and materials

- Event water consumption data was provided by the venue
- Emissions for event-specific items (lanyards, banners, tennis equipment) were calculated based on the weight of primary input materials in each item
- Emissions data for technology (phones, laptops, printers), tennis balls, paint, clothing and drinks containers was sourced from desktop research
- Emissions calculations from meals/catering used emission factors and other data sourced from research, for meat and no-meat meals. In the absence of meal composition data, a meat-meal was assumed

Upstream transport and distribution

- Emissions from transport of event equipment by trucks and vans were calculated based on tonne.km travelled, considering truck type and including WTT emissions

Waste generated

- Waste generation data was estimated based on research conducted on other high-profile tennis events

Business travel

Air and ground travel

- Emissions from air and ground travel to and from the event were calculated for attendees, including spectators, staff, VIPs and players
- All departure and arrival information for staff, VIPs, and players, (including distance and air travel class), was provided to The ITF by the respective travel agency, and this information was used to calculate air travel emissions for these stakeholders
- Spectators' registration data was used to calculate associated emissions from travel, where the following assumptions were applied:
  - Those traveling from within a 400 km radius were assumed to have travelled by road
  - Those attending from the (host) city of Saville were assumed to have travelled a ground return-distance of 25 km
  - Those travelling from beyond 400 km were assumed to have travelled by air in economy class (direct), departing from the primary national airport in their country of departure and arriving at the nearest airport to the event (Saville)
  - A provision for emissions from ground travel was included for spectators traveling by air and they were assumed to have travelled by ground transport for 120 km in total (80 km for departure and 40 km for arrival)
  - The Great Circle Distance (GCD) approach was used for air travel calculations, and the method included provisions for upstream Well-to-Tank (WTT) emissions and radiative forcing (RF) for climate change effects from non-CO_2 emissions
  - Spectators for whom departure country was unknown were assigned the average of (European) travel distances
- All ground travel emissions calculations considered mode of transport, distance travelled and WTT emissions

Accommodation

- Staff were estimated to have occupied 168 rooms, for an average of 7 nights
- Players and VIPs were estimated to have occupied 60 rooms, for an average of 9 nights
- Coaches and physios were estimated to have occupied 225 rooms, for an average of 9 nights
- Spectators were estimated to have occupied 1,600 rooms, for an average of 2.5 nights
- A country-specific hotel stay emission factor for Spain was used to calculate emissions from accommodation

Emission factors

- In the absence of specific product, industry or regional emission factors, the most relevant DEFRA emission factor (and associated methodology) was used

Disclaimer

- The accuracy of the carbon footprint calculation depends on the quality of the data provided and other factors beyond AQGT's control. AQGT was not required to verify data and ITF acknowledges that the results are a best approximation, and AQGT does not guarantee that the results reflect the actual carbon footprint. AQGT can only support carbon-related claims that we have explicitly endorsed in writing

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