**Bygge-, Parkerings- og Miljømyndighed**
**Teknik- og Miljøforvaltningen**

# Bilag 3 Bilag til Ansøgning om rammetilladelse til Copenhagen Historic Grand Prix 2025-27

**12-03-2024**

Sagsnummer I F2
2024 - 1334

Dokumentnummer i F2
121392

Sagsnummer eDoc
2024-0019702

Bygge-, Parkerings- og Miljømyndighed

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5798009809452

# Methodology Report

2022 Emissions Recalculation

Copenhagen Historic Grand Prix

09/11/2023

## Location of origin

The following assumptions have been applied:

- Country of origin is preliminarily retrieved from the mobile country code
- For Denmark, the city of origin is obtained from the Danish postcode
- The unique list of countries found in the dataset was tagged as "fly_only = TRUE" if the country of origin was an island or far away location.

## Distance

### Preliminary distance

For each country for which fly_only = FALSE distance was calculated through the Google Distance Matrix API with the following parameters:

- Origin: City Postcode
- Destination: Hvidkildevej 64, 2400 København

NB. When no postcode was provided the city is set to country as obtained from the mobile number country code.
When no value was retrieved by the Distance Matrix API, the distance was set to "not_known".

## Transportation mode

### Transport adjustments

Several adjustments to the reported transport mode were made during the analysis.

- When "Til fods" was reported together with other types of transportation, it was deleted from the string

- Thus, “Til fods” was first accepted exclusively as this was the only reported transport

## Assigned transport

The actual transportation mode chosen for each entry has been selected according to different combinations of:

- Fly_only country
    - TRUE
    - FALSE
- Transportation
    - Andet
    - ≠ Andet
- Country of origin
    - DK
    - Not DK
- Distance
    - Known
    - Not known

The full range of options are explained in Logical flows for assigned_transport.

## Real distance and transport

The real distance is calculated with the following formula:

```
=if(T2<>"not_known",T2,ifs(S2="Flight",index(flight_Distance!C:C,match(O2,flight_Distance!A:A,0)),S2="Denmark_AVG",index(Google_Distance!$O$6:$W$6,,match(Q2,Google_Distance!$O$1:$W$1,0)),S2="country_AVG",index(Google_Distance!$O$2:$W$22,match(O2,Google_Distance!$N$2:$N$22,0),match(Q2,Google_Distance!$O$1:$W$1,0)),S2="AVG_Andet_Tog",Google_Distance!$AA$7))
```

So:

- If the distance is known, the preliminary API distance is used
- If the assigned_transport is *Flight*, the average flight distance from the country of origin is used.
- For Denmark_AVG, the estimated distance is the one for each transport mode averaged in Denmark.
- For country_AVG the estimated distance is the one for each transport mode averaged in the given country.
- For number 4 cases, the average distance of train trips in DK is used.

The column real_transport was used to associate each entry with the correct assigned_transport according to the logical flows explained above. This variable is mainly used to optimise lookups for emission factors across different transportation types.

# GHG emissions

## Emission Factors (EF)

The EF for bus, train, car and flight transportation types were retrieved from DEFRA (2023). For flights, the distance used was chosen as the main airport in a given entry country.

In cases when multiple transportation modes were reported, the model averages across the given modes in an even manner. This means equal weights are associated with each transport type.

### Adjustments for Cars (Bil)

- The number of Passengers is calculated by counting the number of tickets reporting *Bil* within the same booking ID (Ordre ID)
- The number of cars is calculated as the number of cars needed to transport the calculated number of passengers under each booking ID. Each car is assumed to carry a max of 5 passengers.
- The final emission factors per passenger travelling by car are adjusted according to the number of cars and total passengers:
    - EF_Bil_adjusted = EF_Bil * n_Cars / n_Passengers

## Emission per ticket

kgCO2e / round trip= weighted_EF * real_distance * trips

The basic number or trips was set to 2 (round trip to the CHGP location).
Additional trips were accounted for Weekend tickets with distances <100 km. In this case, it is assumed that:

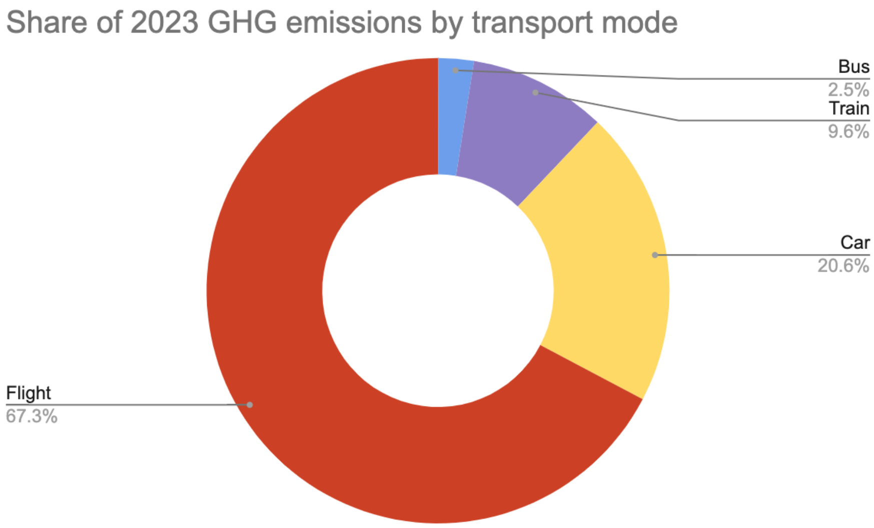
- The respondent travels back home daily after attending the event.
- The average multiplier index used was 2.5 to account for guests coming for 3 days while others coming for 2 days in a row.

## Total GHG Emissions

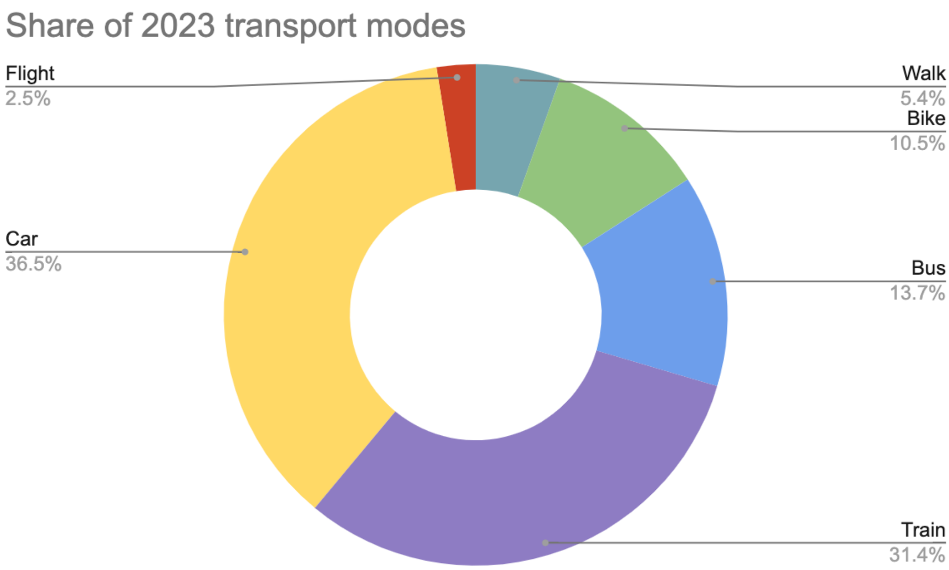
To recalculate GHG emissions for the 2022 CHGP, the results for the 6468 tickets provided were proportionally extrapolated to the total tickets sold in 2022.

Additional trips were considered for Exhibitors and Press, assumed to travel back and forth every day for a total of 3 days (Multiplier index = 3, total trips = 6).

Total emissions were also categorised by each transport mode reported.




Although flights represent only 2.5% of the tickets sold, they accounted for more than half (67.3%) of the total GHG emissions calculated.



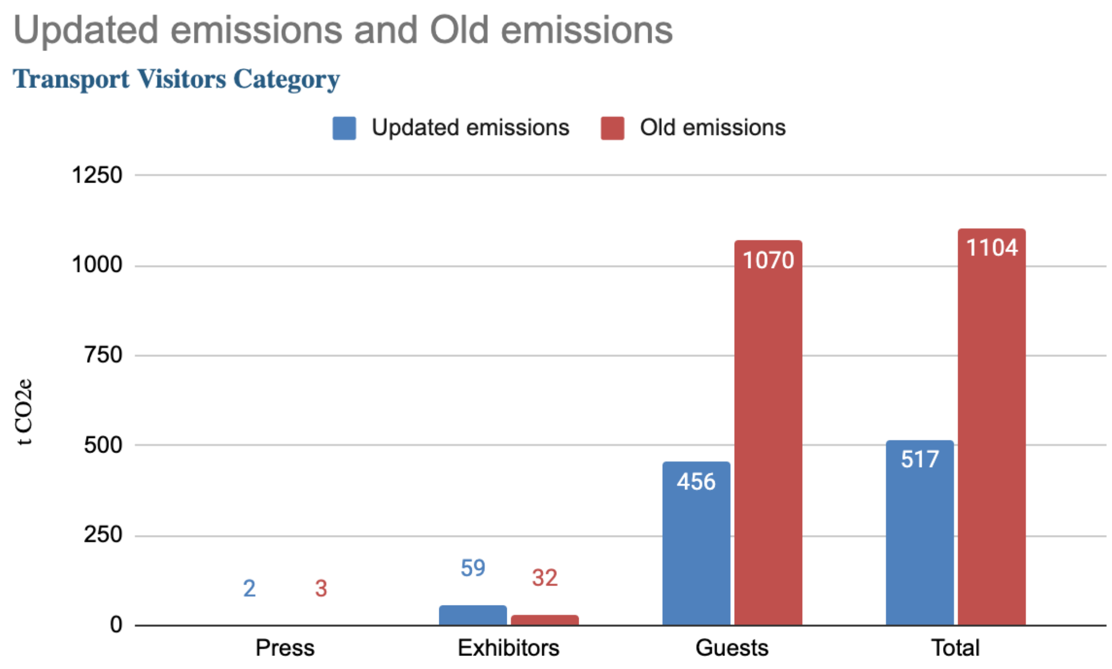
### Adjusted comparison with previous data

There was no perfect match between the total visitors reported in the previous calculations and the updated data provided by CHGP.

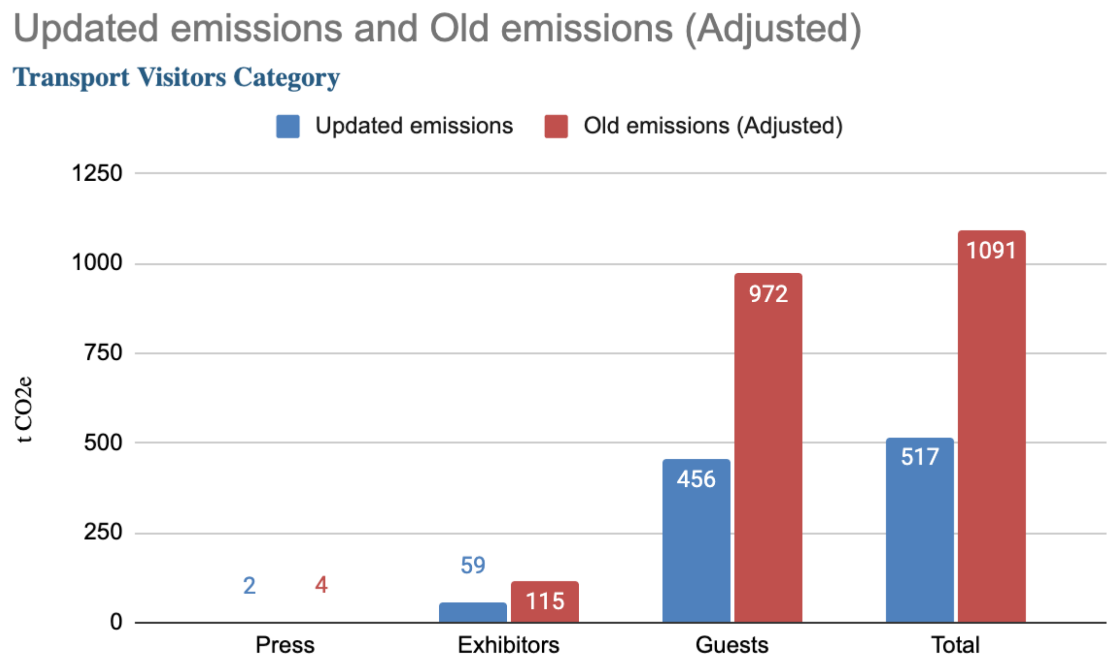
| Visitor type | Previously reported | Updated |
|---|---|---|
| Grand prix club | 865 | 948 |
| Visitors | 32920 | 29743 |
| Press | 94 | 135 |
| Exhibitors | 996 | 3642 |
| Total | 34875 | 34468 |

Thus, total emissions figures had to be readjusted to make them comparable with the newly calculated data.

In previous calculations, travelling emissions were calculated per visitor, i.e. the sum of people that participate daily in the CHGP event.
However, the new data used in this model is able to provide more accurate results by associating GHG emissions to each ticket sold.
Thus, previous results were converted to emissions per ticket by using the indexes (or total trips) for each visitor type.



Updated emissions and Old emissions
Transport Visitors Category
Updated emissions
Old emissions
1250
1000
750
500
250
0
t CO2e
2
3
59
32
456
1070
517
1104
Press
Exhibitors
Guests
Total

Updated emissions and Old emissions (Adjusted)
Transport Visitors Category
Updated emissions
Old emissions (Adjusted)
1250
1000
750
500
250
0
t CO2e
2
4
59
115
456
972
517
1091
Press
Exhibitors
Guests
Total

## Logical flows for assigned_transport

| Case | Fly only? | Mode | Country | Distance | Assigned transport | Assumption |
|---|---|---|---|---|---|---|
| 1 | True | Andet | From country | Flight from country | *Flight* | Since no flight option is given by the survey, Andet is interpreted as such |
| 2 | True | ≠ Andet | As Origin | DK Average | Adjusted transport | Since the respondent reported a clear transportation type, the mobile number is considered insufficient to infer the country of origin. In this case, the respondent is believed to live or arrive from an average location in Denmark with the reported (adjusted transport) |
| 3 | False | Andet | DK | Known | - *Bus* if <10 km<br>- *Tog* if 10-300 km<br>- *Flight* if > 300 km | Some respondents in DK stated a general Andet transport Since the distance is known, the most probable transport was assumed from the calculated distance. |
| 4 | False | Andet | DK | Not known | *AVG_Andet_Tog*<br>- Average distance for Andet category<br>- Real transport = *Tog* | When Andet was reported but the distance is not known, the transport mode was set to train (*Tog*) and the distance set to the average distance travelled by the *Andet* category for which a distance was retrievable (case 3). The assumption was made because *Tog* was found to be the most probable option for the Andet category in DK (61.71% of cases), with an average distance of 59.60 km. |
| 5 | False | Andet | Not DK | Not known | *Flight* | For all countries other than Denmark, an average flight distance was considered if the distance was not retrievable and the transport not specified |
| 6 | False | Andet | Not DK | Known | - *Tog* if <= 300 km<br>- *Flight* if > 300 km | For countries other than Denmark, but connected by land, all reported transport was adjusted to train or flight according to the calculated distance |
| 7 | False | ≠ Andet | DK | Not known | Country average (DK average) | The transportation mode is known, but the distance is not. The average distance is calculated for each transportation |

| Case | Fly only? | Mode | Country | Distance | Assigned transport | Assumption |
|---|---|---|---|---|---|---|
| | | | | | | mode used in Denmark. |
| 8 | False | ≠ Andet | DK | Known | *Til fods*:<br>- OK if <= 5 km<br>- *Bus* if 5-10 km<br>- *Tog* if > 10 km<br><br>*Cykel*<br>- OK if <= 35 km<br>- *Tog* if > 35 km<br><br>OK for the rest | The distance and the transportation type are known and therefore are generally used as a reference for calculations.<br><br>For walking (*Til fods*) and biking (*Cykel*) an adjustment is made according to the measured distance. |
| 9 | False | ≠ Andet | Not DK | Not known | DK Average<br>- *Til fods*<br>- *Cykel*<br>- *Bus*<br><br>Country average<br>- *Tog*<br>- *Bil* | Since the precise origin is not known, two assumptions are made:<br>- If the respondent stated Til fods, Cykel or Bus the DK averaged is used: the respondent is believed to live in Denmark even though the mobile country code is not Danish<br>- For Tog or Bil, the respondent is treated as living outside of Denmark and travel an average distance from the their country or origin |
| 10 | False | ≠ Andet | Not DK | Known | Accepted:<br>- *Bus*<br>- *Tog*<br>- *Bil*<br>Til fods or Cykel:<br>- *Tog* if < 600 km<br>- *Flight* if > 600 km | If the distance from the origin is known, the reported (adjusted) transport type is accepted.<br>However, cases of *Til fods* and *Cykel* are always readjusted to *Tog* (for trips below 600 km) or *Flight* (for trips over 600 km). |

# References

DEFRA (2023). Conversion factors 2023: full set [Research and analysis]. Greenhouse gas reporting: conversion factors 2023. Department for Business, Energy & Industrial Strategy.

# Emissions Recalculation Report

Copenhagen Historic Grand Prix - 2022 Emissions

09/11/2023

## Executive summary

The 2022 Copenhagen Historic Grand Prix (CHGP) event report has undergone adjustments to enhance its accuracy by incorporating retroactive assumptions. These adjustments were deemed essential to facilitate a comparative analysis of the results between the two editions of the event. In 2023, CHGP distributed a questionnaire to event participants during the ticket purchasing process, providing information for a more precise recalculation of the primary emission source: visitor transportation, which accounted for a substantial 79.2% of total emissions. Due to the significant impact of this emission category, addressing the informational gaps required making necessary assumptions. Retroactively modifying the 2022 accounting report was needed to establish a meaningful basis for comparison.

The outcome of the recalculation revealed a notable reduction in Transport - Visitors emissions, decreasing from 1104 tCO2e to 517 tCO2e, a -52.5% change. Furthermore, the total emissions dropped from 1419 tCO2e to 832 tCO2e representing a 41.4% decrease. These adjustments provide a more accurate reflection of the environmental impact, allowing for a comprehensive comparison between the two editions.

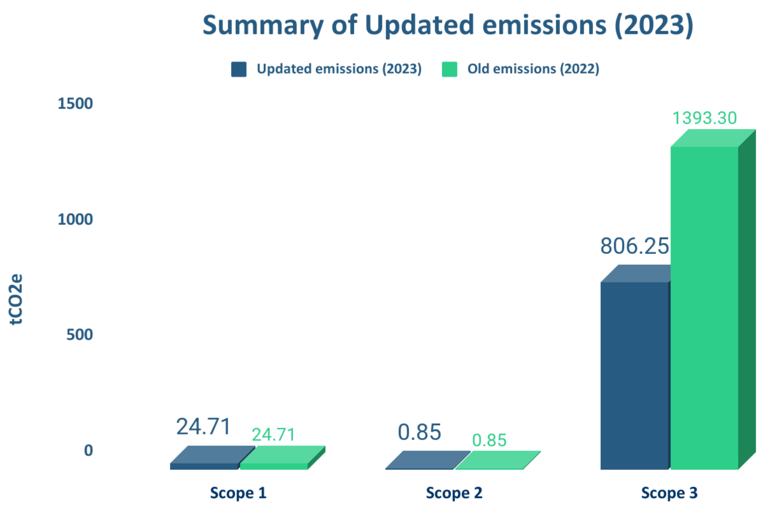



*Figure 1. Comparison of updated and old emissions divided by Scope*

# Assumptions

In the initial calculations, emissions were computed per visitor, aggregating daily participants in the CHGP event. The revised methodology utilizes more precise data, associating GHG emissions with each ticket sold. This shift resulted in a -52.5% change in emissions. Key driving factors for this drop in emissions include:

1. Previous calculations considered emissions per visitor, while the updated model converted results to emissions per ticket, eliminating double-counting for multiday ticket holders travelling from distances over 100km, the segment with the highest transport emissions per visitor.
2. The new dataset provided included order ID, acting as a proxy for groups of visitors travelling together. This allowed for the counting of multiple visitors in the same vehicle.
3. Fewer visitors than assumed opted for transport by car.
4. Some visitors reached the event by walking or hiking, a scenario not previously considered.

## Old Assumptions - 2022 Data

Geographical location data from website visits at the time of ticket purchase was used as a proxy for determining visitor country of origin. However, lacking real data on modes of transport, assumptions were made based on origin: Danish and Swedish visitors split 50% by car and 50% by train, while visitors from other countries were assumed to arrive 100% by plane. Attendee calculations were based on the total number of participants per day, regardless of ticket purchases for multiple days.

## New Assumptions - 2023 Data

The 2023 data provided additional insights, such as the mode of transport input in the ticket sale form. This, coupled with IP, phone suffix, and location of purchase, enabled more refined assumptions. Various transport options were considered, and the methodology was adjusted accordingly.

For an in-depth review of the methodology, refer to the document titled "CHGP 22_Methodology Report _2022 Emissions Recalculation" appended to this report.

# Results

## Total GHG Emissions

Total emissions exhibit a significant decline, dropping from 1418.86 to 831.81. This reduction is particularly notable in Scope 3, with a pronounced impact observed in the "Transport - Visitors" category.

Figure 2 offers an overview of the updated emission categories within Scope 3.

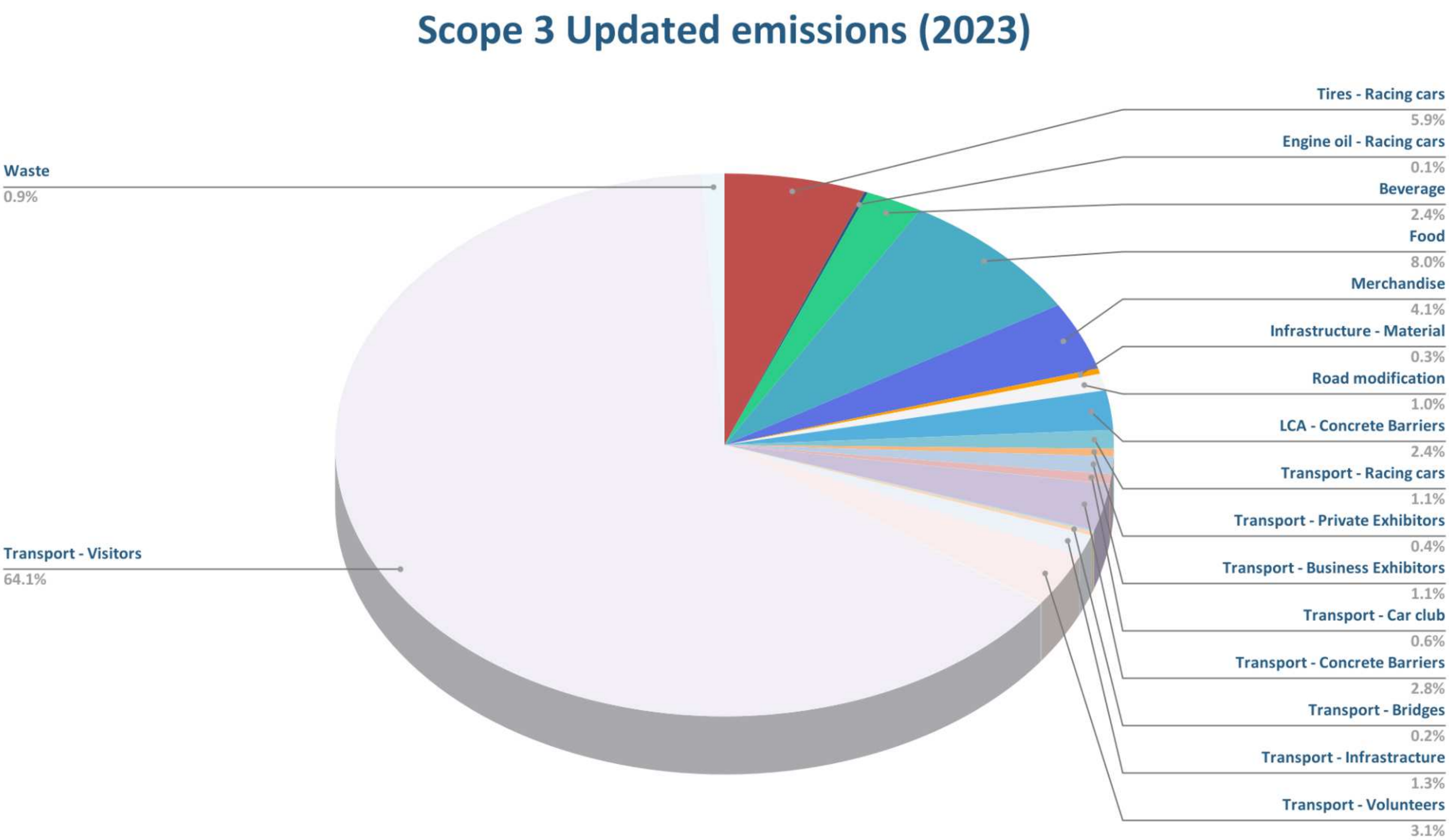



*Figure 2. Updated emission categories within Scope 3.*

The table below (Table 1) displays emissions data for both the original and revised figures for the CHGP 2022 event. Emissions are categorized into Scope 1, 2, and 3, as well as grouped by specific categories. The alterations in emissions are presented in both absolute and relative terms.

| Summary Of Emissions | | tCO2e | | Share of total emission | |
|---|---|---|---|---|---|
| | | Old emissions (2022) | Updated emissions (2023) | Old emissions (2022) | Updated emissions (2023) |
| Scope 1 | Fuel - Racing cars | 22.50 | 22.50 | 1.6% | 2.7% |
| | Fuel - Service vehicles | 2.08 | 2.08 | 0.1% | 0.2% |
| | Fuel - Parade | 0.06 | 0.06 | 0.0% | 0.0% |
| | Fuel - Generators | 0.07 | 0.07 | 0.0% | 0.0% |
| | Total S1 | 24.71 | 24.71 | 1.7% | 3.0% |
| Scope 2 | Electricity (Market-based) | 0.85 | 0.85 | 0.1% | 0.1% |
| | Electricity (Location-based) | 0.85 | 0.85 | 0.1% | 0.1% |
| | Total S2 (Market-based) | 0.85 | 0.85 | 0.1% | 0.1% |
| | Total S2 (Location-based) | 0.85 | 0.85 | 0.1% | 0.1% |
| Scope 3 | Water supply | 0.00 | 0.00 | 0.0% | 0.0% |
| | Tires - Racing cars | 47.26 | 47.26 | 3.3% | 5.7% |
| | Engine oil - Racing cars | 1.11 | 1.11 | 0.1% | 0.1% |
| | Beverage | 19.16 | 19.16 | 1.4% | 2.3% |
| | Food | 64.62 | 64.62 | 4.6% | 7.8% |
| | Merchandise | 32.76 | 32.76 | 2.3% | 3.9% |
| | Infrastructure - Material | 2.59 | 2.59 | 0.2% | 0.3% |
| | Road modification | 8.01 | 8.01 | 0.6% | 1.0% |
| | LCA - Concrete Barriers | 18.96 | 18.96 | 1.3% | 2.3% |
| | Transmission & distribution loss | 0.04 | 0.04 | 0.0% | 0.0% |
| | Transport - Racing cars | 8.84 | 8.84 | 0.6% | 1.1% |
| | Transport - Private Exhibitors | 3.57 | 3.57 | 0.3% | 0.4% |
| | Transport - Business Exhibitors | 8.56 | 8.56 | 0.6% | 1.0% |
| | Transport - Car club | 4.58 | 4.58 | 0.3% | 0.6% |
| | Transport - Generators | 0.05 | 0.05 | 0.0% | 0.0% |
| | Transport - Concrete Barriers | 22.49 | 22.49 | 1.6% | 2.7% |
| | Transport - Safety fences | 0.79 | 0.79 | 0.1% | 0.1% |
| | Transport - Bridges | 1.77 | 1.77 | 0.1% | 0.2% |
| | Transport - Infrastructure | 10.66 | 10.66 | 0.8% | 1.3% |
| | Waste | 7.62 | 7.62 | 0.5% | 0.9% |
| | Transport - Volunteers | 25.38 | 25.38 | 1.8% | 3.1% |
| | Transport - Bus | 0.42 | 0.42 | 0.0% | 0.1% |
| | Transport - Visitors | 1104.05 | 517.00 | 77.8% | 62.2% |
| | Total S3 | 1393.30 | 806.25 | 98.2% | 96.9% |
| All Scopes | Total Emissions | 1418.86 | 831.81 | | |

*Table 1. Comparison of old emissions (2022) and updated emissions (2023) divided by Scopes and Categories*

The provided image (Figure 3) illustrates a detailed breakdown of updated and historical emissions within the Transport - Visitors category. This breakdown categorizes emissions into subgroups, including Press, Exhibitors, Guests, and Total emissions.

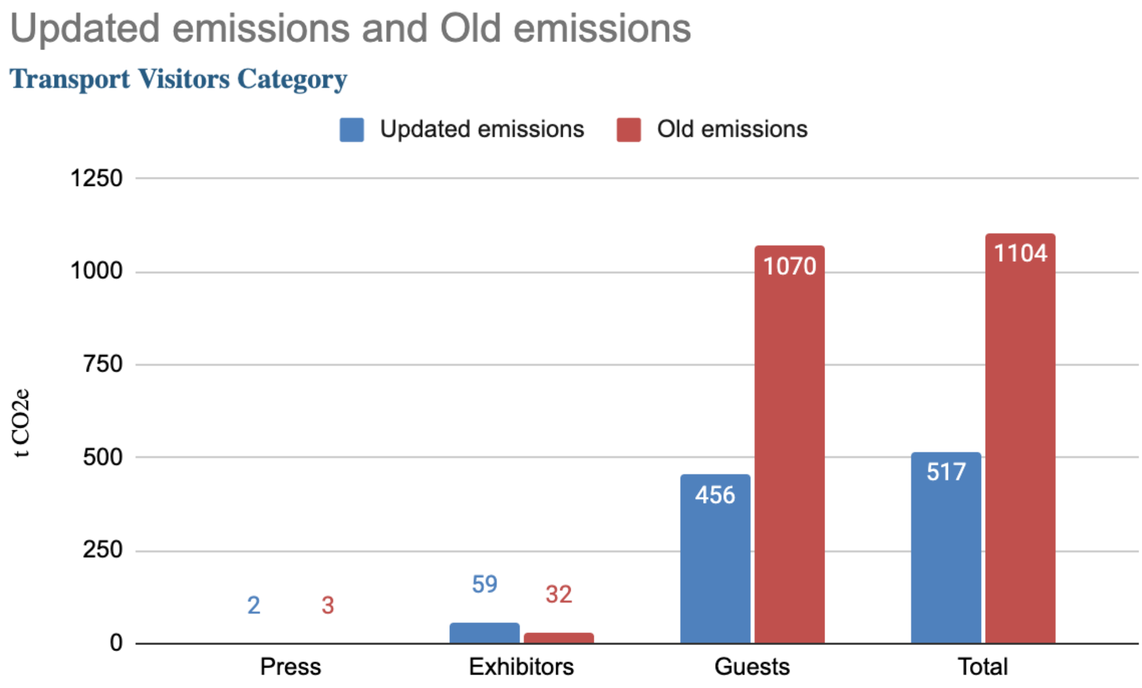



*Figure 3. Transport - Visitors category emissions*

## Share of transport modes comparison

The charts below (Figures 4 and 5) illustrate the impact of adjustments made based on new assumptions derived from the data obtained in this year's Grand Prix. It's evident that the inclusion of walking and biking as transportation modes is now part of the original private vehicle category, and the combined percentages remain roughly consistent across the two versions of the quantification.

Similarly, in the section detailing commuters using public transport, the total of train and bus commuters aligns closely with the original value reported in last year's analysis.

Notably, the proportion of commuters who have flown in for the event has increased by approximately 1 percentage point, signifying a significant rise compared to the previous analysis. As depicted in the upcoming infographics, this uptick results in a substantial growth in emissions.

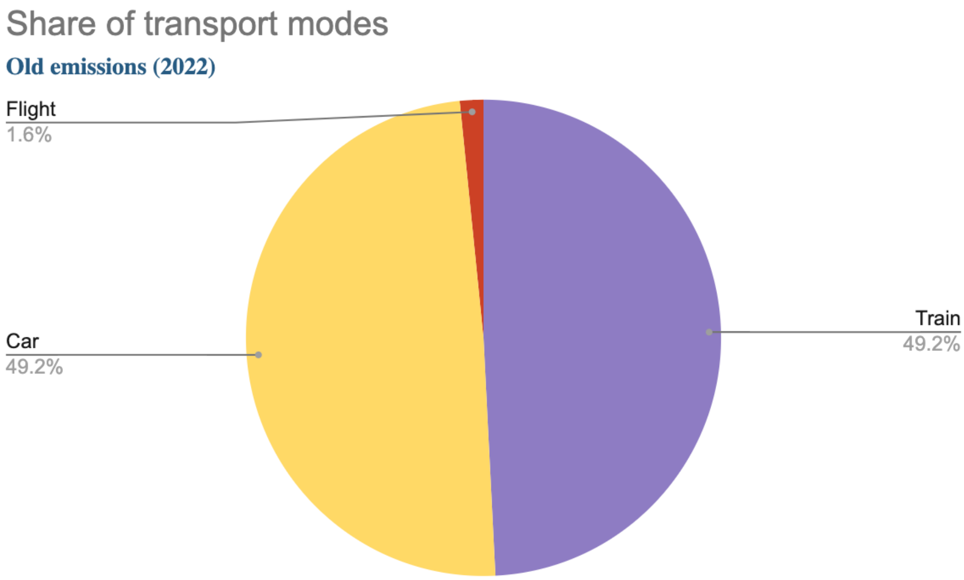



*Figure 4. Transport - Visitors category by mode of transportation. Old emissions data (2022)*

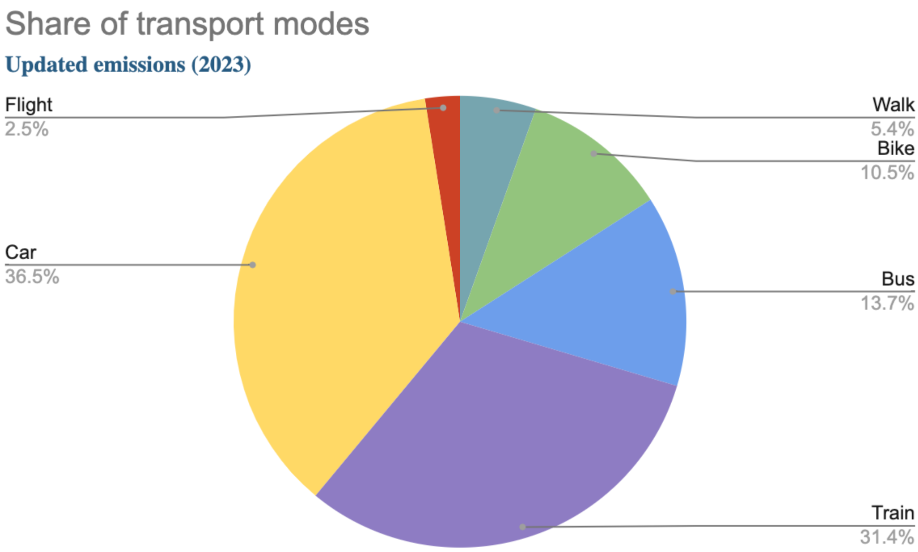



*Figure 5. Transport - Visitors category by mode of transportation. Updated emissions data (2023)*

## Share of emissions by mode of transportation

The following two figures (Figures 6 and 7) illustrate the impact of the assumed increase in attendees who opted for flights to reach the event venue, along with the exclusion of emissions-related to walking and biking, which are naturally exempt from the calculation. The breakdown of total emissions is further categorized based on each reported mode of transportation. Despite flights constituting only 2.5% of ticket sales, they contributed significantly, representing 67.3% of the total calculated greenhouse gas emissions.

It's essential to note that the distribution of emissions across various transport modes directly influences the overall emission shares. When considered alongside data on ticket purchase location, phone prefix, and overall distance from the event, this approach yields more meaningful results. There's a noteworthy shift in the share of emissions attributed to public transportation and cars due to the adoption of an updated distance metric, resulting in lower emissions per kilometre. For instance, longer distances are now associated with public transportation use, particularly for visitors from Denmark.

Of particular interest is the 16% increase in emissions from the flight category, which resulted from a 1% rise in the number of attendees using air transport. This adjustment was made possible by retrospectively updating assumptions about the realistic number of attendees utilizing air transport, aligning with more sensible estimates derived from the latest data.

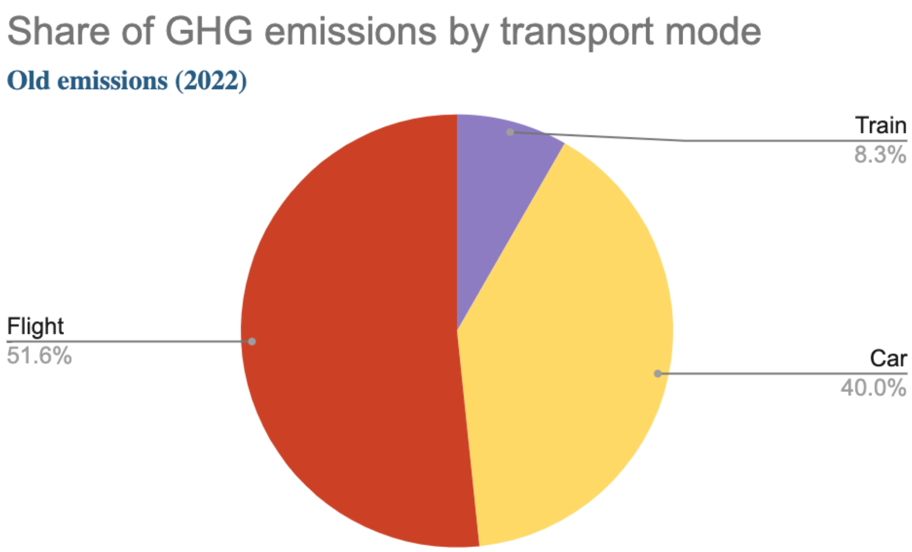



*Figure 6. Transport - Visitors category by share of GHG emissions. Old emissions data (2022)*

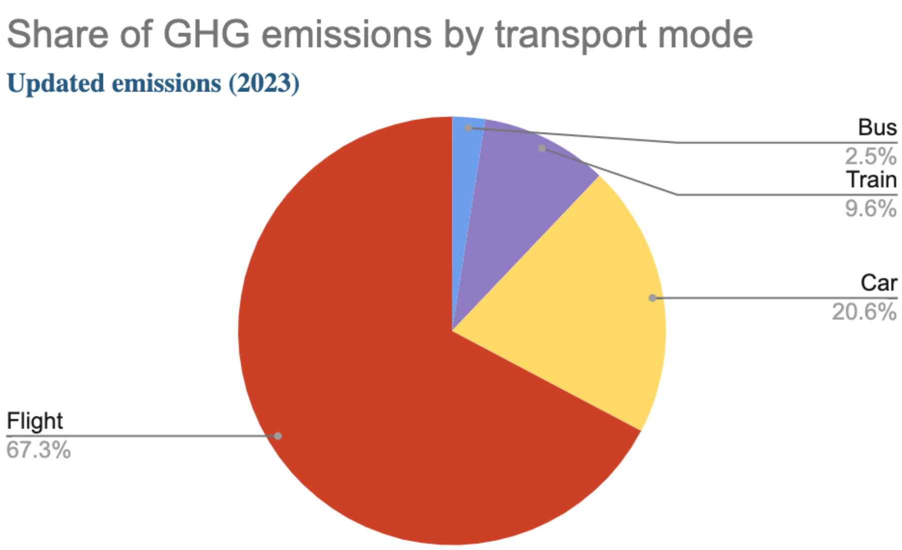



*Figure 7. Transport - Visitors category by share of GHG emissions. Updated emissions data (2023)*

# Conclusion

This report aims to highlight the impact of new data and updated assumptions on the emissions profile of the event. SuFu's objective is to provide the client with a comprehensive view, enabling them to compare emission results over the years, thereby offering valuable insights into the yearly environmental impact of organizing the event.

The most significant shifts in emissions occur in Scope 3, delineated by factors beyond the immediate control of event organizers and not directly attributable to the event itself (with directly connected emissions falling under Scope 1 and 2). Notably, the effective reduction of Scope 3 emissions hinges on the transportation choices made by participants.

The adjustments presented in this document facilitate a more accurate comparison and monitoring of emitted quantities. Moreover, future data points, such as a clearer understanding of the number of days attendees spend at the event linked to their mode of transportation, can substantially influence emission figures. Additionally, insights into the preferences of attendees, such as choosing overnight stays over multiple trips, are vital for comprehending the intricate relationship between distance, transportation means, and emissions, as discussed in this report.

In conclusion, we recommend that CHGP revise its current questionnaire to eliminate errors and enhance data accuracy.

# GREENHOUSE GAS ACCOUNTING REPORT

## 2022

sufu x COPENHAGEN HISTORIC GRAND PRIX

# Table of Contents:

# List of Abbreviation

**GHG** - Greenhouse Gas

**EF** - Emission Factor

**CO2e** - Carbon dioxide is the most common greenhouse gas; all the other greenhouse gases are measured as an equivalent (e) of CO2 according to their global warming potential.

(**t**) - tonnes

**PPA** - Power Purchase Agreement(s)

**S1** - Scope 1 emissions

**S2** - Scope 2 emissions

**S3** - Scope 3 emissions

**iLUC** - Indirect land use change

**LULUFC** - Land use, land-use change and forestry

**Note**

English numerical notation has been used for the decimal numbers (.), not Danish notation.

## Executive Summary

This is an account of Copenhagen Historical Grand Prix's (CHGP) greenhouse gas emissions for the year 2022. It is calculated in line with the World Resource Institute Greenhouse Gas Protocol and ISO 14064-1:2018 international reporting standards. This GHG inventory covers Scope 1 (S1), Scope 2 (S2) and Scope 3 (S3) of CHGP emissions. For the assessed period, total emissions were 1418.86 tCO2e both for the market-based approach and the location-based approach. These are divided as follows:

- Market-based: **S1:** 24.71 tCO2e **S2:** 0.85 tCO2e **S3**: 1393.30 tCO2e
- Location-based: **S1**: 24.71 tCO2e **S2**: 0.85 tCO2e **S3**: 1393.30 tCO2e

**1,418.86**
tCO2e
are equal to...

Yearly average emissions by:
**281** people in Denmark
**747** people in Morocco

**8,322,736** km
driven by car

**1,598** Roundtrips
from Copenhagen to Malaga

CO2 absorbed in a year by
**56,754** trees

# Introduction

This report summarises the greenhouse gas (GHG) emissions of CHGP for the year 2022. As agreed upon between CHGP and SuFu, the main focus and objectives of the GHG account and this report was to provide:

1. A summary report for CHGP outlining the key points calculated in the data file and recommendations for emission reductions (in this document).
2. One emission inventory document, divided by scopes, presenting the calculations performed and a summary of the emissions.
3. One GHG quantification certificate signed by SuFu ApS, showing the total GHG emissions of CHGP divided between scopes and calculated using both location-based and market-based approaches.

The following Scope 3 categories have been included in the calculations:

- 1 Purchase goods and services
- 2 Capital Goods
- 3,c Transmission & distribution losses
- 4 Upstream transport & distribution
- 5 Waste generated in operations
- 7 Employee commuting
- 9 Downstream transport and distribution

## GHG Accounting

The GHG accounting is the act of creating an inventory and audit of GHG emissions for an organisation, business or product. The accounting quantifies the total GHGs produced directly and indirectly from a business's or organisation's activities and/or from a product that the company sells or procures. The GHG accounting service is a useful exercise for businesses as it can provide the foundation for understanding, accounting and reducing emissions from their operations. Additionally, the service can help reduce the impacts of climate change's associated risk and provide readiness for future regulation and aid in the reporting of ESGs to investors and other stakeholders. Finally, it can be used to verify any claims of sustainability from a business and its suppliers to alleviate any accusations of greenwashing[1].

[1] Greenwashing is the process of conveying a false impression or providing misleading information about how a company's products are more environmentally sound than reality

# The GHG Protocol

The Greenhouse Gas Protocol (GHG Protocol) is an international standard for companies to assess and report their greenhouse gas emissions. Created by the World Resource Institute (WRI) and the World Business Council for Sustainable Development (WBCSD) in 2001, the GHG Protocol aims to provide transparency, consistency, accuracy, completeness, and relevance for GHG accounting. It also emphasises the importance of setting operational boundaries to ensure effective management and prevent double-counting of emissions.

The GHG Protocol divides the assessment of emissions into three categories:

- **Scope 1**: Direct emissions from sources owned or controlled by the company, including on-site emissions from engines, production, and fugitive emissions (S1).
- **Scope 2**: Indirect emissions due to the company's activities, such as energy consumption, water use, heating, and electricity (S2).
- **Scope 3**: Other indirect emissions resulting from the company's activities, including travel, waste disposal, product shipping, employee commuting, and purchases of goods and services (S3).

Scope 3 is further divided into upstream (categories 1-8) and downstream (categories 9-15) emissions in the supply chain.

# What is CO2e?

Greenhouse gases are emitted by human activities, and their climate change impact is evaluated by converting emissions to a common metric: carbon dioxide equivalent (CO2e). This conversion is made by scaling the quantity of each GHG according to its Global Warming Potential (GWP), which represents the GHG's impact on the greenhouse effect in comparison to CO2. The GWP allows for the conversion of 1 kg of GHG into X kg of CO2e and enables the accounting of emissions from different GHGs.

GHGs expressed in CO2e typically include CO2, CH4, N2O, HFCs, PFCs, and SF6. For example, beef has a high emission factor (EF) because cattle emit a large amount of methane (CH4) during their lifetime. As a GHG, CH4 is 27-30 times more potent than CO2 and remains active in the atmosphere for a longer period. An EF is a coefficient that converts activity data into GHG emissions. It is the average emission rate of a given source relative to units of the activity or process(es). The emission factor for GHG emissions is typically expressed relative to the weight of CO2e.

# Methodology

## Boundaries of the study

**Temporal Boundary**: From 22nd July 2022 to 29th Aug 2022

**Organisational boundary**: Control-Operational

A company has operational control over an operation if the former or one of its subsidiaries has the full authority to introduce and implement its operating policies at the operation facility. Under the operational control approach, a company accounts for 100% of emissions from operations over which it or one of its subsidiaries has operational control.

**Operational boundary:**

| | | |
|---|---|---|
| Scope 1 | Fuel used during the event at the event location. | |
| Scope 2 | Emissions from electricity consumed during the event. | |
| Scope 3 | Category 1 | Purchase goods and services |
| | Category 2 | Capital goods |
| | Category 3-c | Transmission and distribution losses |
| | Category 4 | Upstream transport & distribution |
| | Category 5 | Waste generated in operations |
| | Category 7 | Employee commuting |
| | Category 9 | Downstream transport and distribution |

### Out of boundaries

After conducting initial analysis, we have excluded the following emission sources from our analysis. Scope 3, Categories 3d, 6, 8, 10, 11, 12, 13, 14, and 15 were deemed **not relevant**. Scope 3, Category 3a and 3b was considered **immaterial**.

# Data and assumptions

## Peer-reviewed data

The peer-reviewed data used in this study has been obtained from academic literature and governmental climate databases. A comprehensive list of the literature sources can be found in the References section. In cases where exact matching emission factors (EFs) for resources used by CHGP were unavailable, the closest possible resource type was assumed to estimate the emissions.

There is an industry-accepted way of carrying out emission accounting, and the assumptions employed in this report are as accurate as possible. The databases used in this study provide both the emissions of the various products and the references to the scientific studies on which they are based, allowing the elaboration of consistent and scientifically sourced data. This means SuFu has a high level of certainty about the accuracy and transparency of the emission factor and the data used for the calculations. Nonetheless, a certain degree of uncertainty is inevitably present and over- or underestimation of EFs is possible.

## Data Quality

For our calculations, we used two main approaches: spend-based and activity-based. The spend-based approach estimates emissions based on the amount of money spent on certain categories, while the activity-based approach calculates emissions based on the actual activity that generated the emissions. At SuFu, we prioritize the activity-based approach as it is considered more accurate and precise. The approach used depends on the quality of the data obtained. However, it is important to note that the accuracy of our results is reliant on the quality of the data provided by the client. Data quality is a critical aspect of GHG emissions accounting as it ensures the accuracy, completeness, consistency, and reliability of the results.

In this report, we employed a moderate level of data granularity since the accuracy and completeness varied across the data provided by the client Generally, CHGP provided granular data which included lists of invoices for various services performed at the venue, list of and car transported by category, food and beverage products purchased, detailed information on energy and water consumption, data on infrastructure used during the event and data on volunteers commuting distance.

## Visitors transport

The geographical location data from visits on the CHGP website at the time of ticket purchase has been utilised as a proxy for determining the country and area of origin of the attendees. This data has been extrapolated from 1095 ticket purchases and applied to all visitors during the entire event. For a comprehensive understanding of how the average transport distance of visitors has been calculated, please refer to the "Visitors" tab in the CHGP_2022__GHG Emission Inventory spreadsheet. However, it's important to note that the extrapolation has not been applied to Volunteers, Employees, and Drivers, as accurate data regarding their area of origin is available. Please refer to the "Volunteers transport" tab in the CHGP_2022__GHG Emission Inventory spreadsheet for detailed information on these groups.

## Electricity and water

Emission figures using both the market-based and location-based approaches have been calculated[2]. The average emission intensity of the energy mix of Easter Denmark in 2022, considering electricity consumed (not produced) has been used to calculate emissions from electricity consumption. To calculate electricity and water consumption emissions, data from CHGP's energy bills was used.

## Waste

Emissions generated from waste were calculated based on information provided by CHGP, stating that no sorting took place at the event and assuming that all the waste would be incinerated. The emission factors used were based on a review of existing literature (Dansk Affaldsforening, 2010, Hillman,et al., 2015 and Turner et al., 2015). However, it is important to notice that potential emissions avoided from electricity or heating energy production through the incineration process were not included in this GHG report since they were considered outside the client's operational boundaries. Data on waste has been estimated from the volume of containers, assuming a load factor of 80%.

## Transport

When calculating the GHG emissions for the transport of vehicles, participants and products purchased by CHGP to the event location, SuFu made the following assumptions. We use Google Maps coordinates. We take the distance in kilometres according to the first option available in Google Maps. The origin was obtained from data provided by CHGPs. In cases where the address of origin was unavailable, the geographical centre of the area has been used as a starting point.

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[2] In 2015, the GHG Protocol Corporate Standard introduced new reporting requirements for Scope 2 emissions. Companies are now required to report on two types of Scope 2 emissions: the location-based method and the market-based method. The location-based method calculates emissions based on the average emission factors of the electricity grid being used, while the market-based method takes into account the emission intensity of energy contracts. However, the use of renewable energy credits through the market-based method can be misleading and may not accurately reflect a company's emissions. This is because renewable energy certificates do not necessarily correspond to the actual source of the electricity provided.

# Results

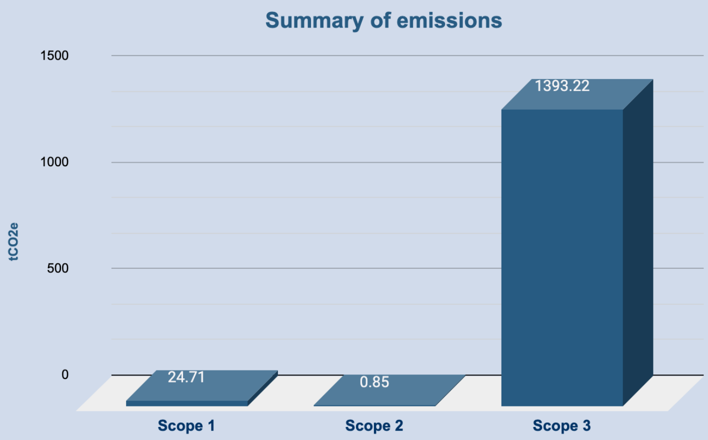
In 2022, the total GHG emissions amounted to 1418.86 tCO2e for the market-based approach and 1418.86 tCO2e for the location-based approach. A summary of all GHG emissions can be found in Table 1.

*Table 1. Summary of GHG emissions and relative share for S1, S2 and S3.*

| Summary Of Emissions | | tCO2e | Share of total emission |
|---|---|---|---|
| Scope 1 | Fuel - Racing cars | 22.50 | 1.6% |
| | Fuel - Service vehicles | 2.08 | 0.1% |
| | Fuel - Parade | 0.06 | 0.0% |
| | Fuel - Generators | 0.07 | 0.0% |
| | Total | 24.71 | 1.7% |
| | | | |
| Scope 2 | Electricity (Market-based) | 0.85 | 0.1% |
| | Electricity (Location-based) | 0.85 | 0.1% |
| | Total (Market-based) | 0.85 | 0.1% |
| | Total (Location-based) | 0.85 | 0.1% |
| | | | |
| Scope 3 | Water supply | 0.00 | 0.0% |
| | Tires - Racing cars | 47.26 | 3.3% |
| | Engine oil - Racing cars | 1.11 | 0.1% |
| | Beverage | 19.16 | 1.4% |
| | Food | 64.62 | 4.6% |
| | Merchandise | 32.76 | 2.3% |
| | Infrastructure - Material | 2.59 | 0.2% |
| | Road modification | 8.01 | 0.6% |
| | LCA - Concrete Barriers | 18.96 | 1.3% |
| | Transmission & distribution loss | 0.04 | 0.0% |
| | Transport - Racing cars | 8.84 | 0.6% |
| | Transport - Private Exhibitors | 3.57 | 0.3% |
| | Transport - Business Exhibitors | 8.56 | 0.6% |
| | Transport - Car club | 4.58 | 0.3% |
| | Transport - Generators | 0.05 | 0.0% |
| | Transport - Concrete Barriers | 22.49 | 1.6% |
| | Transport - Safety fences | 0.79 | 0.1% |
| | Transport - Bridges | 1.77 | 0.1% |
| | Transport - Infrastructure | 10.66 | 0.8% |

| | | | |
|---|---|---|---|
| | Waste | 7.62 | 0.5% |
| | Transport - Volunteers | 25.38 | 1.8% |
| | Transport - Bus | 0.42 | 0.0% |
| | Transport - Visitors | 1104.05 | 77.8% |
| | Total | 1393.30 | 98.2% |
| | | | |
| All Scopes | Total Emissions (Market-based) | 1418.86 | |
| | Total Emissions (Location-based) | 1418.86 | |

Figure 1 shows the breakdown of emissions into Scope 1, Scope 2, and Scope 3. It is immediately possible to note how Scope 3 emissions account for the vast majority (98.2%) of total emissions.



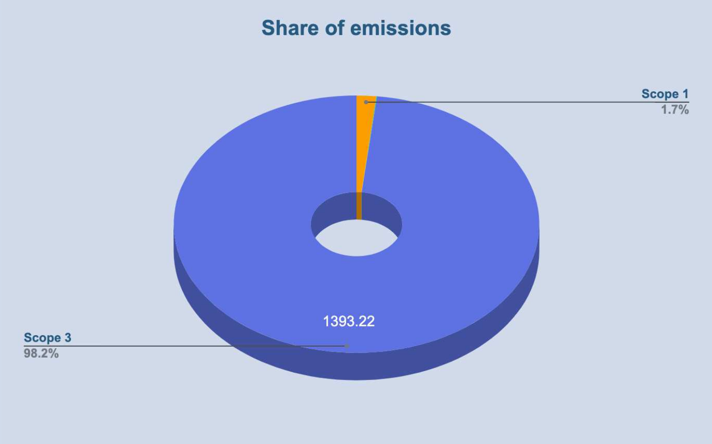




*Figure 1. Summary of CHGP GHG emissions and relative share contribution.*

## Scope 1

Scope 1 emissions which include direct emissions from sources owned or controlled by CHGP at the event location, totalled 24.71 $tCO_2e$ and were correlated to direct combustion from vehicles at the event facilities or during the parade. In relation to total emissions, Scope 1 emissions accounted for approximately 1.7%.

The most emitting source in Scope 1 is the use of fuel during the races, which accounts for 22.50 $tCO_2e$, or 1.6% of total emissions. Figure 2 shows emissions from the use of fuel by different race categories.

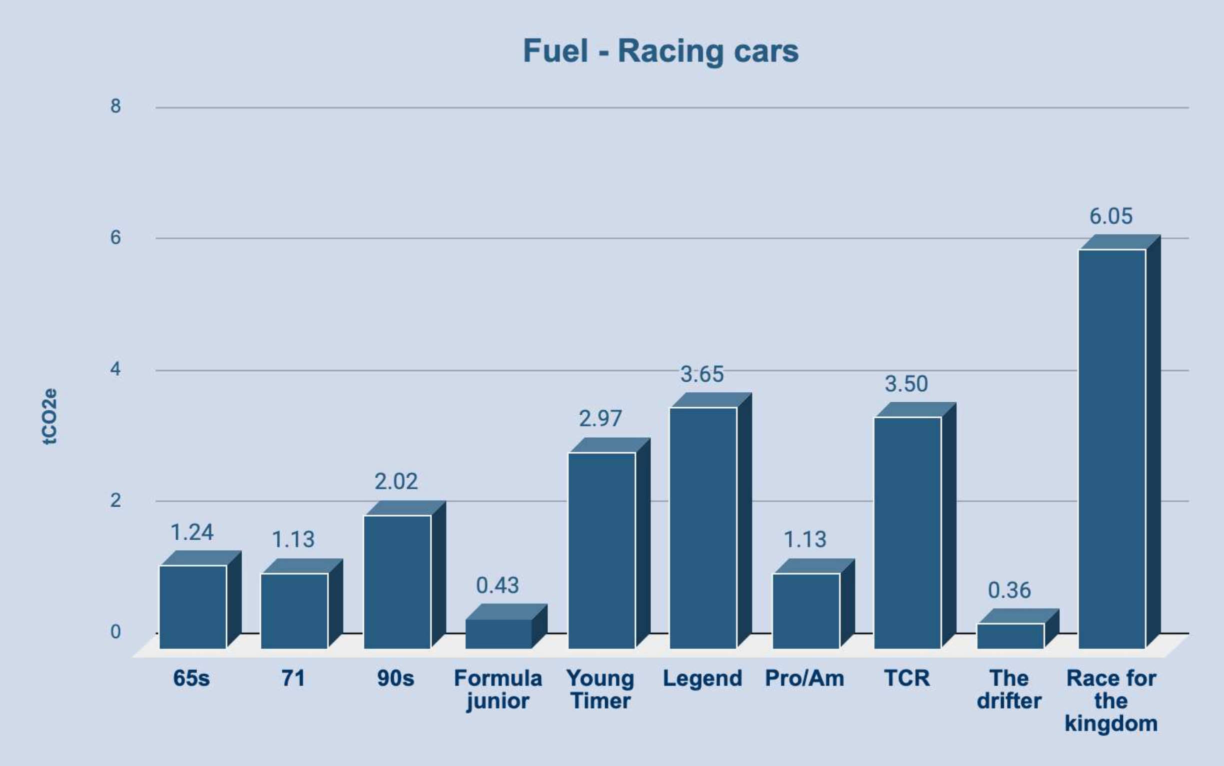



*Figure 2. Emissions from use of fuel by race category.*

Other sources of emissions in Scope 1 are also associated with fuel usage. Service vehicles contribute 2.08 tCO2e, which accounts for approximately 0.1% of the total emissions. Generators contribute 0.07 tCO2e (<0.1%), and cars during the parade contribute 0.06 tCO2e (<0.1%).

The relatively low emissions from these sources can be attributed to the use of biodiesel for electricity production in the generators and the limited distance covered during the parade. Only 15 cars participate in the parade, maintaining an average speed of 40 km/h.

The utilization of biodiesel contributes to lower carbon emissions in comparison to traditional fossil fuels. Additionally, the shorter distance and controlled speed of the parade help minimize emissions associated with vehicle transportation.

## Scope 2

CHGP's Scope 2 emissions primarily arise from electricity consumption. In the case of CHGP's 2022 event, the absence of green energy certificates or power purchase agreements resulted in identical results for both the market and location-based approaches. Scope 2 emissions amount to a total of 0.85 tCO2e, which accounts for only 0.1% of the total emissions.

This relatively low figure can be attributed to the fact that a portion of the electricity consumed during the event was generated by biodiesel-fueled generators. These generators and their associated emissions have already been accounted for in Scope 1, thereby reducing the impact on Scope 2 emissions.

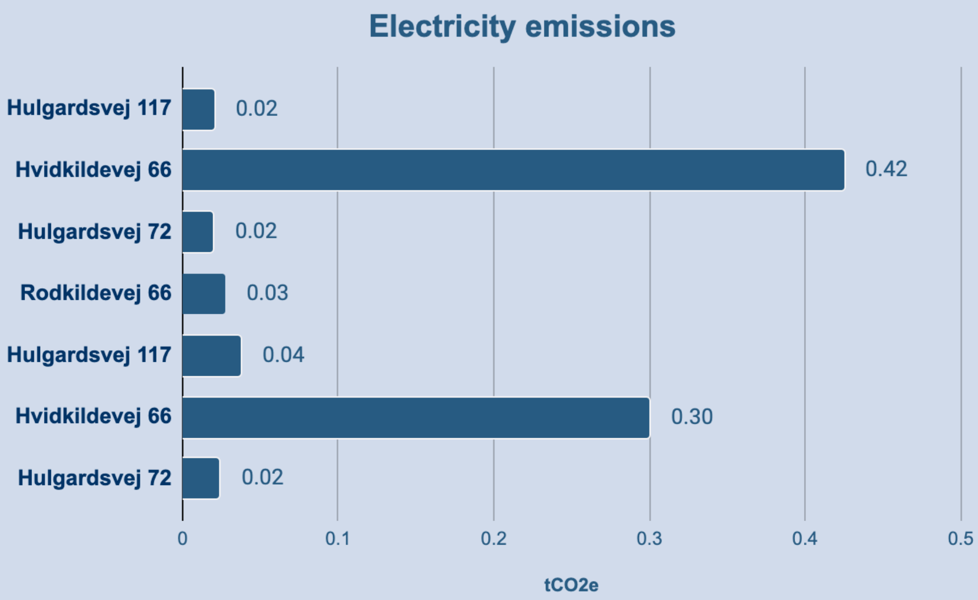



*Figure 3. Emissions from electricity usage.*

## Scope 3

Scope 3 emissions for CHGP were more diverse as different sources of emissions fall under this category. In absolute terms, S3 emissions totalled 1393.30 tCO2, representing 98.2% of total emissions.

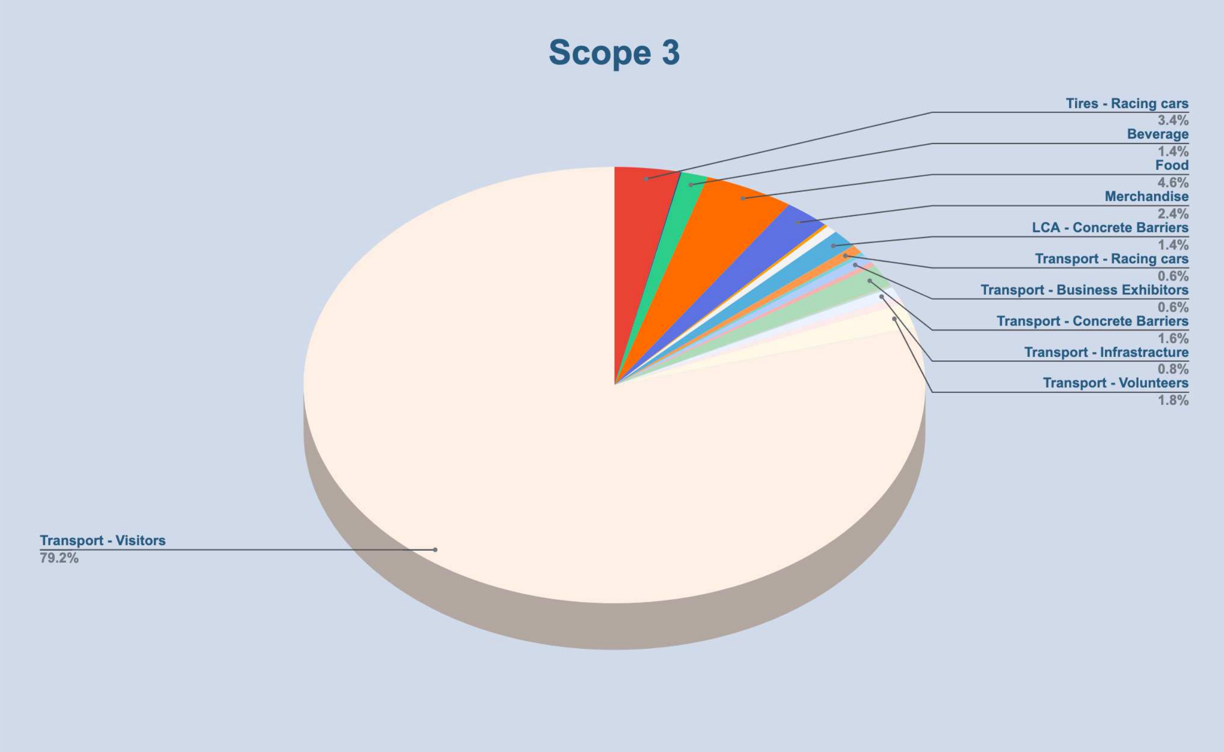



*Figure 4. Total Scope 3 emissions divided by category.*

The primary contributor to Scope 3 emissions is the transportation of participants, which accounts for 1104.05 tCO2e or 77.8% of the total emissions. This indicates that the movement of individuals to and from the event has a significant environmental impact.

Other notable sources of emissions include food-related activities, which contribute 64.62 tCO2e (4.6%), the use of tires by racing cars resulting in 47.26 tCO2e (3.3%), merchandise with 32.76 tCO2e (2.3%), transportation of volunteers totalling 25.38 tCO2e (1.8%), the transportation of concrete barriers accounting for 22.49 tCO2e (1.6%), beverage-related emissions at 19.16 tCO2e (1.4%), and the production of concrete barriers as a capital good contributing 18.96 tCO2e (1.3%).

## Visitors transport

The chart provides a breakdown of emissions in terms of participant groups at the CHGP 2022 event. The participant groups include the Grand Prix Club, Visitors, Press, and Exhibitors. The number of participants in each group is provided, along with their respective share of the total.

The results indicate that the Visitors group constitutes the majority with 87.1% of total participants, followed by the Exhibitors group with 2.6%. The Grand Prix Club and Press groups have smaller shares of 2.3% and 0.2%, respectively.

The emissions per visitor are consistent across all groups, with a value of 31.7 kgCO2e. Total emissions for each group are also provided, with the highest emissions coming from the Visitors group at 1,042.16 tCO2e.

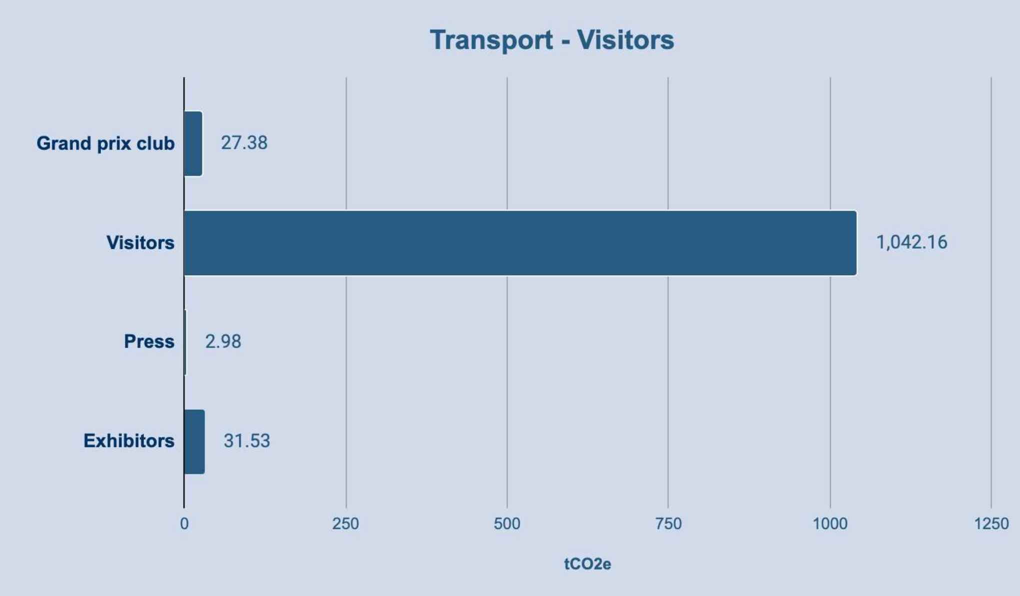



*Figure 5. Breakdown of emissions by participant group, excluding Volunteers, Employees, and Drivers.*

## Food and beverage

Figure 6 presents a breakdown of food-related emissions in different categories at the event. The categories include Volunteers, Crew, and Press; Visitors; Drivers; Exhibitors; Grand Prix Club; and AMB Catering. The table provides a comprehensive overview of the emissions associated with each meal or food item consumed. It allows for a comparison of emissions between different categories and highlights variations in emissions based on the type of meal or dietary choices (e.g., vegan options).

Notably, the total food-related emissions for the event are 64.62 tCO2e. The Visitors category stands out as the largest contributor to food-related emissions, with a total of 49.68 tCO2e. This can be attributed to the many meals consumed (32,920). Within the Volunteers, Crew, and Press category, lunch has the highest emissions (2.90 $tCO_2e$), followed by breakfast (1.70 $tCO_2e$). These meals have relatively larger quantities compared to other meals in the same category. It is worth noting that opting for the vegan dinner and lunch significantly reduces emissions, with emissions as low as 0.01 and 0.04 $tCO_2e$, respectively.

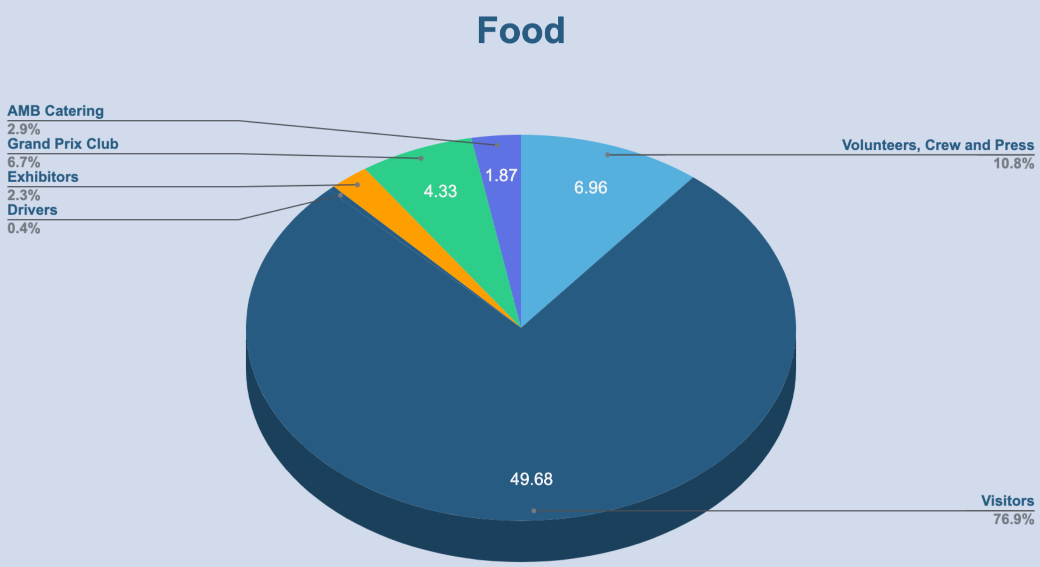



*Figure 6. Total food-related emissions, divided by participant category.*

The chart below offers a breakdown of different beverage products and their associated values. The table reveals significant contributors to the total beverage value, with Royal Classic, Royal Pilsner, Egekilde, Faxe Kondi, and Pepsi standing out. These products contribute a substantial portion to the overall value.

Analysing their contributions, Royal Classic accounts for approximately 21.6% of the total beverage value. Royal Pilsner follows closely behind, representing around 18.1% of the total. Egekilde contributes approximately 8.4% of the total value.

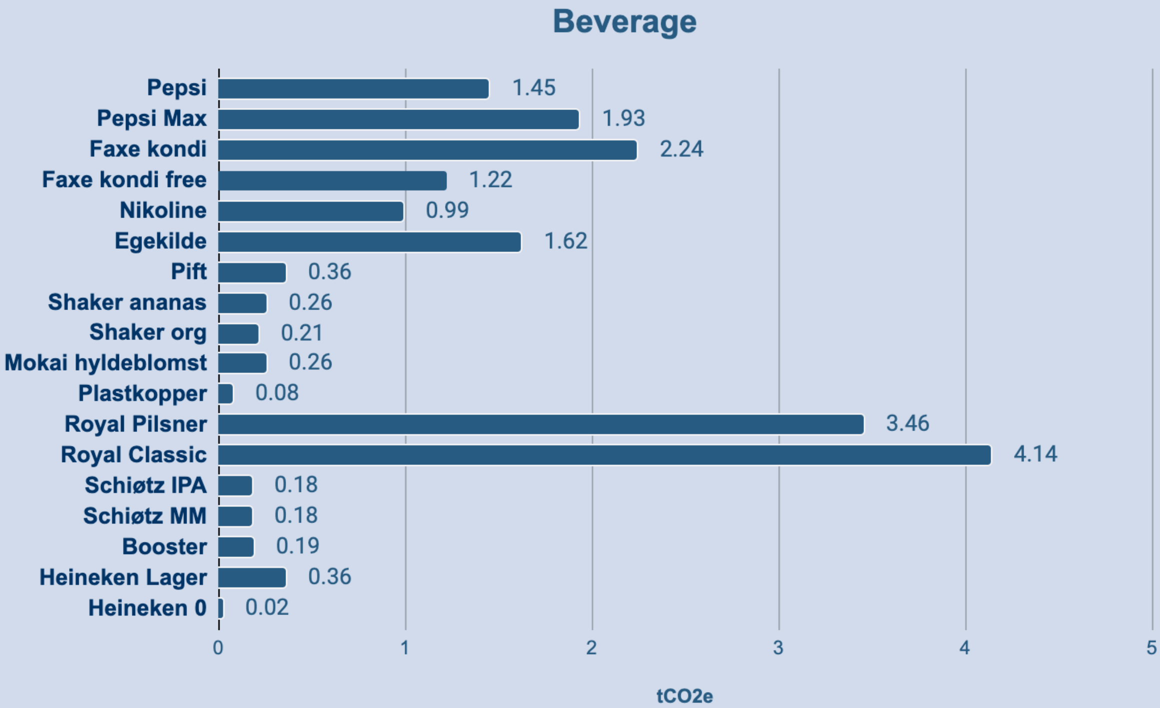



*Figure 7. Total beverage-related emissions divided per product.*

## Other Categories

Figure 8 provides an overview of the GHG emissions from various categories of racing cars, specifically focusing on tire consumption. The main contributors to GHG emissions in this context are the different types of racing cars and their corresponding tire consumption.

The data shows that the categories "Young Timer," "90s," and "TCR" have the highest emissions, with values of 11.80 tCO2e, 8.02 tCO2e, and 8.50 tCO2e, respectively. These categories likely have larger numbers of drivers or longer performance times, resulting in higher tire consumption and consequently higher emissions.

It is worth noting that the emissions as a whole amount to 47.26 tCO2e. This highlights the significant contribution of tire consumption to the overall GHG emissions from racing cars.

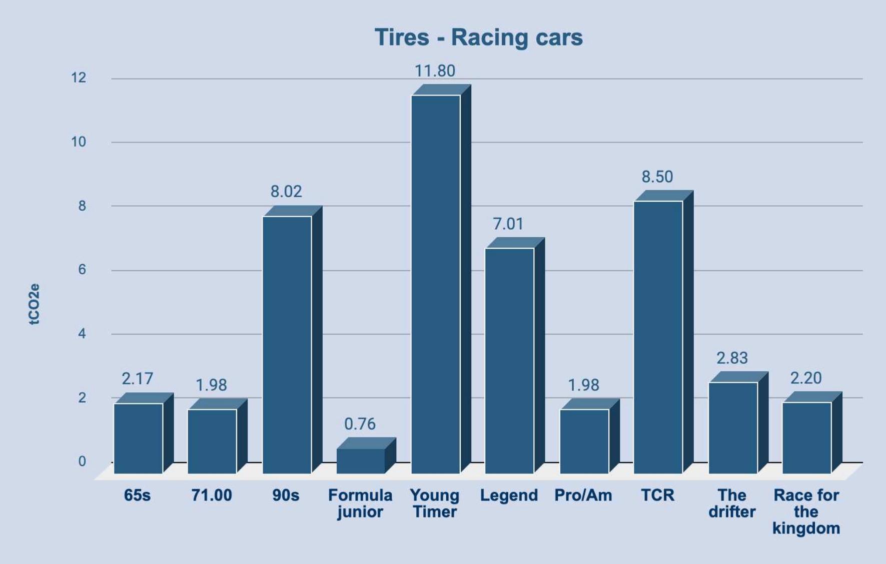



*Figure 8. Overview of the GHG emissions from various categories of racing cars, specifically focusing on tire consumption.*

The chart below (Figure 9) provides a breakdown of GHG emissions associated with various merchandise items. The main contributors to the total merchandise emissions are the Red Polo (4.62 tCO2e), the Navy Polo (3.78 tCO2e), and the Drink Can (9.60 tCO2e). These items have relatively high quantities and emission factors, resulting in significant emissions.

Other notable contributors include the Gym Bag (0.34 tCO2e), the Key Hangers (1.00 tCO2e), and the T-Shirts (1.34 tCO2e). Although their individual emissions are relatively lower, their higher quantities contribute to the overall emissions.

On the other hand, items such as the Trophies (0.08 tCO2e) and the Armband RPET (0.17 tCO2e) have minimal emissions due to their low quantities and/or low emission factors.

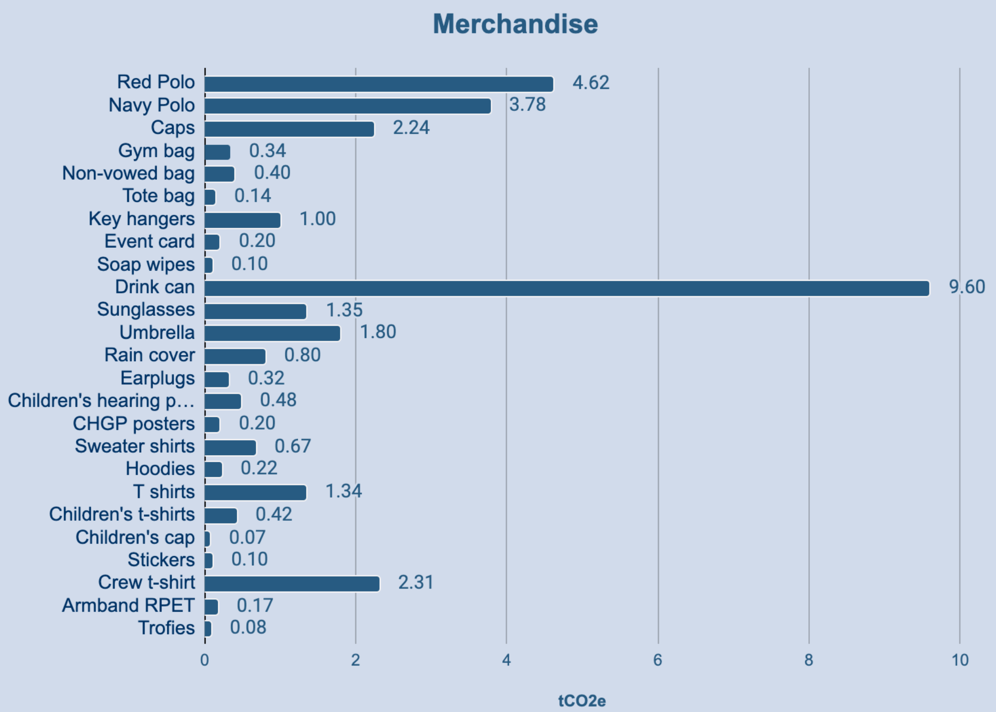
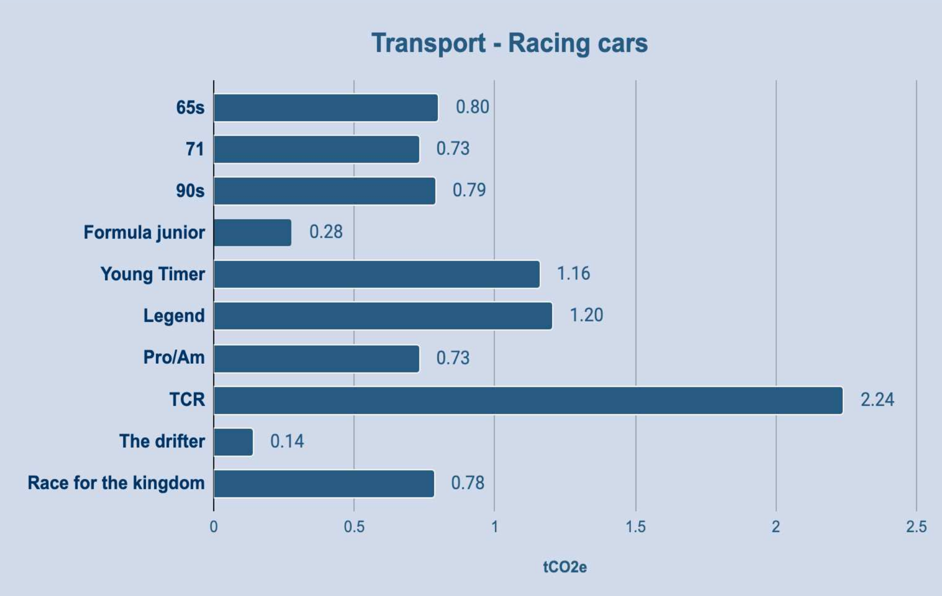



*Figure 9. Breakdown of GHG emissions associated with various merchandise items.*

Finally, Figure 10 gives an overview of emissions for three distinct categories of vehicle transportation to the event facilities: racing cars, private exhibitors, and car clubs. The figure illustrates the emissions associated with each category, allowing for a comparison of their respective environmental impacts.



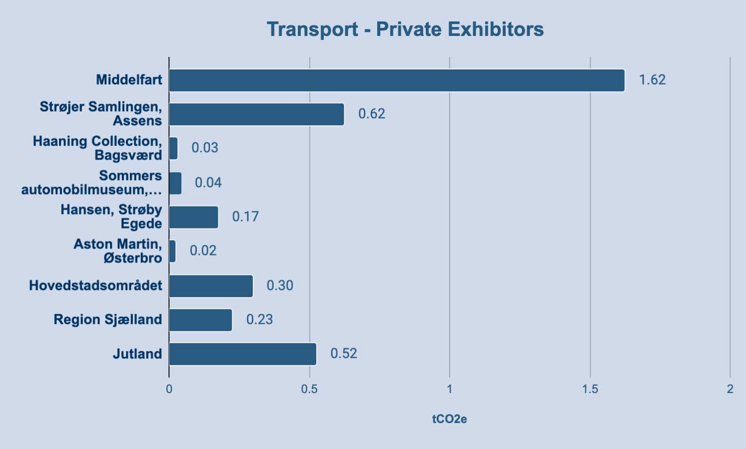




*Figure 10. Overview of emissions for three distinct categories of vehicle transportation to the event facilities: racing cars, private exhibitors, and car clubs.*

# Emission Reduction Strategies

## Emission hotspots

Emission hotspots are critical focal points in a company's carbon accounting, as they represent areas with the highest carbon emissions compared to others. By identifying and addressing these hotspots, companies can effectively reduce their overall carbon footprint.

One significant emission hotspot for CHGP in 2022 is visitor transport, which alone accounts for 1104.05 tCO2e or 77.8% of the total emissions. When including volunteer transport, which contributes 25.38 tCO2e or 1.8%, the total emissions from participant transport rise to 1129.42 tCO2e or 79.6%.

Another noteworthy emission source is food and beverage, totalling 83.78 tCO2e or 5.9% of the overall emissions. This category is composed of food, which accounts for 64.62 tCO2e or 4.6%, and beverages, which contribute 19.16 tCO2e or 1.4%.

Racing cars represent the third most significant emitting source, with a total of 79.72 tCO2e or 5.6% of the total emissions. Within this category, the primary contributors are tires, accounting for 47.26 tCO2e or 3.3%, fuel with 22.50 tCO2e or 1.6%, transport with 8.84 tCO2e or 0.6%, and engine oil with 1.11 tCO2e or 0.1%.

## Reduction strategies

### Participants Transport

When it comes to participants' transport, one potential emission reduction strategy is to incentivize the use of public transport. This can be implemented through the event website or by sending information via email to visitors during the ticket purchase process. By informing participants that parking spots are limited and for a fee, and providing clear instructions on how to reach the venue by public transport, you can encourage them to consider alternative transportation options.

Another approach to enhance sustainable transport is to establish multiple connections with electric buses from major cities in Denmark, such as Aarhus, Aalborg, and Odense. This initiative would enable participants from these cities to conveniently travel to the event using eco-friendly transportation options, further reducing the carbon footprint associated with their journeys.

It is also possible to encourage participants to carpool by providing designated carpooling areas, facilitating online platforms for participants to connect and coordinate ridesharing, and offering incentives such as discounted parking fees or priority access for carpool vehicles.

## Food and Beverage

These strategies aim to minimise the environmental impact associated with food and beverage consumption during the event.

Food-related strategies:

- Increase Vegetarian and Vegan Choices: CHGP can expand the availability of vegetarian and vegan food options not only for volunteers, crew, and press but also for spectators. This shift can help reduce the carbon footprint associated with animal agriculture and provide healthier choices.
- Partial Vegetarian or Vegan Policies: Implementing policies where at least one meal per day is exclusively vegetarian or vegan can further promote sustainable and plant-based eating habits, thereby reducing greenhouse gas emissions.
- Sustainable Protein Choices: Encouraging the consumption of chicken, pork, and fish instead of beef and lamb can significantly lower emissions, as beef and lamb production have higher carbon footprints. Promoting sustainable sourcing practices for these animal proteins can have additional environmental benefits.

Food Stand Policy:

- Require Vegan and Vegetarian Options: CHGP can establish a policy mandating that all food stands operating within the event premises offer at least one vegan and one vegetarian option. This ensures that attendees have access to diverse and sustainable food choices, supporting a more environmentally conscious event.

Food Waste Reduction:

- Minimise Buffet Food Waste: Implementing measures to limit food waste at the Grand Prix Club buffet is crucial. This can be achieved by reducing the number of always-available food items and focusing on providing a variety of other animal proteins and vegetarian/vegan options. By actively managing the food offerings, CHGP can decrease waste while still catering to diverse dietary preferences.

Beverage Sustainability:

- Implement Deposit Policy: Introducing a deposit policy for glasses encourages attendees to return their used glasses in exchange for a refundable deposit. This approach reduces single-use plastic waste and promotes a circular economy by reusing and recycling beverage containers.

The adoption of these emission reduction strategies by CHGP brings multiple benefits. It helps mitigate the event's carbon footprint, promotes sustainable and healthier food choices, minimises food waste, and reduces single-use plastic waste. Additionally, incorporating vegetarian and vegan options aligns with the growing trend of sustainability-conscious consumers, enhancing the overall event experience and reputation.

## Toilets

Regarding toilets, there are additional emission reduction strategies that can be considered by CHGP to minimise the environmental impact associated with sanitation facilities. Specifically, the suggestion is to complement the existing chemical toilets with a few dry toilets.

Introduce Dry Toilets: CHGP can explore the option of incorporating dry toilets alongside the existing chemical toilets. Dry toilets, also known as composting toilets, operate without the need for water and rely on natural processes to decompose waste into compost. These toilets have several benefits:

- Water Conservation: Dry toilets eliminate the need for water flushing, reducing overall water consumption during the event.
- Waste Reduction: Composting toilets facilitate the decomposition of waste, resulting in the production of nutrient-rich compost that can be used for soil enrichment. This helps divert waste from landfills and contributes to a circular waste management approach.
- Lower Emissions: Dry toilets have the potential to reduce greenhouse gas emissions associated with the treatment and transportation of wastewater.

Placement and Education: Strategically locating dry toilets in areas with high footfall can encourage their usage and raise awareness about their environmental benefits. Clear signage and educational materials can inform attendees about the advantages of dry toilets and provide instructions on proper usage.

By incorporating a few dry toilets alongside the existing chemical toilets, CHGP can promote sustainable sanitation practices and reduce the environmental impact of the event. This initiative demonstrates a commitment to water conservation, waste reduction, and greenhouse gas emissions mitigation. Additionally, it provides an opportunity to educate attendees about sustainable alternatives in sanitation and encourages responsible environmental behaviour.

## Concrete Barrier

To address the emission reduction strategies for concrete barrier transport at the CHGP event, the following suggestions can be implemented:

- Optimize Storage Location: Moving the storage of concrete barriers closer to the event venue can significantly reduce transportation distances. By identifying a storage area in close proximity to the venue, the need for long-distance transportation can be minimized, thereby lowering carbon emissions associated with transporting the barriers.
- Minimize Barrier Usage: Assessing the necessity of using concrete barriers and finding alternative solutions whenever possible can contribute to emission reduction. For certain areas where barriers may not be essential for safety or crowd control, exploring alternative options like temporary fencing or other lightweight barriers can help minimize the use of concrete barriers altogether.
- Efficient Transportation: Maximizing the number of concrete barriers transported per journey can optimize transportation efficiency and reduce emissions. This can be achieved by utilizing vehicles with higher load capacities or coordinating deliveries to ensure full loads, thus reducing the number of trips required for transportation.

Implementing these strategies for concrete barrier transport brings several benefits. First, reducing transportation distances and optimizing storage locations helps decrease fuel consumption and associated emissions. Second, minimizing the use of concrete barriers whenever possible reduces the demand for new barriers, saving resources and reducing the environmental impact of their production. Lastly, maximizing the number of barriers transported per journey enhances transportation efficiency, reducing overall emissions and contributing to a more sustainable event infrastructure.

## Waste

Implementing waste sorting measures can significantly reduce the environmental impact associated with waste generation. Here are some strategies and benefits of starting waste sorting at the event:

- Introduce Dedicated Waste Bins: CHGP can set up clearly labelled waste bins for different types of waste, such as general waste, recyclables (paper, plastic, glass), and organic waste. This enables event attendees to easily segregate their waste materials.
- Communicate Sorting Guidelines: Raise awareness among attendees, volunteers, and staff about the importance of waste sorting. Provide clear instructions on how to properly separate and dispose of different waste streams to maximize recycling and minimize contamination.
- Establish Partnerships: Collaborate with waste management companies or local recycling facilities to ensure proper collection, sorting, and recycling of segregated waste materials from

the event. This helps divert recyclable materials away from landfills, reducing the overall carbon footprint.

Benefits of Waste Sorting:

Increased Recycling Rates: Implementing waste sorting at CHGP can lead to higher recycling rates by capturing recyclable materials that would otherwise end up in landfills or incinerated. This contributes to the conservation of natural resources and reduces the need for energy-intensive virgin material production.

Positive Public Image: Promoting waste sorting practices showcases CHGP's commitment to environmental sustainability. It demonstrates responsible waste management and positions the event as a leader in sustainable event practices, enhancing its reputation among attendees, sponsors, and the wider community.

## Fuel

Here are some suggestions to consider to reduce emissions related to the use of fuel during the races.

High-Performing Biofuels:

- Exploration of Biofuel Options: CHGP can investigate the feasibility of using high-performing biofuels as an alternative to conventional gasoline in the race vehicles. Biofuels derived from sustainable sources, such as advanced biofuels or renewable diesel, can help reduce carbon emissions and promote a more sustainable racing event.
- Collaborate with Biofuel Suppliers: CHGP can establish partnerships with biofuel suppliers to ensure a reliable and sustainable source of high-performing biofuels. This collaboration can contribute to the development and utilization of cleaner and greener fuel options for the races.

Electric Car Races:

- Feasibility Study: Conduct a comprehensive feasibility study to assess the viability of introducing electric car races at the CHGP. Evaluate the availability of electric race cars, the infrastructure required for charging stations, and the compatibility with the existing race track.
- Collaborate with Electric Car Manufacturers: Engage with electric car manufacturers and explore the possibility of showcasing their vehicles in electric car races. Collaborations can help raise awareness about electric mobility and accelerate the transition to sustainable transportation in the racing industry.

Benefits of these strategies:

Reduced Carbon Emissions: By exploring the use of high-performing biofuels and introducing electric car races, the CHGP can significantly reduce greenhouse gas emissions associated with traditional gasoline-powered races. This contributes to mitigating the event's environmental impact.

Promotion of Sustainable Technologies: Incorporating biofuels and electric vehicles into the races sends a powerful message about the importance of sustainable technologies and their potential in motorsports. The CHGP can become a platform for showcasing and promoting these innovations.

Positive Brand Image: Embracing environmentally friendly practices and technologies can enhance the CHGP's brand image and reputation, attracting environmentally conscious sponsors, participants, and spectators who appreciate sustainable initiatives.

Alignment with Global Trends: The motorsports industry is increasingly shifting towards sustainability, and the CHGP can position itself as a leader in this movement. By embracing biofuels and electric car races, the event stays in line with global trends and future-proofs its operations.

## Electricity

A potential way to drastically reduce Scope 2 emissions related to the provision of electricity would be to enter into a Power Purchase Agreement (PPA)[3] for the electricity provision. This would ensure that the electricity consumed comes 100% from renewable sources. It is important to note that PPAs are different from energy contracts with green tariffs. Green tariffs, unlike (PPAs, allow customers to choose a rate guaranteeing a percentage of renewable energy. However, challenges include transparency, additionality, and accounting for emission reductions. PPAs offer a more direct and transparent approach, ensuring electricity consumption comes solely from renewable sources. In line with the Greenhouse Gas Protocol, it is important to note that when accounting for Scope 2 emissions using the location-based approach, the emission reductions achieved through green tariffs may not be considered.

# Recommendations

This section outlines some general recommendations that, by improving the accuracy and comprehensiveness of the study, can help the client achieve its emission reduction goals.

[3] PPAs are long-term contracts between a renewable energy generator (such as a wind or solar farm) and an electricity buyer (such as a company or organisation). In a PPA, the buyer agrees to purchase a specified amount of renewable energy from the generator over a predetermined period, typically ranging from 10 to 20 years. The PPA sets the price and terms of the agreement, which may include fixed or variable pricing structures. The buyer benefits from a stable and often lower cost of electricity while supporting the development and operation of renewable energy projects.

## Data quality

This chapter assesses the data quality of the greenhouse gas (GHG) accounting report for the CHGP and provides recommendations for improving data accuracy and completeness for future reports. The analysis reveals areas where data quality can be enhanced, particularly in emission categories related to participant transport, waste, merchandise, food, and event infrastructure.

Scope 1 Emissions:

The data analysis indicates that fuel consumption data for the race was acquired for only a few drivers and then extrapolated to all drivers. To improve data quality in this category, it is recommended to require drivers to disclose their fuel consumption data or prepare a questionnaire that can be filled out by each driver individually. This will provide more accurate and representative information for calculating emissions from Scope 1 sources.

Scope 2 Emissions:

The data for Scope 2 emissions was generally accurate and well-reported. However, ensuring the completeness of reported data across the entire study scope is essential, even though these emissions typically have a lower weight. A thorough review and verification process should be implemented to confirm that all relevant data for Scope 2 emissions is included, thereby enhancing the overall accuracy of the GHG accounting report.

Scope 3 Emissions:

The data provided for Scope 3 emissions were generally detailed, but there are areas that require improvement to enhance the accuracy of the GHG accounting.

- Participants Transport: It is crucial to improve the data quality related to participant transport for next year's event. Obtaining more accurate information about how each category of participants commutes to the CHGP will provide valuable insights into transportation patterns and enable the development of targeted emission reduction strategies aligned with climate goals. Conducting a survey among volunteers to gather information about their commuting habits can be an effective approach to collecting this data.
- Car Clubs: The origin of the vehicles was unknown, and it is recommended to capture this information to enhance data accuracy.
- Bus Transport: Instead of estimating the distance and applying an efficacy rate, obtaining data on total electricity consumption will improve data quality in this category.
- Waste: Data on the weight of waste generated was not available. It is suggested to provide information on waste generation by obtaining accurate measurements or bills for waste disposal services.

- Merchandise: The weight of product purchases was missing. Including this information and specifying the country of origin for each purchased product will enhance data quality.
- Food: Requesting food stands and partner restaurants serving the Grand Prix Club visitors to provide detailed lists of products purchased or menus of the buffet will improve data accuracy.
- Event Infrastructure: To improve data quality in the transport of bridges, fences, audiovisual material, and various infrastructures from GODIK, it is recommended to collect information on the exact number of trips or fuel consumption during transportation.

Enhancing data quality is vital for accurately assessing and managing GHG emissions. The recommendations provided in this chapter will help improve data completeness and accuracy in various emission categories for next year's CHGP event. By implementing these improvements, the CHGP can generate a more reliable and comprehensive GHG accounting report, enabling effective emission reduction strategies and demonstrating its commitment to environmental sustainability.

## Rationale of this study

After outlining all the results and recommendations, we would like to reiterate that the main objectives of this report include:

- Provide accurate figures regarding the client's activity emissions for the year 2022.
- Establish a reporting baseline that can enable our client to build upon the current state of activities and implement effective emission reduction strategies in the future.

While we believe that the first objective has been achieved satisfactorily, it remains questionable whether the current GHG accounting report can be safely used as a baseline for future emission reduction strategies. We recommend that the client consider requesting a new GHG accounting report for the year 2022, following the above-mentioned recommendations, in order to establish a more accurate baseline for future emission reduction strategies.

# Conclusions

In 2022, the total GHG emissions for the CHGP event amounted to 1418.86 tCO2e. While CHGP's emissions can be considered relatively high, a more comprehensive literature review or analysis of similar restaurants in the food sector would be beneficial for a final assessment.

The analysis revealed that the main emission hotspot was participants' transport, which accounted for a significant 79.6% of total emissions. As a result, emission reduction strategies primarily focused on improving this area. Recommendations included the promotion of sustainable forms of transport and the incentive to the use of public transport.

SuFu recommends that CHGP continue to expand the scope of its emission accounting by including more variables and Scope 3 categories while prioritizing data quality improvement. Enhancing the quality of data used for emission accounting requires continual refinement of methodologies and measurement techniques. This may involve updating the emission inventory with new data, seeking additional sources of information, and enhancing the accuracy and reliability of emissions calculations. Improving data quality will lead to a more precise understanding of emissions and facilitate the development of effective strategies for emission reduction over time.

By participating in GHG Accounting with SuFu, CHGP has taken a crucial step in defining, reducing, and mitigating its emissions. The significance of regular monitoring and accounting for emissions cannot be overstated. Continuous monitoring and reporting enable the identification of areas requiring improvement, the establishment of reduction goals, and the tracking of progress over time. This approach will empower CHGP to proactively address its environmental impact and drive sustainable practices within its industry.

# Report communication statement

As CHGP showcases their emission reduction efforts, it is important to be cautious about making false or exaggerated claims, as this can be perceived as greenwashing and have a negative impact. SuFu is always available to provide guidance if needed. If CHGP has any questions or would like additional explanations or outputs, please don't hesitate to contact us at any time.

If questioned about the results of a GHG assessment, we recommend the following statement about the method used and the results:

'*We, CHGP, commissioned SuFu ApS, an external consulting agency, to calculate our company's GHG emissions for the year 2022 in accordance with the GHG Protocol. The calculations include all mandatory Scope 1 and 2 emissions, as well as the following Scope 3 categories: 1, 2, 3c, 4, 5, 7 and 9 to cover the emissions generated from our business activities. We have been transparent with our data throughout the process, and SuFu has provided us with an accurate account of our emissions. Our emission account was produced in accordance with the principles and guidelines of the WRI GHG Protocol and ISO 14064-1:2018. We are now working to reduce and offset our emissions throughout our supply chain.*'

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# Thank you for the collaboration!

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FEDERATION INTERNATIONALE DE L'AUTOMOBILE

Copenhagen Historic Grand Prix
Hulsgårdsvej 72 - Ishøj Capital Region –
2730 – Denmark
Carlos Krapper - Sustainability
Coordinator

23 June 2023

**Re: FIA Two-Star Environmental Accreditation – Copenhagen Historic Grand Prix**

Dear Mr. Krapper,

We are pleased to confirm that following the remote audit conducted by the FIA Environmental Accreditation Auditor on June 23rd 2023, **Copenhagen Historic Grand Prix** has obtained the Two-Star level of the FIA Environmental Accreditation Framework.

After achieving the 1-star accreditation, the Copenhagen Historic Grand Prix has demonstrated a strong commitment by achieving the 2-star level, demonstrating its determination to improve its environmental performance over the long term.

We have attached a brief audit report that summarises the auditor's comments.

We look forward to continued collaboration in regard to supporting your organization achieve its environmental objectives.

Yours sincerely,

**Robert Reid**
FIA Deputy President for Sport

**Felipe Calderón**
FIA Environment & Sustainability Commission President

**Garry Connelly AM**
FIA Environmental Delegate

Copy: Andrew Wheatley, FIA Road Sport Director
Barbara Silva, Social Responsibility Programmes Manager, FIA Sport
Sergio Cerquetti, FIA Environmental Accreditation Auditor

Appendix 1: Audit Report

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A WORLD IN MOTION

# Emissionsgenberegningsrapport

*Tillægsstykke vedr. Scope 3 gæstetransportudledning. 09/11/2023*

## Et fokus på mindre skadelige løsninger

Understøttet af data fra intern Scope 1,2 og 3 Co2e-udledningsrapport

CHGP 2022-2023.


FIA Environmental Accreditation
STAR RATING

## Indholdsfortegnelse

# Baggrund for genberegningsrapport.

Copenhagen Historic Grand Pric har på baggrund af en dybdegående analyse af emissionsrapporten omhandlende udledningen fra arrangementsafholdelsen pr. 2022 fået foretaget en genkalkulering af udledningerne fra Scope 3 kategorien gæstetransport.

Genkalkuleringen er et produkt af to primære aspekter. For det første er netop denne underafdeling den med længder største og stod ifølge rapporten for 77,8% af eventets samlede udledninger. Af den grund er det naturligvis et område hvis indhold vi har stort fokus på at få et overblik over, især med fokus på hvilke projekter og initiativer vi kan søsætte for at reducere dens omfang.

For det andet, har vi i forbindelse med et samarbejde med Klimate om Co2-kompensation, indgået en dialog om intern Co2-kompensation for vores Scope 1 og 2 udledninger, hvilket ligeledes har medført at vi åbner op for, at vores gæster kan yde bidrag til en kompensation af netop denne Scope 3 undersektion. Dette åbnede op for en dialog om vi fra et etisk synspunkt kunne gå ud og beskrive at vores gæster alene stod for hele de 77,8% af udledningen, om det kun var en andel af denne de stod for, og i sidste ende om tallet i virkeligheden var retvisende nok til at vi overhovedet kunne stå inde for det. I den forbindelse skal det fremgå, at virksomheden der udviklede rapporten, Sufu, i udfærdigelsesprocessen påtalte at underbyggende data der forholdt sig til den konkrete transportadfærd fra vores gæster ville yde stor nytte i at give et mere retvisende indblik i, hvilken udledning der helt konkret udgik fra transport af gæster.

Af ovenstående grunde implementerede vi primo januar 2022 en undersektion på vores hjemmeside, hvor man ifm. billetkøb fik muligheden for at besvare følgende:

1. Hvad er dit postnummer?
2. Hvordan kommer du til CHGP?
3. Rejser du alene, med 1, med to, med to eller flere.

Det er på baggrund af de over 6.000 besvarelser fra vores gæster vi fik herfra, samt indledende tal fra rapporten, at følgende genberegningssidestykke til vores emissionsrapport omhandlende events afholdelsen 2022 er kalkuleret.

# Resultater – komparativ analyse af emissionsrapport og genberegningsrapport.

Genberegningsrapportens resultater viste en signifikant reduktion i vores Scope 3 udledninger, og deraf grundet udledningens størrelse CHGP´s samlede Co2 udledning. Den udledning der ifølge tillægsstykket udgår fra omhandlende afdeling, så en reduktion på -52,5%, fra en emission på 1104 tCO2e til 517 tCO2e.


Figure 1. Comparison of updated and old emissions divided by Scope

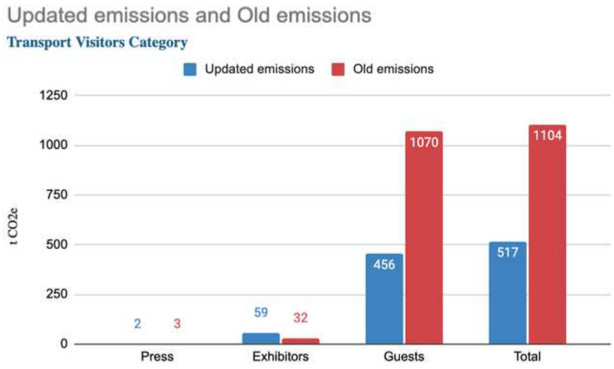


Figure 3. Transport - Visitors category emissions

Dertil medfører denne præcisering af udledningen, at SuFu ud fra en komparativ kalkulatorisk analyse af tallene og informationskvaliteten af udregningen af tallet fra 2022, har estimeret at det reducerer eventet 2022´s totale udledning med 41,4% fra en total på 1419 tCO2e til 832 tCO2e. Dette kan rundt regnet eksemplificeres ved, at hvad der før svarede til 281 danskeres årlige udledning eller 8.322.736 km i bil, nu i stedet hedder ca. 165 danskere, eller 4.877.123 km i bil.

# Antagelser.

Som tidligere beskrevet er denne reduktion et produkt af øget datakvalitet. Dataen der ligger til grund for emissionsrapporten var udregnet pba. data på geografisk fordeling af billetkøb opdelt på det gennemsnitlige antal daglige deltagere. Her giver den nye datamængde et helt andet indblik, da den tager udgangspunkt i kvantitativ data direkte fra ca. 6.000 af vores gæster. Yderligere dataspecifikationer for hhv. rapport og tillægsstykke fremgår af: *Emission recalculation report – Copenhagen Historic Grand Pric – 2022 Emissions, Assumptions.*

# Bemærkninger.

Dette tillægsstykke til den indledende rapport CHGP fik foretaget, kan ikke ses som et direkte komparativ af udledningerne fra 2022 og 2023. Dette af den grund at det ikke er den samme type datasæt der har ligget til grund for de to analyser. Det vurderes dog, som det også fremgår af afsnittet *conclusion* fra SuFu, at rapportens konklusion giver et mere retvisende estimat over den forventede udledning fra vores gæster transport til pladsen. Dette er besluttet på baggrund af en antagelse om at der ikke i hhv. 2022 og 2023 har været de store adfærdsmæssige ændringer ift. transport af vores gæster, samt at det totale tilskuertal i de to år ikke varierede i særlig grad.

# Samlet overblik over kalkulerede udledninger Scope 1, 2 og 3
- Emissionsrapport og tillægsstykke.

- **Fordelingen af tilskuertransport.**

2022

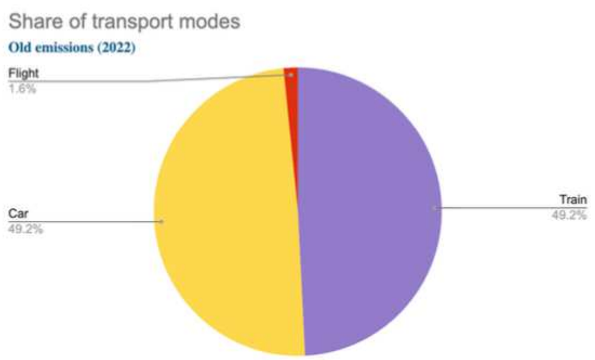


*Figure 4. Transport - Visitors category by mode of transportation. Old emissions data (2022)*

2023

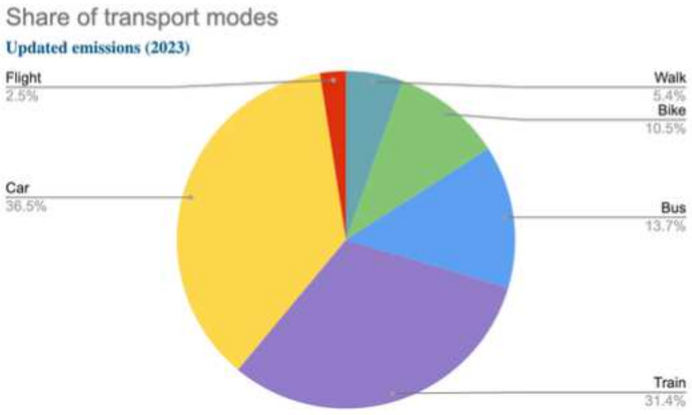


*Figure 5. Transport - Visitors category by mode of transportation. Updated emissions data (2023)*

Som det kan ses, så har informationen givet en væsentlig mere detaljeret indsigt i dels fordeling, men også tilføjet data på en række kategorier, der giver os mulighed for at inkluderer dem i rapporten.

Især konstaterer vi her, at en overraskende stor del af vores deltagere tager toget, og at incitament til at tage cyklen er et fokuspunkt der er værd at kigge nærmere på.

- **Udledning fra tilskuertransport.**

2022

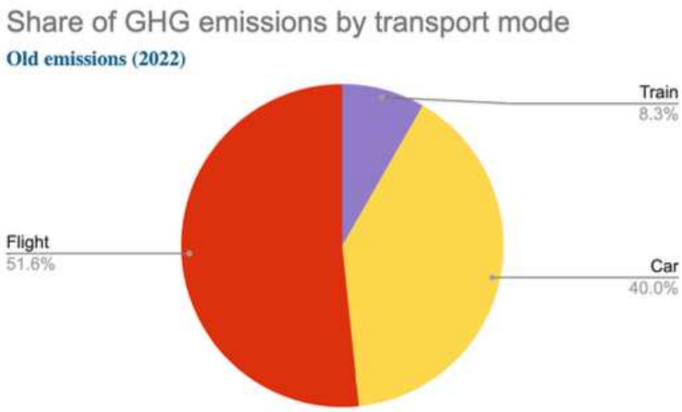


*Figure 6. Transport - Visitors category by share of GHG emissions. Old emissions data (2022)*

2023

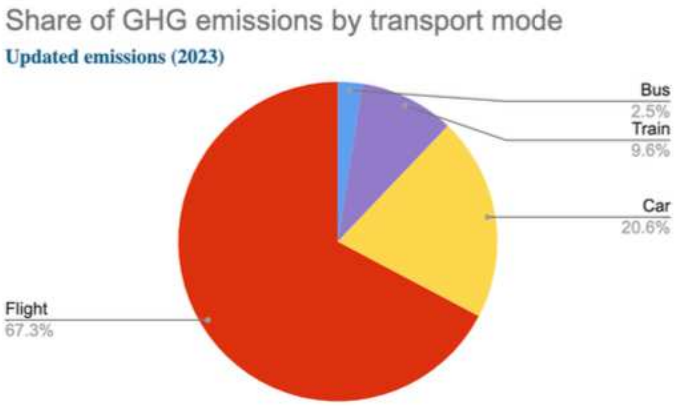


*Figure 7. Transport - Visitors category by share of GHG emissions. Updated emissions data (2023)*

Ovenstående giver os en indsigt i at flytransport med længder har den største Scope 3 udledningsfaktor for os. Det er en meget svær udledning at forhindre, i og med at det må antages at dem der tager flyet til CHGP kommer fra udlandet, og dermed ikke umiddelbart kan komme til eventet uden. Da CHGP i sidste ende eksisterer for at skabe værdi for vores ca. 40.000 årlige gæster, går det imod vores eksistensberettigelse at skulle gå ud og bede folk om at lade være med at komme.

Et løsningsforslag i relation til denne problemstilling er dog allerede etableret, i den forstand at deltagere i år har muligheden for at bidrage med klimakompensation når de køber deres billet.

Derudover, som det også fremgår af selve bæredygtighedsrapporten er vi i fuld gang med planlægning og implementering af en række projekter der dels fokuserer på at øge incitamentet til at tage cyklen, samt at give vores gæster indsigt i fordelene ved en mere bæredygtig kørselsadfærd.

- **Komplet oversigt over den gamle og nye emissionsfordeling.**

| Summary Of Emissions | | tCO2e | | Share of total emission | |
|---|---|---|---|---|---|
| | | Old emissions (2022) | Updated emissions (2023) | Old emissions (2022) | Updated emissions (2023) |
| Scope 1 | Fuel - Racing cars | 22.50 | 22.50 | 1.6% | 2.7% |
| | Fuel - Service vehicles | 2.08 | 2.08 | 0.1% | 0.2% |
| | Fuel - Parade | 0.06 | 0.06 | 0.0% | 0.0% |
| | Fuel - Generators | 0.07 | 0.07 | 0.0% | 0.0% |
| | Total S1 | 24.71 | 24.71 | 1.7% | 3.0% |
| Scope 2 | Electricity (Market-based) | 0.85 | 0.85 | 0.1% | 0.1% |
| | Electricity (Location-based) | 0.85 | 0.85 | 0.1% | 0.1% |
| | Total S2 (Market-based) | 0.85 | 0.85 | 0.1% | 0.1% |
| | Total S2 (Location-based) | 0.85 | 0.85 | 0.1% | 0.1% |
| Scope 3 | Water supply | 0.00 | 0.00 | 0.0% | 0.0% |
| | Tires - Racing cars | 47.26 | 47.26 | 3.3% | 5.7% |
| | Engine oil - Racing cars | 1.11 | 1.11 | 0.1% | 0.1% |
| | Beverage | 19.16 | 19.16 | 1.4% | 2.3% |
| | Food | 64.62 | 64.62 | 4.6% | 7.8% |
| | Merchandise | 32.76 | 32.76 | 2.3% | 3.9% |
| | Infrastructure - Material | 2.59 | 2.59 | 0.2% | 0.3% |
| | Road modification | 8.01 | 8.01 | 0.6% | 1.0% |
| | LCA - Concrete Barriers | 18.96 | 18.96 | 1.3% | 2.3% |
| | Transmission & distribution loss | 0.04 | 0.04 | 0.0% | 0.0% |
| | Transport - Racing cars | 8.84 | 8.84 | 0.6% | 1.1% |
| | Transport - Private Exhibitors | 3.57 | 3.57 | 0.3% | 0.4% |
| | Transport - Business Exhibitors | 8.56 | 8.56 | 0.6% | 1.0% |
| | Transport - Car club | 4.58 | 4.58 | 0.3% | 0.6% |
| | Transport - Generators | 0.05 | 0.05 | 0.0% | 0.0% |
| | Transport - Concrete Barriers | 22.49 | 22.49 | 1.6% | 2.7% |
| | Transport - Safety fences | 0.79 | 0.79 | 0.1% | 0.1% |
| | Transport - Bridges | 1.77 | 1.77 | 0.1% | 0.2% |
| | Transport - Infrastracture | 10.66 | 10.66 | 0.8% | 1.3% |
| | Waste | 7.62 | 7.62 | 0.5% | 0.9% |
| | Transport - Volunteers | 25.38 | 25.38 | 1.8% | 3.1% |
| | Transport - Bus | 0.42 | 0.42 | 0.0% | 0.1% |
| | Transport - Visitors | 1104.05 | 517.00 | 77.8% | 62.2% |
| | Total S3 | 1393.30 | 806.25 | 98.2% | 96.9% |
| All Scopes | Total Emissions | 1418.86 | 831.81 | | |

*Table 1. Comparison of old emissions (2022) and updated emissions (2023) divided by Scopes and Categories*

# Yderligere information:

- **For nærmere indsigt i de konkrete datasæt læs: Methodology report.**

Heri gennemgås antagelser samt databaserede skøn i relation til følgende områder:

- Afgangsdestination
- Transportdistance
- Transportmetode
- Fordeling af transportmetoder
- Udledning fra transportmetoder
- Udledning pr. billet (gæst)
- Samlede Co2-udledning
- Justering og sammenlægning af ny og gammel data
- Opdaterede og tidligere udledninger
- Antagelser i udregning om flytransport