

# Net Zero Conference

## How to Account for Conferences' Carbon Emissions

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### Intro

When it comes to the work that needs to be done to mitigate climate change, several stakeholders need to cooperate and find solutions together. As mentioned by the EU, “it is extremely urgent to take action against climate change and conferences, such as the COP26, brought together world leaders to act together to limit temperature rises and climate change”<sup>1</sup>. That is why KVS, in collaboration with the Israeli Ministry of Foreign Affairs, 2B friendly, and CarboNet IL, hosted the first Israeli Carbon Capture Conference in Israel. Many people showed up, and progress was made on the topic. However, this also required plenty of affairs and activities that will inevitably lead to some emissions, whether direct or indirect. Therefore, we were eager to know the answer to a question that came up during the planning process: “*What is the carbon footprint of such a conference?*”.

### Relevant categories

Understanding what the relevant categories are proved to be easier said than done, as there is currently no commonly agreed-upon standard for measuring the footprint/impact of conferences. The closest one found is a greenhouse gas (GHG) inventory guidance put out by the US Environmental Protection Agency (EPA) that recommends which main calculations are needed to understand the indirect emissions of events and conferences<sup>2</sup>. This document served as a valuable guide to have a foundation for the basic relevant calculations presented. The three areas included in the document are: ‘*Travel*’ (by attendees), ‘*Hotels*’, and ‘*Venues*’. Although these aspects are indeed relevant, other categories were absent, which would lead to the final numbers lacking in precision. These supplementary categories are needed to account for the complete impact of the conference. Hence, in order to make the measurements more accurate, parts of the EPA standard and sections from the GHG Protocols 1, 2, and 3<sup>3</sup> were merged. Examples of categories added are: ‘Employee commuting,’ ‘Conference-specific purchased/used goods,’ ‘Information and communication technology (ICT) used,’ ‘Waste-related emissions generated,’ etc. After putting the categories together, the inventory process started.

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<sup>1</sup> <https://www.consilium.europa.eu/en/policies/climate-change/paris-agreement/cop26/>

<sup>2</sup>

[https://www.epa.gov/sites/default/files/2018-12/documents/indirectemissions\\_draft2\\_12212018\\_b\\_508pas\\_s\\_3.pdf](https://www.epa.gov/sites/default/files/2018-12/documents/indirectemissions_draft2_12212018_b_508pas_s_3.pdf)

<sup>3</sup> <https://ghgprotocol.org/>

## The final list of categories:

The GHG Protocol Corporate Standard classifies a company's GHG emissions into three 'scopes':

### **Scope I**

Scope 1 emissions are direct emissions of GHGs to the atmosphere from owned or controlled sources. At the conference, there were no activities that emitted GHGs directly into the atmosphere.

### **Scope II**

Scope 2 emissions are indirect emissions from the generation of purchased energy. In the conference, electricity was purchased for both:

- Venues
- Hotels where attendees stayed

### **Scope III**

Scope 3 emissions are all indirect emissions (not included in scope 2) that occur in the value chain. The relevant categories for the conference activities were:

- Attendee travel
- Purchased goods
  - Food
  - Furniture and equipment
  - Other
- Waste
- Employee commuting
- Communication, video, and marketing

## Data collection

The data collection is a crucial step when accounting for GHG emissions. Without this step, there won't be any calculations or quantified results. It is also the step that determines how accurate the calculations will be. The higher the quality of the data collection, the closer the results will be to the actual emissions stemming from the conference.

The data collection can be separated into two pillars:

### **I - Data gathered from the conference activities that are certain**

Data collected from

- The hotel that hosted the conference
- Conference organizers
- Employee and guest surveys
- Estimations on-site

## **II - The amount of GHG emissions related to those activities**

The Data collected from:

- Scientific papers
- Industrial surveys
- Ministries and governmental reports,

Unfortunately, due to a lack of cooperation and replies from the attendees in the conference, there was a lack of primary information about the distance traveled and vehicles used in order to reach the conference. In addition, there were missing data from the hotel that hosted the conference about activities and resources used. Therefore there was a need for some quantities needed for the calculations. This fact increased the uncertainty of the results and needs to be considered.

## **Description of Categories - Where do the emissions come from?**

### **Electricity consumption**

According to a 2020 official report from the Israel Ministry of Energy, the Israel electricity grid uses, to a large extent, fossil fuels, mainly natural gas (67%) and coal (26%), as well as renewable energy (5.7%)<sup>4</sup>, in order to generate electricity. Therefore, the mere fact that electricity is used at the conference will inevitably lead to some emissions being emitted by the generated electricity. In the conference framework, the electricity usage accounted for was at the venue and hotel accommodation of the guests.

### **Hotels,**

The majority of the emissions, are caused by electricity consumption, heating, water consumption, food, etc. Most guests at the conference did not stay at a hotel except for the honored guest at the conference - Mr. Perumal Arumugam. Therefore, the category had a smaller impact as compared to if more people had stayed at a hotel.

### **Municipal waste**

The impact of the municipal waste generated at the conference was caused mainly by food waste and other waste such as bottles, plastics, etc. The primary source of GHG emissions is the emissions generated during the decomposition of waste (in anaerobic and aerobic conditions) in landfills and the incineration of the waste for energy recovery. A secondary source of emissions related to the waste generated is transportation to the waste treatment plant.

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<sup>4</sup> [https://www.gov.il/BlobFolder/reports/energy\\_sector\\_2020/he/energy\\_sector\\_review\\_2020.pdf](https://www.gov.il/BlobFolder/reports/energy_sector_2020/he/energy_sector_review_2020.pdf)

## Purchased goods and services

The categories include all upstream (i.e., cradle-to-gate) emissions from the production of products, both tangible (food, marketing-related materials) and intangible (ICT, expanded below). There was almost no transportation due to the fact that there was no significant procurement for the conference except for food (calculated in the food section).

## Food

When it comes to food, there are varying sources of GHG emissions, and the difference between the carbon footprint of different types of food/meals can vary by almost 10 times. The emissions of an average meal can vary and end up being around 2 kg CO<sub>2</sub>eq for a vegetarian meal, 4-5 kg CO<sub>2</sub>eq for a meal with chicken or fish, and up to 20 kg CO<sub>2</sub>eq for a hot meal with beef steak <sup>5</sup>. The sources of the emissions can be caused by deforestation, livestock manure, fossil fuels used on farms and food retail, water consumption, and more.

## ICT

A category important for conferences held today, especially in a post-covid world, is the digital aspect. Sending out emails, having zoom preparation meetings/live streaming, and creating and maintaining websites will all have indirect carbon footprints as well. Even though some of the parts, such as writing and sending out emails, may have a small impact individually, when added up, the impact becomes notable. The emissions are generated mainly by the electricity consumption needed for all the activities above. In a globalized world, even though the direct electricity consumption for devices may be local, the servers and the people accessing the servers are located in different countries.

## Travel

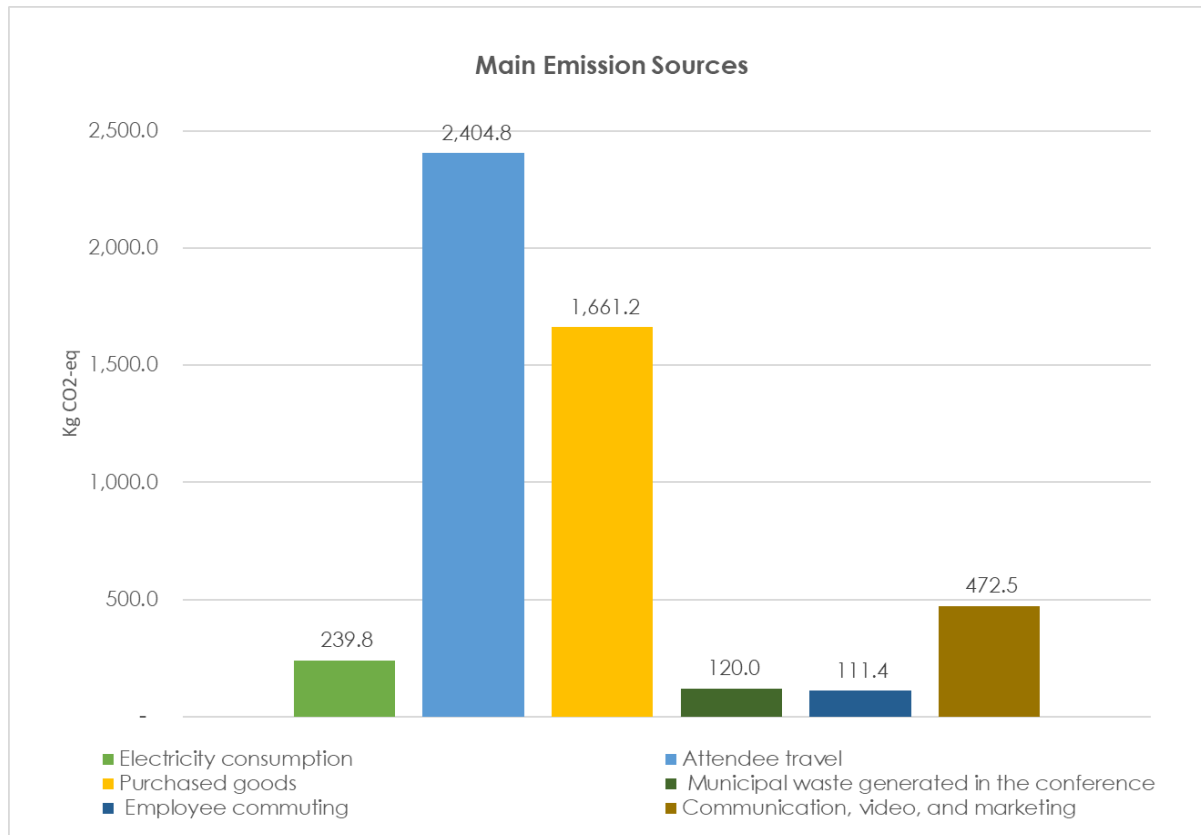
The emissions from the travel categories of the attendees or employees are derived from the different fuels, or electricity, that are commonly used for all vehicle types - cars, trucks, commercial aircraft, railroads, and more. The main factors that determine how intensive the emissions are caused by transport are - the number of people using the vehicle, vehicle type, fuel type, distance, infrastructure, and more.

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<sup>5</sup> <https://doi.org/10.1126/science.aag0216>

## Results

Main sources of emission:



Specified Categories included in the accounting and the share in the total results:

| Scope                                     | Category                  | Subcategory           | Footprint [Kg CO <sub>2</sub> -eq] | Percentage |
|---|---------------------------|-----------------------|------------------------------------|------------|
| 1   | Fuels                     |                       | N.R                                |            |
|   | Process Emissions         |                       | N.R                                |            |
| 2   | Electricity consumption   | Venue                 | 166.5                              | 3%         |
|   |                           | Hotels                | 73.3                               | 1%         |
| 3   | Attendee travel           |                       | 2,404.8                            | 48%        |
|   | Purchased goods           | Other                 | 6.9                                | 0.1%       |
|   |                           | Food                  | 1,654.3                            | 33%        |
|   |                           | Furniture & equipment | N.R                                |            |
|   | Upstream transportation   |                       | N.R                                |            |
|   | Municipal waste generated |                       | 120                                | 2%         |
|   | Employee commuting        |                       | 111.4                              | 2%         |
| Communication, video, and marketing (ICT) |                           | 472.5                 | 9%                                 |            |
| <b>Total</b>                              |                           |                       | <b>5,009.7</b>                     |            |

## Key findings

- The calculation provides a qualitative and quantitative look over the GHG emission of the conference and allows to execute improvements and reductions in the following conferences.
- There is a need to create comprehensive guidance for measuring the impact of conferences, which was done as shown in this article.
- The GHG accounting allowed the possibility to offset the emissions of the conference and, by that, become the first carbon-neutral conference in Israel.
- As can be seen in table 2, it is crucial to understand the type of impact that the three emission scopes can have. The more commonly reported emission sources that can be found in scopes 1 & 2 contributed merely to 0% and 4%, respectively. Almost all of the emissions came from scope 3 and illustrate that a large part of an event's impacts can come from more unexpected places.
- The 'attendee travel' was responsible for almost half of the footprint of the conference. Looking closer, almost 20% of the attendee travel impact was due to 1 person's flight and was equivalent to 27 people attending the conference by car alone within Israel.
- The food consumed at the conference is the second largest category in emissions, responsible for a third of the impact. It can be significantly reduced by choosing more vegetarian options and fewer beef/meat dishes.
- The ICT, which many studies and carbon accounting do not take into account, had a notable impact of almost 10%.
- Ultimately, insufficient people answered the questionnaire, and the travel data had to be estimated instead. This led to the data losing some accuracy, which could be resolved with higher cooperation and collaboration.
- A potential solution for the transport data collection at the next conference could be to ask the attendees the same questions when they arrive and receive their name badges instead of sending out an optional questionnaire email. Moreover, publishing this article increases awareness about accurate data's importance.

*It was a big opportunity to lead the measurement, sequestration, and offset of the equivalent emissions caused by the conference and contribute to the sustainability community in Israel by writing the article and explaining key concepts*