

“Sustainable OR 2011”

Greenhouse Gas Emissions of the International Conference on Operations Research 2011 – Summary of the Results

As a part of the project “Sustainable OR 2011” the International Conference on Operations Research 2011, that took place from August 30th to September 2nd at the University of Zurich, was evaluated regarding its greenhouse gas emissions. This paper gives a short overview of the calculation and summarises the results.

1. Scope of observation

For the assessment of the emitted greenhouse gases (GHG) the four main categories **travel**, **accommodation**, **catering** and **infrastructure and materials** were allocated, including the following elements:

Categories	Elements
Travel (participants journey from hometown to Zurich)	<ul style="list-style-type: none"> • direct energy consumption (incl. energy production and supply) • construction, maintenance and disposal of vehicles • infrastructure provision
Accommodation	<ul style="list-style-type: none"> • energy and water consumption at the hotel • waste disposal
Catering	<ul style="list-style-type: none"> • production and processing of food and beverages • packaging • transportation • preparation • infrastructure
Infrastructure and Materials	<ul style="list-style-type: none"> • energy and water consumption at the conference venue • waste disposal • printing materials • gifts

Whenever possible real data was collected (travel, catering, materials); when there was no data available or difficult to collect, average data or approximations were used (accommodation, infrastructure).¹

2. Summary of the results

The greenhouse gases emitted during the conference amount to approx. 786.4 t of carbon dioxide equivalents (CO₂e) or around 0.9 t CO₂e per participant. In comparison, the average greenhouse gas emissions of a Swiss are about 10 t a year. The greatest part of the conference's carbon footprint is caused by the travel activities, which add up to 94%, followed by accommodation (4%), catering (1%) and infrastructure and materials (<1%):

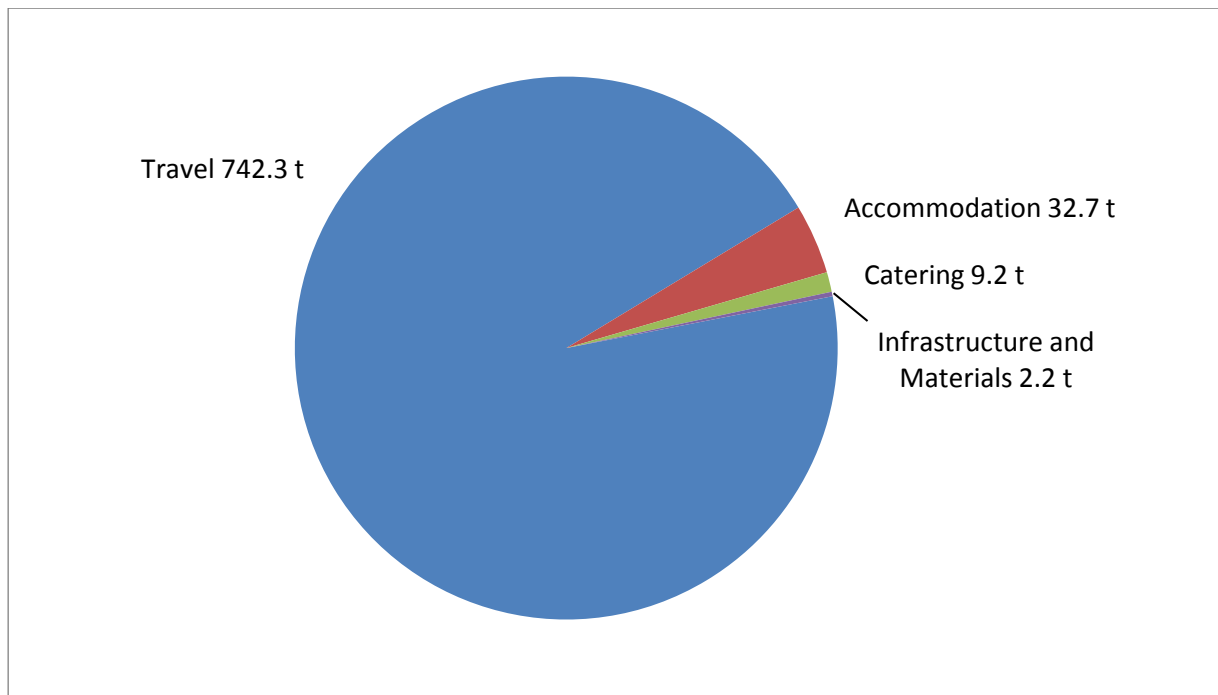


Figure 1: Greenhouse gas emissions of the conference by categories in tonnes of CO₂e

Travel

Around 96% of the travel emissions are due to air travel. Train and car travel each account for 2% of the total travel emissions. The following figure shows the emitted greenhouse gases for the different modes of transportation in relation to the number of participants:

¹ For more information concerning the assumptions and data sources please contact Helene Schmelzer (helene.schmelzer@zhaw.ch) at the Zurich University of Applied Sciences.

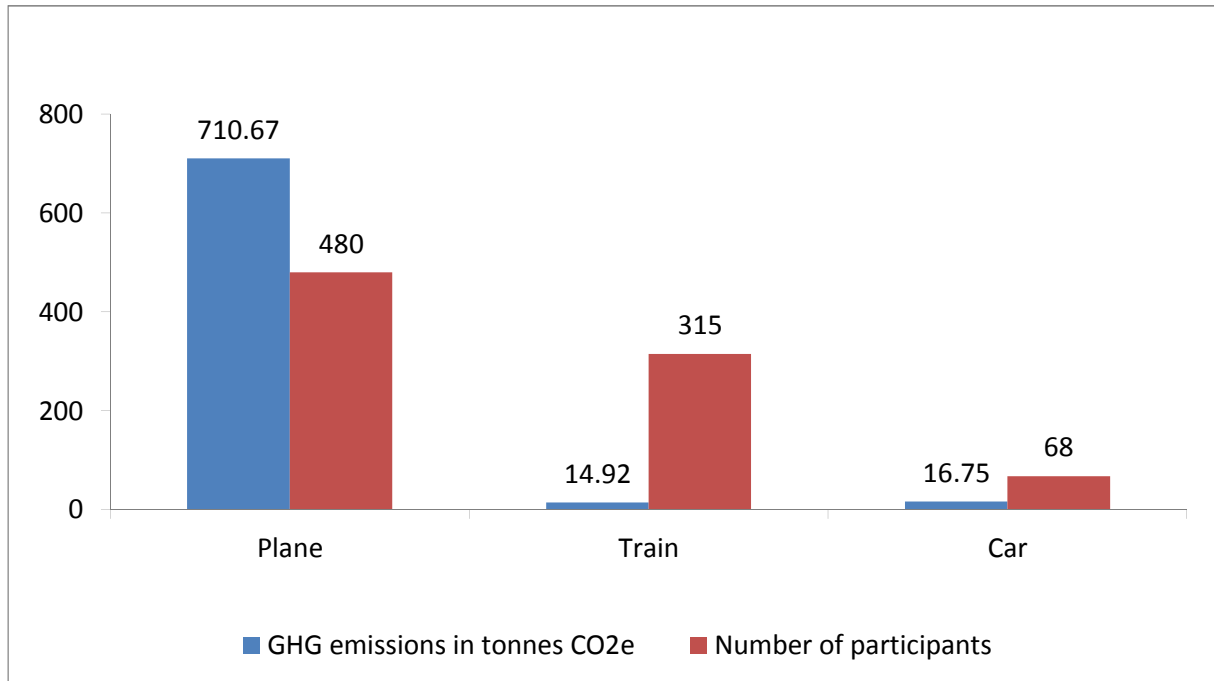


Figure 2: Travel emissions by modes of transportation

The high emissions of air travel are mainly driven by the relatively high emission levels of air travel in general, exemplary shown for a round trip Berlin-Zurich in figure 3, and the long distance flights (figure 4).

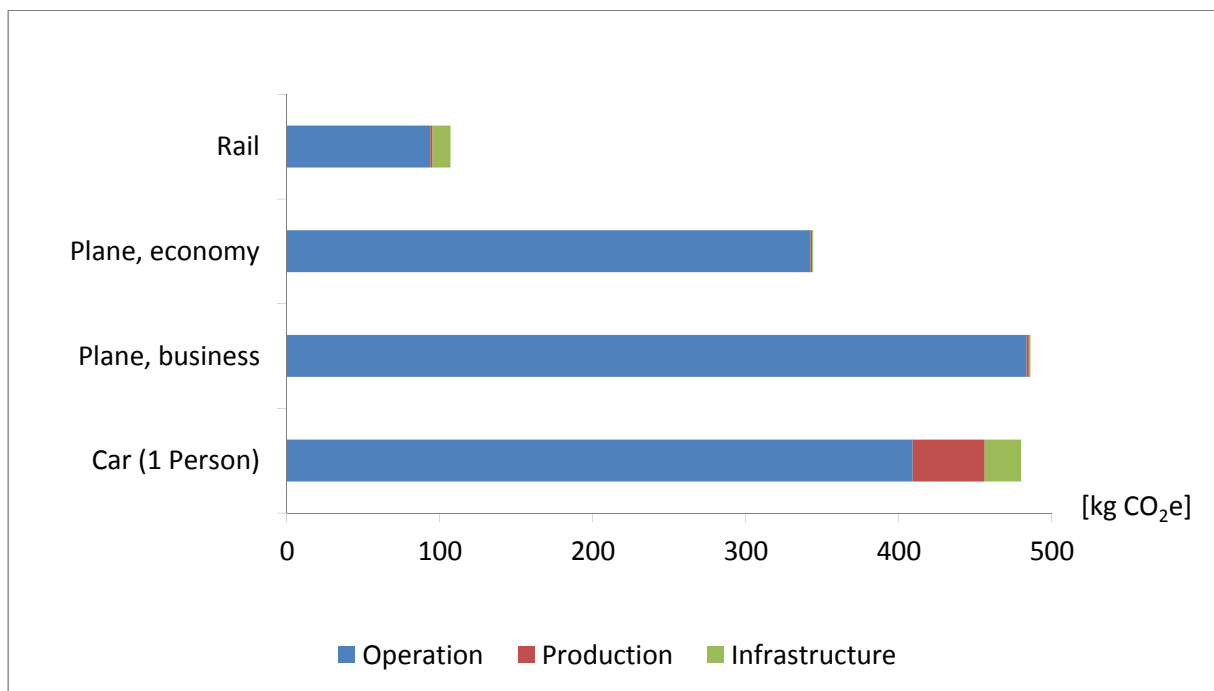


Figure 3: Emissions of different modes of transportation for a round trip Berlin-Zurich

Figure 4 shows the greenhouse gases of air travel for each air passenger and illustrates that the long distance flights (participants 360-480/ destinations Asia, America, Oceania) are the main drivers for the high emission levels. In other words, the journey of 14% of the participants accounts for 66% of the total conference’s carbon footprint. Short distance flights (up to 700 km one way) add up to 73 t CO₂e. If these would have been replaced by train travel, about 54 t CO₂e could have been saved – more than the total emissions caused by accommodation, catering, infrastructure and materials (44 t CO₂e).

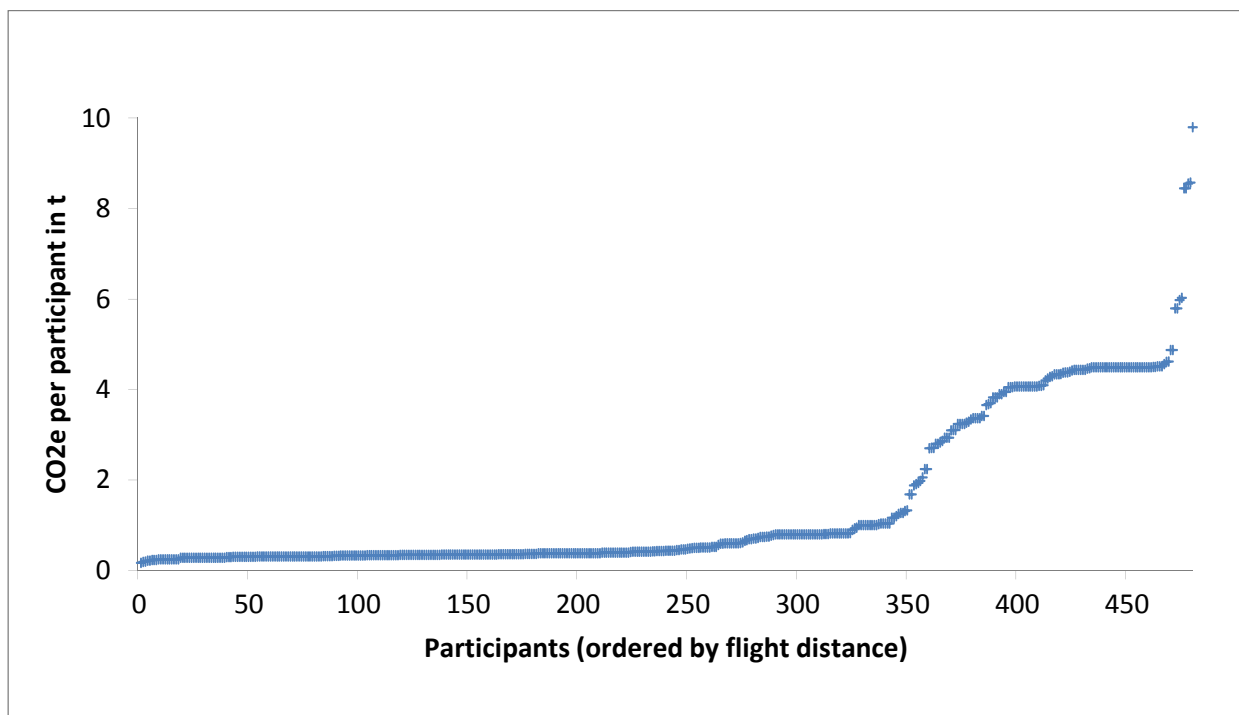


Figure 4: Air travel emissions per air passenger

Catering

With 1.2% catering makes up only a small fraction of the conference’s carbon footprint, however, also offers a differentiated analysis of its main influencing elements. Production, processing, packaging and transportation of food and beverages account for about 73% of the catering emissions. Around 27% derive from food preparation and the caterer’s infrastructure. Figure 5 shows the greenhouse gas emissions of the consumed food products (without preparation and the caterer’s infrastructure) by categories in relation to their weight in kg. With only 36% of the total weight, animal and dairy products account for 83% of the total emissions. In contrast, fruits and vegetables, that add up to 41% of the total weight, are responsible for only 5% of the emitted greenhouse gases. In general, this can be explained by the high emissions of livestock farming, mainly caused by the cultivation of feed crops and the methane emissions of cattle.

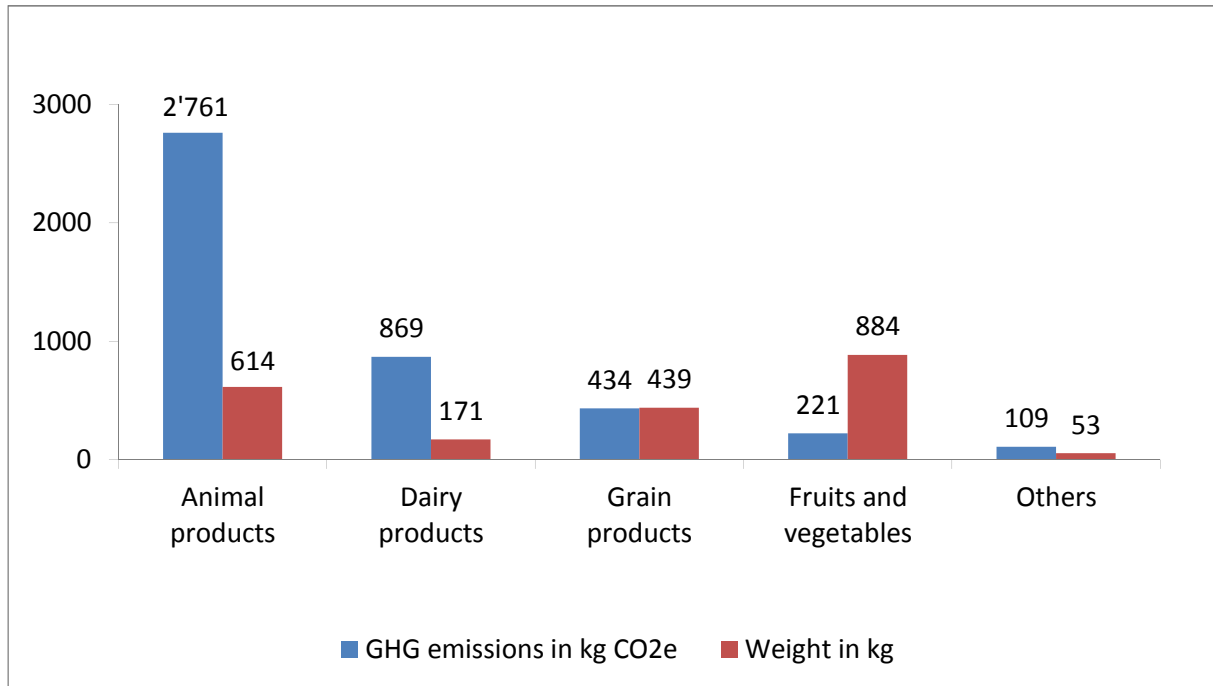


Figure 5: Emissions from catering by food categories

Accommodation, infrastructure and materials

The categories accommodation, infrastructure and materials are not discussed in detail, due to the average underlying data and their relatively low impact on the total carbon footprint of the conference. Among other factors the low level of the emissions of infrastructure and materials can be explained by the green energy supply at the University of Zurich and the efforts of the conference organization to minimize the carbon footprint of the event (e.g. by reducing printing materials, CO₂-neutral USB flash drives, etc.).

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