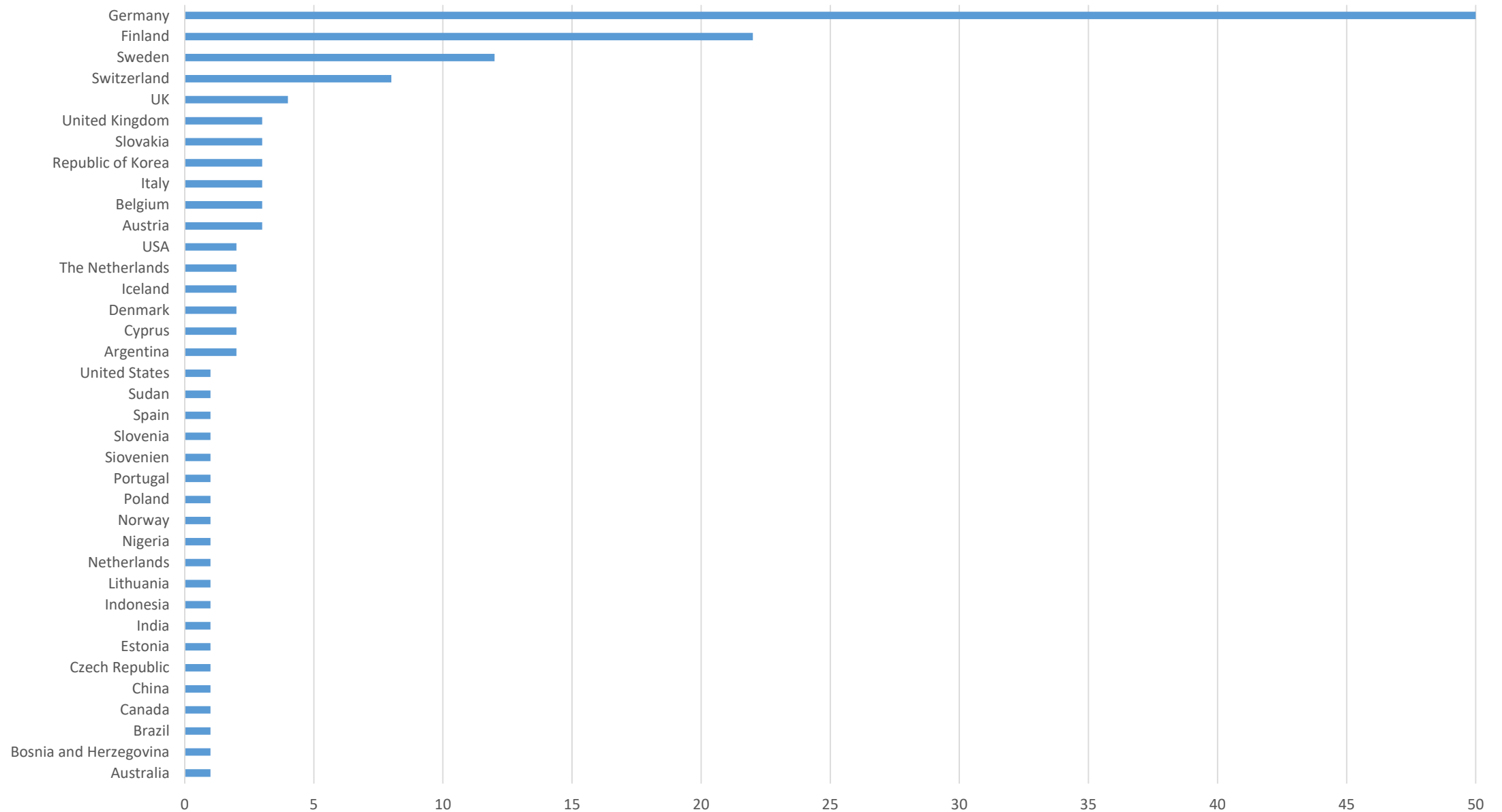


# Carbon Footprint IFPM3

Sebastian Jäckle, University of Freiburg

# Participants by country



# Copenhagen

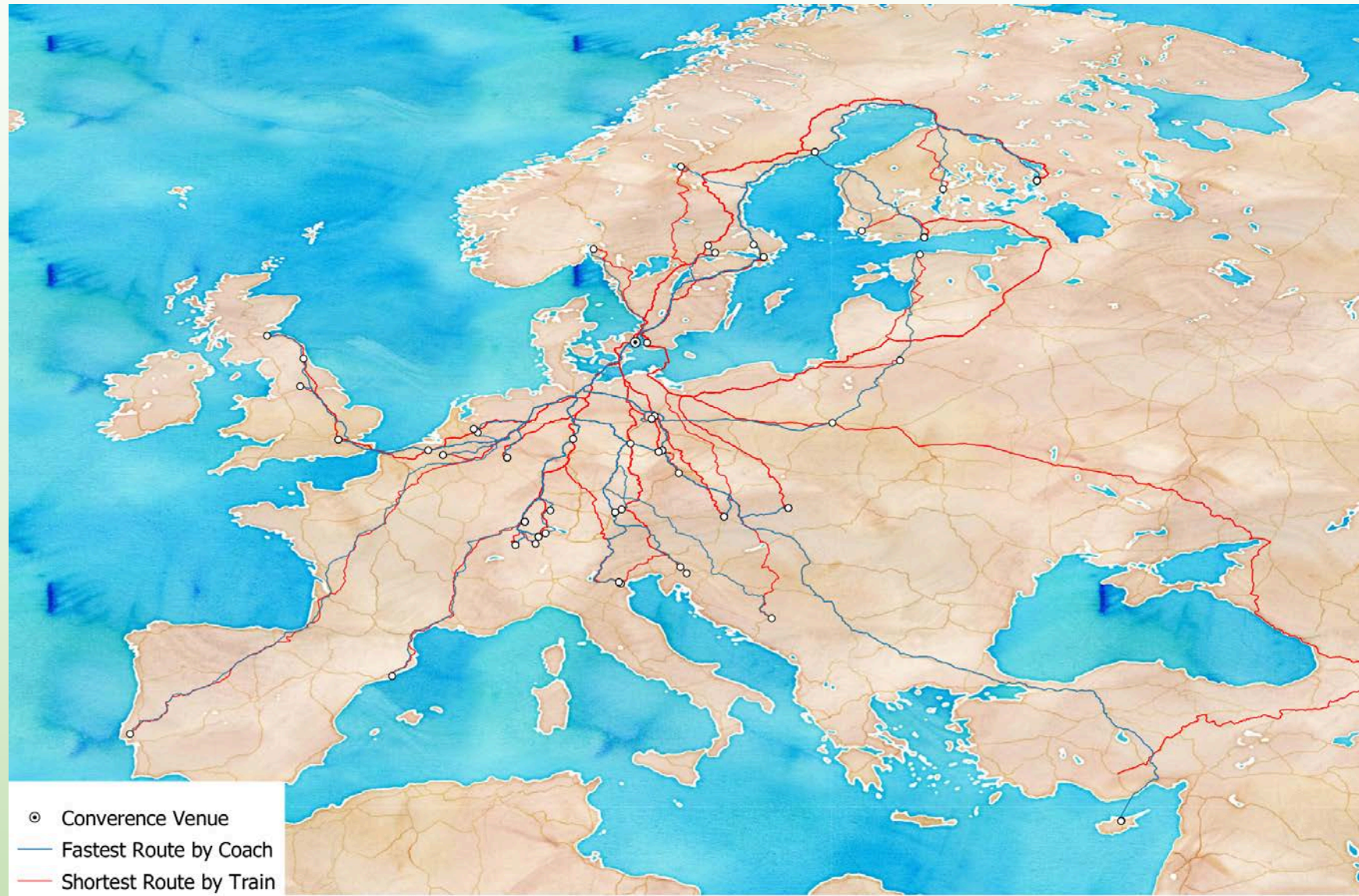
The following slides estimate the carbon footprint if the conference had taken place in Copenhagen (Denmark)

# Participants flight distances

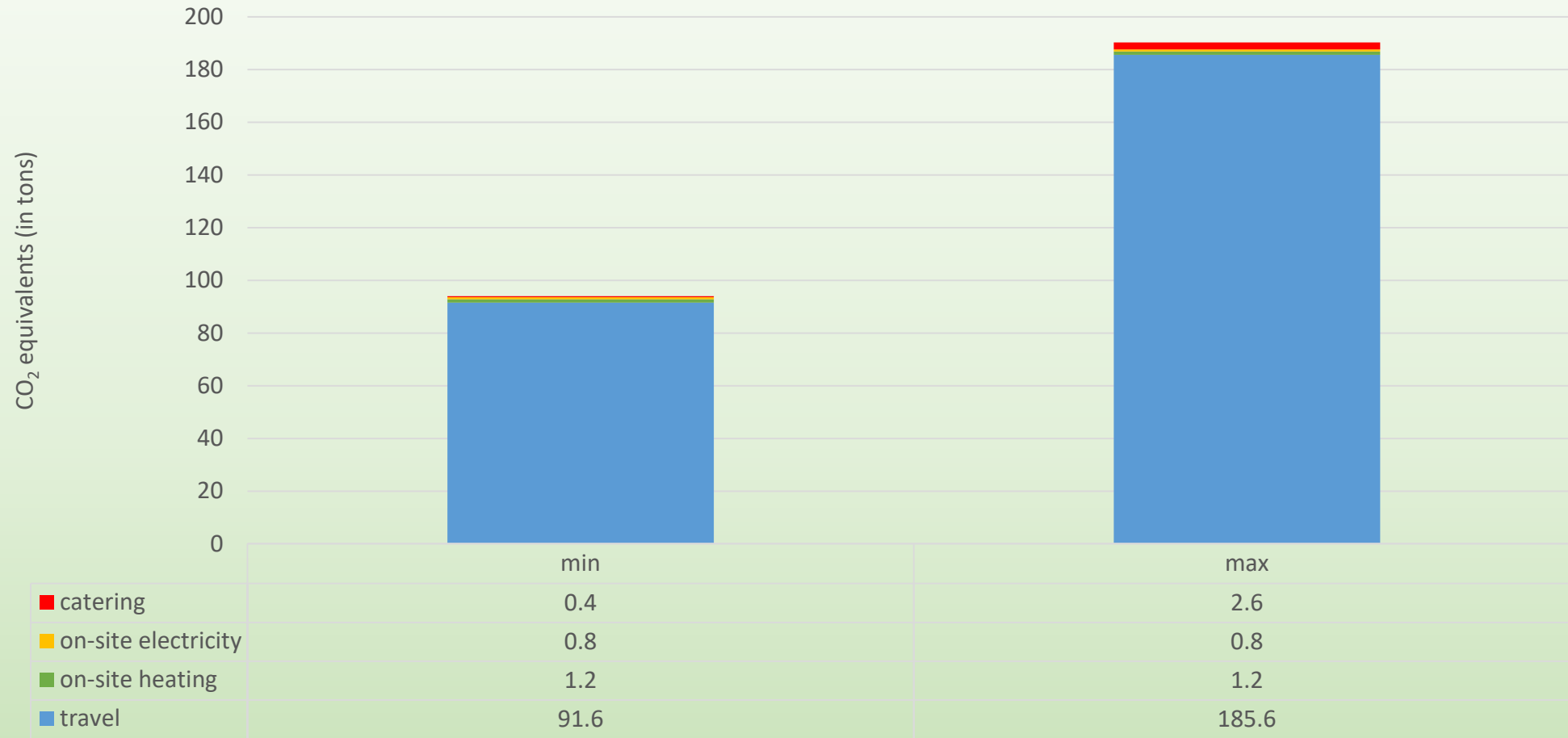




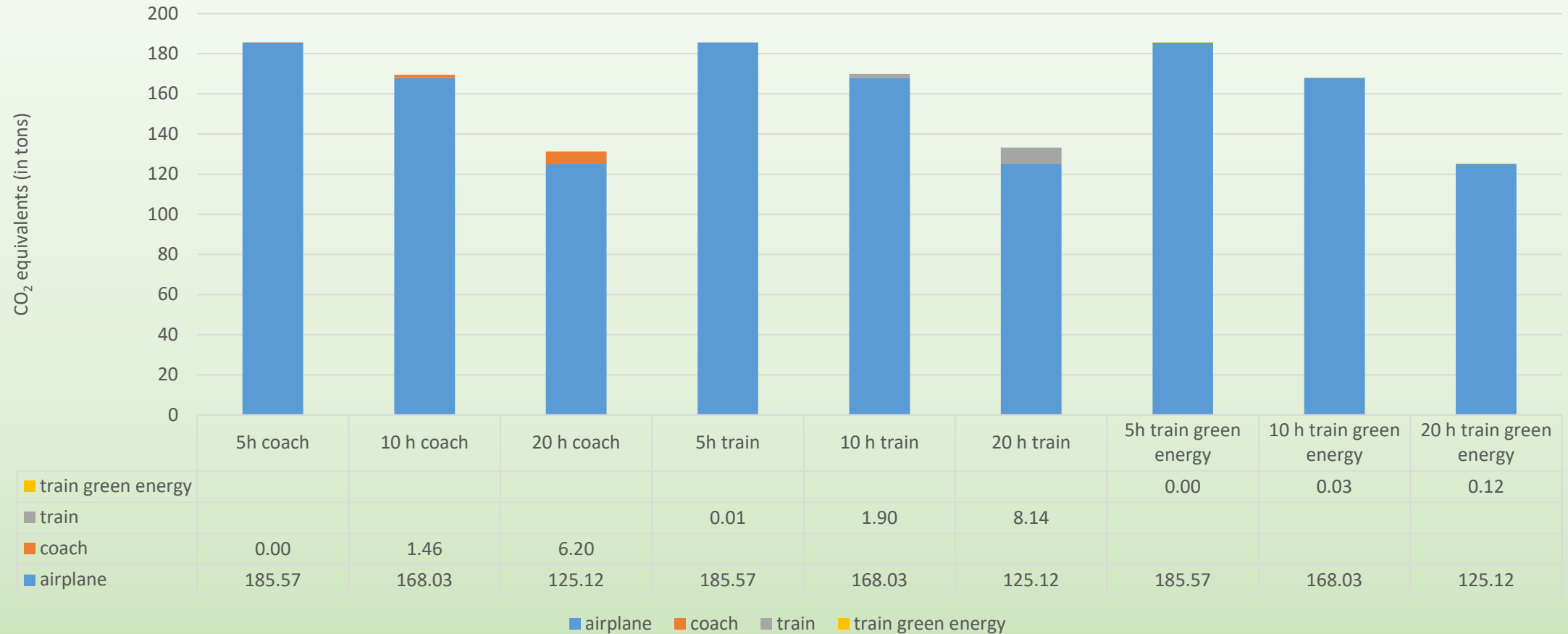
# Participants routes by bus and train



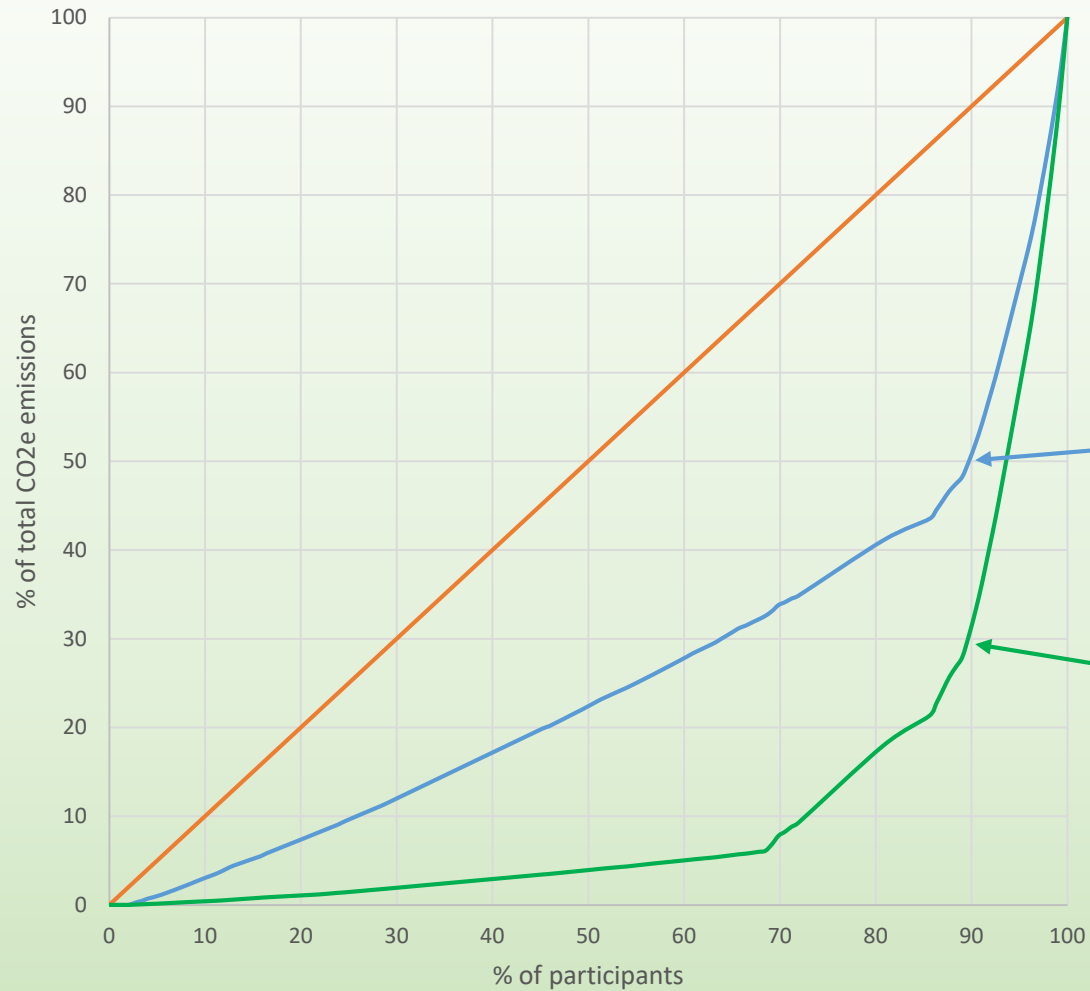
# Total Carbon Footprint if the conference had taken place in Copenhagen (min/max-estimation)



# Total travel induced carbon footprint by means of transportation and accepted hours of traveling



# Distribution of carbon footprint



If participants accept a maximum of 5h travel time landbound: 10% of participants produce 50% of the travel induced emissions.

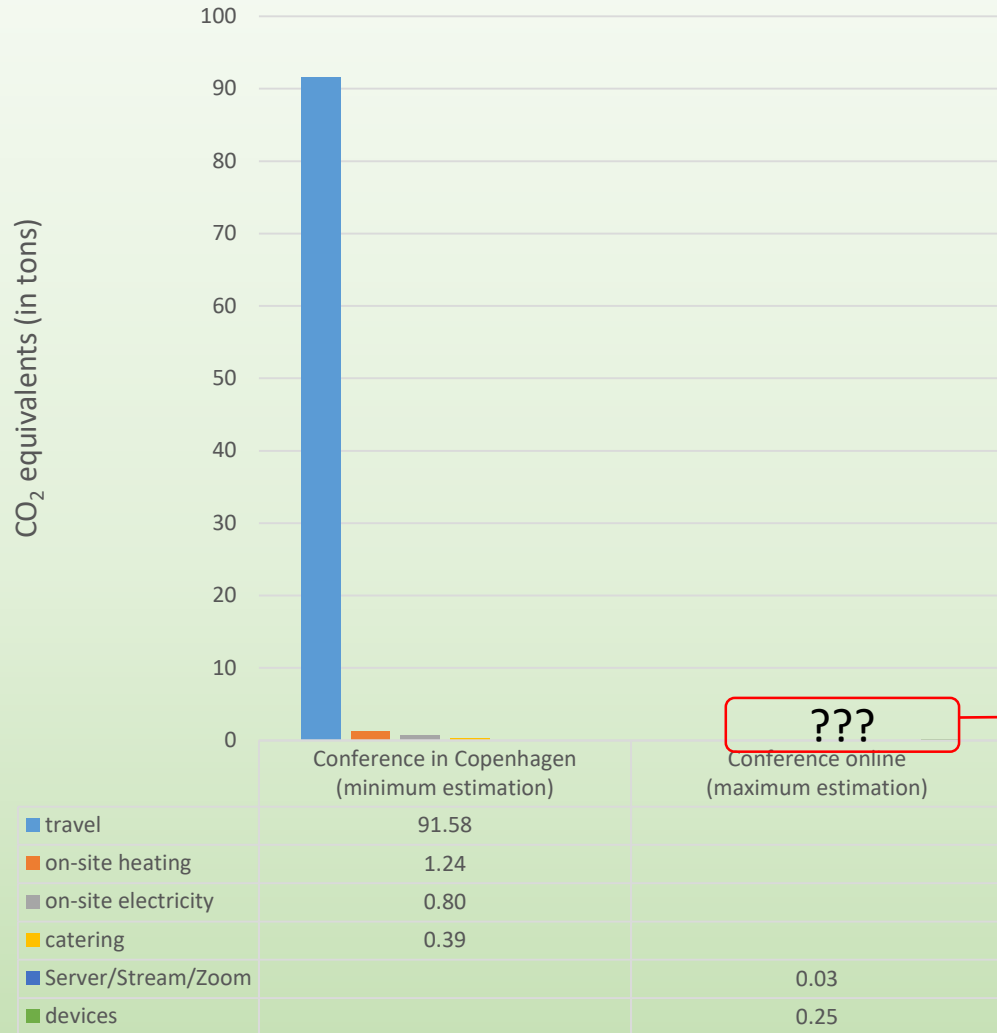
If participants even accept a maximum of 20h travel time landbound: 10% of participants produce 70% of the travel induced emissions.

- landbound travel time < 5h by train, > 5h by airplane
- landbound travel time < 20h by train, > 20h by airplane



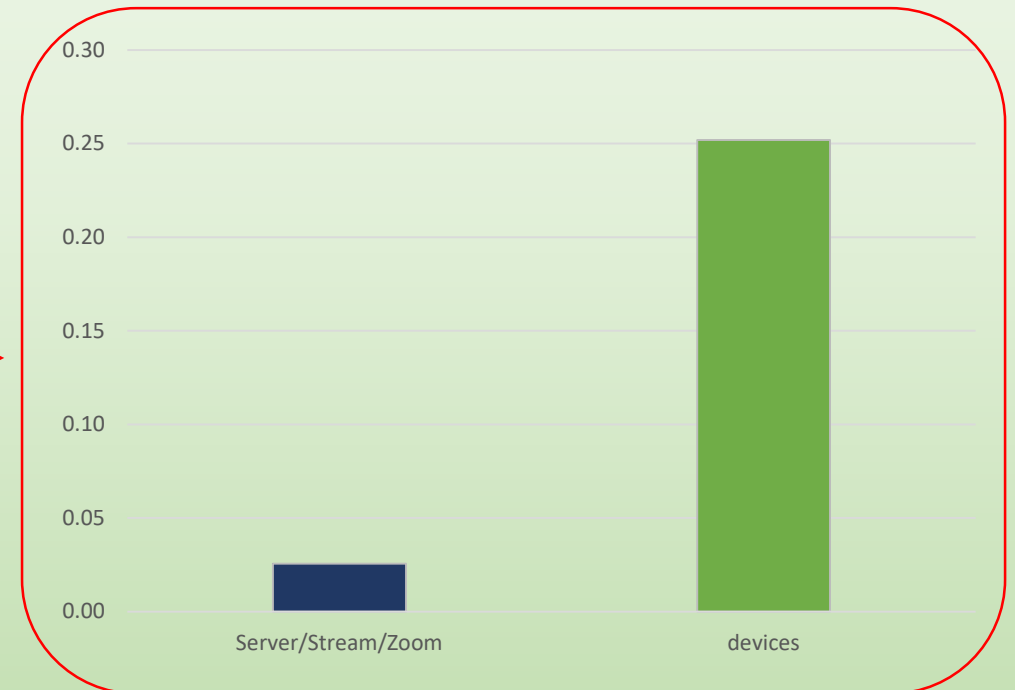
# Carbon footprint in person vs. online event (in tons CO<sub>2</sub>e)

## Minimum vs. maximum estimation



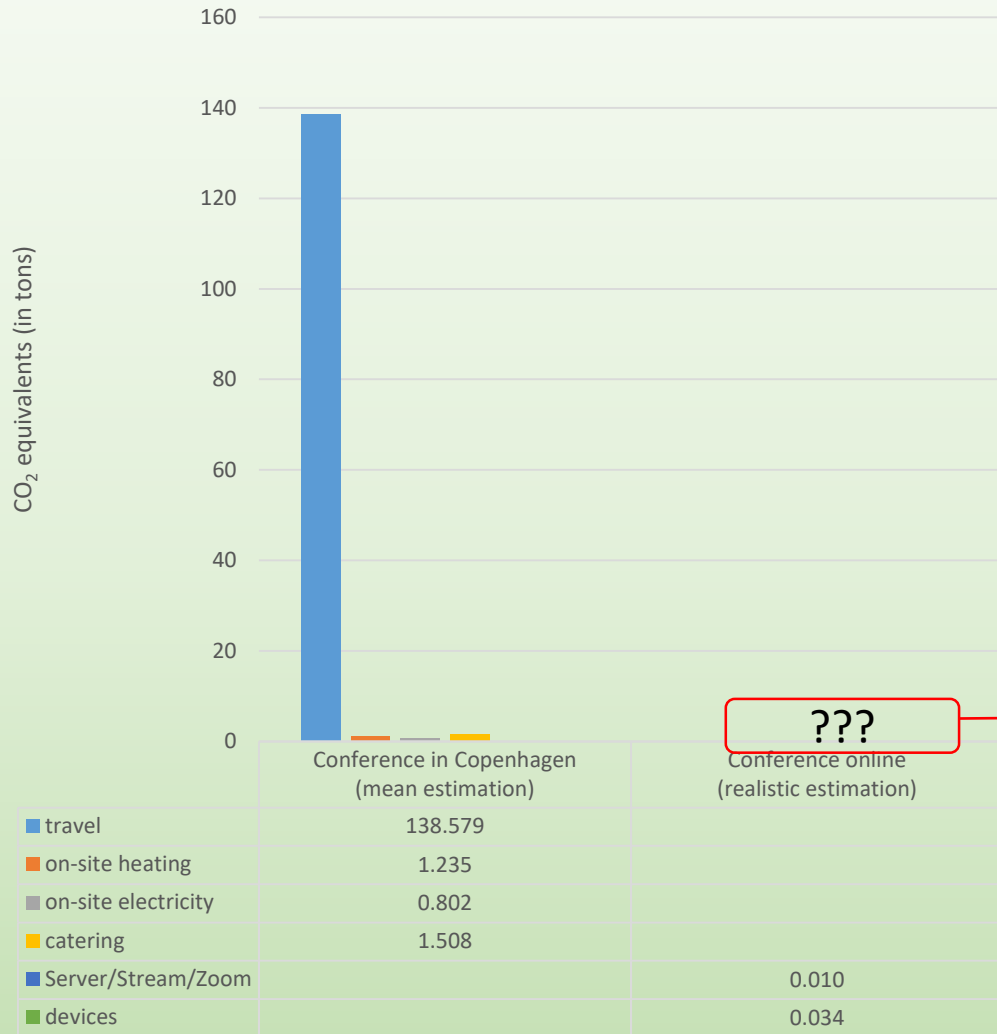
The minimum estimation for the physical event is still about **340x** higher than the maximum estimation for the online event\*.

\* 100% attendance rate for 20 hours on Zoom, PC + monitor (no laptops), emission factor for electricity = 719 g/kWh (Poland 2019)



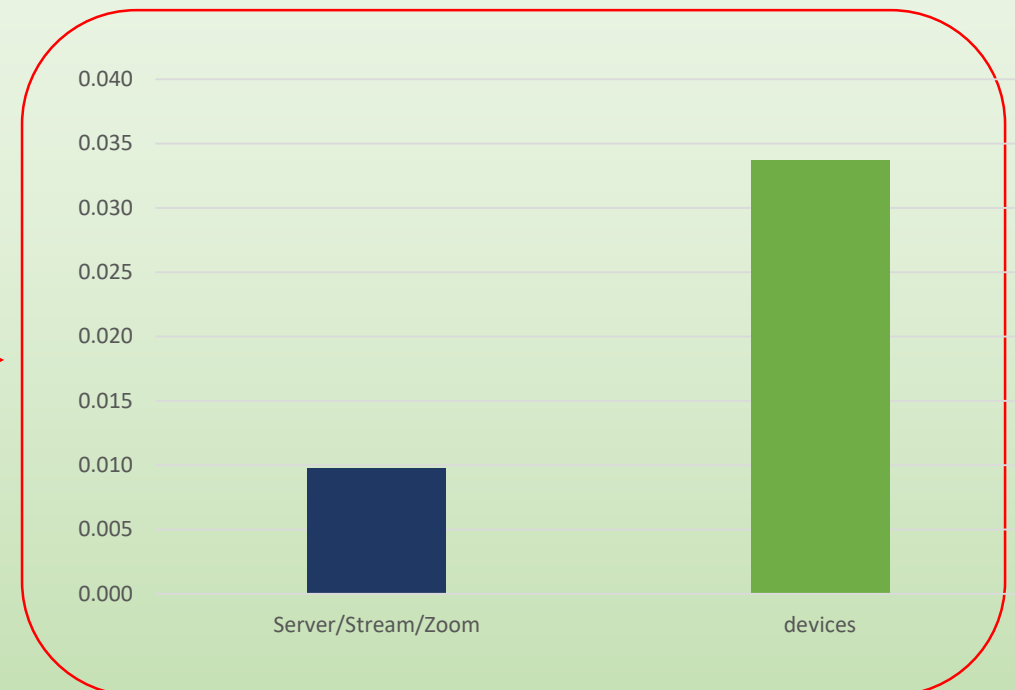
# Carbon footprint in person vs. online event (in tons CO<sub>2</sub>e)

## More realistic estimation



A more realistic estimation\* gives an estimate for the physical event that is more than **3260x** higher than the estimate for the online event.

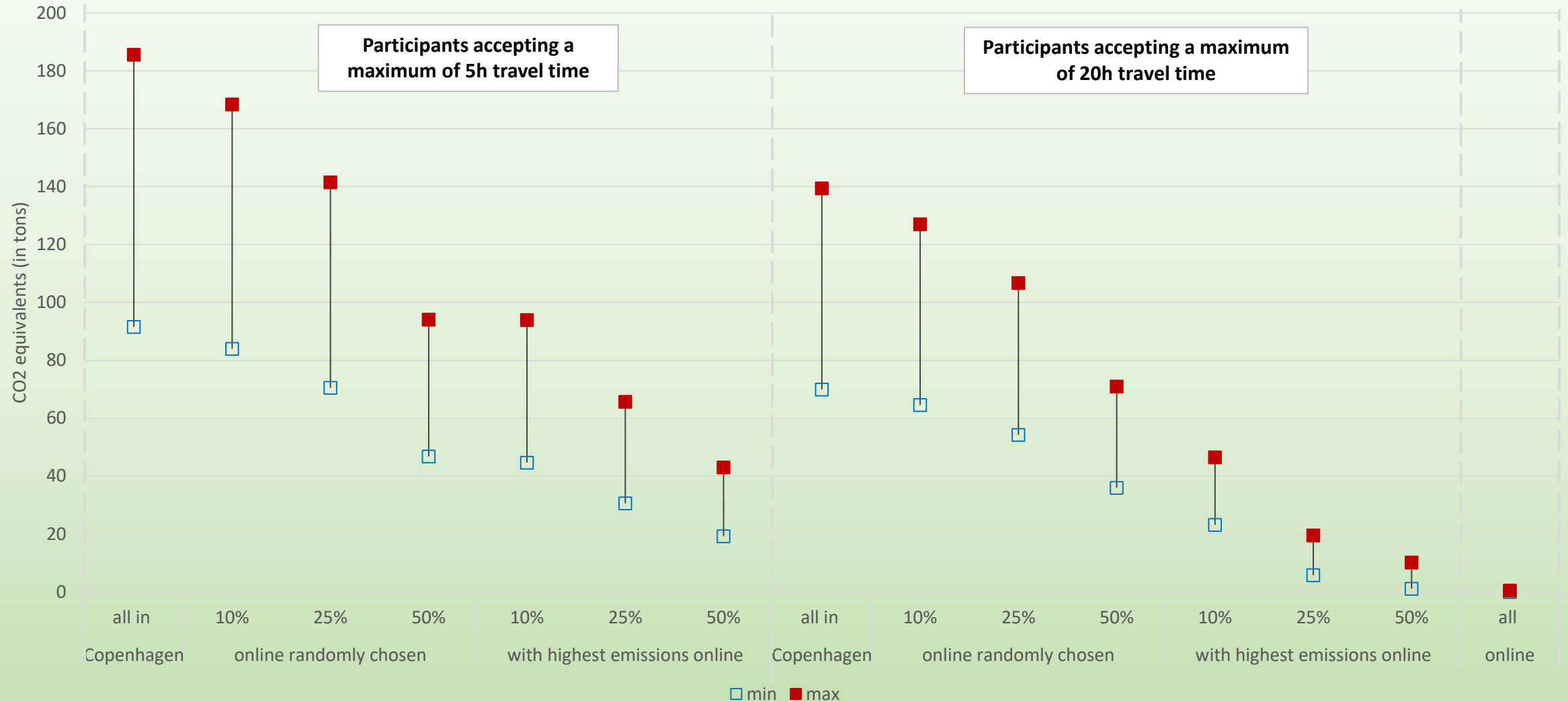
\*mean of min and max estimation for physical event; 60% attendance rate for 20 hours on Zoom using Laptops and emission factor for electricity = 296g/kWh (EU average 2019)



## Carbon footprint in person vs. online event (in tons CO<sub>2</sub>e)

|   | Virtual      |              |              | Copenhagen    |                |
|---|--------------|--------------|--------------|---------------|----------------|
|   | Realist est. | Min est.     | Max est.     | Min est.      | Max est.       |
| Participants' devices                           | 0.096        | 0.002        | 0.420        | -             |                |
| Internet data transfers (Zoom)                  | 0.010        | 0.000        | 0.078        | -             |                |
| Travel*   | -            | -            | -            | 91.581        | 185.577        |
| Accommodation in hotels (electricity + heating) | -            | -            | -            | 1.269         |                |
| Conference venue (electricity + heating)        | -            | -            | -            | 0.769         |                |
| Catering  | -            | -            | -            | 0.389         | 2.626          |
| <b>Total</b>                                    | <b>0.106</b> | <b>0.002</b> | <b>0.498</b> | <b>94.008</b> | <b>190.241</b> |

# Comparison between in person, hybrid and online conference (min/max estimation)

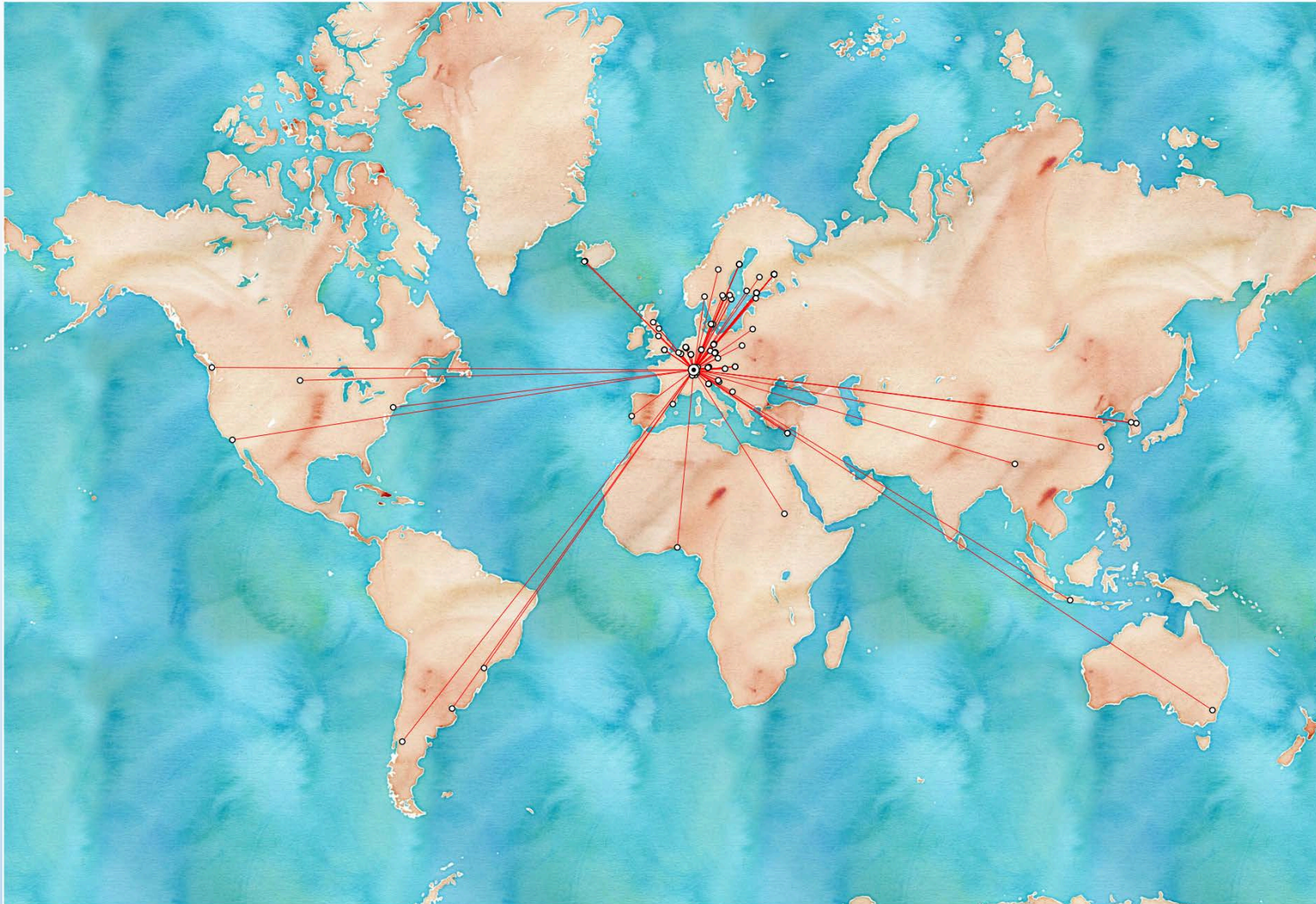


# Freiburg

The following slides estimate the carbon footprint if the conference had taken place in Freiburg (Germany)

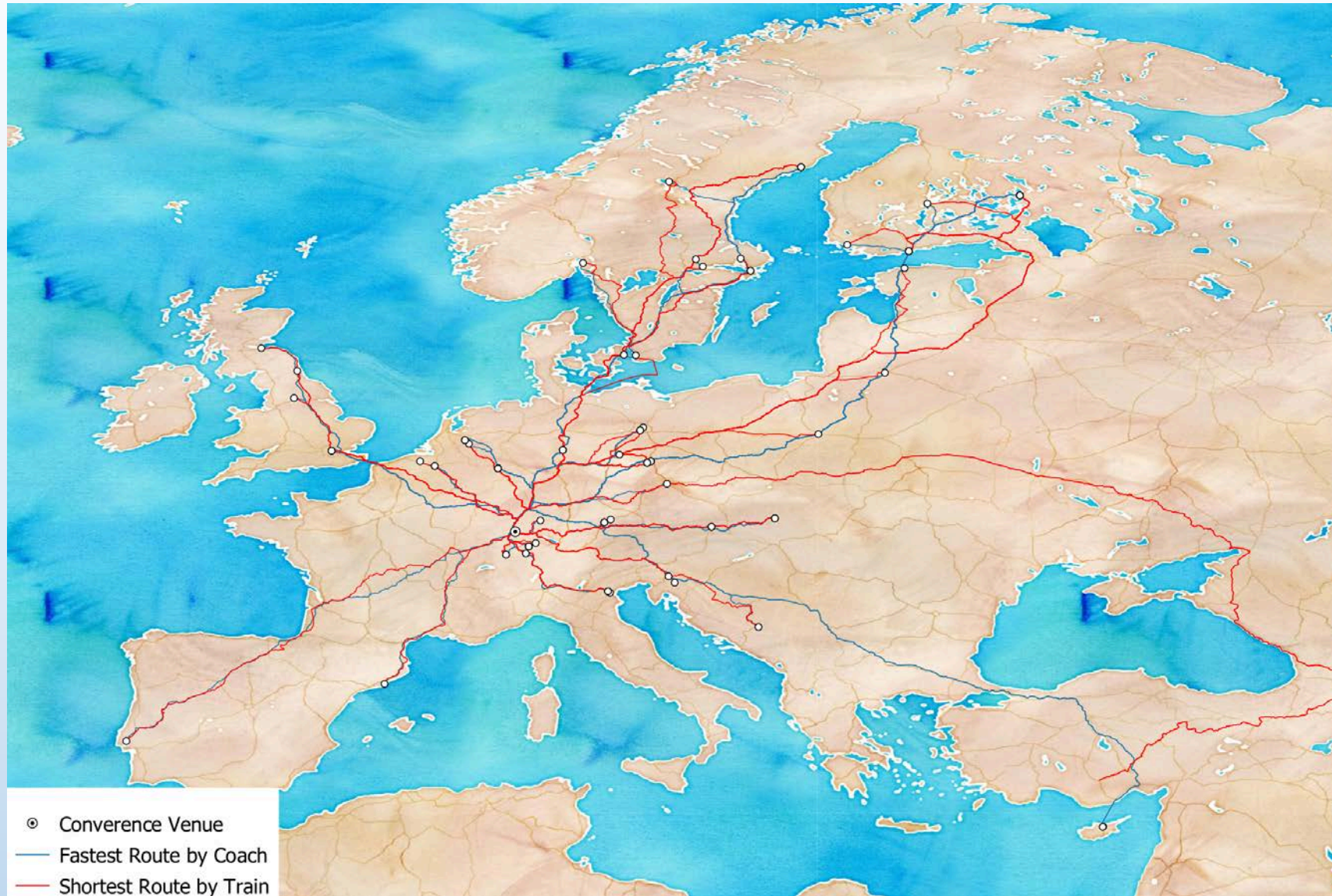


# Participants flight distances

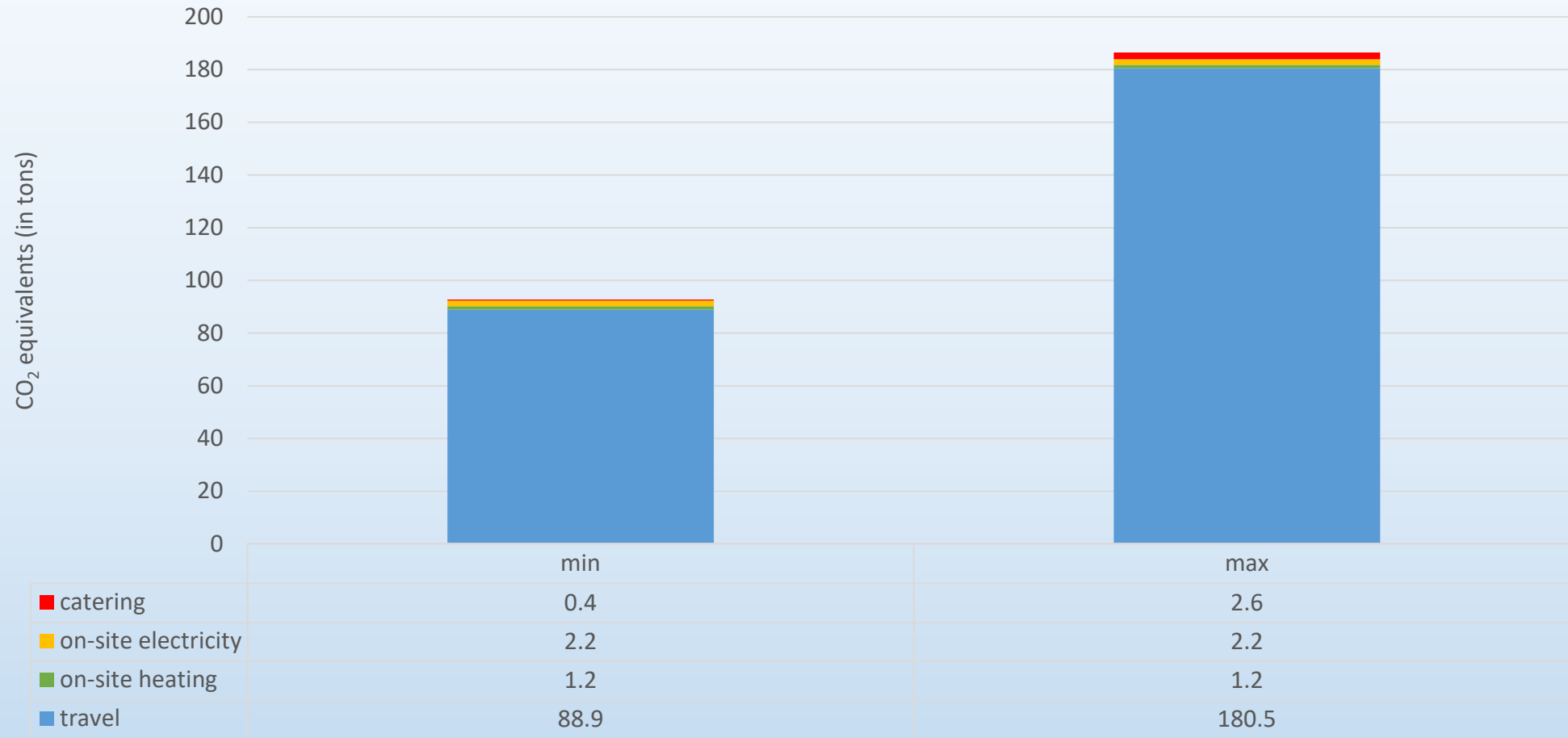




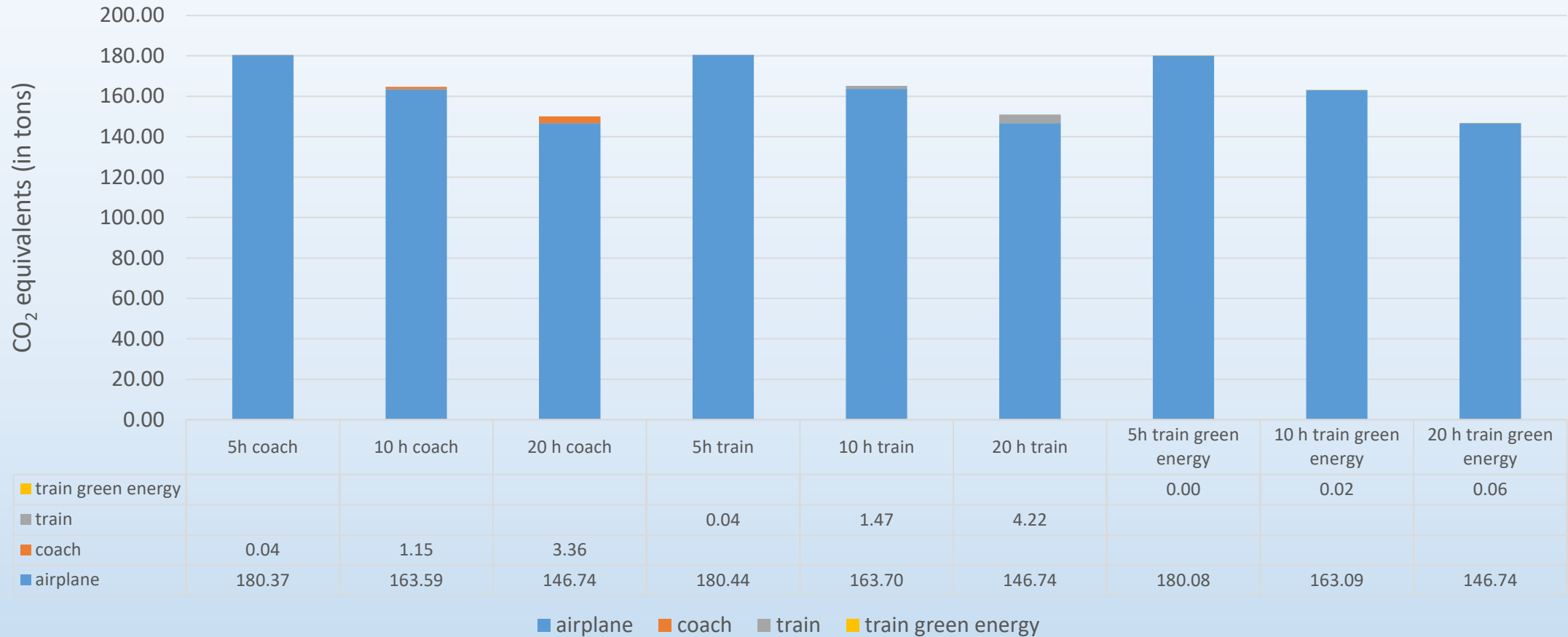
# Participants routes by bus and train



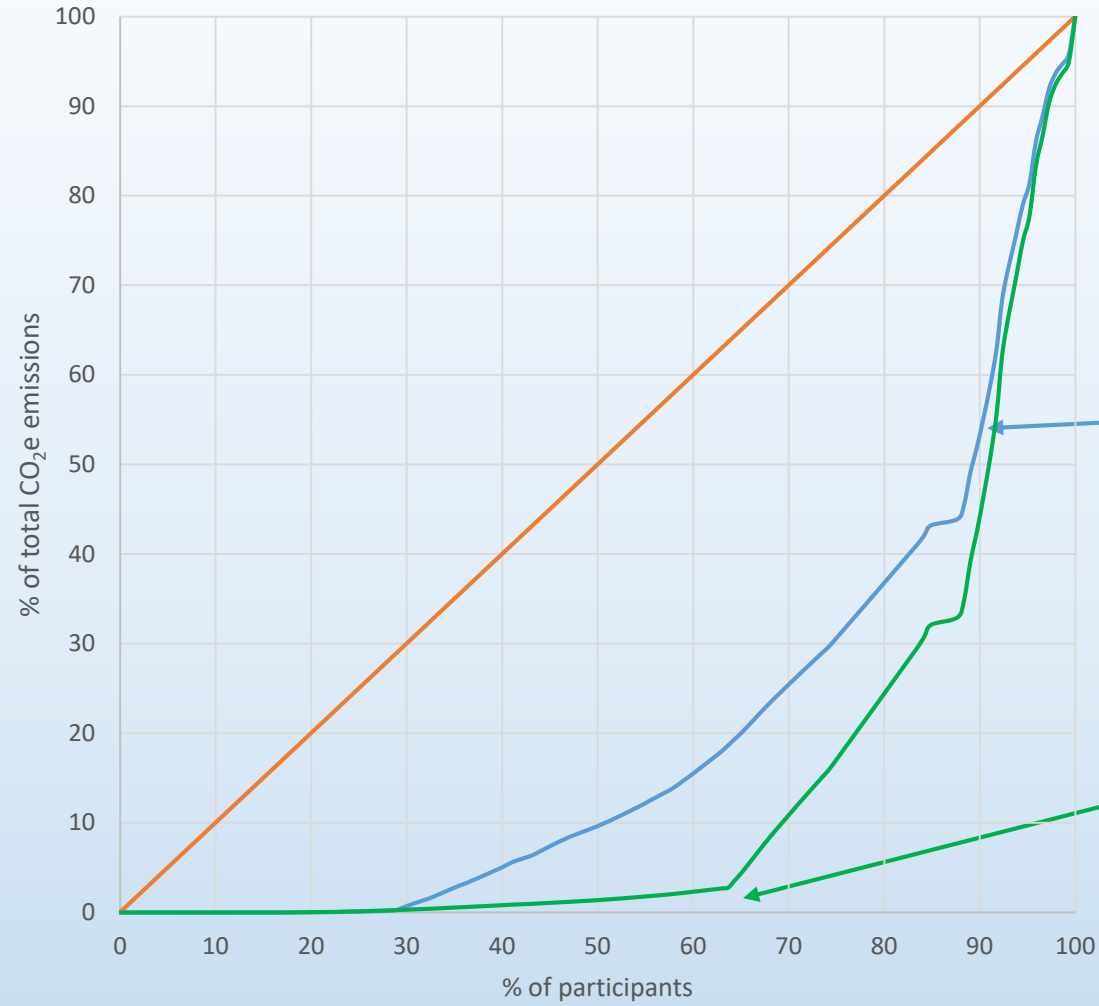
# Total Carbon Footprint if the conference had taken place in Freiburg (min/max-estimation)



# Total travel induced carbon footprint by means of transportation and accepted hours of traveling



# Distribution of carbon footprint



If participants accept a maximum of 5h travel time landbound: 10% of participants produce 45% of the travel induced emissions.

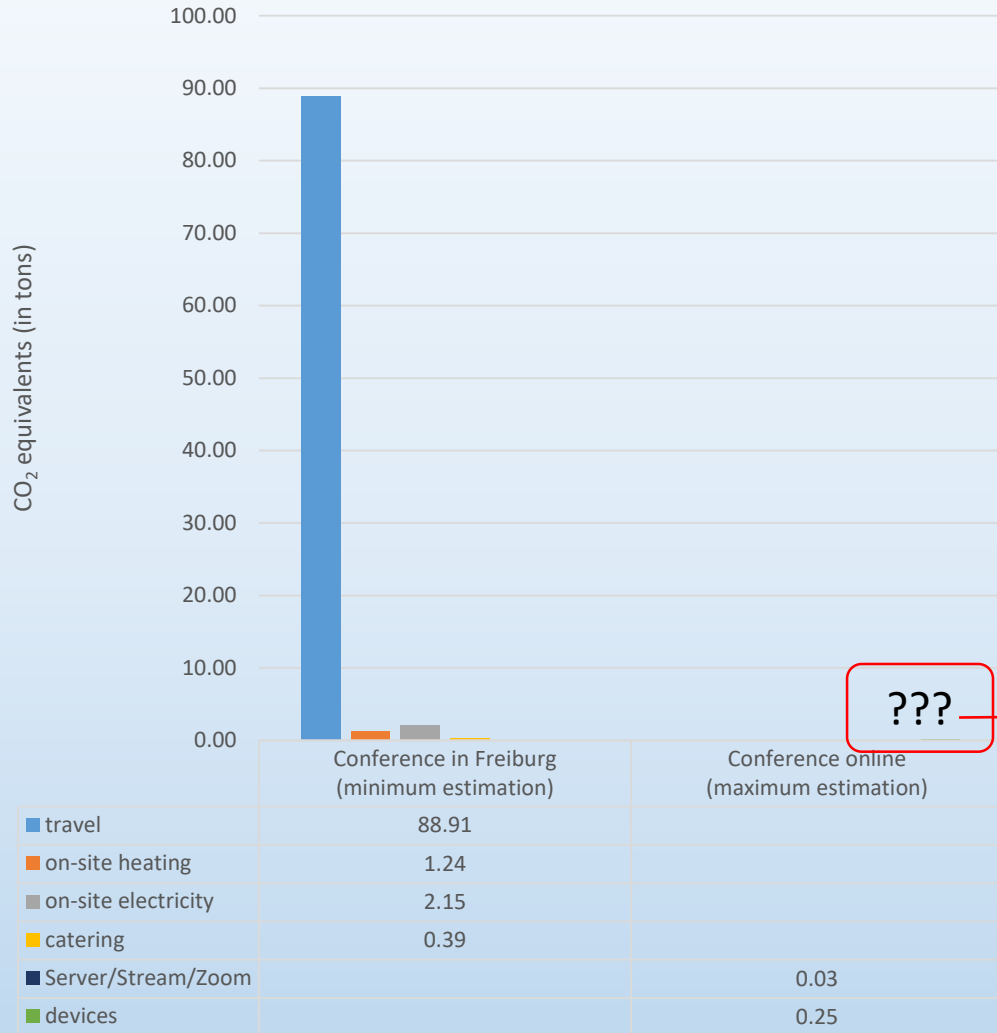
If participants even accept a maximum of 20h travel time landbound: 65% of participants only produce 4% of the travel induced emissions. The other 35% account for 96% of the emissions.

- landbound travel time < 5h by train, > 5h by airplane
- landbound travel time < 20h by train, > 20h by airplane



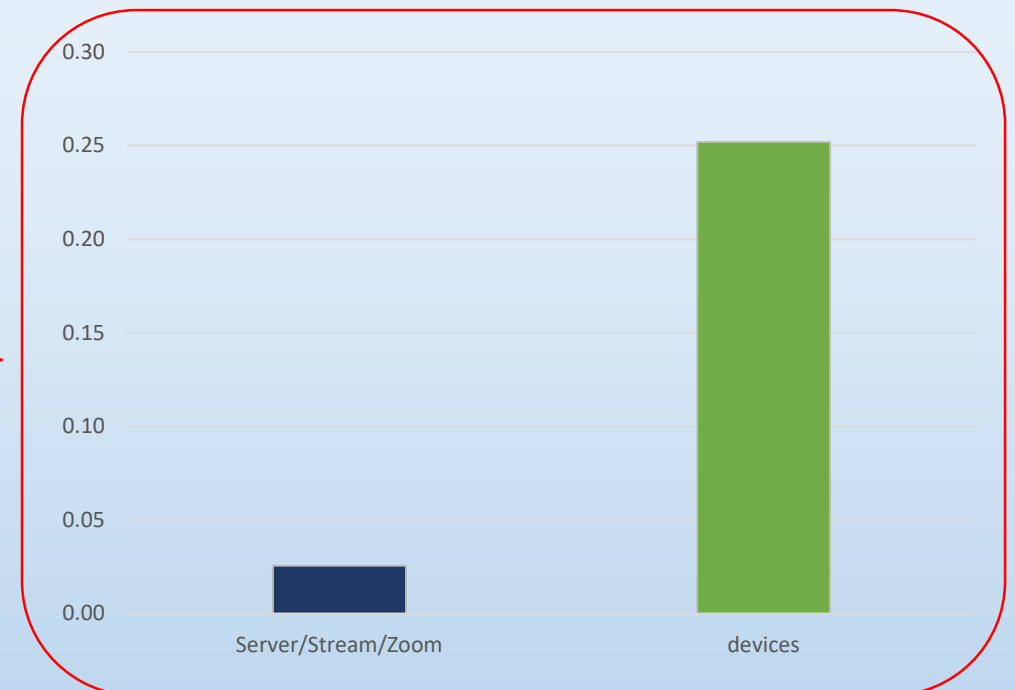
# Carbon footprint in person vs. online event (in tons CO<sub>2</sub>e)

## Minimum vs. maximum estimation



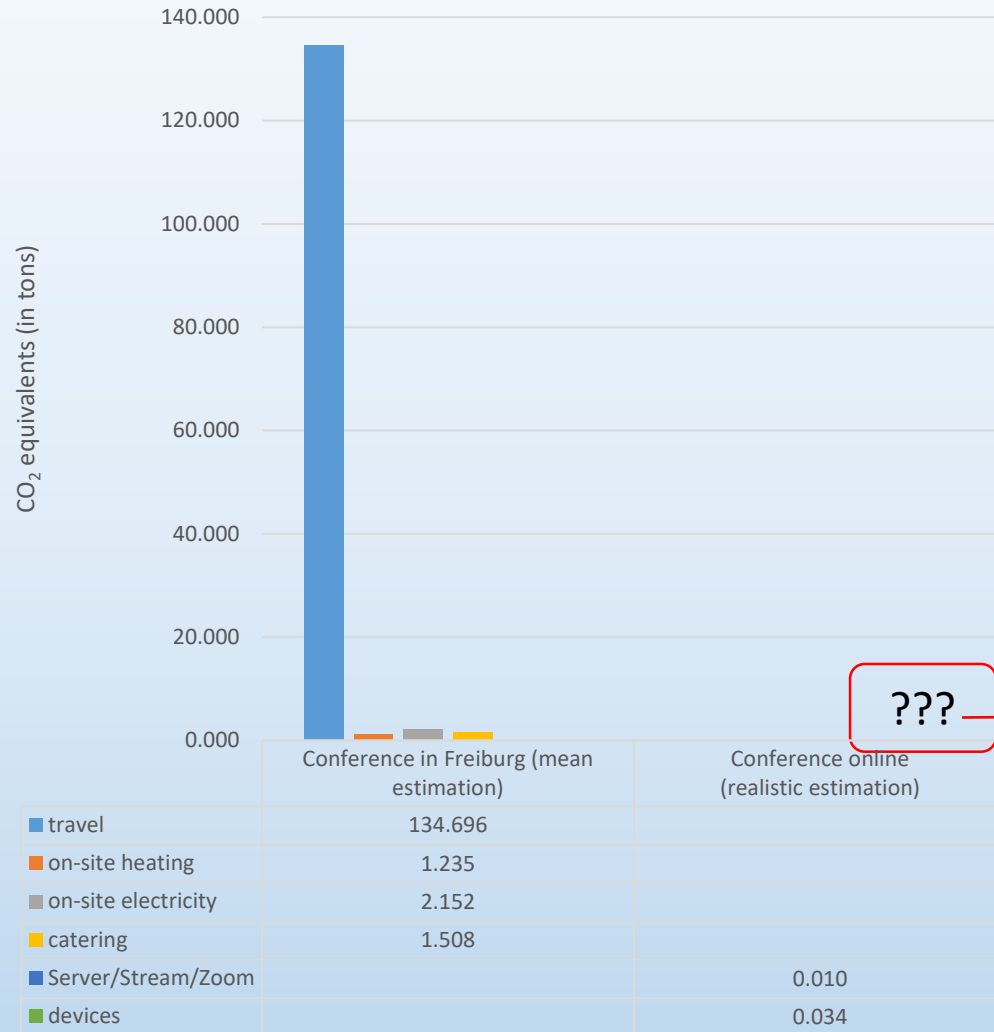
The minimum estimation for the physical event is still about **334x** higher than the maximum estimation for the online event\*.

\* 100% attendance rate for 20 hours on Zoom, PC + monitor (no laptops), emission factor for electricity = 719 g/kWh (Poland 2019)



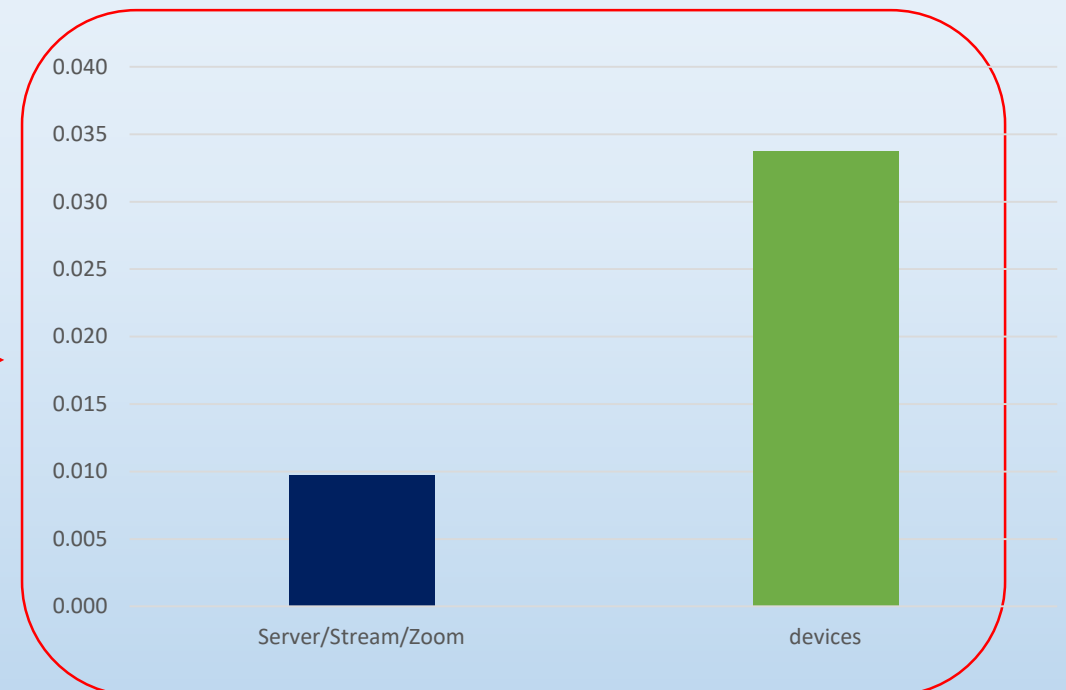
# Carbon footprint in person vs. online event (in tons CO<sub>2</sub>e)

## More realistic estimation



A more realistic estimation\* gives an estimate for the physical event that is more than **3200x** higher than the estimate for the online event.

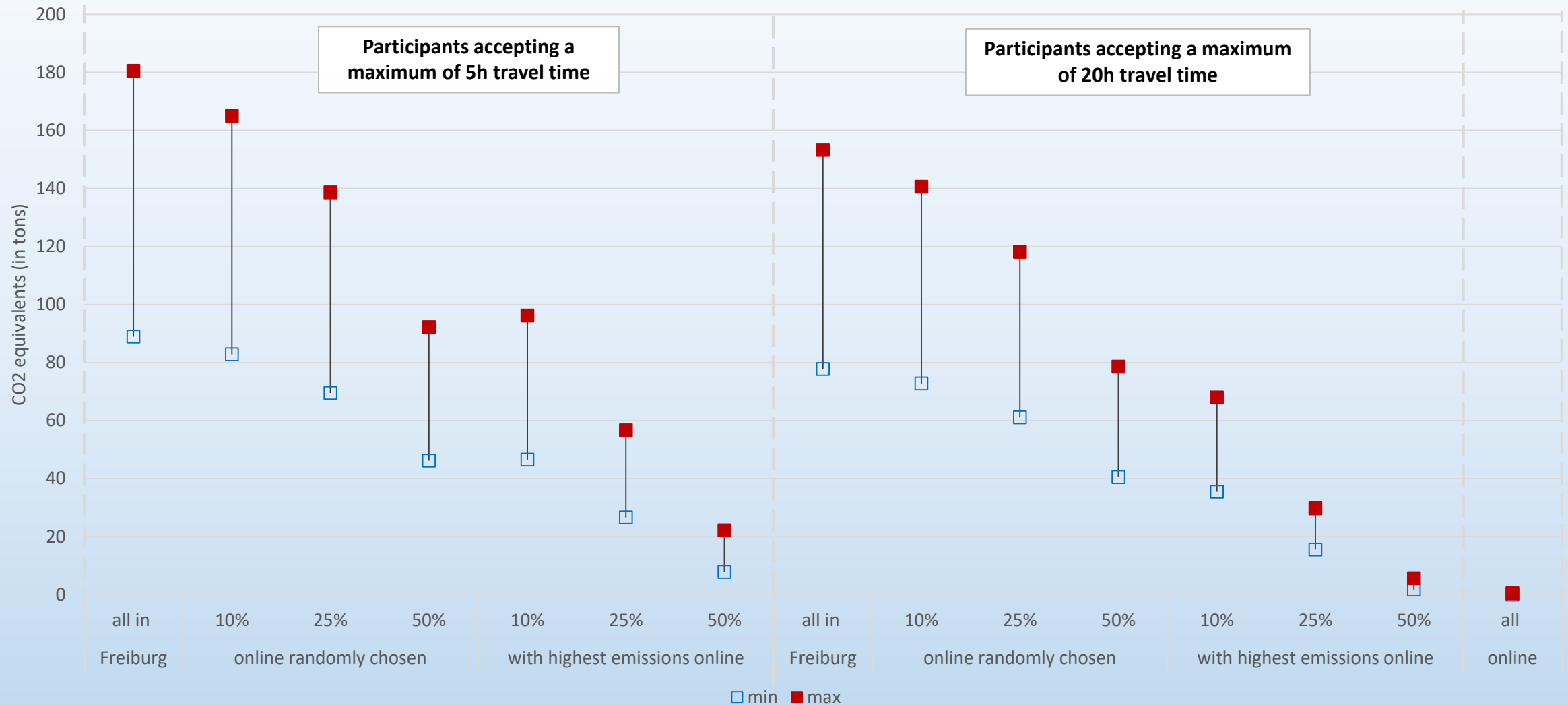
\*mean of min and max estimation for physical event; 60% attendance rate for 20 hours on Zoom using Laptops and emission factor for electricity = 296g/kWh (EU average 2019)



## Carbon footprint in person vs. online event (in tons CO<sub>2</sub>e)

|   | virtual      |              |              | Freiburg      |                |
|---|--------------|--------------|--------------|---------------|----------------|
|   | best est.    | min          | max          | min           | max            |
| Participants' devices                           | 0.096        | 0.002        | 0.420        | -             | -              |
| Internet data transfers (Zoom)                  | 0.010        | 0.000        | 0.078        | -             | -              |
| Travel*   | -            | -            | -            | 88.911        | 180.480        |
| Accommodation in hotels (electricity + heating) | -            | -            | -            | 2.035         | -              |
| Conference venue (electricity + heating)        | -            | -            | -            | 1.352         | -              |
| Catering  | -            | -            | -            | 0.389         | 2.626          |
| <b>Total</b>                                    | <b>0.106</b> | <b>0.002</b> | <b>0.498</b> | <b>92.688</b> | <b>186.495</b> |

# Comparison between in person, hybrid and online conference (min/max estimation)



## Source

Estimations based on the approach described in Jäckle, Sebastian (2021): Reducing the Carbon Footprint of Academic Conferences by Online Participation - the Case of the 2020 Virtual ECPR General Conference, in PS: Political Science & Politics, online first DOI: [10.1017/S1049096521000020](https://doi.org/10.1017/S1049096521000020).