

International Green e-camp “Clean transportation”, Day 2: Workshop - carbon footprint

Workshop held by: dr Aleksandra Drewko, expert on environment, sustainability and carbon

Workshop duration: 1.5 hours

The virtual workshop on carbon footprint consisted of three distinct parts:

- 1) **Presentation** by the expert as an introduction to the topic of carbon footprint (30 minutes)
- 2) Solving of **exercises in groups** in breakout rooms (25 minutes)
- 3) **Presentation of results** by teams to all other participants in the general room (35 minutes).

The presentation (part 1) covered the following topics:

- Explanation of what greenhouse gases are and why they are important;
- Examples of where greenhouse gases come from;
- Description of the concept of global warming potential and what carbon dioxide equivalent is;
- Details on the Paris Agreement and its main purpose;
- Showing of examples of the effects of climate change;
- Explanation of what carbon footprint is;
- Explanation of the calculation of greenhouse emissions from transportation:
 - Showing practical examples of the calculation;
 - Explaining what the difference between direct and indirect emissions is,
 - Introducing the concept of passenger-kilometer and its importance when calculating emissions per person present in one car;
- Detailed explanation of exercises to solve in groups:
 - Firstly, exercise 1 and 2 were described in detail and questions from the audience were answered in order to clarify any doubts before dividing the participants into breakout rooms.

The instructions for Exercise 1 were as follows: 1) Calculate direct and indirect emissions for one person traveling one way from London to Manchester (distance: 340 kilometers) in/on a:

- a. small car running on diesel, you are alone in the car;
- b. large car running on diesel, you and 3 other people are in the car;
- c. bus;
- d. train;
- e. plane.

2) Please order the results from the lowest to the highest emissions (considering the sum of direct and indirect emissions).

The emission factors to be used in the calculation were provided as in the table below:

mode of transportation	emission factor, direct emissions	emission factor, indirect emissions	Unit
small car, diesel	0,1372	0,0329	kg CO ₂ e/km
large car, diesel	0,2042	0,0492	kg CO ₂ e/km
bus (coach)	0,0273	0,0065	kg CO ₂ e/pkm
train (national rail)	0,0369	0,0072	kg CO ₂ e/pkm
plane	0,2443	0,0267	kg CO ₂ e/pkm

The instructions for Exercise 2 were as follows: Please think of at least 3 examples of how we as individuals can reduce our carbon footprint from transportation / mobility. Name barriers connected to each of your ideas, for example, idea: using bicycles instead of cars; barrier: no bicycle lanes on the roads, making it dangerous for cyclists.

The participants were asked to download a file from the chat, where both exercises were described in detail, before they went into breakout rooms. They were informed about the time limit of 25 minutes to work in groups and that all participants and supervisors would meet again in the general room, where one person from each group would present ideas on how to reduce your carbon footprint from transportation / mobility. Each group was allowed a maximum of 2.5 minutes to present. The participants were asked to nominate the person who would present the results for their group prior to leaving their breakout rooms.

About 60 participants were divided into 8 breakout rooms. Throughout 25 minutes assigned to the solution of exercises, the groups were visited by either the workshop facilitator and/or project partners, who answered any additional questions and made sure that the work in groups was going smoothly.

After the allocated time passed, everyone met in the general room again. First, the solutions to the exercise 1 were given and questions from the audience were allowed. No clarification of results was necessary at this point. The exercise was solved correctly.

Then, groups were called out one by one in order to present their ideas on how to reduce an individual's carbon footprint from transportation and possible barriers to their implementation. The summary of ideas and barriers presented are given below:

Ideas	Barriers
Pop-up bike lanes	Not possible to implement on every surface
Choosing a holiday destination closer to home	Attitude shift required
Choosing a direct flight instead of connecting flights	Not always available
Using public transportation	Stations not located close to home, especially in low-populated areas, attitude shift is necessary, public transportation needs to be attractive, clean, well maintained, on-time
Using bicycles	Not appropriate for long distances, the willingness to use depends on weather conditions, not everyone is sporty or healthy enough to use it
More eco-friendly vehicles / e-mobility	High price, need to become more developed, especially when it comes to their range, but also the infrastructure, such as charging stations
Carpooling, car sharing	They can become damaged if not maintained properly, not as comfortable as having your own car at disposal
e-scooters on a rental basis	Not suitable for longer distances, need to be properly maintained (note: this can be seen as a job opportunity and not necessarily as a barrier), only available in cities
Driving efficiently	Proper information and training needs to be provided, e.g., tires needs to be inflated, avoid aggressive driving, etc.
Consume locally in order to avoid transportation of goods over long distances	Attitude shift required

Reflection on results

The workshop participants understood the allocated exercises and were able to solve them properly. Exercise 1 was mainly focused on the calculation of emissions by applying different emission factors that correspond to respective means of transportation chosen for the same trip. The exercise was designed to help the workshop participants use knowledge that was transferred during the first part of the workshop as well as reflect on the differences between using various modes of transportation for the same trip and how our choices can result in different carbon footprint. In this way, a good starting point was created for coming up with ideas on how to lower our carbon footprint from transportation, i.e. Exercise 2. The ideas provided were coherent and clear. Barriers were also clearly identified.

Lessons Learnt

Organizing a virtual workshop for a large number of participants requires a tailored-made concept, properly functioning online tools and enough time allocation for problem solving and discussion. Exercise 1 was solved by all groups, whereas Exercise 2 was solved by 6 out of 8 groups. The given reason for not managing to solve the task was lack of time. At the same time, other groups managed to come up with more than 3 ideas on how to improve an individual's carbon footprint, which leads to the conclusion that enough time was allocated for problem solving. Also, during the presentation of group ideas in the main room, the time limit given per each group was monitored by the facilitator, which proved successful. Also, using live surveys, e.g., a fist one as an icebreaker, asking the participants where they were from, proved a successful method for keeping the participants focused and engaged. Overall, three live surveys were performed during the course of this workshop.