

# Interinstitutional EMAS Days 2024



Session 2: Sustainable  
Conferences and Events in the EU  
institutions

5/11/2024

# Speakers

## **Guidelines on sustainable events:**

- Alessandra Pertot, European Commission, DG SCIC, Conference Services unit
- Nora Csanyi, European Commission, DG SCIC, Conference Services unit

## **European Sustainable Energy Week:**

- Raffaele Ferrando, European Commission, CINEA, Communication Adviser

## **European Youth Event**

- Guillaume Frison, European Parliament, DG COMM Outreach Unit

# Guidelines on Organising Sustainable Meetings and Events at the Commission

**Nora Csanyi**

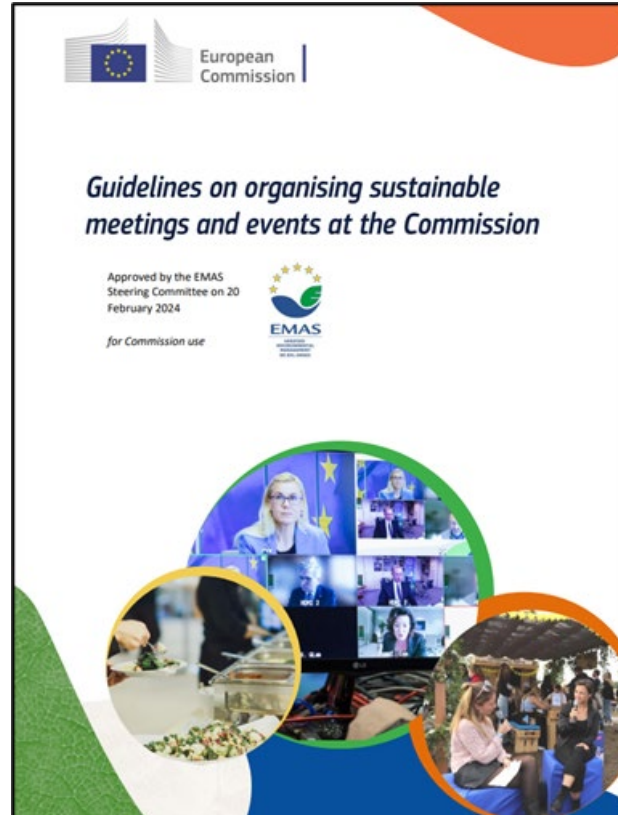
European Commission, DG SCIC,  
Conference Services unit



# Guidelines on Organising Sustainable Meetings and Events at the Commission

Version “for Commission use” with internal links and references available on [Greening the Commission](#) and [SCIC conference wiki](#)

External version available on the [Publications Office portal](#) and on the [Europa website](#) to share with contractors and external stakeholders



# Guidelines composition

- **Main document:** Guidelines on organising sustainable meetings and events at the Commission
- **Annex I:** Checklist with basic and advanced options
- **Annex II:** Eco tips for organisers to minimise an event's digital footprint
- **Annex III:** Example of technical specifications for sustainable catering



# Steps structure

Step 0	Format: physical, virtual or hybrid
Step 1	Venue
Step 2	Transport and accommodation
Step 3	The 5 Rs: rethink, refuse, reduce, reuse, recycle
Step 4	Catering
Step 5	Promotional and printed materials
Step 6	Social aspects
Step 7	Raising awareness

## Step 2: Transport and accommodation



### Basic options

Reduce travel emissions by reducing and targeting the number of people attending in person.

Recommend accommodation close to the venue and easily accessible by public transport, foot and bike.

Encourage sustainable transport by providing participants with relevant information (e.g. maps, timetables)

Recommend participants to use more sustainable transport modes (e.g. train instead of air travel).

To minimise transport needs, promote carpooling or provide green transport (electrical shuttle) in more remote locations.

When flying is the only option, prioritise direct and economy flights.

Apply the same principles when you organise travel for guest speakers.

### Advanced options

Choose hotels with excellent environmental performance (certified through the EU Ecolabel<sup>13</sup> or another ISO 14024 certification such as the Green Key) or hotels that registered to a premium environmental management system (such as EMAS<sup>14</sup>) to evaluate, report, and improve their environmental performance.

Recommend participants to reduce the greenhouse gas emissions from their travel by choosing more sustainable transport options.

Organise local shared transport arrangements (e.g. shuttle buses) to transfer participants from and to airports, field visits and the city centre.

The accommodation you recommend to your participants should be close to the venue or well connected by public transport. Ideally, it should be possible for participants to walk or cycle to the venue. The hotels you recommend should make bikes available to their guests or be located close to a public bike-sharing station. Unfortunately, this is more difficult for more remote Commission sites (e.g. Ispra). For those sites, you could organise a shuttle service for event participants. Use and promote existing carpooling platforms and shuttle services<sup>15</sup>.

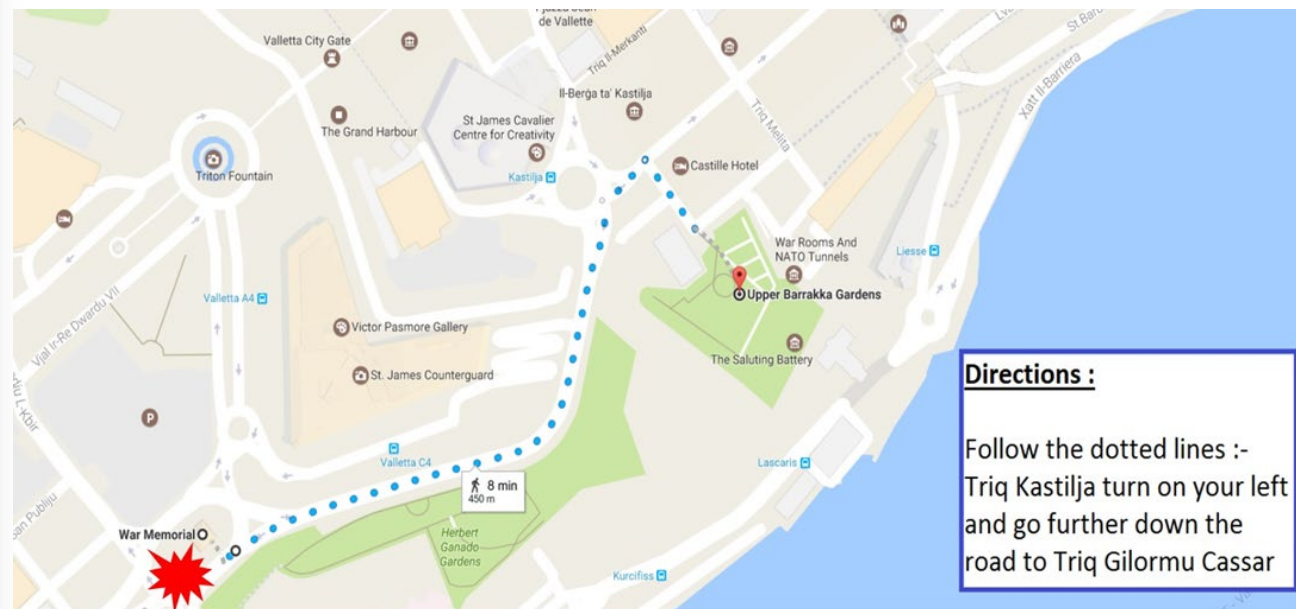
Give preference to hotels that prioritise energy and natural resources efficiency, advanced waste management schemes, sustainable catering and ecological cleaning practices. The EU Ecolabel, the EU official voluntary label for environmental excellence or other ISO 14024 certifications such as the Green Key guarantee that the accommodation meets high environmental standards. EMAS registered accommodations are moreover committed to evaluate, report, and improve their environmental performance. Big hotel chains may more easily accommodate large numbers of guests and provide high-quality and often environmentally certified services. However, smaller hotels with a good environmental performance and corporate social responsibility policies can offer significant benefits to the environment and local communities.

<sup>13</sup> EU Ecolabel - Home (europa.eu)

<sup>14</sup> Eco-Management and Audit Scheme (EMAS) (europa.eu)

<sup>15</sup> Carpooling (europa.eu)

- Basic options
- Advanced options



## Step 4: Catering



### Basic options

Choose preferably a combination of seasonal, organic and fair-trade food and drinks with a short supply chain whenever possible.

Provide a large choice of plant-based food options.

Order less food to prevent waste. Be aware of no-shows: planning for 20% fewer than the registered participants is a safe approach for catering. Adjust the quantities as close as possible to the event date. Offer small portions or plates to encourage participants to come back for more rather than leaving larger half-eaten portions.

Avoid single-use items, especially plastic. Instead, use reusable cutlery and crockery.

Preferably provide water fountains or jugs with glasses or compostable/recyclable cups instead of single-use bottles.

Use alternatives to individual condiment packets, such as self-serve dispensers.

Wherever possible, dispose of organic waste using local waste selection options.

### Advanced options

Whenever possible, propose a full vegetarian or vegan menu option.

If you use an external caterer, give extra points in the selection procedure to certified caterers applying environmental management schemes (e.g. EMAS).

Propose tap water instead of mineral water.

Advertise and promote your sustainable catering efforts on the service tables and through channels like the event website.

Whenever available, ask for certified organic food.

If you use an external caterer, explore the possibility to donate leftover food. Even donating food to animal shelters is better than throwing it out.

If water fountains are available, encourage your participants in the invitation letter to bring their own water bottle.

Make green requirements part of the procurement process for selecting catering companies.

The significant environmental impact of our food choices is becoming more and more evident, and the impact of meat and dairy is higher than that of plant-based dishes (see FAO report 2018)<sup>17</sup>. For virtual or hybrid events, there will be significantly less catering; however, even some catering choices can make a difference, especially if it is visible on screen, like a glass of tap water.

When planning the menu for your event, the first meaningful choice is for healthy food, with moderate meat content and seasonal and/or organic products. A well-planned menu with a wider variety of plant-based food can be nutritionally balanced and tasty. It can also reduce the impact on the environment and benefit participants' health, as shown in several international studies (including EPIC)<sup>18</sup>. Moreover, all health guidance documents (such as from the World Health Organization or the Commission's initiative on Food 2030)<sup>19</sup> underline the need to eat more fruit, vegetables, nuts and whole grains and reduce saturated and hydrogenated fats.

<sup>17</sup>The Food and Agriculture Organization (FAO) of the United Nations report: [Nutrient flows and associated environmental impacts in livestock supply chains. Guidelines for assessment \(fao.org\)](#).

<sup>18</sup> European Prospective Investigation into Cancer and Nutrition.

<sup>19</sup> [Food 2030 initiative](#).



- Basic options
- Advanced options







# Checklist

## Guidelines on organising sustainable meetings and events at the Commission

The main elements that should be considered to significantly reduce the environmental impact when organising an event are presented below. You can complete this checklist to keep a record of how you have taken them into account for a particular event.

Event title: .....

Date: ...../...../.....

Step 0: Format: physical, hybrid or virtual	Yes/No comments
<b>Basic options</b>	
Reflect on the best format for the meeting or event and how people can participate online.	
Meetings: Replace a physical meeting (if appropriate) with an audio or video conference or webinar, possibly supported by Commission collaborative solutions.	
Conferences: To be more inclusive, organise a fully virtual or hybrid conference (in-person and virtual) or a multi-site conference to reduce travel and give participants the option to attend remotely.	
Record the physical event and make it available online (let your audience know beforehand).	
Turn off non-presenting participants' cameras by default.	
Enable live chat.	
Encourage people to zip media files before sharing them.	
Do not send unnecessary emails or share unnecessary files before and after the event.	
<b>Advanced options</b>	
Use a sustainable event management tool, for example, based on ISO 20121 <sup>1</sup> , or opt for suppliers/contractors implementing an environmental management scheme, e.g. EMAS, ISO 14001 or an equivalent standard.	
Adjust the time and location of the meeting or conference to external factors (such as other meetings taking place in the same town, the frequency of scheduled flights, and the possibility of direct transport options).	
Consider organising a more inclusive event: ensure better physical and virtual accessibility <sup>2</sup> .	

Step 1: Venue	Yes/No comments
<b>Basic options</b>	
Consider the venue's proximity to airports, train stations and the city centre; the venue should be easily accessible by public transport, bike and foot and have secure bike parking.	
Prioritise energy efficient buildings: choose venues and accommodation that comply	

<sup>1</sup> ISO 20121 available at: [Greening of events - SCIC Corporate Conference Organisation - EC Extranet Wiki \(europa.eu\)](#).

<sup>2</sup> Accessibility and Inclusion - SCIC Corporate Conference Organisation - EC Extranet Wiki (europa.eu).

- Complete
- Concise

## Eco tips for organisers to minimise an event's digital footprint

To complement the points mentioned under step 0 of the guidelines, organisers may consider the following measures to minimise an event's digital footprint. These can be shared with attendees in a pre-event email and on the event's website.

- Reflect on the best format for the meeting or event and how people can participate online.
- Meetings: Replace a physical meeting (if appropriate) with an audio or video conference or webinar, possibly supported by Commission collaborative solutions.
- Conferences: to be more inclusive, organise a hybrid conference (in-person and virtual) or a multi-site conference to reduce travel and give participants the option to attend remotely.
- Record the physical event and make it available online (let your audience know beforehand).
- Turn off non-presenting participants' cameras by default.
- Lower the video quality when streaming where possible. Switching from high definition or 4K to standard definition can considerably reduce your carbon footprint.
- Enable live chat.
- Encourage people to zip media files before sharing them.
- Do not send unnecessary emails or share unnecessary files before and after the event.

## Example of email/message to participants

**'We also encourage you to do what you can to reduce the environmental impact of your attendance. A few easy steps you can take during and after the event to make a difference are listed below.'**

- Switch off your camera when it is not necessary. This can considerably reduce the carbon footprint of your online presence.
- Reduce the brightness of your computer monitor. Lowering it from 100% to 70% brightness can save up to 20% of the energy used without affecting your experience.
- Switch off your computer when it is not in use: this saves power, improves your computer's performance and helps battery life. Your energy consumption can be reduced by two thirds by simply turning off the monitor.
- Consider unplugging your laptop from time to time, even for a short period, especially if your laptop is fully charged.

- **Reduce your digital footprint**

# Catering



## Technical specifications

<b>Event title:</b>			
<b>Date:</b>			
<b>Address:</b>			
<b>Services' summary:</b>			
<b>When</b>	<b>What</b>	<b>Where</b>	<b>Quantity</b>
<i>e.g. 9:30-10:00</i>	<i>Coffee break</i>	<i>Foyer main room</i>	<i>350</i>
...			
...			

The contractor is required to provide quality food and beverages at the conference above and any staff, material or transport needed to provide this service.

### General

Menus and set-ups need to be adapted to event space and take into account any constraints. The contractor may be required to integrate the catering into space used for other purposes at the event (for example, a mixed catering and exhibition space).

Any catering offer should include an explanation of what action the contractor will take to avoid food waste. For any unavoidable leftover foods or materials, the contractor must propose solutions for disposing of them in a sustainable way, for example, donating them to a local charity or composting/recycling them.

The catering services required for the event include but are not limited to:

- food and beverages;
- tables and chairs or other furniture;
- cutlery and crockery;
- tablecloths;
- dedicated staff to help with last-minute changes or adapt to ad hoc requests;
- accommodating special dietary needs, including gluten/lactose-free, halal, kosher, vegan, vegetarian;
- food labelling (e.g. vegetarian, vegan, lactose-free, gluten-free);
- catering at the event location and off site;

- Detailed specifications
- Breaks, lunch, cocktails
- Wrapping, presentation
- Labelling





# European Sustainable Energy Week winner of the Sustainable Events Awards 2024

**Raffaele Ferrando**

European Commission, CINEA

Communication and Event Management



# European Sustainable Energy Week

- Biggest annual event dedicated to renewables and efficient energy use in Europe, since 2007
- Yearly conference, organised by the European Commission (DG ENER and CINEA)
- Average of 10,000 participants onsite and online in the last three editions
- Mix of sessions, stands and networking activities



# Sustainability measures (1/3)

- **Compensation** of the event's carbon footprint by making a financial investment in a certified sustainable project
  - 571 tonnes of CO<sub>2</sub> in 2024
  - 632.5 tonnes of CO<sub>2</sub> in 2023
- **Catering**
  - Use of organic, seasonal and local food and drink, including plant-based options for onsite catering
  - No plastic single-use items
  - Prevention of food waste via redistribution of leftovers





# Sustainability measures (2/3)

- **Material**

- recycling and upcycling of previous conference material (banners, decorations, badges, etc.)
- paperless event
- no promotional gadgets distributed



- **Awards' trophies**

- made of recycled wood from fallen tree in Belgium
- engraving is done by an inclusivity-minded company employing disabled workers
- every trip made during the trophies production process done by bike




# Sustainability measures (3/3)

- **Logistics**

- EMAS/ISO14001-certified company implementing the event works (service provider)
- EU Green Key eco-label for the venue

- **Communication**

- publicly available on conference website ([EUSEW sustainability measures](#))
- promoted via EUSEW newsletters and social media channels



**Sustainability Measures**  
European Sustainable Energy Week (EUSEW) 2024

The principles of sustainability underpin the thematic focus of the European Sustainable Energy Week (EUSEW) and guide every aspect of the conference's organisation.

The EMAS/ISO14001-certified company implementing the event works in cooperation with the European Commission (Directorate General for Energy and the European Climate, Infrastructure and Environment Executive Agency), adopting a holistic approach to sustainability that takes environmental, social and economic factors into account.

This approach forms the foundation for actions and decisions concerning the following:

- **Venues:** Use of venues ([Charlemagne building](#) and [Martin's Hotel](#)) close to public transport and whose rooms require limited customisation as excessive production of new material. The Martin's Hotel also holds the [Green Key eco-label](#).
- **Catering:** Use of seasonal and local food and drink, including plant-based options for onsite catering. Prevention of food waste via redistribution of leftovers. No plastic single-use items.
- **Suppliers:** A focus on local suppliers for all elements of the conference's logistics, including AV production, decoration, catering and support staff leading to a limitation of the CO2 emissions.
- **Trophies production:** Trophies delivered during the Awards ceremony are produced out of the wood taken from a fallen tree from Belgium. They are levelled, planed and sanded manually. Engraving is done by an inclusivity-minded company employing disabled workers.
- **Carbon offsetting:** The event compensates for its carbon footprint by making a financial investment in a certified sustainable project that reduces carbon emissions and advances the United Nations Sustainable Development Goals for 2030. For the 2024 edition, carbon offsetting of the event was achieved through investment in the 'Macaúbas Landfill Gas Capture' project in Brazil.
- **Decoration and materials:** Conference materials from past events (banners, decorations, badges,

# Key takeaways

- Include sustainability from start (for both the event and the organisation) and at all levels
- Avoid single-use items
- If working with an external provider, include sustainability measures as part of the contract and tasks/services
- Inform speakers and participants
- Communicate to inspire other events



# European Youth Event European Parliament

**Guillaume Frison**

EP, DG COMM, Youth Outreach Unit  
Officer for Communication and Events





European Parliament



# EYE2021 & 2023 as certified sustainable events

Guillaume Frison (*DG COMM Youth Outreach Unit*)  
**EYE 2021 & 2023 Sustainable Development Officer**

# **EYE** *(European Youth Event)*



**Meet and inspire, share and shape ideas on the future of Europe**



**16 – 30 year olds**



**13-14 June 2025,  
Strasbourg and online**



**[eye2025.eu](https://eye2025.eu)**



9-11 MAY

**2014**

5400 participants



20-21 MAY

**2016**

7500 participants



1-2 JUNE

**2018**

8500 participants



8-9 OCTOBER

**2021**

10000 participants



9-10 JUNE

**2023**

8500 participants



# EYE2025

EYE2025, the sixth edition of the EYE, will offer an **interactive and dynamic mix of activities**, debates, workshops, visits, artistic performances and much more – both inside the **European Parliament in Strasbourg** and around the **EYE Village**.





# ISO 20121 – what is it?

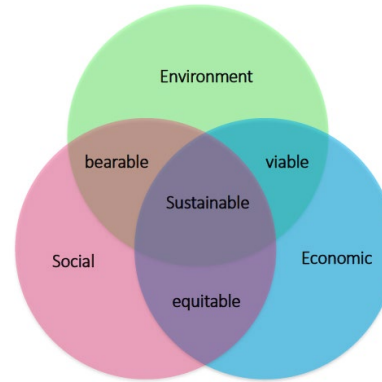
## Event sustainability management systems



International  
standard



Management system



A standard for the whole event industry

### Objectives :

- Identifying key sustainable issues with the contribution/collaboration of the stakeholders and integrating them to the organisation
- Giving a framework to develop co-responsibility

The guiding principle is: continuous improvement

Systèmes de management responsable  
appliqués à l'activité événementielle

**Exigences et recommandations  
de mise en œuvre**

E : Event sustainability management systems — Requirements with guidance  
for use

D : Nachhaltiges Veranstaltungsmanagement — Anforderungen mit Anleitung  
zur Anwendung

### Norme française homologuée

par décision du Directeur Général d'AFNOR le 11 juillet 2012 pour prendre effet  
le 11 août 2012.

### Correspondance

Le présent document reproduit intégralement la Norme internationale  
ISO 20121:2012.

### Analyse

Le présent document spécifie les exigences applicables à un système  
de management responsable appliqué à l'activité événementielle pour tous les types  
d'événements ou activités événementielles, et fournit des directives relatives  
à la mise en conformité à ces exigences.

### Descripteurs

Thésaurus International Technique : gestion, développement durable,  
organisation, planification, processus, mise en œuvre, exigence, contrôle,  
mesurage, audit de qualité, évaluation, personnel, qualification.

### Modifications

### Corrections

# ISO 20121 – continual improvement

## The Deming's cycle or PDCA cycle



### Improving your performance

- Providing a vision
- Mobilizing stakeholders
- Launching the Action Plan
- Enhancing processes or setting up new processes
- Capitalizing and improving



### Being recognized as a sustainable organisation

- ISO International Standard Organisation
- Independent certification

# ISO 20121 – the methodology

## Inside

1. Collecting information about previous events, keeping best practices and pointing out what you want to avoid
2. Identifying your impacts and the solutions -> actions
3. Writing the Policy of the event/the organization
4. Building your action plan with the KPIs

6. Mobilizing the teams and the contractors to facilitate the measurement and evaluation of actions

7. Assessment

## Outside

1. Interviewing your stakeholders
5. Communicating about your approach with all your stakeholders : raising awareness of the future participants

8. Sharing the results

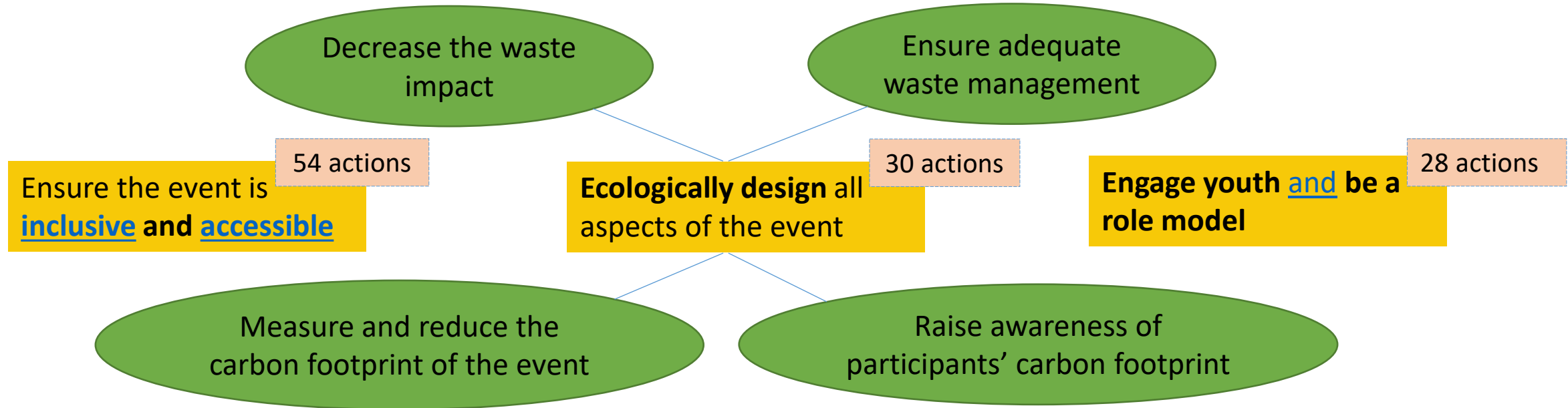
Before

During

After

# EYE Sustainable Development Policy

[Link to Sustainable Development policy](#) (in detail)



Philipp Schulmeister  
Director for Campaigns, DG COMM

# Decrease the waste impact

## 1. Catering

1. Provide only reusable cutlery and serve meals in jars (inside)
2. Reuse or recycle remaining waste outside
3. Donate left-overs

## 2. Water consumption

1. « Bring your own bottle » communications
2. Provide glasses inside the EP, eco-cups in the Village
3. Provide water fountains in the Village connected to municipal systems
4. Install dry toilets

## 3. Logistics

1. Reuse at least 2/3 of the banners produced for EYE2021

## 4. Give aways

1. Clear goodies policy
2. No printed programme
3. Backpack with sustainable label
4. Use leftover wristbands for other EP events (possibly next EYE events)



# Ensure adequate waste management

## 1. Processes

1. Provide volume or weight of the waste of the EYE event
2. Have as much as possible the same waste streams inside the EP and in the Village
3. Provide organic waste sorting solution outside the European Parliament
4. Work with Ecomanifestation Alsace on waste prevention, awareness raising on waste production, reduction and management
5. Clear waste sorting guidelines

## 2. Engage participants and volunteers

1. Include waste management/sorting in the tasks of all volunteers
2. Train volunteers on waste management (awareness & good practices)



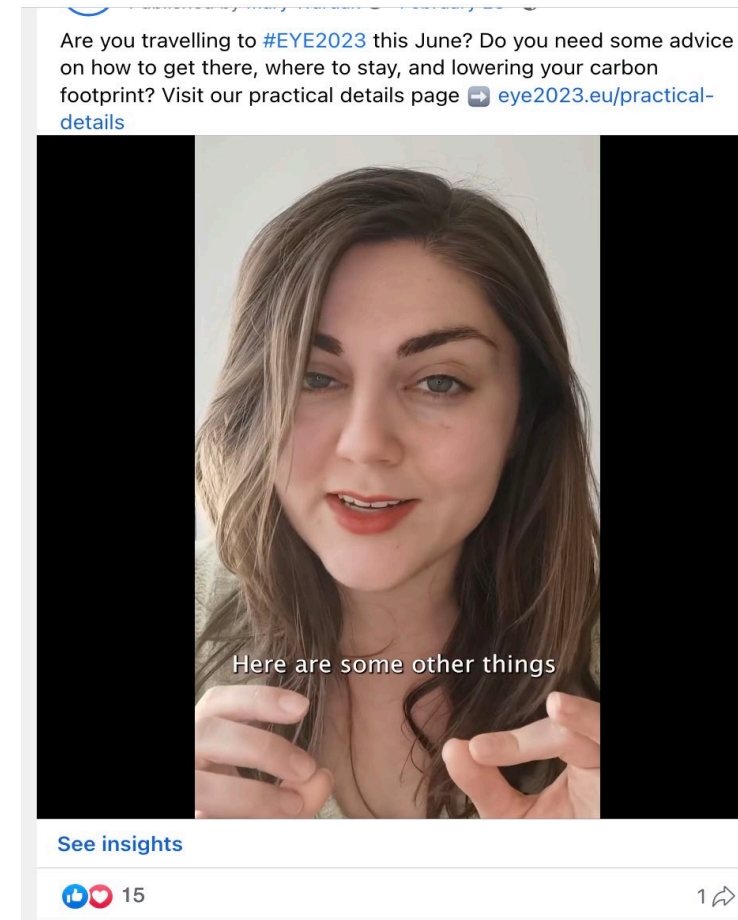
# Raise awareness of participants' carbon footprint

## 1. Communication

1. Promote sustainable transport for the participants including but not limited to 3-day pass sold by the CTS).
2. Inform participants about the impact of their choices on the overall ecological impact of the event ([link](#))

## 2. Programme

1. Involve Ecomanifestation Alsace on awareness-actions on environmental impact of event for grantees



# Measure and reduce the carbon footprint of the event

## 1. Data collection

1. Improve the data collection template developed for EYE2021 to enhance the measurement of the carbon footprint and share it with all contractors, subcontractors and grantees
2. Use the registration process in EP Events to collect participant's data on transportation

## 2. Local transport

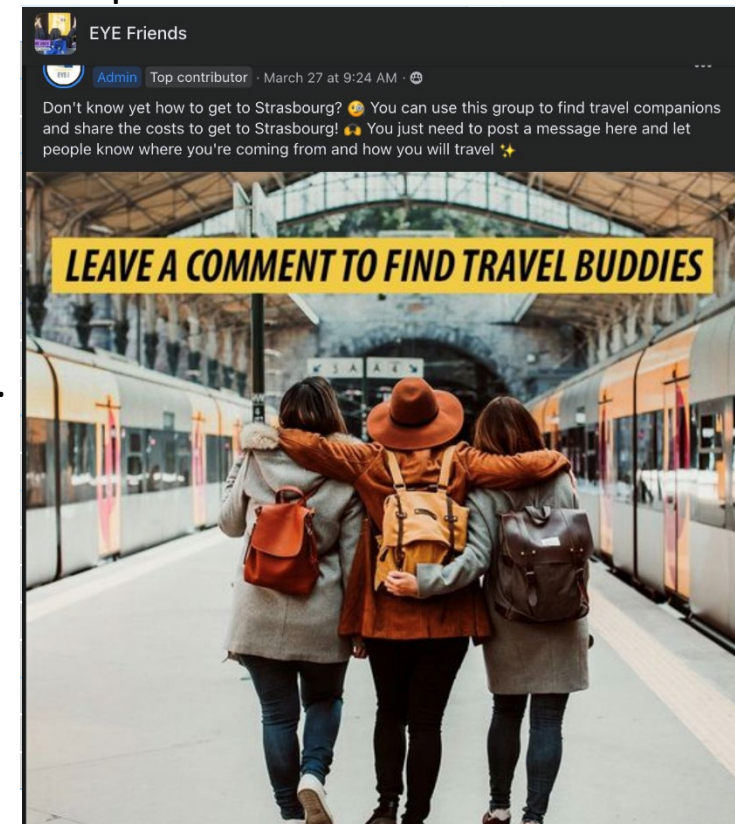
1. Provide a parking for those groups of participants arriving by bus
2. Provide enough secured parking for bicycles close to EYE Village

## 3. Catering

1. Have 2/3 of the catering options outside the canteen plant-based/Veggi.
2. For meat options inside and outside the canteen, no red meat.

## 4. Communication

1. Write a post on Facebook encouraging participants to get in touch with each other to set transportation sharing options





# Challenges for EYE2025

1. Reduce environmental impact (waste, carbon-footprint) now that we have data for two events
2. Organise the catering in the Village to ensure financial sustainability for caterers, affordable prices for participants, while reducing waste (cutlery, eco-cups)
3. Have water fountains that keep the water cold
4. Take measures against the heat, while keeping the sustainability impact low
5. Simplify the continual improvement process

# STAY IN TOUCH



- ✉ • [youth@ep.europa.eu](mailto:youth@ep.europa.eu)
- f • European Youth Event
- 📷 • [ep\\_eye](#)
- X • [europarl\\_EYE](#)



European Parliament



# Thank you for your attention!

## References

- [Guidelines for Sustainable Events](#)  
(external)
- [Guidelines for Commission use](#)
- [EUSEW](#)
- [EYE](#)

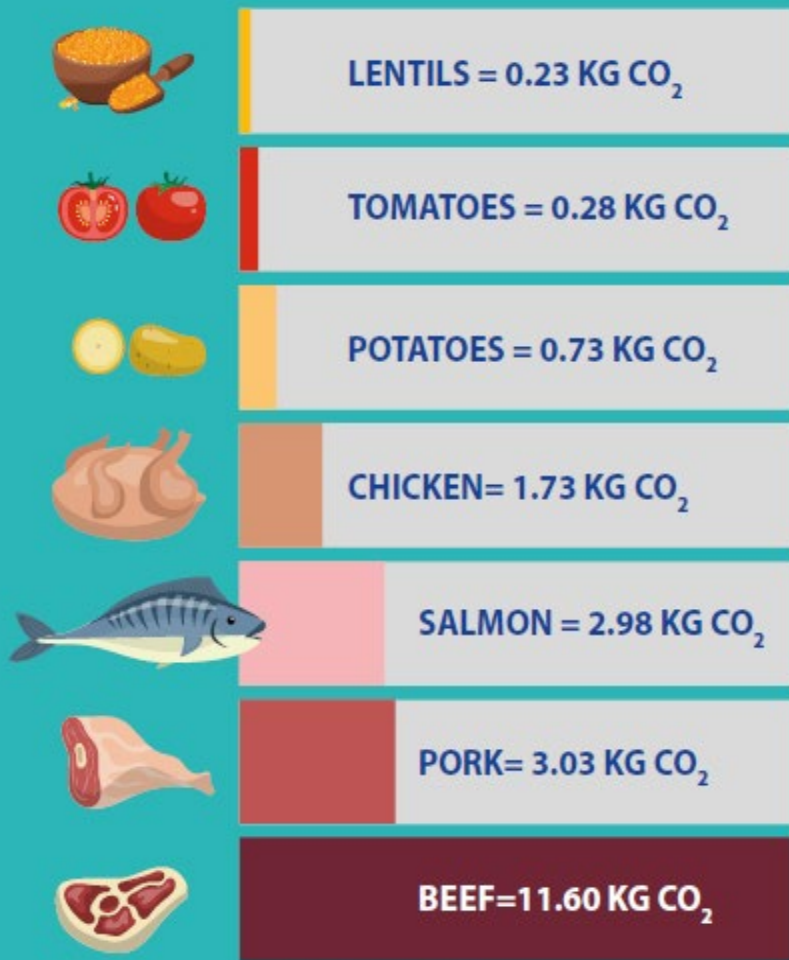
**Contact: [SCIC-EMAS@europa.eu](mailto:SCIC-EMAS@europa.eu)**

# EXTRA SLIDES



# Co<sub>2</sub> emissions of food

Half a plate (250grams) of...



KG CO<sub>2</sub>/250 GR

All calculations are based on average values in standard emission factors.

# Co<sub>2</sub> per means of transport



CO<sub>2</sub> emissions (kg) per person (one-way journey)



## WHAT CAN YOU DO WITH 1 KWH OF ENERGY?

LIGHT UP 4 HALOGEN LIGHT BULBS FOR 6 HOURS

LIGHT UP 4 LED LIGHT BULBS FOR 36 HOURS

LIGHT UP 1 LED DESK LAMP FOR 200 HOURS



SEND 300 EMAILS WITH ATTACHMENTS

SEND 8,300 EMAILS WITHOUT ATTACHMENTS





European Youth Event @Europarl\_EYE · May 2

Are you coming to #EYE2023? Do you have some tips on how to be more sustainable ahead of and during the event? ❤️

Share your ideas in the EYE Friends Facebook group 😊 The best ideas receive a surprise from us at the event in Strasbourg! 🏆

➔ [facebook.com/groups/eye2023...](https://facebook.com/groups/eye2023...)

**SHARE YOUR BEST IDEAS**

**ON HOW TO BE MORE**

**SUSTAINABLE AT EYE2023**



↻ 5

❤️ 14

📊 672



European Youth Event

Admin Top contributor +1 · June 1 at 11:03 AM · 🌐

Here are some sustainable tips our #EYE2023 participants shared with us!

- 🌱 Keep your notes on a sustainable notebook (made of recycled paper)
- 🌱 Buy local
- 🌱 When eating out, take only what you are sure you can eat in order to avoid food waste
- 🌱 ... See more



# Ensure inclusive access to activities

1. Communication
  - inclusive writing for the programme
  - digital accessibility of the website, registration platform, programme
  - communication with participants in 6 languages
  - 24 in the Hemicycle and 6 in most other activities
  - sign language in offline and online activities, speech to text for Hemicycle activities
  - Helpline
  - Induction loops in the Village and headsets inside the EP
2. Wheelchairs made available and adapted van shuttle
3. Team of volunteers to support disabled participants



# Ensure inclusive access to activities

## 1. Logistics

1. Quiet room inside the EP building
2. Gender neutral toilets
3. Prayer room
4. Health and safety officer on-site from assembly to dismantling
5. Charging facilities

## 2. Catering

1. Propose affordable food options
2. Communicate clearly on the availability of non-alergenic food options
3. Communicate about the possibility to bring your own food
4. People with a disability and from less priviledged backgrounds hired to support catering services

# Ensure inclusive access to activities

1. Call for applications for groups with disadvantaged background to receive a financial contribution (+ webinar to explain the call)
2. Strong code of conduct to prevent any harrassment during the event, both at the event and online, together with the presence of a mediator
3. Sanitary plan

# Engage youth and be a role model

## 1. Sustainable procurement

1. Include additional SD objectives in the call for tender and proposal
2. Organise a workshop with grant beneficiaries on sustainability

## 2. Feedback from participants

1. Promote stories: call to participants about sustainability interesting stories ([link](#))
2. Get more suggestions from the feedback questionnaire: ask more questions related to sustainability (survey on the spot and after event)
3. Set up a platform where participants can give their feedback on sustainability, security etc. for instance with a QR code to fill in on the spot a feedback or survey, or a QR code to evaluate a specific activity

## 3. Communication

1. Communicate at strategic event locations (accreditation centre, catering, other queuing locations), with a specific design (signs, no text) on all sustainable actions, incl. on the 3 pillars of sustainability

## 4. Programme

1. Put in place a Green Track to feature environment-related activities organised by the European Parliament, partners and youth groups alike
2. Have a stand dedicated to EMAS