

Esports Events Environmental Sustainability 2022 Gamers Assembly's Carbon Footprint Estimation

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01

Context

Climate Change (Global Warming) Impacts

- Biodiversity Loss
- Extreme Weather Events
- Deforestation
- Air Pollution
- Melting Ice Caps & Sea Level Rise
- Food & Water Insecurity...



Negative Impact of Internet (Morley, Widdicks & Hazas, 2018) and Video Games (Mills et al., 2019)

- **Network and data center consumption is growing**
- **Data traffic is growing** (from 100 GB per second in 2002 to 26,600 GB per second in 2016)
- **Internet Pollution** accounts for almost 3.7% of all global gas emissions
- Cloud Gaming uses **156% more energy compared to local gaming**
- Consoles and PCs rely on **mined rare materials for production** (copper, nickel, gold, zinc, lithium, etc.)
- **Planned obsolescence** adds to the global e-waste problem (New console generations are released every five to 10 years)

Little is known about Esports Environmental Impact (Nyström et al., 2021)

- **Online Events** (Remote)
 - Same as Gaming
 - +
 - Internet Pollution and Data traffic
 - Electricity to Power Servers
- **Offline Events** (In-Person)
 - Same as Online Events
 - +
 - Electricity, Water, Food, etc.
 - Accommodating Players, Staffs, Officials, Spectators, etc.
 - Transportation of People & Equipment
- **Broadcast & Streaming**



**Esports environmental impact adds
to the global environmental destruction**

The background features several large, overlapping geometric shapes in various shades of green, including triangles and polygons, scattered across the white background. A central green quadrilateral contains the number '02'.

02

Objectives



01

Conduct an exploratory study to **estimate the carbon footprint of the biggest LAN in France**

02

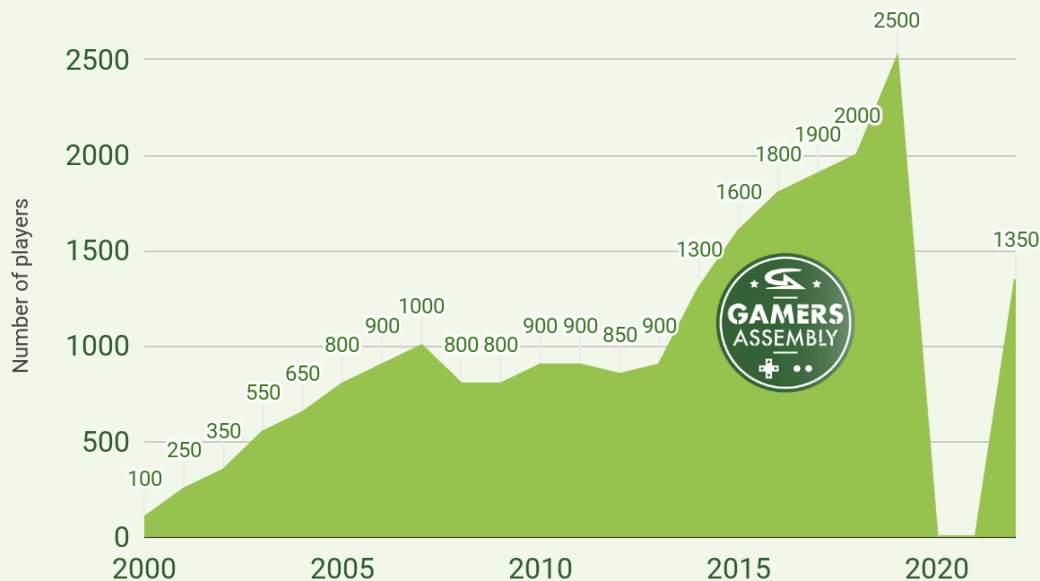
Raise awareness among the esports communities through communication during the event

03

Launch **initial reflections and action plans** regarding esports environmental impact

About the Gamers Assembly

Evolution of the number of Players from 2000 to 2022



22

Editions

2000 First Edition
2020 Cancelled
2021 Online



Poitiers

Easter Weekend (April)
Annual

2022

1349 Players
442 Volunteers
14260 Visitors





03

Method

- **Exploratory Study**

- Scope of the **analysis limited to players, staff and volunteers** (n = 1,944)
- **Only mobility Carbon Footprint** has been estimated (i.e., travels and transportation)

- **18-Question Survey**

- Transportation used to come to the event
- Distance between accommodation & venue
- Mode of transportation during the event
- Number of people involved in the travel mode
- Sociodemographics

- **Data Collection (16-29 April 2022)**

- **URL Link on Twitter** at the beginning and the end of the event
- **QR Code displayed in the venue** during the 3-day event
- **URL Link emailed** 10 days after the event

- **Data Analysis**

- Descriptive Statistics
- Flat & Cross Sorting





04

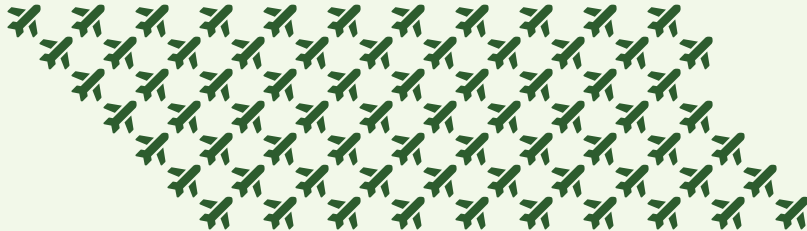
Findings

- **Response Rate / Population Reached**

- 328 Questionnaires collected ($N_{\text{total}} = 1944 \Rightarrow$ Response Rate = 17%)
- This represents 920 respondents (“For how many people are you completing the survey?”)
- **Population Reached = 47%**

- **Total Mobility Carbon Footprint Estimated = 72 Tons of CO₂ Equivalent**

- **“Long-Distance Travel” = 66 Tons of CO₂ Equivalent**
 - i.e., Participants' travels to and from the event
 - Due to some answers' inaccuracy, we had to do some estimations
- **“Local Mobility” = 6 Tons of CO₂ Equivalent**
 - i.e., Participants' travels to and from their accommodation to the venue during their stay



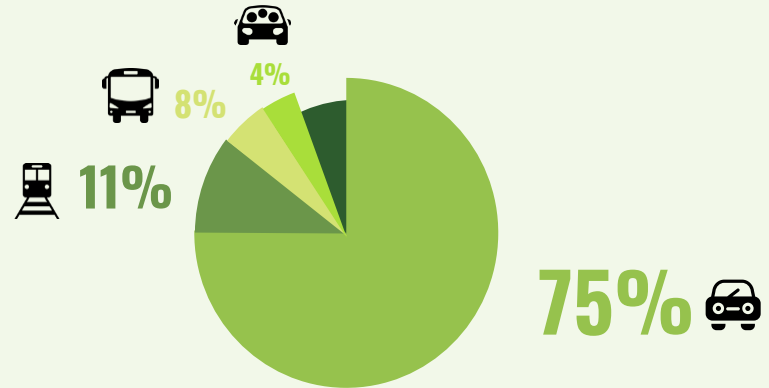
**1 Ton of CO₂ =
1 Paris-NYC Flight (way & return)**

- **Long-Distance Travel**

- **More than 55%** of the participants traveled **more than 500 km** round trip = **85% of the CO₂ emitted** during the travel to and from the Gamers Assembly
- **6%** of the participants traveled **more than 1200 km** round trip (Switzerland, Germany, Sweden)

- **Long Distance Transportation Mode**

- **75%** of participants came by **individual mode of mobility**
- **Car is the most widely used** mode of transportation (75%)
- Avg number of **people per vehicle = 2.5** (i.e., "fill rate" of 50%)



- Local Mobility

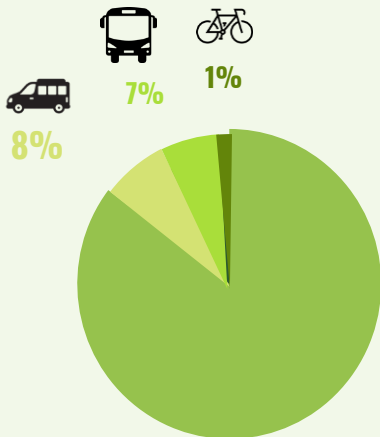
87%

of respondents **stayed 3.5 days** in Poitiers and its surroundings

66%

of these respondents had an accommodation **within a radius of 8 km or 10 min travel time**

- On-site Transportation Mode



Only 7% of those who used carbon emitting mobility used a **public transportation**

84%





05

Recommendations



- **Long-Distance Travels**

1. Favor **collective and public transport** solutions, in particular the **train**
2. Set up **adapted and specific carpooling** solutions (e.g., with an app)
3. Propose on-site **PC equipment rental solutions**

- **Local Mobility**

1. Encourage **short distance carpooling** solutions
2. Set up **public transportation adapted to the specific needs** of the event's population (schedules, destinations, etc.) => e.g., busses, shuttles, etc.
3. **Bicycles or scooters rentals** solutions





To capitalize on this first exploratory study, we recommended to carry out this research **recurrently** to:

1. **Raise the awareness of esports stakeholders and communities** who are not expecting to be exposed to the subject of eco-responsibility
2. **Increase the level of confidence** in the estimates
3. **Broaden the scope** of the study
4. **Monitor the impact of implemented action** plans



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06


**Research
Perspectives**

Need to define **how to integrate into the scope of the study** the impact of:

1. **IT equipment** (e.g., networks, servers, etc.)
2. **Food** offered by the event organizer (i.e., catering)
3. **Energy** (i.e., water and electricity)

The challenge is to define the processes for collecting and/or estimating of data.

Overall, this first study demonstrates the **need to raise awareness and "educate" the esports stakeholders and communities**. This could be achieved through 3 levers:

1. **Pedagogy** (e.g., regular communication, conferences, etc.)
 2. **Recurrence** (i.e., reiterate the data collection every year)
 3. **Reward Systems** (e.g., LAN Tickets, jerseys, equipment, etc.)
- 

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Thanks!

Do you have any questions?

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