



Digital Carbon Footprint Calculator

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Digital Carbon Footprint Calculator

Target: Faculty, Support staff, Students

Suggested uses:

- **Teaching activities**, to illustrate concepts related to digital sustainability, carbon footprints, and environmental impact assessment in an interactive and practical way.
- **Outreach activities**, to engage the wider community, raise awareness about the environmental consequences of digital technologies, and encourage the adoption of more sustainable behaviors.

Context: Why This Matters?



Climate change is one of the most urgent global challenges

- **Greenhouse gas** emissions caused by human activities are the main driver of **global warming**.
- The **digital sector**, though often overlooked, already accounts for around **2–4% of global GHG** emissions and is expected to keep rising.
- **Measuring** these environmental impacts is essential to **raise awareness and to take action** to mitigate the problem.

What is a Carbon Footprint Calculator?

A **Carbon Footprint Calculator** is a tool designed to **estimate the greenhouse gas emissions** generated by **human activities**. It translates **everyday actions** – such as energy use, transportation, consumption, or digital practices – into **CO₂ equivalents**, making invisible impacts measurable.

It serves two main purposes



Quantification

providing an estimate of emissions based on user data.



Awareness

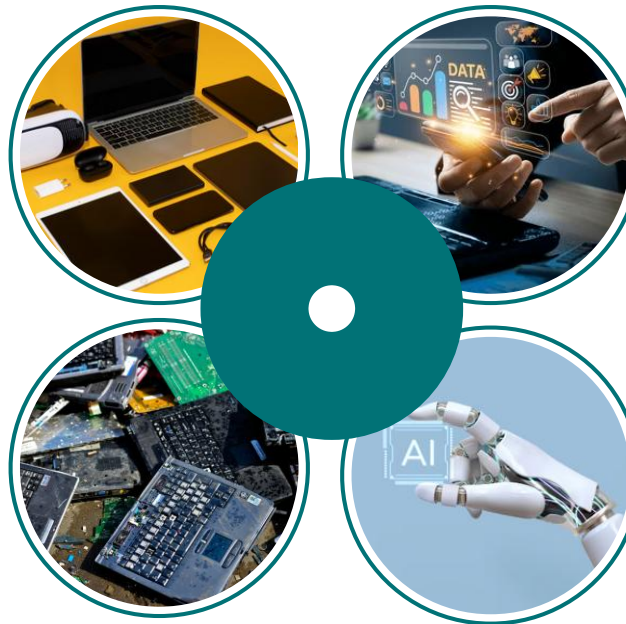
helping individuals understand their footprint and fostering more sustainable practices.

Digital Carbon Footprint Calculator

The Digital Carbon Footprint Calculator is structured into four main dimensions.

Devices – includes production and transport phase. It also considers lifespan, purchase condition (new or used) and ownership (shared or personal)

E-Waste – evaluates different end-of-life scenarios, distinguishing between disposal, recycling, reuse, and storage at home.



Digital Activities – measures the impact of online practices such as email, videoconferencing, streaming, cloud storage, and the use of learning platforms.

Artificial Intelligence – includes emissions from the inference phase of AI-based tools, which are increasingly relevant in academic and research contexts.

Digital Carbon Footprint Calculator

The Digital Carbon Footprint Calculator is **adapted to different user profiles** to provide a more **personalized** experience (student, faculty, support staff)

Core formula:

$$CO_2e = EF \cdot Q \cdot F_{\text{scaling}}$$

- **Emission Factor (EF)** → coefficient for the amount of GHG per unit of activity.
- **Activity Quantity (Q)** → user-provided level of use.
- **Scaling Factor (F_s)** → converts all data to an annual basis.

Example: CO₂e E-mails = (Average number of e-mails per day) × (EF per 1 email) × (Working days per year).

Emission factors are from authoritative sources such as *Ecoinvent v3.11*, *Base Carbone® v23.7 (ADEME)* and peer-reviewed academic literature.

Digital Carbon Footprint Calculator

Results provided to users:

- The **annual carbon footprint**, compared with the average of the same category.
- **Tangible equivalences**. (e.g. your carbon footprint is equal to producing X burgers).
- **Personalized tips** and **good practices** tailored to the user's digital profile.

USER, before you discover your full Digital Carbon Footprint, take a guess!

Based on the area where you think you have the biggest impact, which digital archetype matches you best?

Lord of the Latest Gadgets



Devices

Choose

Prompt Pirate, Ruler of the Queries



Artificial Intelligence

Choose

Guardian of the Eternal E-Waste Pile



E-Waste

Choose

Master of Endless Streams



Digital Activities

Choose

Digital Carbon Footprint Calculator

<https://digitalcarbonfootprintcalculator.azurewebsites.net/>

