

AI and the Carbon Footprint

SMaiLE Project

Key Information

Target Group: 13 - 16 y.o.

Duration: 3 Weeks (55 min/session)

Key Learning Goals:

1. **Scientific Understanding:** Explain carbon footprints and AI energy consumption.
2. **Digital Awareness:** Evaluate environmental impact of digital habits.
3. **Critical Thinking:** Debate ethical AI use regarding the environment.
4. **Creative Solutions:** Propose AI solutions for reducing ecological footprints.

Learning Outcomes

By the end of the project, students will be able to:

KNOWLEDGE & UNDERSTANDING:

- Explain "CO₂ equivalents" and data center energy consumption.
- Understand the energy and water costs involved in AI operations.

SKILLS & ABILITIES:

- Compare energy costs of digital actions (email vs. AI training).
- Work in teams to brainstorm sustainable solutions.
- Present sustainable AI-based ideas clearly.

ATTITUDES & VALUES:

- Demonstrate responsibility for digital habits.
- Appreciate the role of innovation in sustainability.

European Dimension / Erasmus+ Connection

- **Digital & Ecological Citizenship:** Building responsible digital citizens.
- **Transnational Challenges:** Comparing energy data across borders.
- **Innovation:** Encouraging creative technical solutions for green goals.



1. Resources and Tools

- **Research:** ChatGPT, Carbon Calculators.
- **Collaboration:** Padlet, Mind Mapping software.
- **Materials:** Mission Sheets, Tablets/Laptops.
- **Video:** "The hidden cost of your digital life".

Activity Overview

Phase	Time	Activity
Intro	20 min	The Cloud is on Earth: Video and discussion on data centers and physical infrastructure.
Research	35 min	Guess the Impact: Researching and matching digital activities to their CO ₂ emissions.
Creative	55 min	AI Solutions Mission: Designing AI-based solutions for green living (e.g., smart energy).
Reflection	20 min	Evaluation: Presentations, Padlet reflection, and final assessment.

2. Introduction: The Invisible Cost

Goal: Visualize the physical internet.

- **Activity:** Watch a video about data centers.
- **Discuss:** "Where does the 'Cloud' live?" "Why do servers need cooling?"

3. Research: Guess the Impact

Goal: Understand carbon footprints.

- **Task:** Students research the emissions of various activities.
- **Comparison:** Watching HD video vs. Sending an email vs. Training a large AI model.
- **Tool:** Use ChatGPT to find estimates.

4. Creative: AI Solutions Mission

Goal: Innovation for sustainability.

- **Group Work:** Teams invent 2 AI-based solutions to reduce impact.
- **Prompts:**
 - Smart AI to optimize home energy.
 - AI to reduce food waste.
 - AI ride-sharing algorithms.
- **Output:** Create a collaborative Mind Map.



5. Reflection and Evaluation

Goal: Personal responsibility.

- **Presentations:** Teams share their solutions.
- **Padlet Reflection:** "What surprised me?" "What action will I take?"
- **Assessment:** Complete the final student workshop evaluation.