



Thematic Sheet 5/6

ENERGY CONSUMPTION AND CO2 EMISSIONS

Sec. I and II

Eduki Competition 2025/2026

Interconnected : human – digital - sustainable

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E) ENERGY CONSUMPTION AND CO2 EMISSIONS

Sustainable consumption and resource management, dependency, digital infrastructures, renewable energies

INTRODUCTION TO THE TOPIC

The rise of digital technology relies on an invisible, yet highly energy-intensive infrastructure composed of data centers, telecommunications networks, production chains, and the daily use of devices. This high electricity consumption is accompanied by significant CO2 emissions, which vary depending on the energy usage of producing and consuming countries. While digital technology offers solutions to reduce the carbon footprint in certain sectors (such as energy optimization, smart mobility, and resource management), it itself represents a growing source of air pollution and pressure on electrical grids.

This topic aims to explore the **effects of digital technology on the balance between innovation and sustainability**, both positive and negative, and to seek ways to **reconcile technological development with emission reductions to limit the digital sector's impact on the global climate**.

TO START THE DEBATE

This sub-theme can be approached from different angles. Here are some possible directions:

→ **Consumption, dependency and sustainable resource management :**

- What is the actual share of global natural resources consumed by the digital sector?
- Have we become too dependent on certain minerals or specific regions of the world to meet our technological needs?
- How can we encourage more responsible and restrained digital consumption among citizens and businesses?

→ **Digital infrastructures:**

- How much energy is consumed by data centers and telecommunication networks worldwide?

- Should the expansion of digital infrastructures be regulated or, on the contrary, encouraged to support innovation?
- Do inequalities in access to these infrastructures exacerbate social and geographic divides?

→ Renewable energies:

- Are data centers and large tech companies investing enough in green energy sources?
- Will renewable resources be sufficient to meet the growing demand of the digital sector, or will fossil fuels still be needed?
- What energy transition models would be most realistic to reconcile digital growth and sustainability?

SOME KEY STATISTICS

- In 2022, data centers worldwide consumed between 240 and 340 TWh (terawatt-hours), accounting for about 1 to 1.3% of global electricity demand. By 2024, this consumption rose to nearly 415 TWh, representing approximately 1.5% of the world's electricity consumption ([International Energy Agency, 2023](#)).
- The IEA (International Energy Agency) estimated that by 2030, this demand is expected to reach around 945 TWh, nearly 3% of the global electricity demand. This increase is linked to the consumption of facilities for Artificial Intelligence (one facility consumes approximately the same amount of electricity as 100,000 households) ([strategic energy europe, 2025](#) ; [International Energy Agency, 2025](#)).
- Between 2017 and 2023, the energy consumption of major data centers increased by nearly 150% ([Swissinfo, 2025](#)). However, a study by the University of Lucerne shows that an energy-saving potential of up to 46% is achievable in these facilities ([Swissinfo, 2024](#)).
- In 2022, renewable energies accounted for nearly 27% of Switzerland's energy consumption, with 30% of that coming from biomass or the biogenic fraction derived from waste. In households, 20% of electricity came from renewable sources, 8% from solid biomass, 2.2% from distributed renewable heat, and 1.1% from solar thermal energy ([IEA Bioenergy, 2024](#)).
- By 2050, Switzerland aims to produce up to 45 TWh per year from renewable energy sources, whether solar, biomass, or wind – which would represent about 60% of the estimated electricity demand ([ETH Zürich, 2025](#)).

However, digital technology can also play a positive role in energy consumption and CO2 emissions:

- It could promote cleaner and better-regulated consumption, thereby contributing to increased sustainability.

- It could enable the recovery of heat produced by data centers to power heating systems.
- It can also contribute to the development of green energies.

... And your students, what do they think?

DID YOU KNOW? (CASE STUDY)

Innovate to protect: "greening" a data center

→ An original example of reusing energy from a data center

In Geneva, in 2025, a data center was inaugurated with an innovative system to valorize the electricity consumed: the heat generated by its servers is recovered and redistributed through the district heating network, providing warmth to nearly 6,000 households in the city. A similar project was already tested in 2022 near Zurich, where the heat from a data center was used to heat the neighboring district.

SOME NON-EXHAUSTIVE PROJECT IDEAS

CATEGORY: ARTWORK

Project idea	Description
Photo montage– « <i>How Energy Consumption Shapes Our Daily Lives</i> »	Reflect on how energy consumption influences our daily lives, both positively and negatively.
Mural painting– «<i>The Energy Future of Our School</i>»	Students create a mural representing their vision of a sustainable school.
Photo montage – «<i>Before and After: My Energy Consumption</i>»	Students create a photomontage comparing their lifestyle before and after adopting more energy-saving habits.
Theater – «<i>The Journey of a Drop of Water</i>»	Students write and perform a play telling the story of a drop of water, illustrating the effects of energy consumption on natural resources and CO ₂ emissions.

CATEGORY: MEDIA CREATION

Project idea	Description
Video Awareness Campaign – «<i>Reducing CO₂ Emissions</i>»	Create a series of videos to be shared on social media and at school, explaining simple actions to reduce energy consumption.

Video Report– «Visit to a Local Power Plant»	Students produce a video report after visiting a local power plant.
Social Media Campaign– « Zero Emission Challenge »	Students launch a campaign on social media inviting their peers to take on a CO ₂ emissions reduction challenge.
Podcast – «Renewable Energies Explained to Youth»	Students produce a podcast series in which they interview various Swiss experts to explore different forms of renewable energy.

CATEGORY: CONCRETE ACTION

Project idea	Description
School Energy Audit – «Is My School Consuming Too Much?»	An energy audit of the school, identifying consumption sources and possible improvement ideas.
Workshop – « Give Your Devices a Second Life »	Create a repair workshop for technological devices.
Car-Free Day – «Breathe Without CO₂ »	A car-free day at school, in the neighborhood, etc.
Awareness Campaign – «Save the Planet»	Awareness campaign within the school community.
Sustainable School Garden – « Growing Together »	Students commit by creating a collective vegetable garden within the school.

DRAW IDEAS FROM PREVIOUS WINNERS OR OTHER EXISTING PROJECTS

- [Hive'Five](#) - Blaise-Cendrars High School (Françoise Demole Award 2024)
- [Déetective-énergie](#) – CO Vuillonex, GE

USEFUL RESOURCES

WEBSITES

Title	Description
WWF – Ecological Footprint Calculator Link	This calculator helps assess our ecological footprint to raise awareness and encourage the adoption of more sustainable habits.

SDG 12: Responsible Consumption and Production Link	The 2030 Agenda for Sustainable Development defines Sustainable Development Goal (SDG) 12 as establishing sustainable consumption and production patterns. Switzerland is making every effort to achieve the goal and its targets by 2030.
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PRESS ARTICLES

Title	Description
Switzerland Has Been Living on Energy Credit since Tuesday Link	Switzerland has exhausted all its natural resources for the rest of the year, mathematically speaking.
Swiss CO₂ Emissions: Small country, big footprint Link	Although Switzerland's «territorial» emissions have declined since 1990, the carbon footprint related to its consumption — including imported emissions — is one of the highest in the world per capita.

EDUCATIONAL RESSOURCES

Title	Description
Consomm'action Link	This is a guide for responsible consumption (in french).
The School Garden: A Key Space for Education on Sustainability Link	This guide (in french) aims to support school leaders and teachers in the canton of Vaud in developing their project by gathering tools, resources, and examples from within the region.