Training Fiche Template

Title	**PROTECTING THE ENVIRONMENT**
Keywords	CLOUD, SOCIAL NETWORK, CO2, ENVIRONMENT, DIGCOMP
Language	EN
Competence area	**1. Information and Data Literacy** Competences ☐ Media Literacy ☐ Browsing, Searching and filtering data, information and digital content **2. Communication and Collaboration** Competences ☐ Engaging Citizenship through digital technologies ☐ Interacting with digital technologies for entertainment and culture **3. Digital content creation** Competences ☐ Developing digital content **4. Safety** Competences ☒ Protecting the environment ☐ Preventing and recognize fake news ☐ Protecting health and well-being **5. Problem Solving** Competences ☐ Creatively using Digital Technologies
Objective and Goal	Objectives of this Training Module are: ✔ explore the PROTECTING THE ENVIRONMENT competence of Digicomp 2.2. ✔ Analyse the impact of Digital Pollution. ✔ Provide tools to acquire skills to use digital tools in an environmentally friendly way.

Learning outcomes	At the end of this module, you will be able to
	➢ recognise simple environmental impacts of digital technologies and their use.
	➢ learn different ways to protect the environment from the impact of digital technologies and their use.
	➢ discuss ways to protect the environment from the impact of digital technologies and their use.
	➢ choose the most appropriate solutions to protect the environment from the impact of digital technologies and their use.
Contents arranged in 3 levels	**1. PROTECTING THE ENVIRONMENT in DIGCOMP** 1.1. DIGCOMP 2.2 DigComp is the framework developed on behalf of the European Commission to better detail digital competence. A process that began in 2010 through conceptual mapping, case study analysis, online consultations, expert workshops, stakeholder consultations, and concluded in 2022 with the updated version of DigComp 2.2. DigComp 2.2 represents an educational tool that allows students to learn the basic concepts of computer science and digital electronics in a practical and interactive way. 1.2 PROTECTING THE ENVIRONMENT Protecting the environment' is one of the digital competences described by the Framework and represents competence 4.4, included in competence area 4 called 'Safety'. In this context, protecting the environment refers to the ability to use digital technologies in a sustainable and eco-friendly manner in order to reduce environmental impact and promote the protection of natural resources. Environmental protection skills in DigComp 2.2 include knowledge of sustainability concepts, the ability to use technologies to reduce greenhouse gas emissions, awareness of the environmental impact of one's own digital activities and the ability to adopt sustainable practices in daily work. These skills are essential for a responsible and sustainable digital culture that takes into account the impact of technologies on the environment and the wider society.

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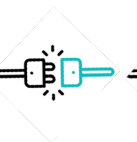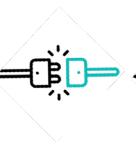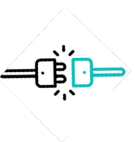
2. DIGITAL IS NOT GREEN

2.1 THE IMPACT OF THE E-MAIL

If the internet were a country, it would be the fourth most polluting in the world.

Whatever we do online, whether it's searches, purchases, or social media posts, requires a server somewhere to process it. In addition to the energy consumption of network devices (such as PCs and smartphones), there is also the energy consumption of servers, data centers, communication infrastructures, and related subsystems.

Each internet search is responsible for releasing 1.7/2 grams of CO_2 into the atmosphere. A single server can produce from 1 to 5 tonnes of carbon dioxide in a year. The simple act of sending an email can result in the production of carbon dioxide ranging from 4 to 50 grams (if attachments are large). Not only that, the energy consumption of data centers accounts for 1% of global energy demand.

We can say that 8 e-mails pollute as much as 1 km by car.

And a lot of useless emails are sent! According to a study commissioned by Ovo Energy in England alone, over 64 million useless emails are sent every year.

According to a study by the Royal Society at the end of 2020, in one year, an average user who uses email for work can emit up to 135 kilograms of CO_2. According to this study, digital technologies contribute between 1.4% and 5.9% to global CO_2 emissions.

Digital would contribute between 1.4 per cent and 5.9 per cent of the global CO_2 emissions (for comparison, air traffic contributes only 2 per cent).

If each of us decided to send even one less email, we would save about 16,433 tonnes of carbon per year. As a rough estimate, that would be about 81,000 airline flights between Rome and London.

2.2 THE CLOUD

In 2022, we took 1.4 billion photos, more than all the photos taken in the 20th century. To date, we have stored around 9 billion photos in the cloud. 90% of those photos will never be viewed again. They will remain there to decay, consuming CO_2 along with other zettabytes of junk data that accumulate every day in data centers. The number of data and users is growing every day, and the data centers that support the network consume more and more energy. The problem is not actually the cloud, but how it is powered. It's worth knowing that a square meter of data center pollutes 10 to 50 times more than the same surface area of any office. It's no surprise, then, that according to a study by the

International Energy Agency, data centers alone consume about 1% of global energy demand.

In recent years, the habit of storing data online has become increasingly common, even becoming the practice (e.g. google drive, one drive, dropbox, iCloud, etc.).
To reduce the use of clouds and respect the environment, you should:

- *Reduce the amount of data you store. Before uploading your files to the cloud, consider whether you really need them and whether there are no other local storage options.*
- *Use an eco-friendly cloud service. There are cloud services that use renewable energy and low-carbon technologies, consider using them.*
- *Use the cloud only when needed. If possible, use the cloud only for tasks that require a constant connection to the Internet.*
- *Select cloud data centres near you. If possible, choose a cloud data centre that is close to you to reduce the latency and environmental impact of data transport.*
- *Make sure your cloud providers adopt sustainable practices. Research the environmental practices of cloud providers and choose those that adopt the most sustainable practices.*

2.3 STREAMING

Streaming of audio and video is the main responsible for the exponential growth of internet usage and the consequent increase in emissions: it accounts for 63 per cent of global traffic. Suffice it to say that Netflix and YouTube together account for 50 per cent of North America's traffic. Gaming also plays its part: live game streaming increases by 19 percent every year.

Here are three practical tips:

1. TURN OFF AUTOPLAY. This feature creates a sequence of videos suggested by the platform's algorithm, which are often unwanted. This way, much more energy is consumed.
2. REDUCE VIDEO RESOLUTION. Setting a standard resolution instead of high definition (HD) is a sustainable choice and can reduce environmental impact by up to 86%. This is because a higher definition means a larger volume of data to be transmitted, and therefore a greater consumption of electrical energy.
3. DOWNLOAD VIDEOS during off-peak hours to watch them later without using the internet connection (offline).

3. SOCIAL NETWORK

3.1 SOCIAL MEDIA POLLUTES

According to a BBC report, contrary to what one might think, sending a message via an application such as WhatsApp or via a messaging system such as Facebook, Messenger does not consume much less than sending an email. And if you choose to include smiles, gifs, voice notes or attach video content or photos, the emissions calculation increases even more.

Social networks contribute to pollution and environmental degradation in several ways:

Firstly, excessive use of social networks can lead to an increase in sedentary behaviour and lack of physical activity, thus contributing to environmental pollution related to energy consumption from electricity production.

Moreover, the use of social networks also contributes to digital pollution, which refers to the increase in the amount of digital data stored online. This in turn requires the use of servers and energy for their maintenance, which can have an impact on the environment.

Disinformation and misinformation: Social networks can be used to spread disinformation and misinformation about environmental issues, leading to a lack of public awareness and action on critical environmental issues.

Finally, social networks can also contribute to cultural pollution by promoting unsustainable consumption patterns and lifestyles. For example, advertising on social networks can incentivize the purchase of goods and products that can be harmful to the environment, such as single-use plastics or household cleaning chemicals.

In summary, excessive use of social networks can have a negative impact on the environment and culture, and it is important to consider our online choices to reduce our impact on the environment.

The most environmentally friendly alternative to a whatsapp message is the SMS: each text generates only 0.014 g of CO2e.

3.2. A GOOD PRACTICE: Social Carbon Footprint Calculator

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The Social Carbon Footprint Calculator is a tool that helps individuals and organizations estimate the amount of carbon emissions associated with their daily activities and lifestyle choices, particularly related to their use of technology and digital services. This calculator takes into account various factors such as energy consumption of electronic devices, transportation, food, and housing, among others, to estimate the carbon footprint of an individual or organization. By using this tool, individuals and organizations can become more aware of their carbon footprint and take steps to reduce it, ultimately contributing to a more sustainable future.

The Social Carbon Footprint Calculator can be used by individual users or by organisations, such as companies or public bodies, to assess the environmental impact of their online social media activities and possibly take measures to reduce greenhouse gas emissions.
It is important to keep in mind that the tool only provides a rough estimate of CO2 emissions and that reducing environmental impact requires concrete and continuous efforts from all social network users.
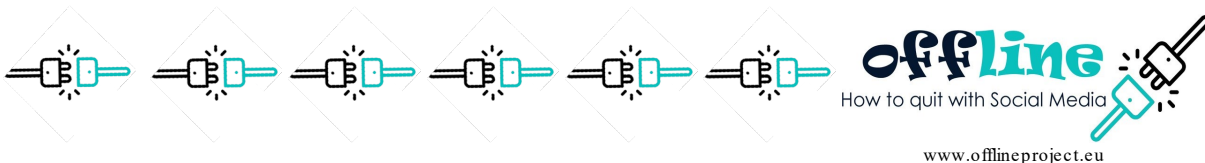
3.3 ChatGPT

ChatGPT (Chat Generative Pre-Trained Transformer) is a programme created by OpenAI, an artificial intelligence research organisation, used for dialogue creation. It is a pre-trained text generator, using natural language processing (NLP) and a large database that includes textbooks, websites and various articles, necessary to model its style and to respond to human interaction. As useful and avant-garde as ChatGPT may be, in a brief analysis Chris Pointon estimates that this artificial intelligence system could emit around 3.8 tonnes of CO2e every single day!
It should therefore be used with caution!

CONCLUSION: QUIT SOCIAL MEDIA

So, the internet pollutes, although it's obvious that in many situations, it would pollute much more if it wasn't there (think of a project meeting among various European partners. A 1-hour meeting on Zoom produces a certain amount of CO2, but if the managers from Lecce took a direct flight to Malaga to attend the meeting in person, how much CO2 would be produced? Surely a much larger amount (Although maybe the plane to Malaga would still depart).
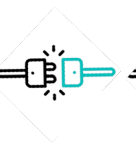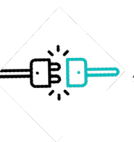
This does not detract from the fact that **a code of civic behaviour in the use of digital technologies and social media is**

	fundamental; just as we are struggling to learn to sort the waste we produce, just as some of us are beginning to eat less meat, we could become a little more ecological when, for example, we produce a Facebook post and add, in addition to the necessary information, lots of smiley faces 😜 👍 🚫 🚌 🚜 🛩️ 🎲 🍾 🍽️ 🥣 images, and even worse videos, that are carried on the platforms: these consume significant portions of the server, especially when considered as a whole. It is important to share less to avoid unnecessary emissions and environmental impacts. _Getting off social media would certainly have a positive impact on the environment. First of all, it would reduce digital pollution, that is, the amount of data stored online. This in turn reduces the amount of energy needed to maintain and manage servers, thus reducing the environmental impact of online services._ _Furthermore, quit with social media can also be an opportunity to rediscover activities that do not require the use of technology, such as contact with nature or reading a book. This can lead to greater environmental awareness and a reduction in personal environmental impact._
Glossary	**Data Center:** A data center is a building, a dedicated space within a building, or a group of buildings used to house computer systems and associated components, such as telecommunications and storage systems. **CO_2**: Carbon dioxide is a colourless, odourless gas that, as part of the carbon cycle, is a natural part of our air. Through the decomposition processes of organic substances, CO_2 is naturally released into the atmosphere. **CLOUD:** a computer network where files and programs can be stored, especially the internet: **ZETTABYTE**: A zettabyte is a digital unit of measurement. One zettabyte is equal to one sextillion bytes or 1021 (1,000,000,000,000,000,000,000) bytes, or, one zettabyte is equal to a trillion gigabytes.
Practical advices	✔ Turning off the camera during a Zoom call reduces emissions by 70%; ✔ If each of us decided to send just one less email, we would save about 16,433 tons of carbon per year.

	To give an indicative estimate, it would be about 81,000 flights between Rome and London;
	✔ Reduce the amount of data you store in the Cloud. Before uploading your files to the cloud, consider if you really need them and if there are no other local storage options;
	✔ Spend less time on social networks;
	✔ The most eco-friendly alternative to a WhatsApp message is SMS: each text generates only 0.014 g of CO2e.
Self-evaluation (multiple choice queries and answers)	1. The competences relating to environmental protection in DigiComp 2.2 include: **a) Digital pollution mitigation measures** b) Online risk mitigation measures c) Measures for the protection of User Health 2. The heavier an email is, the heavier its ecological footprint. **a) True** b) False 3. A responsible digital user a) **Selects files to upload to the Cloud** b) Uses the Cloud to store all his photos c) **Uses an external hard disk to store his files** 4.A text message pollutes less than a WhatsApp message **a) True** b) False c) I don't Know
Resources (videos, reference link)	Social Carbon Footprint Calculator, https://www.comparethemarket.com.au/energy/features/social-carbon-footprint-calculator/
Related material	
Related PPT	

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