



Report

Digital doesn't mean dematerialised: Greening our online practices

from the IETM Berlin Plenary Meeting 2025

By Lian Bell



**IETM Report
Digital Doesn't Mean
Dematerialised: Greening
our Online Practices**

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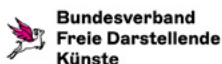
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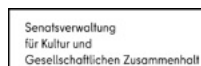
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Digital doesn't mean dematerialised: Greening our online practices

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This very popular workshop was framed as an opportunity to 'explore how to align our digital practices with our environmental and social values. Participants will leave with the knowledge needed to make informed decisions and adopt less impactful digital practices, from email habits to hosting choices, grounded in ecological awareness and aligned with your values'. The structure of the session was a presentation by Gwendolenn Sharp, founder and director of The Green Room (France), followed by the participants breaking into smaller groups to complete an activity that prompted discussion of the topics. The session was introduced by Cilgia Gadola of Bundesverband Freie Darstellende Künste (BFDK), who mentioned that they are currently developing a website catalogue of methods of sustainable practices in the arts, which may be of interest for IETM members when it is launched.

Gwenn was clear that the session was not going to offer solutions, or tell people what to do, but highlight studies, experiences and options that could be inspiring. Digital greening is a hot topic, and things are changing fast and new things come up in relation to it almost every week. Some slides used by Gwenn in the presentation are referenced in this report.

After a short warm up and an introduction to The Green Room and its work, primarily with the music sector, Gwenn tackled the 'myth of dematerialisation'. This is the impression that somehow working digitally is synonymous with going green and being environmentally responsible. It's a very pervasive myth; even EU reports mention it in this context. However, the digital world is very much a physical one even when the words used to describe it, like 'the cloud', seem to be de-materialised. There is a vast volume of material connected with the digital: including mobile phones, computers, chargers, cables, data centres, and the fuel and water needed to run them.




Photo credit: Karam Ghossein

In 2019, the digital world was made up of 34 billion pieces of equipment with 4.1 billion users, i.e. 8 pieces of equipment per user. This average equipment level hides very large disparities depending on the geographical area observed.

In 2019, the mass of this digital world amounted to 223 million tonnes, the equivalent of 179 million cars of 1.3 tonnes (5 times the number of cars in France).

Source: Green IT



The digital world contributes significantly to the environmental footprint of humanity. Its contribution to the environmental footprint of humanity is far from negligible:

| PRIMARY ENERGY CONSUMPTION (PEP) | GREENHOUSEGAS EMISSIONS (GHEG) | WATER CONSUMPTION (WATER) | ELECTRICITY CONSUMPTION (ELEC) |
|----------------------------------|--------------------------------|---------------------------|--------------------------------|
| 4.2 % | 3.8 % | 0.2 % | 5.5%* |

Based on daily use, this amounts to :

- GHG: 1.5 billion French employees going to work for 1 year ;
- Water: 242 billion packs of mineral water (9 litres);
- Elec: 82 million electric radiators (1000 Watts) permanently switched on

Source: Green IT

Session slides by Gwendolenn Sharp

Gwenn gave as an example of this materiality a negotiation that happened during Covid between the French government and major streaming platforms such as Netflix and Amazon, to ask them to reduce the quality of their video streaming to make sure that people who were dependent on the digital infrastructure, such as children studying, could make sure they had access. She also talked about how everything we use is made somewhere, most often in China. While in the EU we might say we're lowering our climate footprint, the environmental impact is actually happening elsewhere.

On the other hand, there is still global inequality and striking regional differences in relation to online connection: about nine countries have less than 20% of the population connected to the internet. So the countries who benefit most from the digital world are often not those feeling the environmental impact of it. As well as that, the impact of the digital world on the environment is significant: 4-6% of the world's carbon footprint is due to digital, and this is growing so fast it may even double in a couple of years. It also impacts greenhouse gas emissions, as well as water and electricity consumption, sometimes coming into competition with other societal needs in different countries. It is estimated that if the digital world were a country it would be three times the size of France, and maybe more, depending on the study. This has hugely increased in the last 15 years as more objects (such as washing machines) become digitally connected.

Gwenn pointed out that there are three main aspects to digital materiality: user equipment, servers and connections, and network. While people often assume that data centres have the biggest environmental impact, it's not true (or at least not yet). Currently, the manufacturing of digital equipment has the biggest impact.

the green room

Hierarchy of sources of carbon impacts

Schematically, we have the following hierarchy, in decreasing order of importance in terms of sources of impact (2019):

- 1/ Manufacture of user equipment
- 2/ Electricity consumption of user equipment
- 3/ Electricity consumption of the network
- 4/ Electricity consumption of data centres
- 5/ Manufacture of network equipment
- 6/ Manufacture of equipment and data centres (servers, etc.)

Session slide by Gwendolenn Sharp


This hierarchy in Gwenn's slide will vary country to country, depending on things such as how local energy generation happens, e.g. nuclear vs. fossil fuel.

In any case, data centres are still extremely draining on environmental resources, particularly water consumption. For example, Microsoft increased their water consumption by 34% in one year. Most of the water used to cool data centres is fresh water from rivers and lakes (rather than grey water, or sea water), which is also water that can be used as drinking water or for agriculture. There is also an issue in how much space is used by data centres, when it could be used for other things, such as fields for agriculture. As well as that, the number of data centres is growing, competing more and more for local resources and sometimes creating geopolitical tension.

The environmental impact of data centres' use of electricity will depend on what kind of electricity generation a particular country uses, such as whether it is from nuclear power or using fossil fuels. However, according to a study by the [International Energy Agency](#), data centres could consume as much energy as countries such as Sweden and Germany within two years. An example of a searchable map of the location of data centres globally [can be found here](#).

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AI draws its power from thousands of computers in data centres around the world (currently around 9000 globally) running at full speed all the time. A ChatGPT query consumes 10 times more energy than a standard google query.



| Country | Data Centres |
|----------------|--------------|
| USA | 2073 |
| Germany | 425 |
| Indonesia | 140 |
| Spain | 175 |
| Netherlands | 130 |
| Australia | 238 |
| France | 173 |
| China | 265 |
| Canada | 264 |
| India | 246 |
| United Kingdom | 433 |
| Sweden | 180 |
| Italy | 169 |
| Poland | 88 |
| Ukraine | 37 |

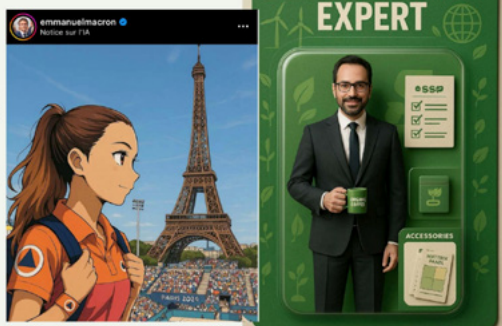
Session slide by Gwendolenn Sharp

Moving on from data centres, Gwenn pointed out the impact of the rise in use of artificial intelligence (AI), and how that is changing very quickly. As an example, a query using Chat GPT uses 10 times more energy than a Google query. Therefore, our personal habits have a big impact on energy consumption. She gave the example of the energy use implications of choosing to play a video just to listen to music, rather than just streaming the audio. Or similarly, the impact of trends such as the creation of AI 'starter packs' seen recently; with the irony that a sustainability expert creating a starter pack image is an example of unnecessary environmental impact, and how that impact can be ignored. As well as energy usage, each AI search invisibly uses water: a recent study by the University of California estimated that 20-50 AI queries would consume the equivalent of half a litre of water.

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AI trends

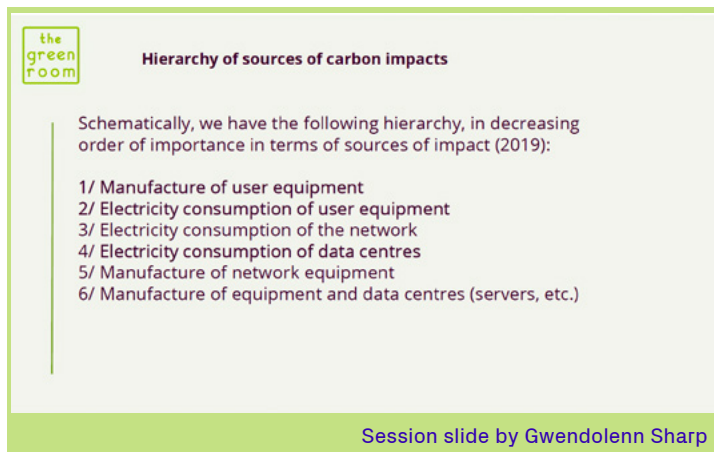
One single Midjourney image is the energy equivalent of recharging a phone. We're talking about 700 million images generated in less than a month for the starter pack and studio Ghibli trends. That's as much as the annual electricity consumption of 2,100 households.



Session slide by Gwendolenn Sharp

Gwenn also touched on the impact of the extractive rare mineral mining needed to make this technology in the first place, often happening in poorer countries. This mining even happens in Europe, supported by an EU project, in lithium mines at Jada in Serbia. Lithium is used in a lot of technology, from electric car batteries to MRI equipment. These natural minerals are a finite resource and there will be increasing conflicts when it comes to how they are used. In the future, decisions will need to be made about what lithium-dependent technologies have priority. It's important to remember that digital technology is not a renewable resource; it may not last that long in the scheme of things. We need to be aware that if we only educate children to use digital, relying on something that may disappear, or that we will have less access to in the future, we may risk losing important skills that will be needed again later.

We also need to consider digital waste as well; it's estimated that there are eight or nine devices currently existing per digital user (things like televisions, phones and computers). Most technological waste ends up in Africa where it is polluting the earth, as well as causing social damage locally. Also looking at the carbon impact of personal digital use (below), doing things like keeping a phone or laptop in use longer will significantly lower your impact.



the green room Hierarchy of sources of carbon impacts

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Session slide by Gwendolenn Sharp

If we want to aim for the objectives of the Green Deal and the Paris Agreement, European citizens need to reach about two tonnes of carbon dioxide emissions per person per year; we are currently at approximately ten tonnes per person per year. When you see that buying a new computer is about half a tonne, that's quite a clear impact; if you go from Europe to New York and back by plane, that's approximately two tonnes of CO₂. Gwenn shared some further carbon emission statistics about meeting in person versus online.

The reaction in the room to seeing these statistics was quite strong. Gwenn reiterated that her aim is primarily to offer knowledge so that we can make more informed decisions, but of course the ultimate goal is to find new digital practices that reduce our impact. With all that in mind, she introduced a practical exercise.

Workshop section

At this point the participants formed smaller groups of about six people each. Gwenn introduced an exercise to work out how effective certain actions are in lowering environmental impact, and how easy they are to implement. Each group was given a different collection of actions on pieces of paper and were asked to decide where to place them on a graph.

The actions that were offered by Gwenn on the pieces of paper included:

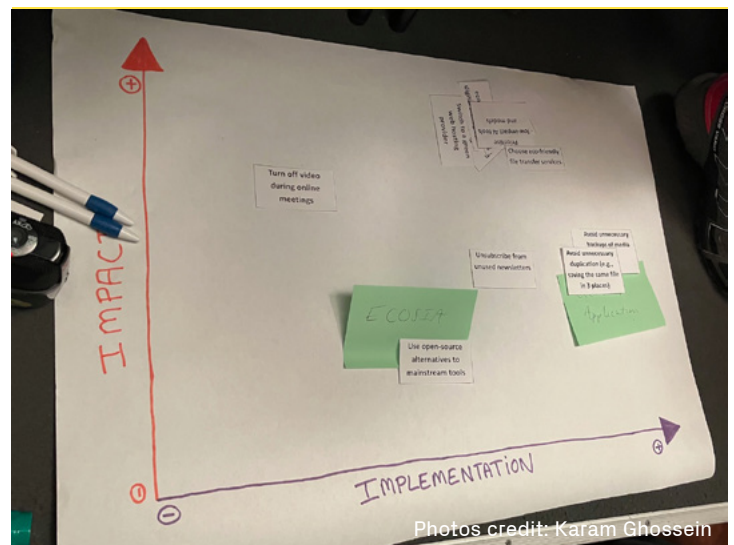
- Turn off video during online meetings
- Unsubscribe from unused newsletters
- Use open-source alternatives to mainstream tools
- Avoid unnecessary duplication (i.e. saving the same file in three places)
- Choose an eco-friendly file transfer service
- Prioritise low-impact AI tools and models
- Switch to a green web hosting provider
- Raise team awareness on digital footprint
- Turn off auto-play on streaming services
- Assess environmental footprint before using AI for creative projects
- Design eco-responsible digital scenography
- Use collaborative tools like CryptPad or Framasoft
- Use simple, light online ticketing systems
- Limit storage of rehearsal videos in the cloud
- Optimise website for low energy consumption
- Integrate digital sobriety into creative processes
- Use audio instead of video when possible
- Limit digital brochures to essential content
- Create an AI usage charter for my organisation or network
- Question the use of technology in each project
- Share files via lightweight links, not attachments
- Regularly delete old emails and archives
- Avoid unnecessary backups of media files

Each of these actions were assessed by the groups as to how easy they were to do, and how big an impact it would have. There was a lot of debate as to what actions different people thought might be easier to achieve. A lot of the suggestions were also surprising to participants; they weren't necessarily actions that they had thought of before, or that they thought of as having environmental impact. It was clear that the majority of the participants across all the groups felt that they didn't have enough understanding of the actual impact of their digital practices to be able to assess how to improve them in the most strategic and useful way. Despite this sense of ignorance, it was generally agreed it was important to implement practical actions like these.

As examples of some of these debates with the groups, one wondered what were the 'golden tickets': actions that are both impactful and easy to do. Another talked about how hidden the environmental impact of AI is, most likely intentionally. One group discussed how the digital world and AI have improved accessibility for some people, such as overcoming language barriers in work; it's therefore important to balance the practical value, before making decisions around how or whether to use it.

Once the exercise was over, the participants fed back some of the discussions to the larger group. Here are some of those topics:

- The answer to the impact and ease of implementation of so many of these actions was 'it depends', which highlights the need for individual consideration of what needs to be prioritised. There is no 'one size fits all' solution. It also highlights the lack of transparency of what the actual impacts of so many of the tools we use are.
- It's important to question whether a change is being made as 'greenwashing', especially when it's a less impactful change.
- Generally, the more local and transparent a digital tool is, the more effective it is in reducing environmental impact.
- It also seems that most positively impactful actions are the collective actions that raise awareness. For example, collectively questioning the use of technology for each project, or creating an AI use charter for an organisation. These collective efforts do more than individual actions.
- Gwenn introduced the term 'co-benefits': that there are other benefits to addressing climate change, as well as any direct positive effects on the climate itself. These other benefits can also be used to advocate for change.
- There is an open letter 'Rethinking Digital Practices and Spaces' addressed to the European Commission and its Creative Europe funding and that was signed by a number of network organisations including IETM. Within the letter is a link for individuals to also endorse it.
- It's important to raise team awareness of what is the actual impact of digital practices. Now that the group from this workshop has a little more knowledge of the importance of small changes (such as turning off the video at meetings) it can spread that knowledge out to the teams we work with.
- We can also communicate about this with our audiences to spread awareness. For example, making a public announcement when switching to a greener website.
- There was a mention of the Green Web Foundation which has a green web check to check your emissions, and where you can get a logo to say your site is green.



- One group discussed what digital scenography is, where it starts and ends. Are we talking about stage design, about fully online performances, and so on.
- There was a discussion about changing our habits. Maybe we can choose to make a phone call over a digital meeting, and only choose to use video at particular moments to connect with each other.
- While there is a need to discuss and share with the public, sometimes a company or artist might have a bit of fear of talking about what they're doing publicly, as it might be perceived as greenwashing or virtue signalling.
- One participant had a question about how to stay connected with the international community and how to promote your work without using Instagram etc.
- Another participant questioned their own use of social media by asking: *do I really need all that information? Do I need to know all of this stuff? It can be inspiring but is it necessary?*
- One group discussed the things you don't have a choice about, and the insidiousness of those choices being made for you by digital platforms, such as Google introducing AI into its searches whether you want them to or not. Knowing a little more about the practical things we can have control over is very helpful.
- While using open source alternatives to mainstream tools can make a difference, it can be time consuming, since it's hard to find out about alternative solutions. So sharing information on these would be good.
- One group had a practical question for Gwenn: *is it better to print a physical programme or to make a digital programme with a QR code?* Gwenn's answer was that, as with many of these questions, it depends. On your needs, on what your audience needs. If you create anything and it's not being used, that is super impactful. She gave the example of eco cups that are available at festivals which then get kept as a souvenir rather than reused multiple times. She also made the point that recycled paper is no longer produced in Europe so the option to use recycled paper may not actually be the most sustainable as you now have to count the transportation of that into its environmental impact.

Gwenn ended the session highlighting the resource that her organisation The Green Room has developed specifically for the music sector called STOMP (Sustainable Tools for Online Music Practice). While it is focussed on a different creative sector, there is a lot of information included that might be relevant and give IETM members useful ideas. She also left us with a slide of her top recommendations:

Throughout all the discussions, the repeated comment from the participants was that we don't have the answers because we don't know enough. We may have passion and good intentions, but the knowledge isn't there. It was clear at the end of the workshop that more knowledge would definitely be welcomed; both about the details of digital impact on the environment, and what are the best practical changes for us as artists and arts workers to reduce that. Many expressed their gratitude for the information and practical suggestions contained in the workshop. It seems like this would be a useful topic for IETM to pick up again in the future, sharing practical tips on what members can do to reduce their negative environmental impact.

