ENVIRONMENTAL SUSTAINABILITY HE DIGITAL AGE OF CULTURE

E X E C U T I V E S U M M A R Y

Julie's Bicycle

CREATIVE · CLIMATE · ACTION

E X E C U T I V E S U M M A R Y

'Digital' is fast transforming arts and culture, bringing with it a multitude of creative possibilities and opportunities for audience engagement. The COVID-19 pandemic has accelerated this inevitable shift as many organisations have transitioned their entire operations online.

What are the environmental and social costs of this new world? How do we make the most of the opportunities the digital transformation brings, whilst understanding the consequences of our decisions?

This briefing aims to summarise what we know and help the cultural community navigate this new territory.

WHAT DO WE MEAN BY 'DIGITAL TRANSFORMATION'?

Digital transformation is the integration of digital technology into areas of an organisation fundamentally changing how it operates and delivers content. It includes using analytics, smart devices and social media, to automating and virtualizing services and processes. Digitalising ways of working can improve efficiency and interactivity and, in the case of arts, culture and entertainment, offer new distribution opportunities and audience/fan experiences.

In the arts, culture and creative industries, 'going digital' can refer to anything from e-tickets to art work. Digital art is a practice that uses <u>digital technology</u> as part of the creative process or final presentation; it is now widely used as a creative medium, and a platform for sharing and creating content.

We have already witnessed the digitalisation of the music industry. Now, galleries, theatres, museums (and more) are streaming their work and digitalising their content, products and collections, using technology to reach audiences.

Environmental considerations

Digital technology comes with a range of environmental consequences and impacts, from the obvious (e.g. energy consumption), to the hidden (e.g. mining for materials and e-waste dumps). The music industry provides a case in point: whilst plastic consumption is declining as CD sales plummet, the use of streaming is growing exponentially around the world, increasing energy use and carbon emissions from devices, network infrastructure and data centres.

Although it is assumed that the carbon impact is relatively modest when compared to other activities and sectors – and there have been rapid improvements in the infrastructure's energy efficiency¹ – there remains a host of environmental challenges, from growing e-waste to new energy demands from emerging technologies like Artificial Intelligence (AI) and Blockchain. The life cycle carbon footprint of the Information and Communications Technology (ICT) sector is equivalent to 1.4% of global greenhouse gas emissions, and around 4% of global electricity use. The entertainment and media sector (TV, gaming, streaming, entertainment, newspapers) accounts for an additional 1.2% of global emissions and 3% of global electricity consumption.²

Translated, if the Information Technology (IT) sector were a country, it would be the 3rd highest consumer of electricity after the USA and China.³ If the internet was a country, it would be the sixth largest greenhouse gas polluter⁴, or the equivalent of Australia, Denmark and the UK combined.⁵

Largest global producers of greenhouse gas emissions from fuel combustion, 2018

Rank	Country	CO2 emissions from fuel combustion in MtCO2, 2018 ⁵
1	China	9.5 thousand
2	United States	2.9 thousand
3	India	2.3 thousand
4	Russian Federation	1.6 thousand
5	Japan	1.1 thousand
6	Democratic Republic of the Internet	830
7	Germany	696

1 Carbon Brief (2020) https://www.carbonbrief.org/factcheck-what-is-the-carbon-footprint-of-streaming-video-on-netflix

- 2 Malmodin & Lunden, 2018, The Energy and Carbon Footprint of the Global ICT and E&M Sectors 2010–2015. Sustainability. vol. 10, no. 9. https://www.mdpi.com/2071-1050/10/9/3027
- 3 Greenpeace, 2017, Click Green Report, http://www.clickclean.org/uk/en/
- 4 Digital Detox, The Green Report, 2020, https://blog.digital-detox.co.uk/digital-pollution-solution-green-report/?inf_contact_key=3f31704198c74156a47cf5a930328569
- 5 IEA, 2018, World Energy Atlas, online: <u>http://energyatlas.iea.org/#!/tellmap/1378539487</u>, accessed 13/10/2020

Looking ahead

Best-case scenario: predictions suggest that renewable energy production should exceed data centre consumption by 2030. Worst-case estimates suggest electricity usage by communications technology could contribute up to 23% of global greenhouse gas emissions by 2030.⁶

Policy signals:

- The new <u>ITU standard</u> requires the Information Communications Technology (ICT) industry to reduce emissions by 45% in the next ten years in line with the Paris Agreement, prioritising a shift to renewable technology as well as greater operating efficiencies.
- The EU Commission has decreed that data centres must be carbon neutral by 2030. If the whole ICT sector switched to renewable energy sources, its footprint could be reduced by 80%.⁷

Learn more

Digital impacts:

- Climate Care Infographic on the <u>carbon</u> <u>footprint of the internet;</u>
- <u>Curiously Green</u>: a monthly newsletter by Wholegrain Digital exploring digital impacts;
- Erjjio's blog: <u>the internet's environmental</u> impact and what you can do;
- Ellen Macarthur's <u>Guide to Circular</u> <u>Consumer Electronics</u>.

Sustainability and web service providers:

• <u>White paper</u> by the Coed:Ethics Community gives an overview of energy use in data centres worldwide and their strategies over the next five years; <u>Greenpeace Click Green report</u> provides company scorecards assessing the sustainability of online service providers, from music streaming platforms, social messaging through to cloud computing platforms.

Practical action:

- Design and build a green website with help from <u>this blog</u> by Whole Grain Digital;
- Digital Detox are launching a new service <u>the green report</u> which advises customers on how to make digital processes more efficient and advise on cutting digital pollution;
- <u>Green Electronics Council</u>: Advocate for sustainable IT by supporting both manufacturers and large-scale purchasers.

6 Anders S. G., Andrae and Edler, T., 2015, On Global Electricity Usage of Communication Technology: Trends to 2030, Challenges 2015, 6(1), 117-157; https://doi.org/10.1011/j.

7 NGI Forward, 2020, Internet of Waste: The Case for a Green Digital Economy, online: https://media.nesta.org.uk/documents/Sustainability_1.pdf

What you can do: the basics

1. ONLINE PROCUREMENT

- Move data to the cloud according to Microsoft, the cloud delivers 72-93% carbon savings in comparison to conventional computing.
- Switch to web hosting switch to web hosting and cloud services which are renewably powered, and service providers which are transparent and accountable on their energy sources, greenhouse gas emissions and targets e.g. having a net zero commitment. Greenpeace have comprehensively assessed tech companies on their energy transparency, policy, renewable procurement and their <u>report</u> is a great place to start informing decisions. Beware of misleading claims. Companies that are reducing impacts by offsetting are much less effective that companies that are investing in renewables. This is because new renewable capacity needs to be added to the grid.

2. THINK CIRCULAR: CHOOSE AND USE DEVICES WISELY

 When it comes to devices, follow the <u>circular</u> <u>economy approach</u> and wherever possible opt for a refurbished device rather than a new one. Use devices for as long as possible, repair whenever you can, pass them on to a new user or recycle them at end of life.





3. DEVELOP UNDERSTANDING, PLAN THE APPROACH AND MEASURE THE IMPACT

- Build more understanding of the issues by reading and speaking to suppliers and service providers. Fully understanding your digital impacts will require collecting data including:
 - the carbon intensity of the local grid
 - the power consumption of devices
 - operational emissions where possible (your choice of type of browsers, websites and applications used can influence the overall carbon footprint).
- Start by mapping where the digital impacts are occurring. Consider: are you looking to understand the footprint of one digital project or to reduce the digital footprint relating to your daily activities, or perhaps create a procurement/circular strategy for digital devices?
- Look to see what options are available to measure digital impacts. Erjjio provide free website health checks and the <u>Green Web</u>
 <u>Foundation app</u> checks the credentials of host providers showing whether a website is hosted "green or grey". Other tools such as Wholegrain Digital's <u>calculator</u> measures a website's carbon footprint and <u>Ecometer</u> allows its users to design and build more sustainable web services.

4. ADVOCATE FOR CHANGE

Start talking about digital impacts, use your art to inspire change, join existing campaigns or start your own.

 Ask – speak to technical and digital providers for their environmental and energy reports and what they are doing to address their impacts. Get involved with existing campaigns such as <u>Greenpeace's Tell Netflix to Go Green</u> campaign.

- Inspire use digital art to engage audiences in environmental and sustainability issues - and remember to share the practical actions taken to reduce the digital impacts. Exit Productions 'Eco-Chambers' used online theatre to engage their audiences in debating what a sustainable, just society future should look like. Apocalypse Reading Rooms is an online world of 'talking stories in the face of environmental and social collapse, a gathering of all the books we might need to change the end of the world.'
- Encourage lead by example and switch to a renewable energy provider such as <u>Good Energy</u>, and encourage home-working colleagues and friends to do the same.
- Share with others what you are doing by signing up to Whole Grain Digital's <u>Sustainable</u> <u>Web Manifesto</u> for a greener internet.

5. DESIGN ONLINE FOR EFFICIENCY AND DO A DIGITAL SPRING CLEAN

- Choose a green hosting page for websites or art work and ask your designers to be as efficient as possible for the user. Techniques to consider include: reducing the amount of code transferred to a users' computer; using static content rather than rebuilding pages; minimising the computation needed to render web pages; and improving audio and video codecs (i.e. a device or computer program which encodes or decodes a digital data stream or signal).⁸
- Delete all the apps, email subscriptions and online services you don't use or need, they require data and energy.

⁸ Ericsson, 2020, The Footprint of Data and Telecoms, online: https://www.ericsson.com/en/reports-and-papers/industrylab/reports/a-quick-guide-to-your-digital-carbon-footprint, accessed 06/10/2020

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The Cloud

In tech terms, the cloud refers to software and services that are run over the internet as opposed to on your computer itself. The cloud can be accessed via any internet browser and includes services that run online such as Netflix as well as storing your data, emails, photos, files etc. on services such as Dropbox or Google Drive. Contrary to the images of the cloud being light and fluffy, it is very much a physical thing which relies on energy and networks of servers to run it.

Data Centre

A building which houses all the computing equipment that makes our online activities possible. According to **Tech UK**: "A data centre is there to manage, store, process, transact, manipulate or transmit digital data at scale, within a controlled, protected, resilient environment. If it isn't doing any of those things then it isn't a data centre."⁹

Power Purchase Agreement

A long term contract between a business and a renewable energy provider, where the business agrees to purchasing renewable energy, which means the renewable energy provider has the financial security to add additional renewable energy capacity to the grid.

Server

A server is in simple terms, a computer which provides data to other computers. In a data centre, servers run remotely and are usually assigned to perform a specific function.

Internet of Things

Refers to all the objects that are connected to the internet, from wearables to lightbulbs, sensors and smart phones. As technology becomes more sophisticated it is expected devices will become increasingly connected, sharing more data and helping to make things easier and more efficient.

Life Cycle Analysis

Understanding the impacts associated with a product or service, from cradle to grave.

⁹ Tech UK, 2013, Er, What is a data centre? Online: https://www.techuk.org/insights/reports/item/273-er-what-

is-a-data-centre?utm_source=http%3a%2f%2fmarketing.intellectuk.info%2flz%2f&utm_medium=email&utm_ campaign=Climate+Change+update+12+March+2015&utm_term=Climate%20Change%20Update%2004%20March%202015%20 &utm_content=44, accessed 13/10/2020

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