Sustainable Web Design

Social Media & SEO

MA Web Design & Content Planning

Sustainable Web Design

- Mentimeter survey
- What is Sustainable Web Design?
- Why is Sustainable Web Design important?
- Tools and metrics for assessing Web Sustainability
- Web Sustainability in action: how to improve your website
- B Corps
- Dos and Don’ts
- Web Sustainability Guidelines (WSG)
- Books and resources

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Sustainable Web Design Warm Up ツ

Go to

www.menti.com

Enter the code

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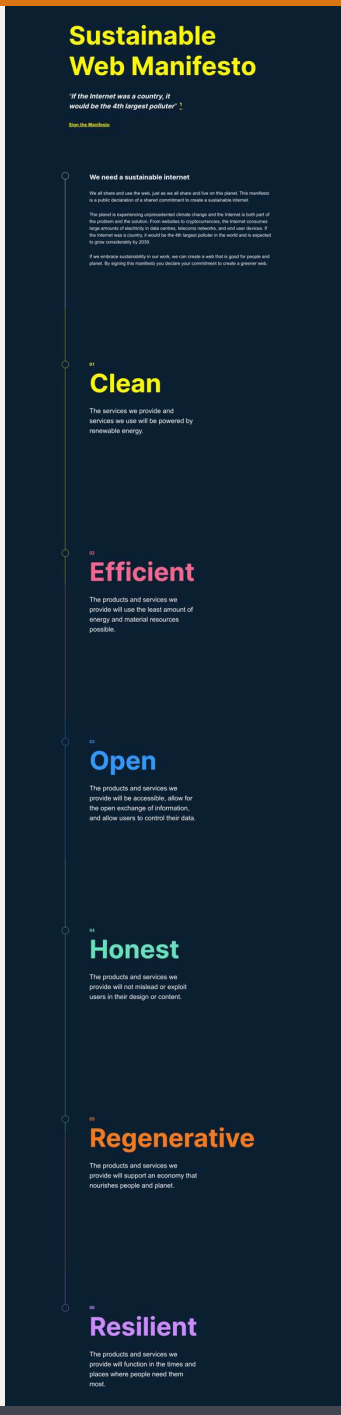
Or use QR code

What is Sustainable Web Design?

Sustainable Web Design is an approach to designing web services that puts people and planet first. It delivers digital products, services, and data that respect the principles of the Sustainable Web Manifesto: clean, efficient, open, honest, regenerative, and resilient.

— sustainablewebdesign.org



Sustainable Web Manifesto

"If the Internet was a country, it would be the 4th largest polluter" [1]

Sign the Manifesto

We need a sustainable internet

We all share and use the web, just as we all share and live on this planet. This manifesto is a public declaration of a shared commitment to create a sustainable internet.

The planet is experiencing unprecedented climate change and the Internet is both part of the problem and the solution. From websites to cryptocurrencies, the Internet consumes large amounts of electricity in data centres, telecoms networks, and end user devices. If the Internet was a country, it would be the 4th largest polluter in the world and is expected to grow considerably by 2030.

If we embrace sustainability in our work, we can create a web that is good for people and planet. By signing this manifesto you declare your commitment to create a greener web.

01

Clean

The services we provide and services we use will be powered by renewable energy.

02

Efficient

The products and services we provide will use the least amount of energy and material resources possible.

03

Open

The products and services we provide will be accessible, allow for the open exchange of information, and allow users to control their data.

04

Honest

The products and services we provide will not mislead or exploit users in their design or content.

05

Regenerative

The products and services we provide will support an economy that nourishes people and planet.

06

Resilient

The products and services we provide will function in the times and places where people need them most.

Why is Sustainable Web Design important?

The internet currently produces approximately **3.7% of global carbon emissions,** which are rising in line with our hunger to consume more data.

— sustainablewebdesign.org

moz://a
Internet Health Report 2018

“If the Internet was a country,
it would be the 4th largest polluter”

— sustainablewebmanifesto.org

The Internet uses more electricity than...
Internet Health Report 2018 - mozilla

Websites have a carbon footprint)-:

The internet consumes a lot of electricity.

416.2TWh per year to be precise.

That's more than the entire United Kingdom!!

TWh - Terawatt hours = unit of energy representing one trillion watt hours

Websites have a carbon footprint)-:

From data centres to transmission networks
to the billions of connected devices
that we hold in our hands,
it is all consuming electricity,
and in turn producing carbon emissions equal
to or greater than the global aviation industry.

THE WORLD'S DIGITAL CARBON FOOTPRINT

Digital transformation is often seen as key to slowing global warming. By using new technology such as artificial intelligence and data analytics, the theory is we can increase efficiency and productivity, thereby reducing emissions. But all this computing power needs to be run by something – and up to now this has predominantly been fossil fuels. And while the industry is working towards reducing emissions, with many companies announcing net-zero emissions targets, the pace of growth in usage means emissions globally look set to keep rising

1.7 billion

tonnes of greenhouse gas emissions caused by the production and running of digital technologies each year

3.7%

of total greenhouse gas emissions

The Shift Project, 2021

+9%

annual increase in energy consumption by digital technology

+4%

annual increase in the digital industry's global energy intensity

The Shift Project, 2021

414 kilos

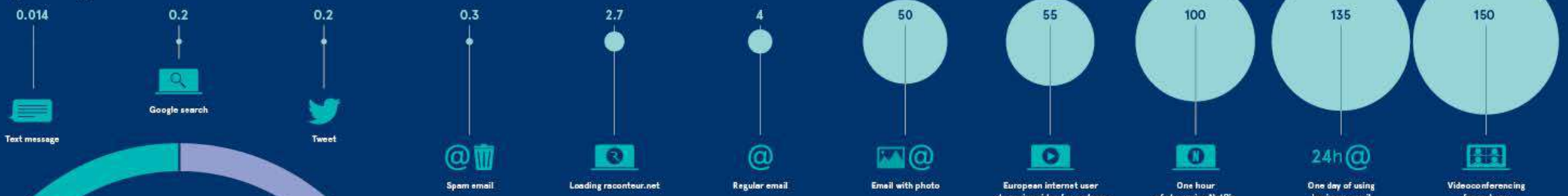
Greenhouse gas emissions caused by each internet user every year

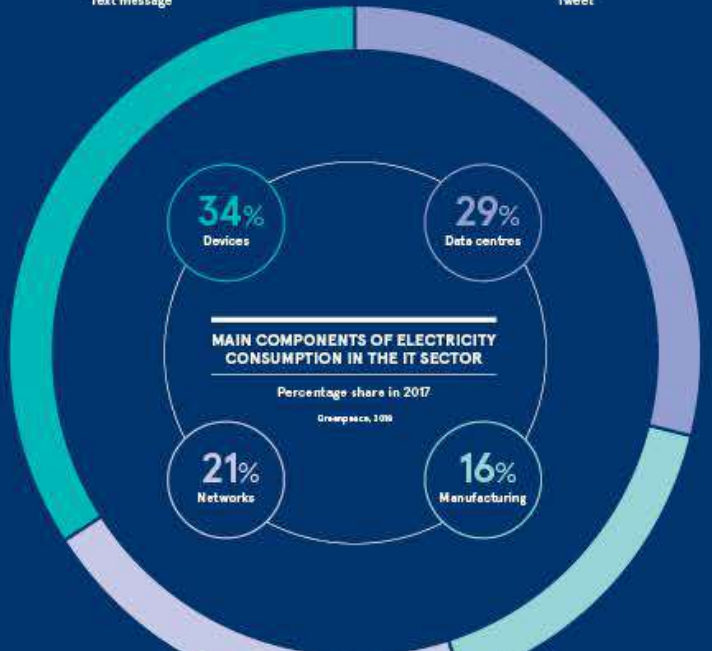
The Shift Project, 2021

THE CARBON FOOTPRINT OF USING THE INTERNET

Lancaster University, 2010; Google, 2010; Websitecarbon.com, 2021; Carbon Trust, 2020; Netflix, 2021

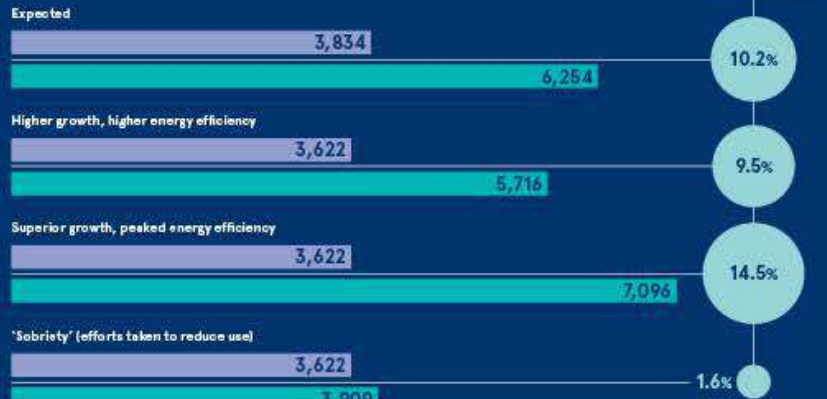
Measured in grammes of CO_2 equivalent emissions





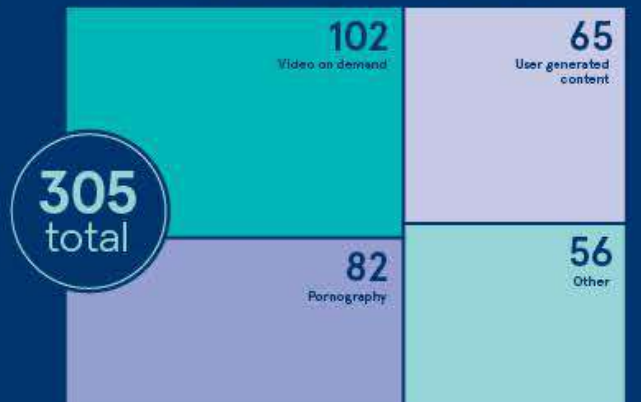
THE PREDICTED GROWTH IN ENERGY CONSUMPTION BY DIGITAL TECHNOLOGY

Energy consumption in terawatt hours under four different scenarios ● 2020 ● 2025



ONLINE VIDEO IS A KEY SOURCE OF GREENHOUSE GAS EMISSIONS FROM DIGITAL TECHNOLOGY

Emissions by different types of online video, in millions of tons of CO_2 per year



96%

reduction in CO_2 emissions if the user turns off their video

Whose problem is this?

Consumer VS Web Designer VS Government

Sustainable Web Design by Tom Greenwood

Web Development VS Energy Consumption

The correlation of web development and environmental impact comes from the energy and resources consumed throughout the lifecycle of a website. Web development practices directly influence the environmental impact of websites.

— sustainablewebmanifesto.org

Web Development VS Energy Consumption

By adopting sustainable development practices, such as **optimising code**, utilising **renewable energy hosting**, and **minimising data transfer**, developers can reduce the environmental footprint of websites and contribute to a more sustainable digital ecosystem.

— sustainablewebmanifesto.org

Web sustainability

 Do..

 Don’t..

Optimise images and multimedia

Do..

use image compression tools
and techniques to reduce the file size

Don’t..

Uploading high-resolution images directly from a camera to a website without resizing or compressing them

Use efficient code and technologies

Do..

utilise efficient coding practices and lightweight technologies to improve website performance and reduce energy consumption.

Don’t..

include unused or redundant code in your website's files as it can increase file sizes and impact performance negatively.

Use renewable energy hosting

Do..

consider hosting your website on servers powered by renewable energy sources to minimise carbon emissions associated with hosting. I.e. Clook.

Don't..

host your website on servers powered by non-renewable energy sources, as it contributes to carbon emissions and environmental degradation.

Minimise HTTP requests

Do..

minimise the number of HTTP requests by combining files, utilizing CSS sprites, and reducing unnecessary resources to improve website speed and efficiency.

Don’t..

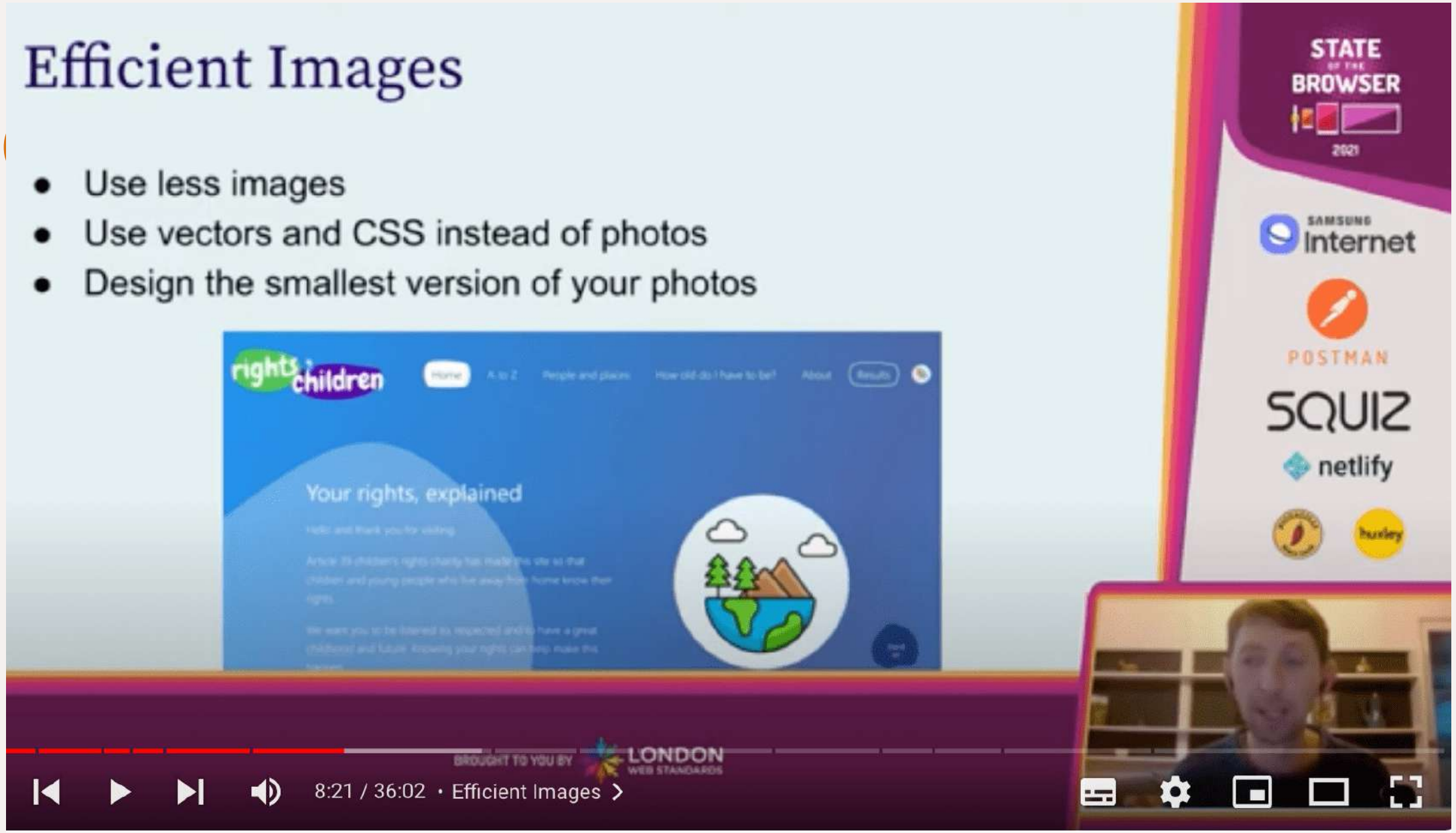
don't use an excessive number of third-party scripts or plugins on your website, as they can increase page load times and energy consumption.

What can we do?

Optimise images

- Consider if you really need an image
- Crop the image for the intended size
- Use image compression tools like **TinyPNG** or **JPEGmini** to reduce the file size of images without significantly compromising quality.
- Use image formats more performant such as **WebP** or **AVIF**

— All about images – Explainers for Devs



[Tom Greenwood: A sustainable web for everyone]

Optimise videos

- Avoid auto-play
- `<video src="dog.mp4" autoplay="none"/>`
- Avoid preload
- `<video src="dog.mp4" preload="none"/>`
- Compress video file with tools like Handbrake
- Stream at a lower definition
- Reduce time
- Avoid embedding from YouTube

using video considerately on sustainable websites

Fonts

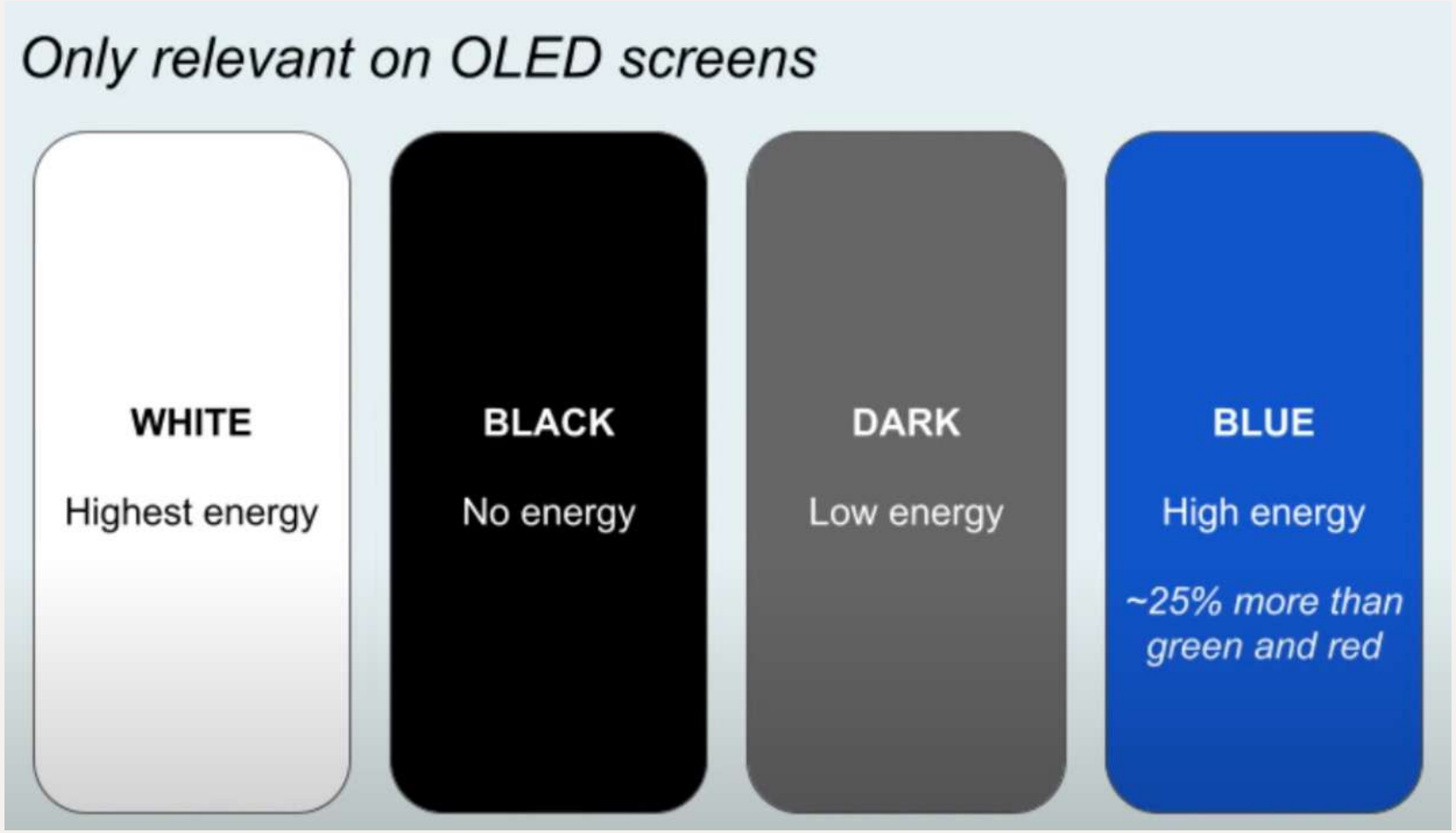
- Use system fonts where possible
- When using a custom font prefer the format **WOFF2**
- Use less font variations (subset)
- If you need to use different font variations use a variable font instead

Inter UI (default)	Inter UI (optimised)
TTF file	WOFF2 file
2192 characters	98 characters
300kb	7kb

On Web Typography – Jason Santa Maria

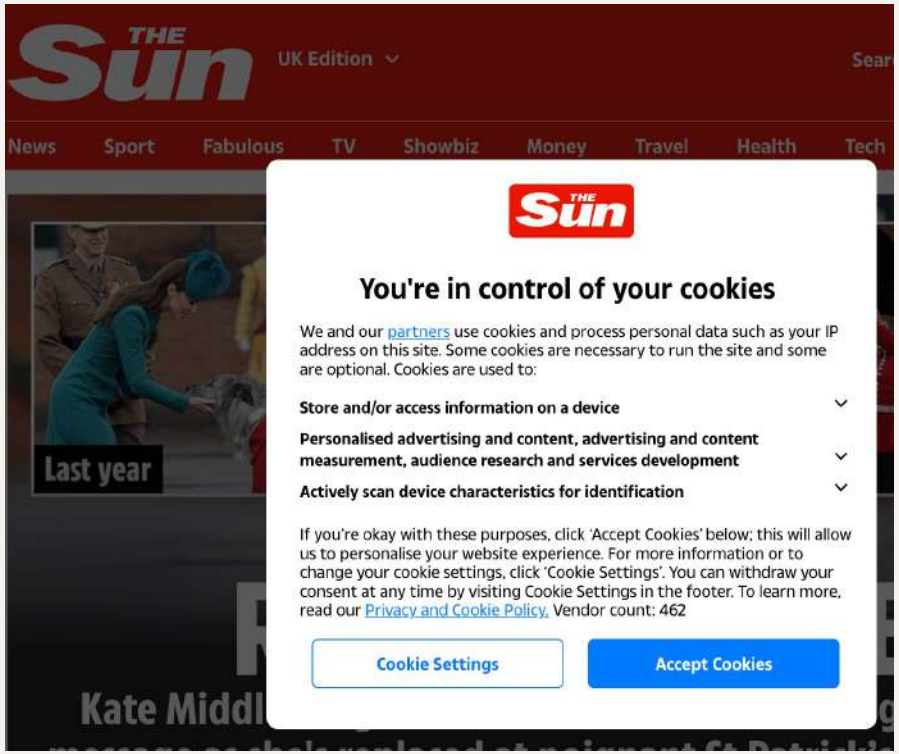
Low energy colors

Darker colors require less energy to illuminate, with black being the lowest energy color and white being the most energy intensive.



[energy efficiency when making color choices]

Track less



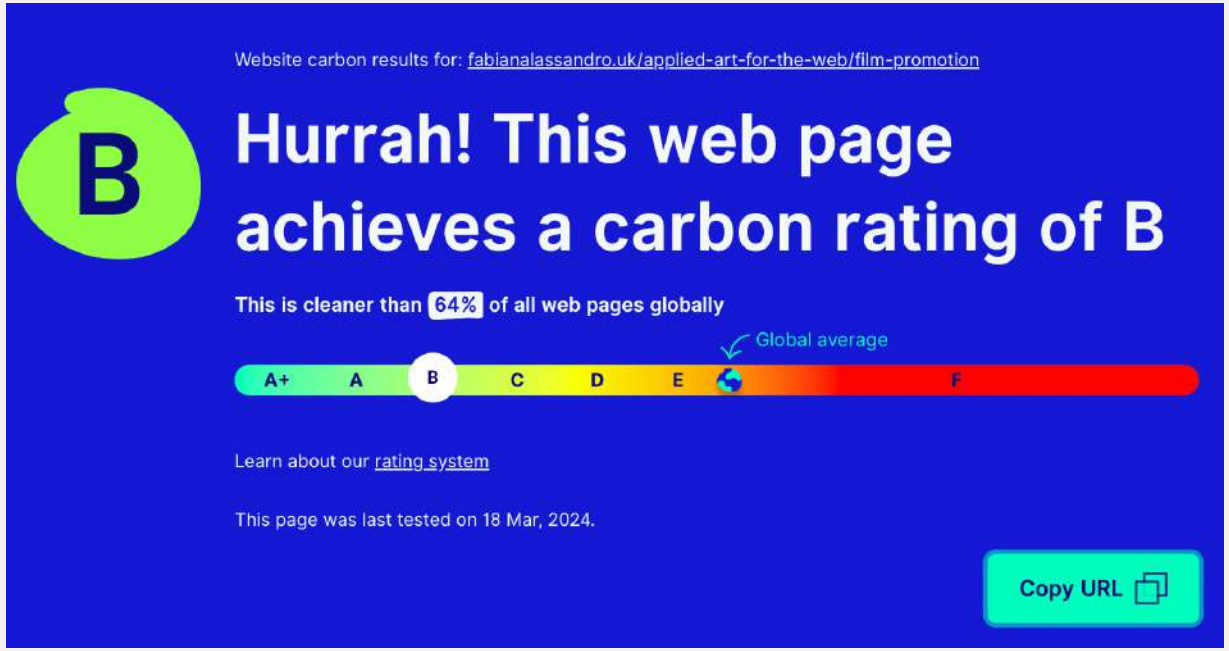
Platform	Size	Cookies?
Google Analytics	17KB	Yes
GA with GTM	75KB	Yes
Matomo	40KB	Yes
Minimal GA	1.5KB	Yes
Fathom	1.2KB	No
Plausible	<1KB	No

Testing Tools and Techniques

Website Carbon Calculator

Website Carbon Calculator the energy and emission of a web page we use the following data points:

- Data transfer over the wire
- Energy intensity of web data
- Energy source used by the data centre
- Carbon intensity of electricity
- Website traffic

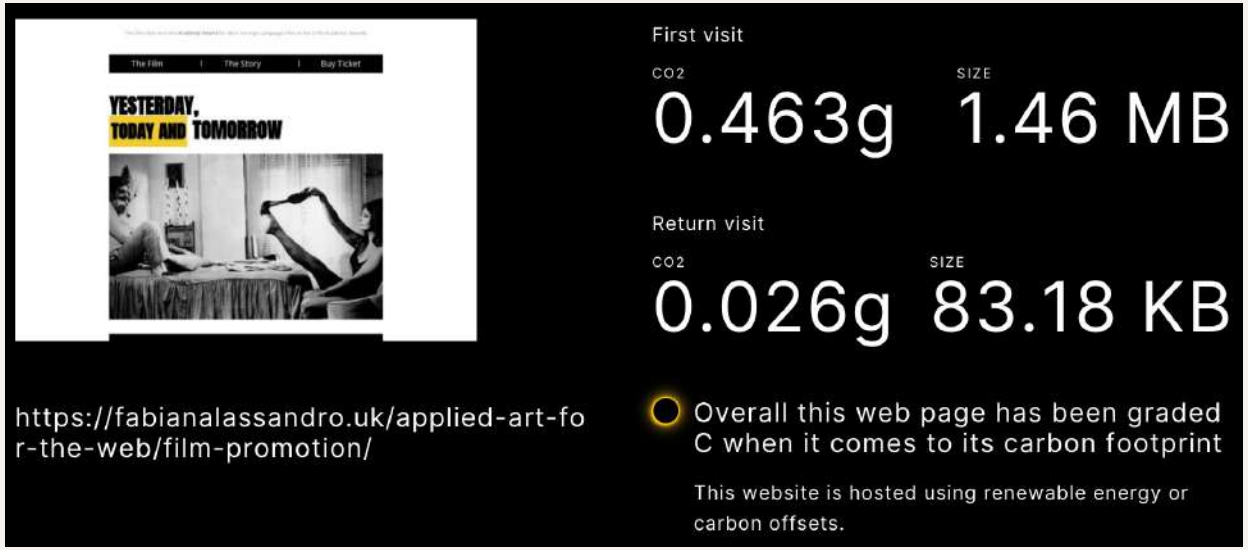


websitecarbon.com

Beacon

- **Digital Beacon** is a useful tool for website analysis. It shows CO2 emissions, page size and many useful tips.
- It calculates the environmental **impact of a web page**, shows the **breakdown** and helps understand **what measures can be taken** to improve it.

digitalbeacon.co

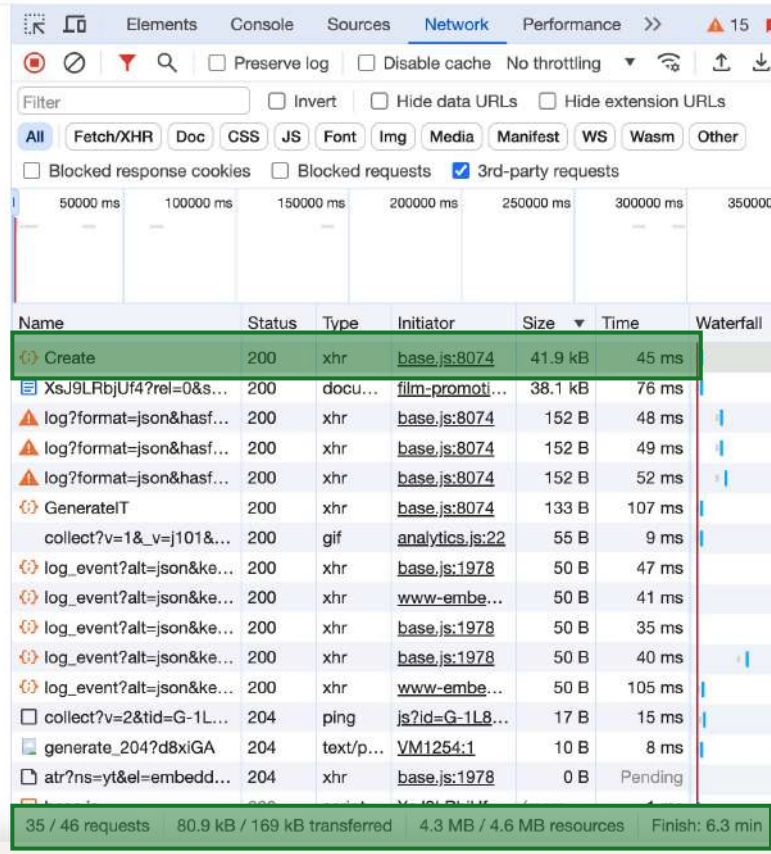


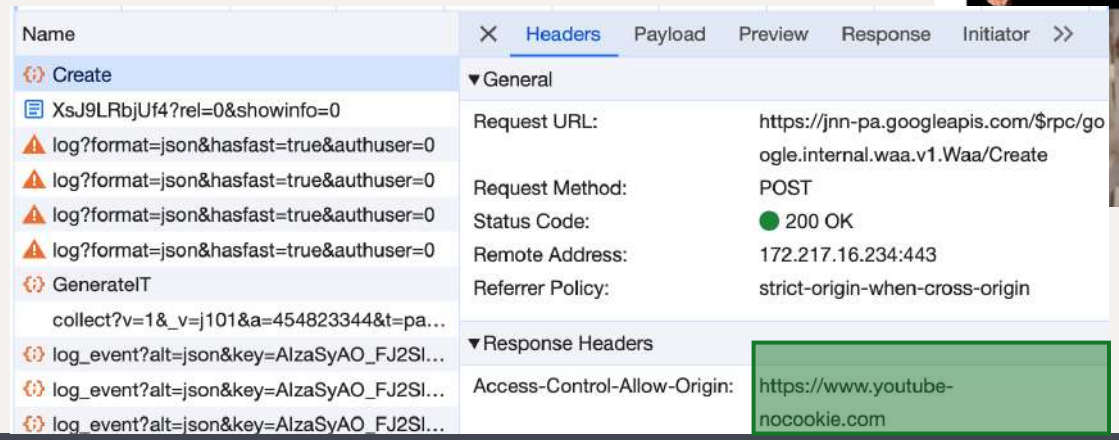
PAGE BREAKDOWN

TYPE	REQUESTS	SIZE	CO2
Document	2	40.57 KB	0.013g
Script	7	1.06 MB	0.338g
Stylesheet	4	52.21 KB	0.016g
Image	6	198.16 KB	0.061g
Font	5	69.67 KB	0.022g
XHR	4	42.6 KB	0.013g
Preflight	2	1.03 KB	0.000g
Total		1.46 MB	0.463g

DevTools Network

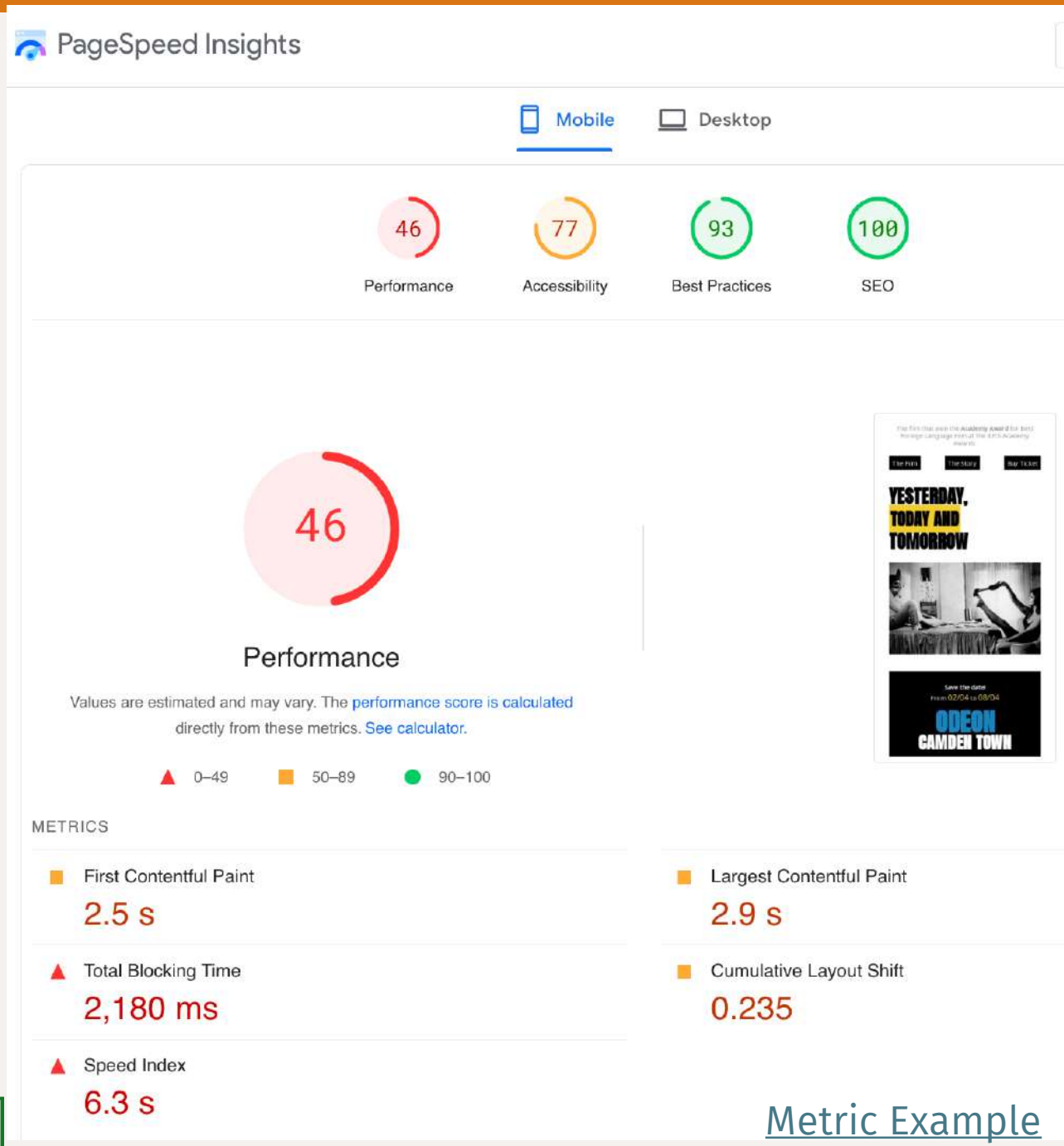
To check how many resources our webpage download every time we request the page we can use the **DevTools Network tab.**





PageSpeed Insights

PageSpeed Insights help us showing what are the resources that slow down our website and provide also practical solutions to improve the performance and therefore the carbon footprint of our webpages.



Metric Example

In-class exercise

Test and Improve your website: in-class exercise

Test and improve your **film promotion** website.

Use the tools and techniques we learned together to improve the performance of your website and make it more sustainable.

Guidelines and Certificates

Web Sustainability Guidelines (WSG)

The Web Sustainability Guidelines (WSG) 1.0, developed by W3C, offer a wide array of **recommendations** to design and develop websites and digital products more eco-friendly.

While still a work in progress and **not yet a formal standard**, it's a valuable resource for web professionals seeking to improve their website's efficiency and sustainability.

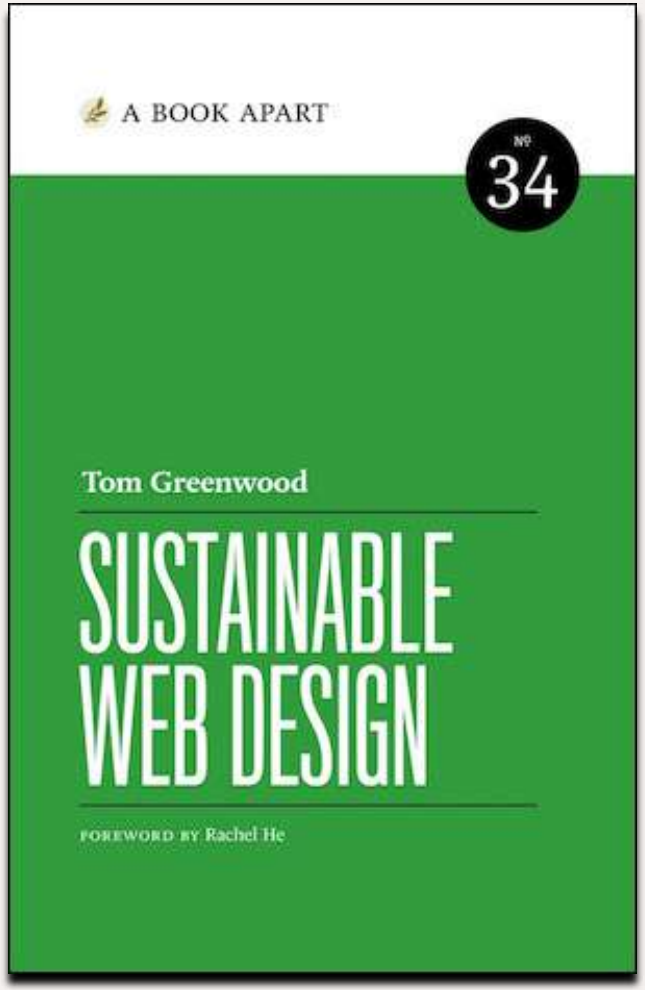
Web Sustainability Guidelines (WSG) 1.0

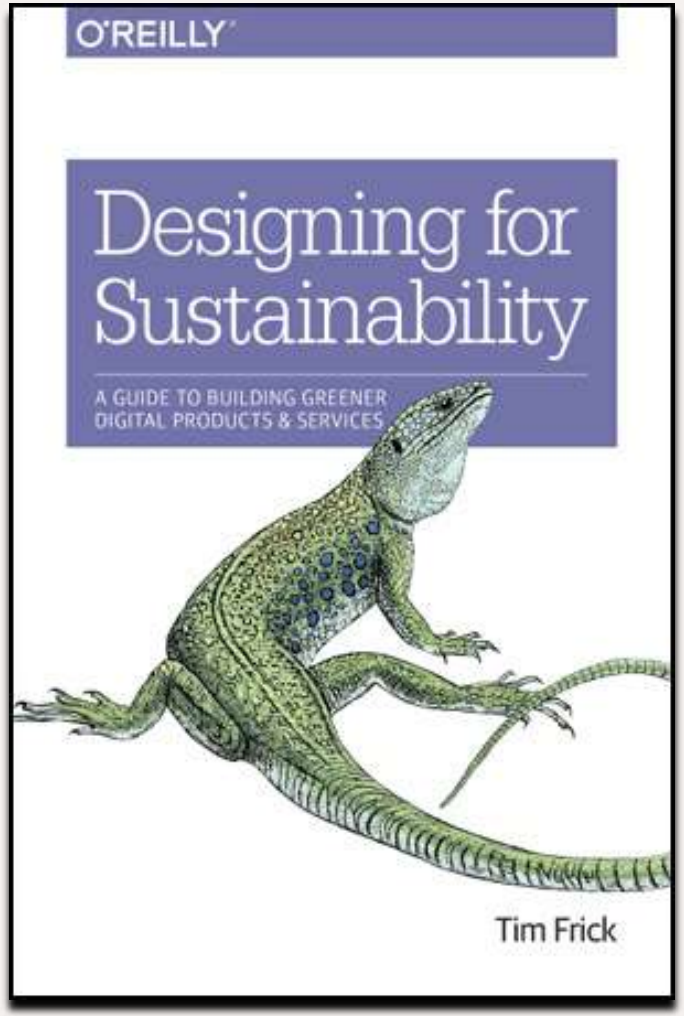
B Corps

Certified B Corporations, or B Corps, are companies verified by B Lab to meet high standards of social and environmental performance, transparency, and accountability.

What does the B Corp certification mean?

Books


A BOOK APART
№ 34
Tom Greenwood
SUSTAINABLE WEB DESIGN
FOREWORD BY Rachel He


O'REILLY
Designing for Sustainability
A GUIDE TO BUILDING GREENER DIGITAL PRODUCTS & SERVICES
Tim Frick

Resources

- Sustainable Web Development Strategies Within An Organization, *Michelle Barker* – Smashing Magazine
- 20 ways to make your website more energy efficient , *Tom Greenwood* — Wholegrain digital
- A sustainable web for everyone, *Tom Greenwood* — State of the Browser [video]
- Michelle Barker – Building a greener web – All Day Hey! 2023 [video]
- Understanding Sustainable Design, *Tim Frick* [video]

end