



A talk that nobody wants to hear

But really should?



The internet has a (huge) carbon footprint

If the internet was a country, it would have been the 6th largest polluter in 2018.



“It’s now or never, if we want to limit global warming to 1.5°C. Without immediate and deep emissions reductions across all sectors, it will be impossible.”

Comment on IPCC’s report 2022 from Jim Skea in [The Guardian](#) (April 4, 2022)



“The internet is the single biggest thing we’re going to build as a species.

If we build it the right way, with the right sources of energy, it could really help power our transition to renewables.

If we build it the wrong way, it could actually exacerbate the problem.”

Gary Cook (Greenpeace)



I'm Csaba

I am a sustainable web developer at LittleBigThings.be, a bio-engineer and a father

Contributing to [WordPress](https://WordPress.org), ClimateAction.tech and [XR](https://XR.com)

I love music and I play guitar :-)



A tiny website

10k apart contest: build a website in 10 kb

Original website (7 kb) turned into globalwarning.blog
(WordPress blog, 30 kb)

Goal: create an easily manageable blog with a little footprint, dealing with the impact of the internet on climate change

csaba.blog/global-warning-a-wordpress-blog-with-a-tiny-footprint/
csaba.blog/site-with-a-tiny-footprint-about-global-warming/



Sustainable Web

**clean, efficient, open,
honest, regenerative &
resilient**

www.sustainablewebmanifesto.com

Sustainable Web Design by Tom Greenwood



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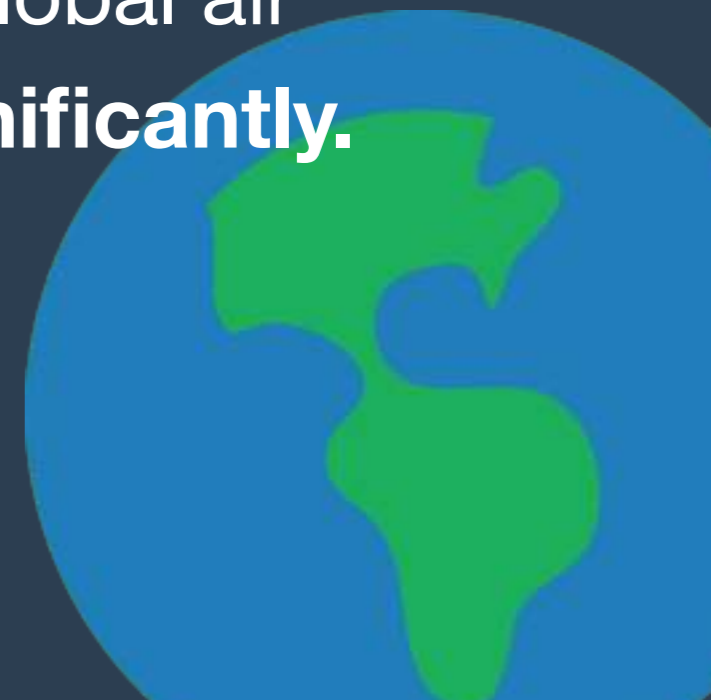


Clean?

Electricity is needed for servers, networks and devices

- from fossil fuels, nuclear or renewable sources
- around 3-5% of global electricity
- up to 20% in the coming years?

2% of global emissions in 2017 (equivalent to global air travel), **estimated to become ... well, rise significantly.**



Clean

Use clean (renewable) energy for hosting to save on emission: www.thegreenwebfoundation.org



Is your website hosted green?

One day the Internet will run entirely on renewable energy. The Green Web Foundation believes that day should be within reach, and develops tools to speed up the transition towards a green Internet



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Efficient?

Total kilobytes transferred



MEDIAN DESKTOP
2165.5 KB

MEDIAN MOBILE
1974.1 KB



Efficient?

**Median web page
(desktop)**

2,17 Mb transfer size
73 requests,
incl. ~ 500 kB JavaScript!!!

First contentful paint

2 s (desktop)
5 s (mobile)

Time to interactive

14.4 s (mobile)



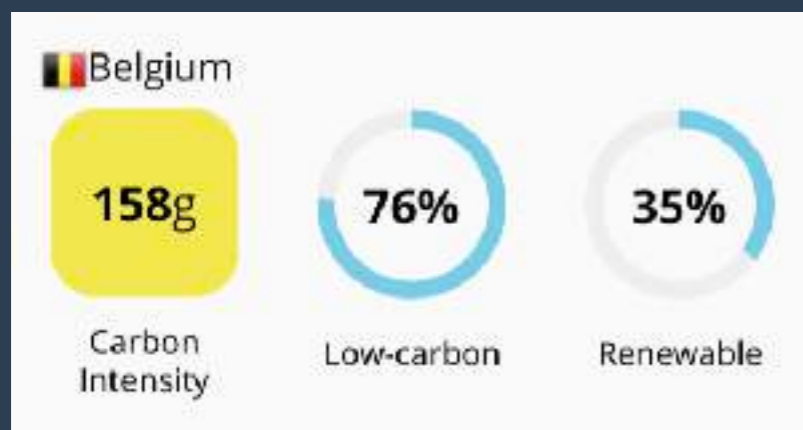
Efficient?

How about carbon emissions? From electricity to CO₂ equivalents:

~ 1.8 W to transfer a MB

$0.158 \text{ g CO}_2 \text{ eq/W} * 1.8 \text{ W/MB} = 0.28 \text{ g CO}_2 \text{ eq/MB}$

$0.28 \text{ g CO}_2 \text{ eq/MB} * 2.166 \text{ MB} = \mathbf{0.61 \text{ g CO}_2 \text{ eq}}$ (median)



Electricity map (app.electricitymap.org/map)



Efficient?

0.61 g CO₂ eq is not that much? But there are billions of users and websites.

A small reduction can have a huge impact!

www.internetlivestats.com

<https://dannyvankooten.com/website-carbon-emissions/>



Efficient

Branch Magazine: branch.climateaction.tech

Google uses electricity map to plan heavy operations

Look for clever ways to optimise for ~~perceived~~ performance.

Electricity map (app.electricitymap.org/map)



Efficient

Tool to measure the carbon emission of a web page:

[websitecarbon.com](https://www.websitecarbon.com)

Average measured:
1.67 g CO₂/page view

Scan and test!



Efficient

Tool to measure the carbon emission of a web page:
[websitecarbon.com](https://www.websitecarbon.com)



Uh oh! This web page is dirtier than **53%** of web pages tested



Oh my, **1.00g of CO2** is produced every time someone visits this web page.



This web page appears to be running on **sustainable energy**



Hurrah! This web page is cleaner than **86%** of web pages tested



Only **0.19g of CO2** is produced every time someone visits this web page.



Oh no, it looks like this web page uses **bog standard energy**

If this site used green hosting, then it would emit 95% less CO2



Hurrah! This web page is cleaner than **97%** of web pages tested



Only **0.02g of CO2** is produced every time someone visits this web page.



This web page appears to be running on **sustainable energy**

Efficient

Reduce image size: use efficient formats (WebP & AVIF), optimise resolution as size and compress

Less JavaScript (including tracking scripts and scripts of embedded content like video)

Fonts: file format and subsetting

Cache (all?) things or keep it static

Progressive Web Apps



“The most sustainable feature of a website is the one you don’t implement.”



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Open

Open-source: more robust solutions that are widely usable

Learn from each other

Accessible for everyone

Applications to communicate with APIs



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Honest

Avoid dark patterns and sneaky tricks

Avoid using personal data unnecessarily (alternatives for Google Analytics: [Plausible](#), [Cabin](#), Matomo, or Fathom analytics)

Support honest and good businesses

Look at the long-term and always be kind and ethical



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Regenerative

Empower people to take meaningful action to restore

Discourage bad habits, encourage good ones

Plant trees (ecologi.com, digitalhumani.com, ...)



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Resilient

Keep the web resilient

Keep things secure

Make things robust



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Sustainable Web

**be clean, efficient, open,
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To our wonderful sponsors, our awesome community and fantastic volunteers! #ddd2022 (Drupal Slack), [@drupaldevdays](https://twitter.com/drupaldevdays) and facebook.com/drupaldevdays

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 dropsolid



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wieni_



agiledrop
Trusted Drupal teammates

AMPLEXOR



INTERNET

ACQUIA



Kraut.Hosting
No Clouds just Sunshine



3sign

Resources: books

Sustainable Web Design - Tom Greenwood

Designing for Sustainability - Tim Frick

Ruined by Design - Mike Monteiro

Material Matters - Thomas Rau & Sabine Oberhuber

How are we going to explain this? - Jelmer Mommers

Going Offline - Jeremy Keith

Resilient Web Design - Jeremy Keith ([free ebook](#))



Resources: tools

Sustainable Web Manifesto: sustainablewebmanifesto.com

Website Carbon Calculator: websitecarbon.com

Sustainable Web Design: sustainablewebdesign.org

Climate Action Tech: climateaction.tech

Branch Magazine: branch.climateaction.tech

Wholegrain Digital: wholegraindigital.com

Mighty Bytes: mightybytes.com

SustainableUX: sustainableux.com

The Lean Web: leanweb.dev from Chris Ferdinandi, the vanilla JS guy

The Sustainable Dev: the-sustainable.dev

Global Warning: globalwarning.blog



Resources: slides

csaba.blog/drupaldevdays-2022/

