Connect, not collect

Making digital sustainability standards discoverable with **carbon.txt**

GREENWEB.ORG

Chris Adams

14.11.2025

Hello, I’m Chris!

My background:

Loco2 - Low CO2 Travel in Europe by train

A.M.E.E (Avoid Mass Extinction Engine) - CO2 calculation as an API

Green Software Foundation - policy working group co-chair, leading the new SCI-Web standard

Branch Magazine - contributor, co-founding editor

ClimateAction.tech - community organiser since 2018

Environment Variables podcast - host since 2022

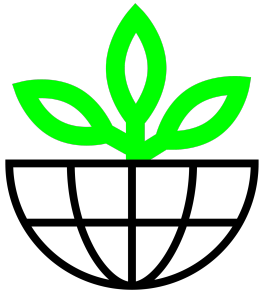
Green Web Foundation - director of tech and policy (my day job)

The Green Web Foundation is working towards a fossil-free internet by 2030.

The internet should be a global public good, and a tool for liberation. Healthy for the planet and for the people who use it.

What we'll cover

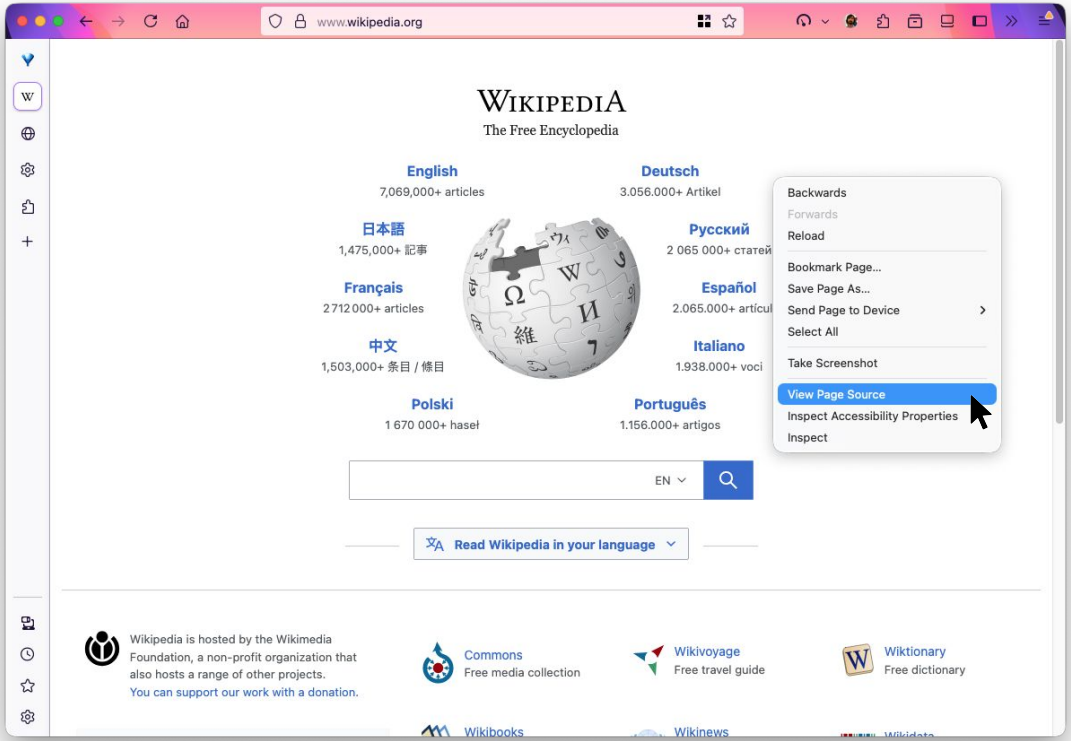
1. A key idea of the web - view source, and why I love it
2. What webby claims are
3. Applying webby claims to digital sustainability
4. The big idea behind our project, carbon.txt
5. Wrapping up



View source, and why I love the web

1

Have you ever done this?

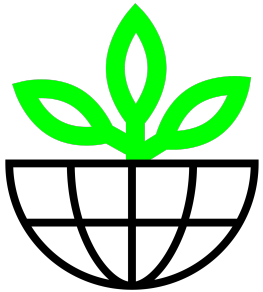


Every single web page you visited contained the code showing you how it was created. The entire internet became a library of how-to guides on programming

From Coders, by Clive Thompson

When you render the page, you demonstrate that your code is behaving the way you said it would.

You’re backing up your claim.



Webby claims, and what they are

2

Security and HTTPS connections

Look for the padlock

Highlights that the connection is secure between your browser and the server you're connecting to.

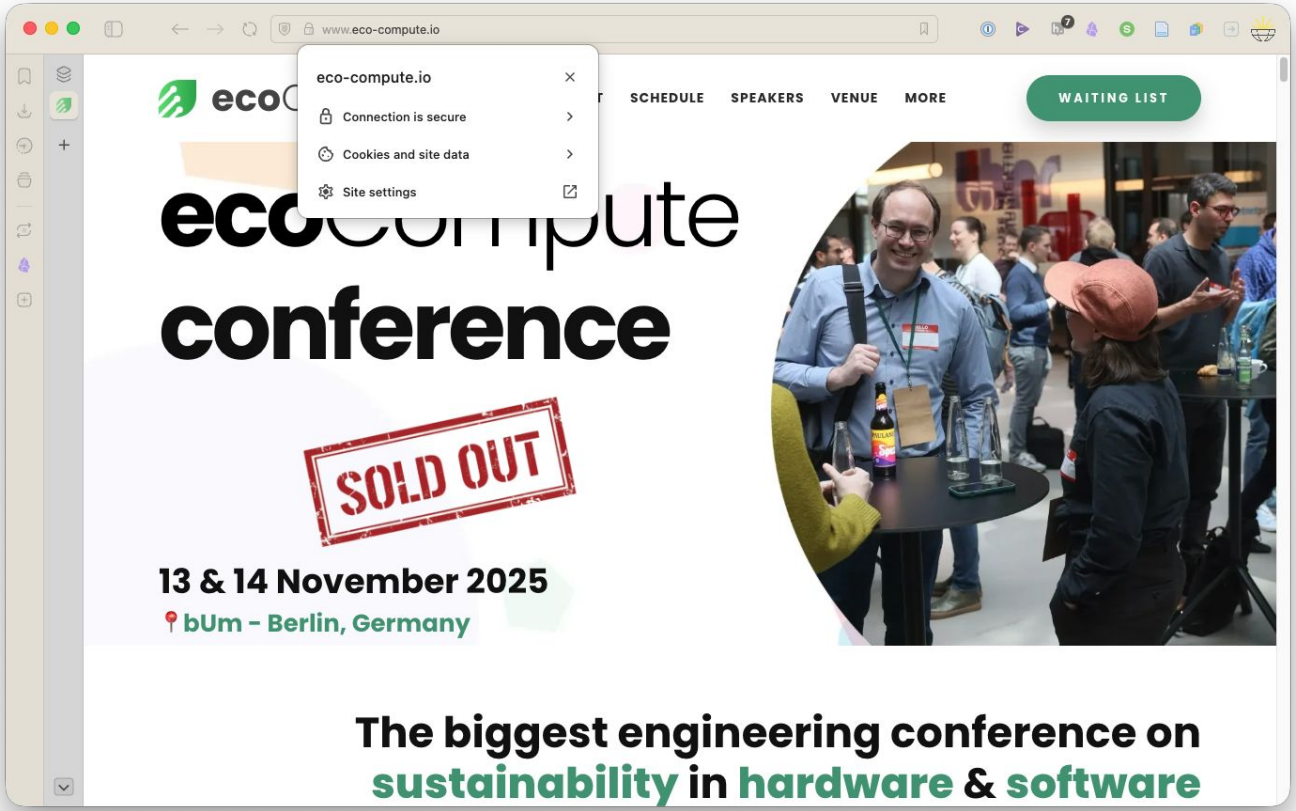
The claim:

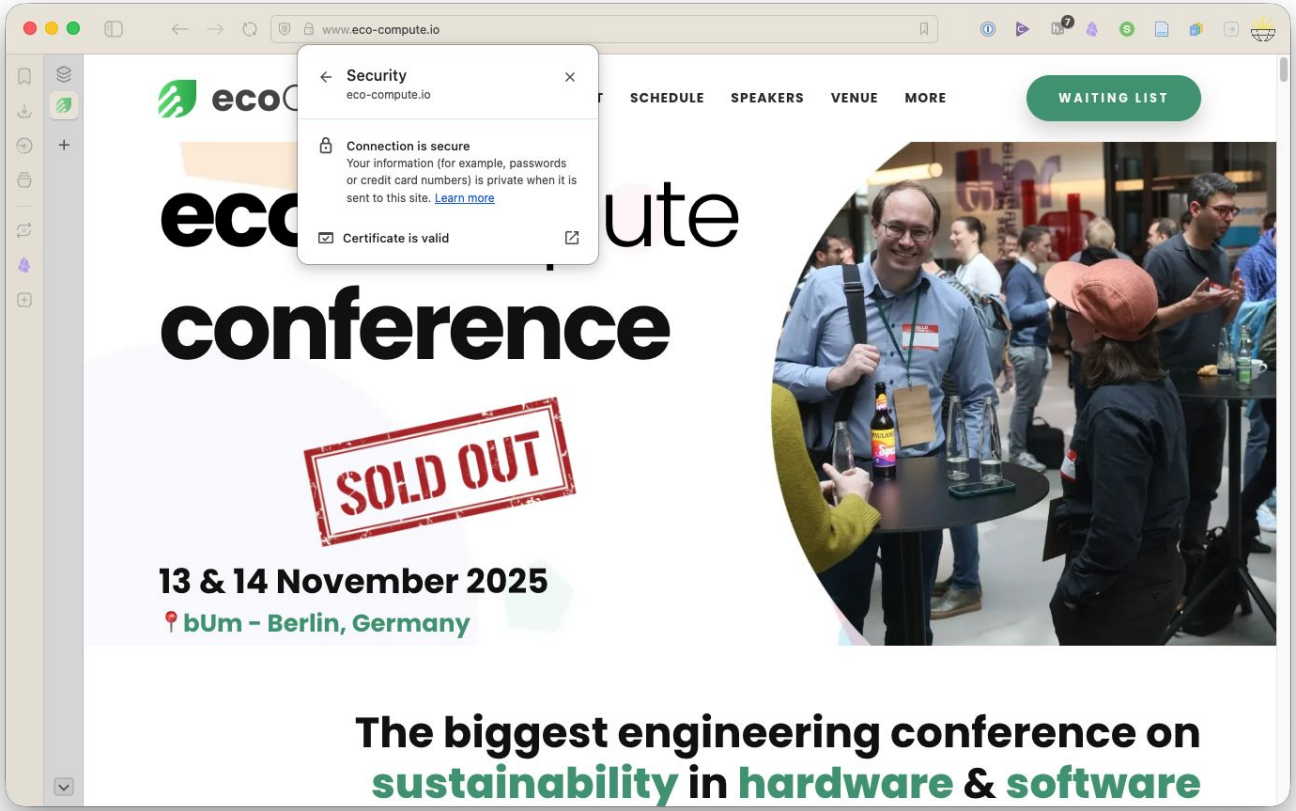
"The connection between your browser and this site is secure"

Backing it up:

Checking the padlock, and where the linked certificate comes from*

* yes, it's more complicated than this, but if there's no padlock, you're not connecting over HTTPS


www.eco-compute.io
eco-compute.io
Connection is secure
Cookies and site data
Site settings
SCHEDULE
SPEAKERS
VENUE
MORE
WAITING LIST
conference
SOLD OUT
13 & 14 November 2025
bUm - Berlin, Germany
The biggest engineering conference on
sustainability in hardware & software


www.eco-compute.io
Security
eco-compute.io
Connection is secure
Your information (for example, passwords or credit card numbers) is private when it is sent to this site. Learn more
Certificate is valid
SCHEDULE
SPEAKERS
VENUE
MORE
WAITING LIST
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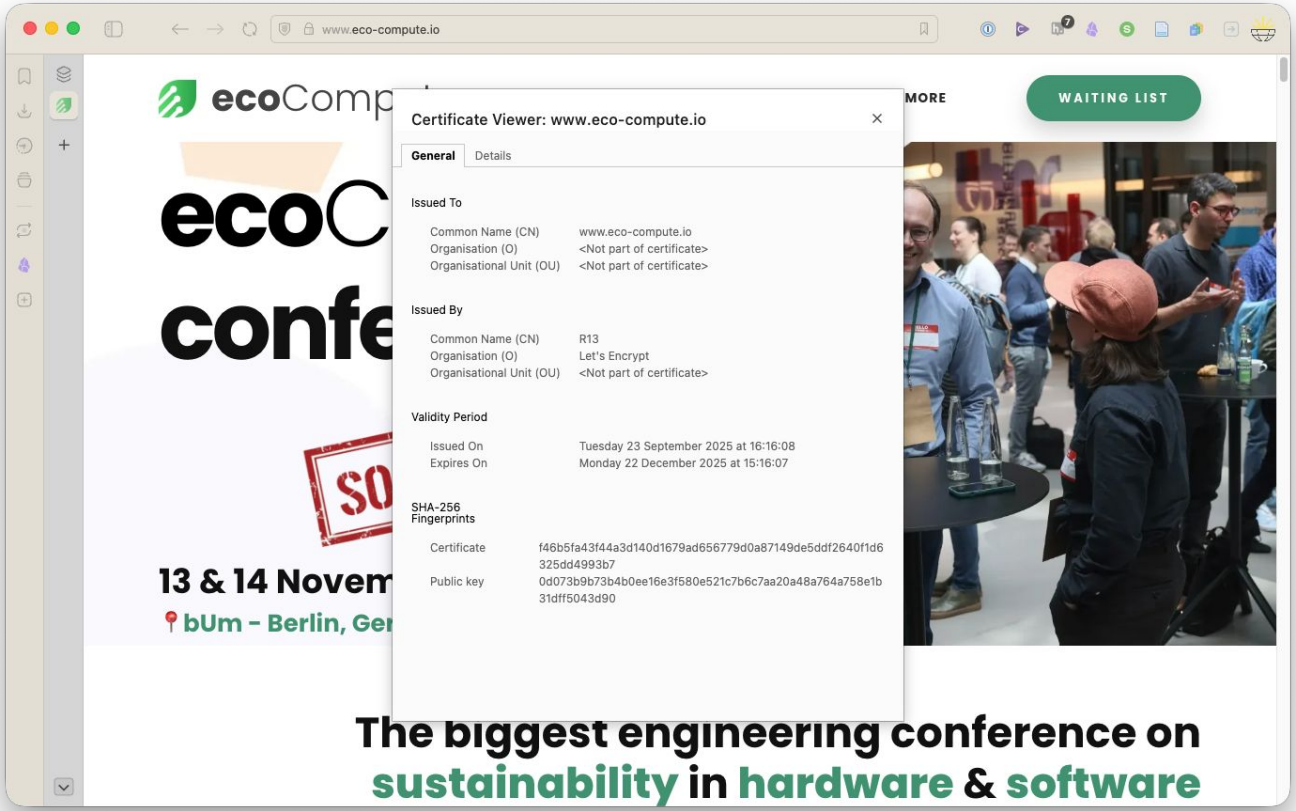

www.eco-compute.io
WAITING LIST
Certificate Viewer: www.eco-compute.io
General
Details
Issued To
Common Name (CN) www.eco-compute.io
Organisation (O) <Not part of certificate>
Organisational Unit (OU) <Not part of certificate>
Issued By
Common Name (CN) R13
Organisation (O) Let's Encrypt
Organisational Unit (OU) <Not part of certificate>
Validity Period
Issued On Tuesday 23 September 2025 at 16:16:08
Expires On Monday 22 December 2025 at 15:16:07
SHA-256 Fingerprints
Certificate f46b5fa43f44a3d140d1679ad656779d0a87149de5ddf2640f1d6325dd4993b7
Public key 0d073b9b73b4b0ee16e3f580e521c7b6c7aa20a48a764a758e1b31dff5043d90
13 & 14 Novem
bUm - Berlin, Ge
The biggest engineering conference on
sustainability in hardware & software

Web Performance

Various metrics are now used to track performance of a website.

Examples:

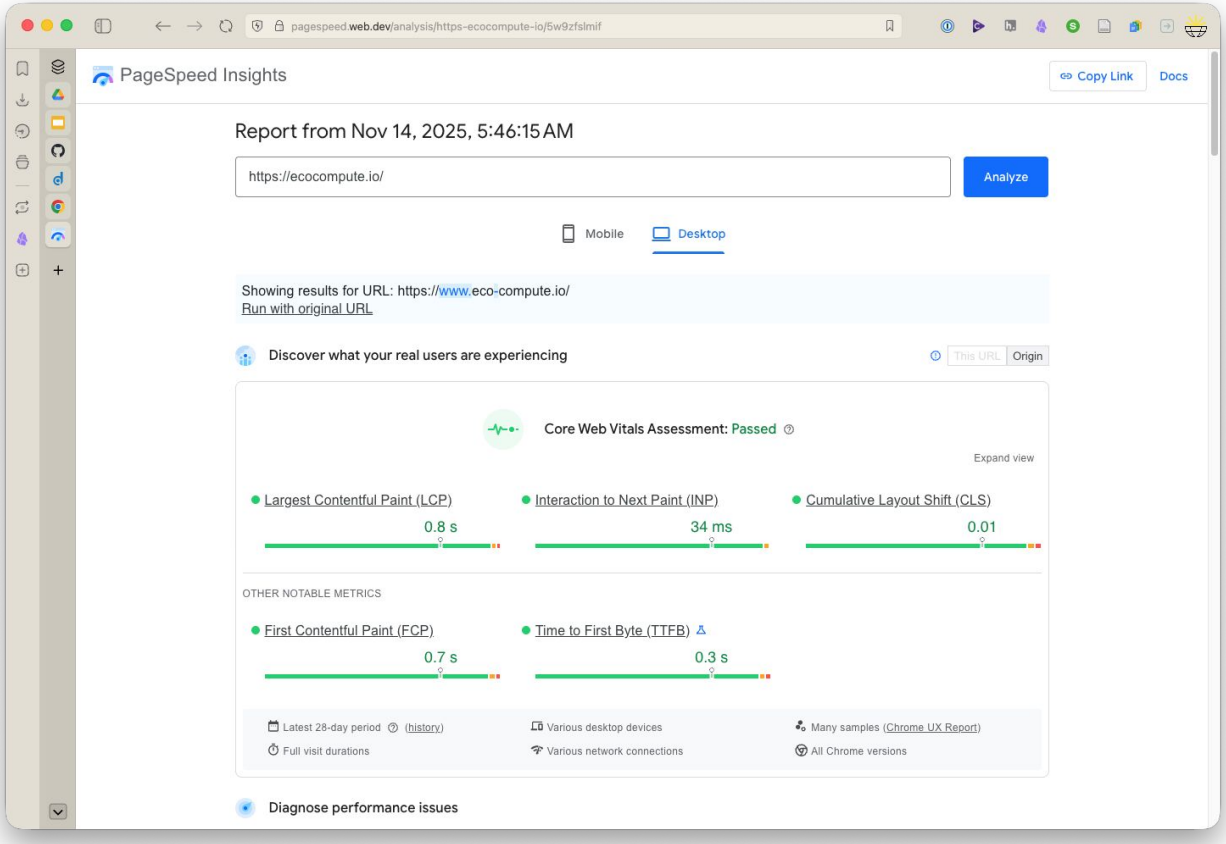
First Contentful Paint - when the first element on a page is rendered
Total Blocking Time - broadly, how long a page spends loading before it can respond to user input
Speed Index - how quickly the layout is visually displayed

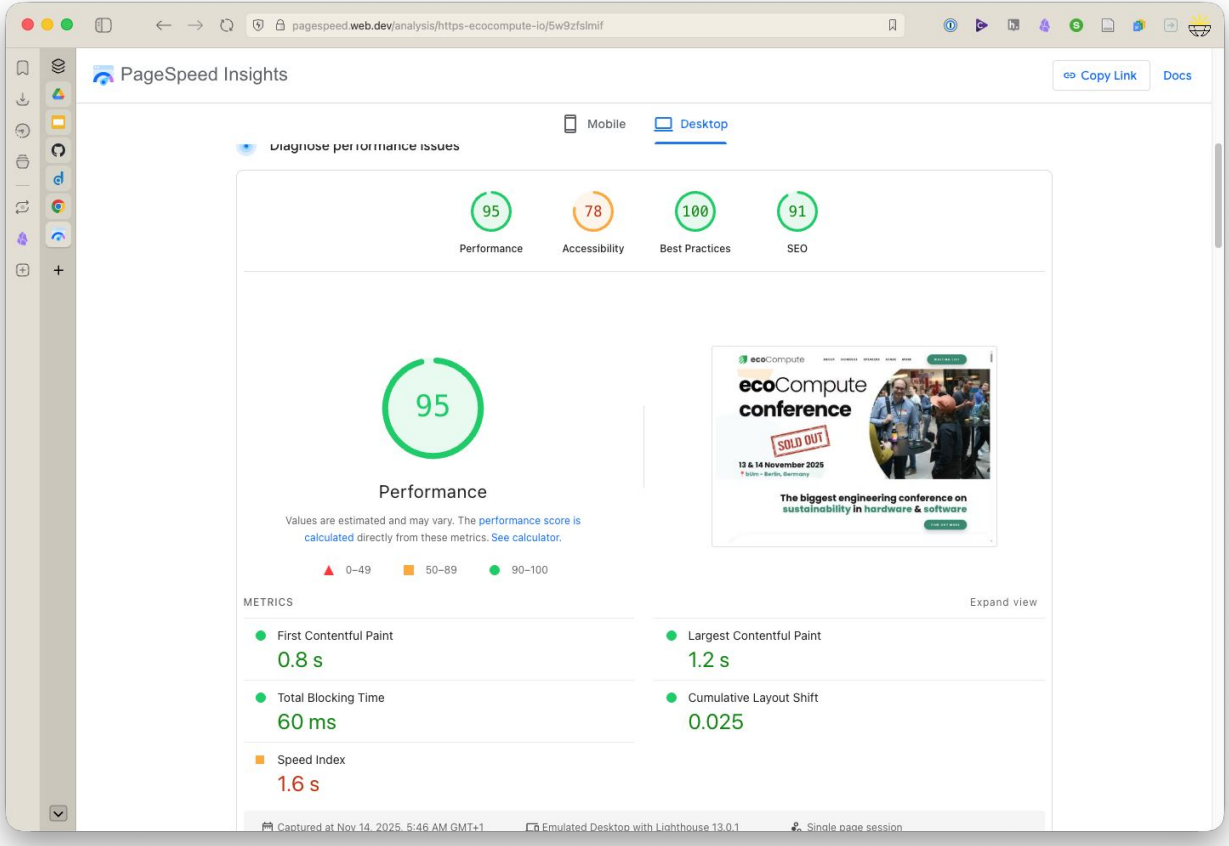
The claim:

“My site is fast loading.”

Backing it up:

Lighthouse score of at least 90, across 5 metrics.


pagespeed.web.dev/analysis/https-ecocompute-io/5w9zfslmif
PageSpeed Insights
Copy Link
Docs
Report from Nov 14, 2025, 5:46:15 AM
https://ecocompute.io/
Analyze
Mobile
Desktop
Showing results for URL: https://www.eco-compute.io/
Run with original URL
Discover what your real users are experiencing
This URL
Origin
Core Web Vitals Assessment: Passed
Expand view
Largest Contentful Paint (LCP)
0.8 s
Interaction to Next Paint (INP)
34 ms
Cumulative Layout Shift (CLS)
0.01
OTHER NOTABLE METRICS
First Contentful Paint (FCP)
0.7 s
Time to First Byte (TTFB)
0.3 s
Latest 28-day period (history)
Full visit durations
Various desktop devices
Various network connections
Many samples (Chrome UX Report)
All Chrome versions
Diagnose performance issues


pagespeed.web.dev/analysis/https-ecocompute-io/5w9zfslmif
PageSpeed Insights
Copy Link
Docs
Mobile
Desktop
95
Performance
78
Accessibility
100
Best Practices
91
SEO
95
Performance
Values are estimated and may vary. The performance score is calculated directly from these metrics. See calculator.
0–49
50–89
90–100
ecoCompute conference
SOLD OUT
13 & 14 November 2025
The biggest engineering conference on sustainability in hardware & software
METRICS
Expand view
First Contentful Paint
0.8 s
Largest Contentful Paint
1.2 s
Total Blocking Time
60 ms
Cumulative Layout Shift
0.025
Speed Index
1.6 s
Captured at Nov 14, 2025, 5:46 AM GMT+1
Emulated Desktop with Lighthouse 13.0.1
Single page session

Web accessibility

W3C Web Content Accessibility Guidelines - **WCAG**

A set of recommendations for people building websites to make them available to people with accessibility needs.

Public sector websites** in many countries now require an ***accessibility statement*** stating the level of accessibility they target, and how to report problems.

** the European Accessibility Act came into effect in June this year. You might need this for your site too now.

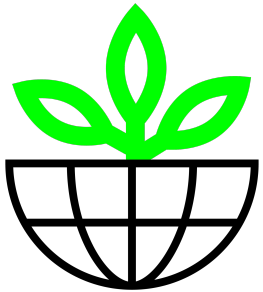
The claim:

"My site is wholly compliant with Web Content Accessibility Guidelines version 2.2 AA standard"

Backing it up:

Site does *not fail** with accessibility checking tools, like Deque's AXE, the Lighthouse checks we saw before, or built-in browser checkers, etc

* it is more complicated than this, but if a site doesn't pass these automated checks, the claim *definitely* isn't in true



Applying webby claims to digital sustainability

3

The claim:

“Our websites run on green energy”*

* green is a loaded term. You can still be green and evil. We mean *annually matched with renewable energy certificates* for the most part. See our blog for more.

Backing it up:

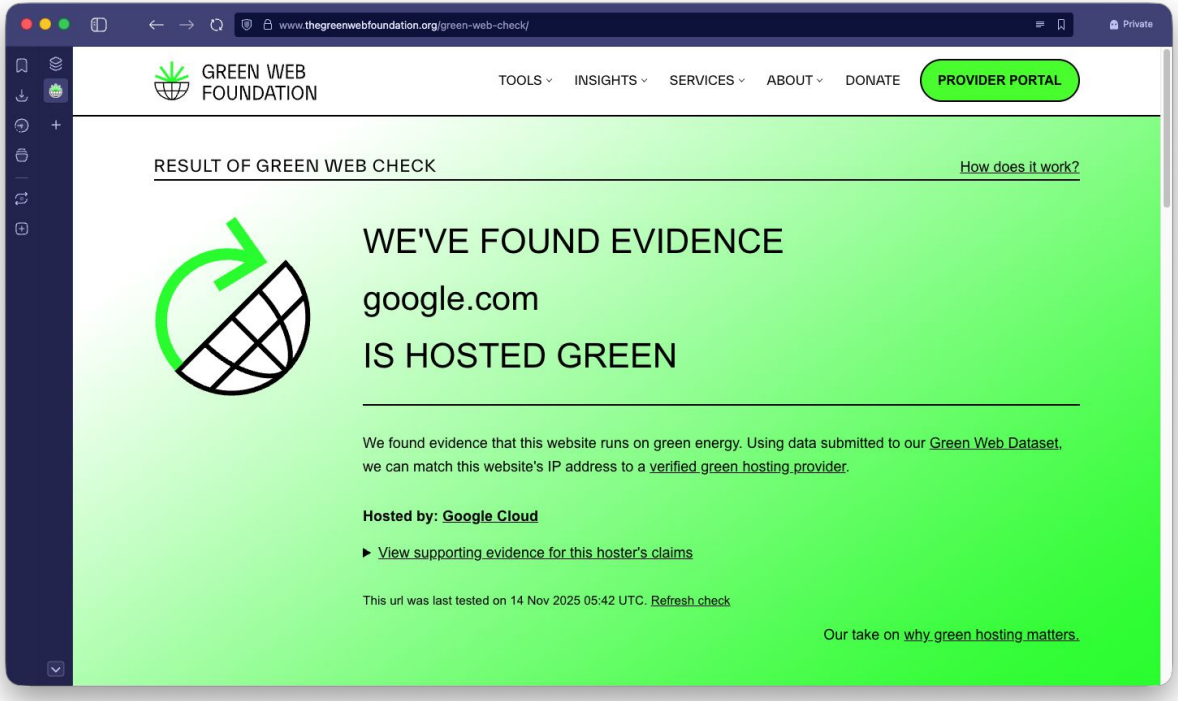
Finding out where the server is run.

Seeing what evidence the operator has shared.

Linking to evidence in the public domain.

This is broadly how our Green Web check works.

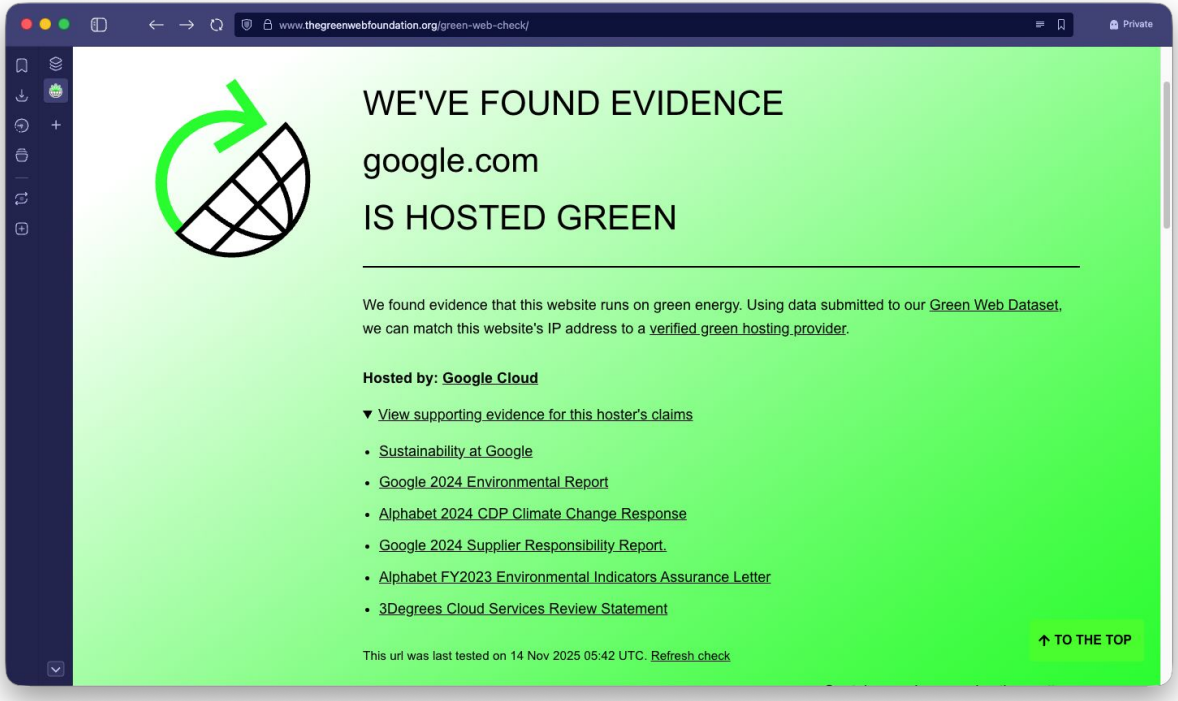
We link domains to reporting entities and the public info they share with us



Why do you have to trust us though?

Can the data be disclosed to make your own decisions?

We'll come back to this with carbon.txt



Did you see Frank from Nextcloud's talk about Green Gates and energy disclosure earlier today?

The claim:

"Our software meets the Blue Angel Standard for transparency and sustainability"

Backing it up:

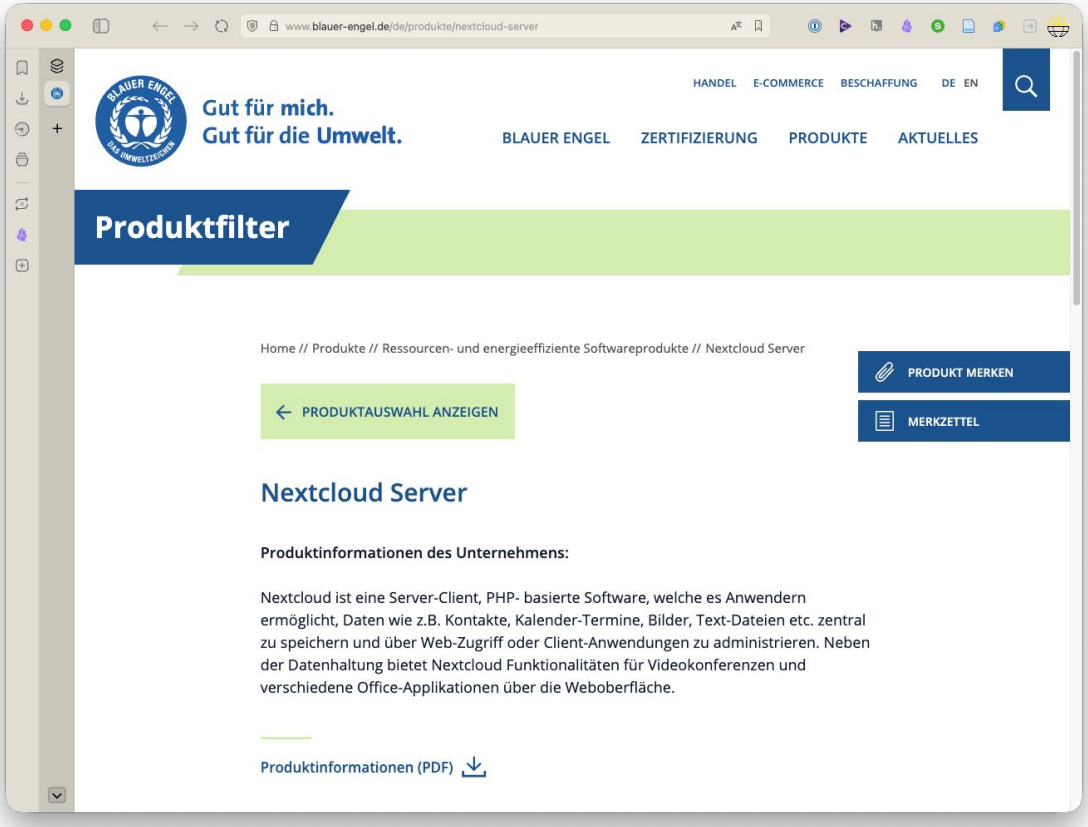
Pulling out the key claims and user journeys.

Linking to the certification published on Blauer Angel.

Linking to the CI?

The underlying details for Nextcloud's sustainability claims does exist.

But you need to know to look for it.



The claim:

"Our software has a Software Carbon intensity rating of 0.5g CO2 for the most common user journey of buying a widget"

Backing it up:

Making clear what the user journey actually is.

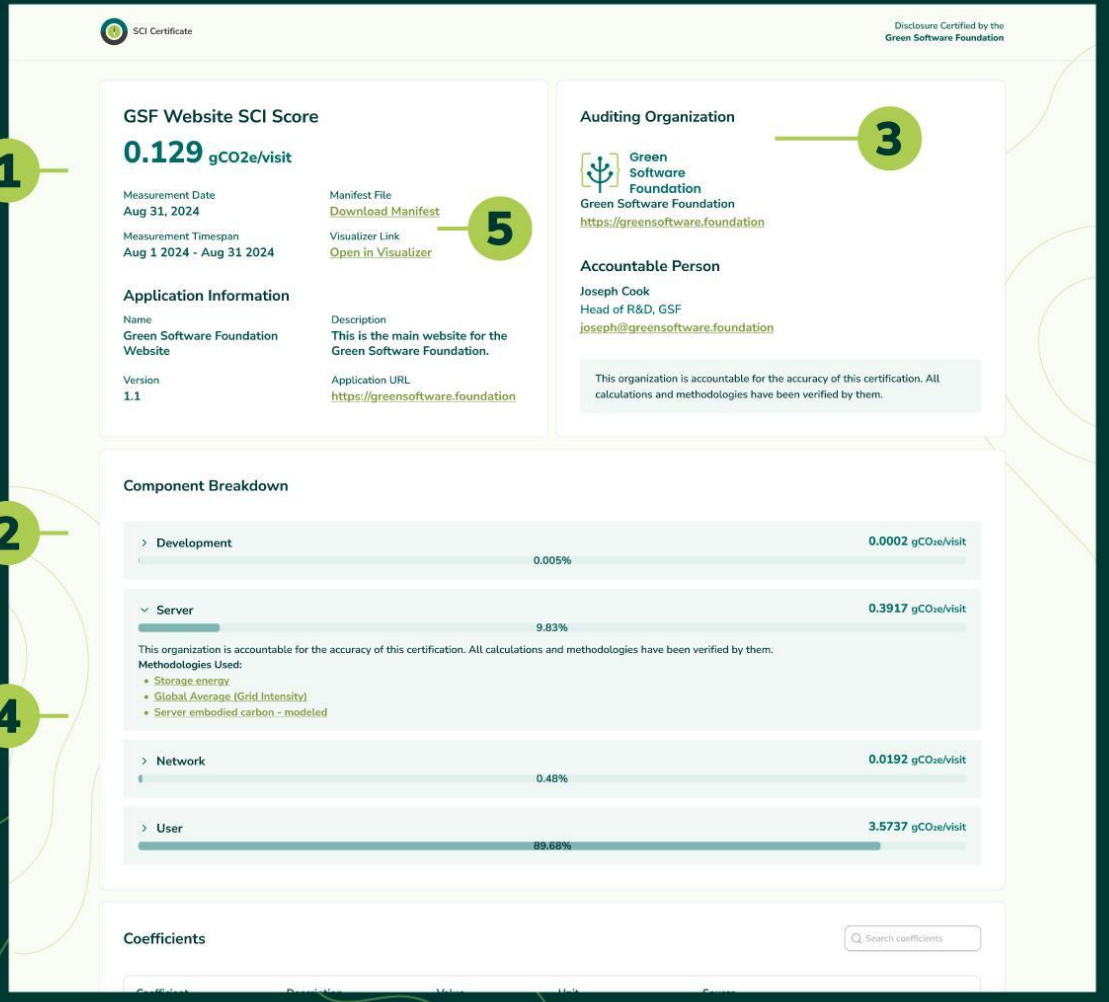
Linking to your work, available in the public domain.

Linking to a hash if you can't share all the data, so the original data can be audited

SCI Certificate of Disclosure

Key sections:

1. Overall SCI score
2. Component breakdown
3. Auditing organization details
4. Methodology information
5. Impact Framework Manifest file download



The claim:

“Our software runs in green, sustainable datacentres”

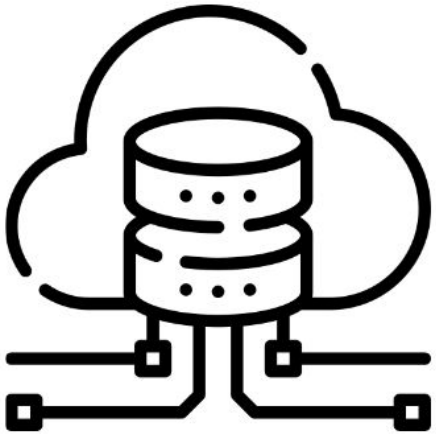
Backing it up:

Linking to a completed E.E.D submission in Europe. For Germany, the EnEfG (Energy Efficiency Law in Germany)

💡 Top tip: Differentiate from your competitors by *actually following the law* - you’re supposed to do this anyway if you run a data centre above a certain size.

Article 12(1) on data centres

Owners and operators of data centres on EU territory with an installed IT power demand of at least 500kW to *make publicly available*:



Name of the data centre, owner and operators date of entry into operation and the municipality where the data centre is based

Floor area of data centre, installed power, annual incoming and outgoing data traffic, amount of data stored and processed

The performance of the data centre during the last full calendar year (energy consumption, power utilisation, temperature set points, waste heat utilisation, water usage and use of renewable energy)

(except information subject to national and EU laws protecting trade and business secrets and confidentiality)

European Commission

The big idea behind carbon.txt

4

The core idea

`/carbon.txt*` is a single place to look on any domain for machine-readable sustainability claims and data for that organisation.

Inspired by existing concepts like `/robots.txt`

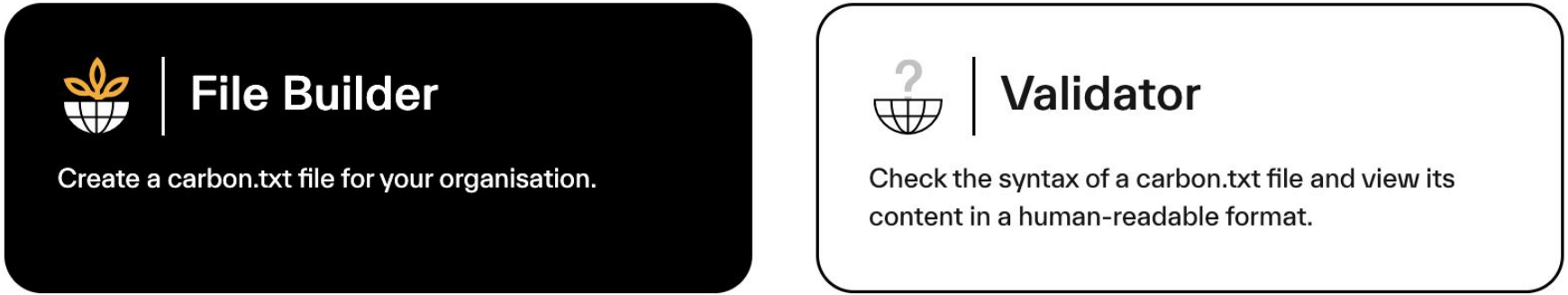
* Yes, we support `.well-known/carbon.txt` too

Extendable syntax, linked validation

- Started with a base validator, and plugin architecture from the start.
- First plugin was for parsing annual CSRD disclosures 💀
- We rely on data following the ESRS taxonomy (i.e. European Sustainability Reporting Standards), in reports formatted as ESEF files (xhtml files, basically)
- All open source (Apache 2), written in Python, works as a HTTP server, a python library and a CLI, for use in data pipelines and your own systems.
- Docs and more on https://developers.greenweb.org/carbon-txt/

Tools to play with

Find at: https://carbontxt.org/tools



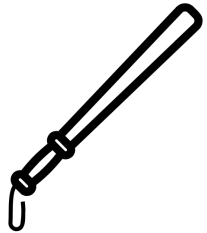
Why start with the CSRD? Part of a trend.

“Show us you track emissions, and share this info with society”

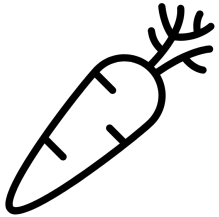
Corporate Sustainability Reporting Directive (CSRD)

Climate Corporate Data Accountability Act (CCDAA)

CSRD: Carrots AND sticks



Created by Darwin Mulya
from Noun Project

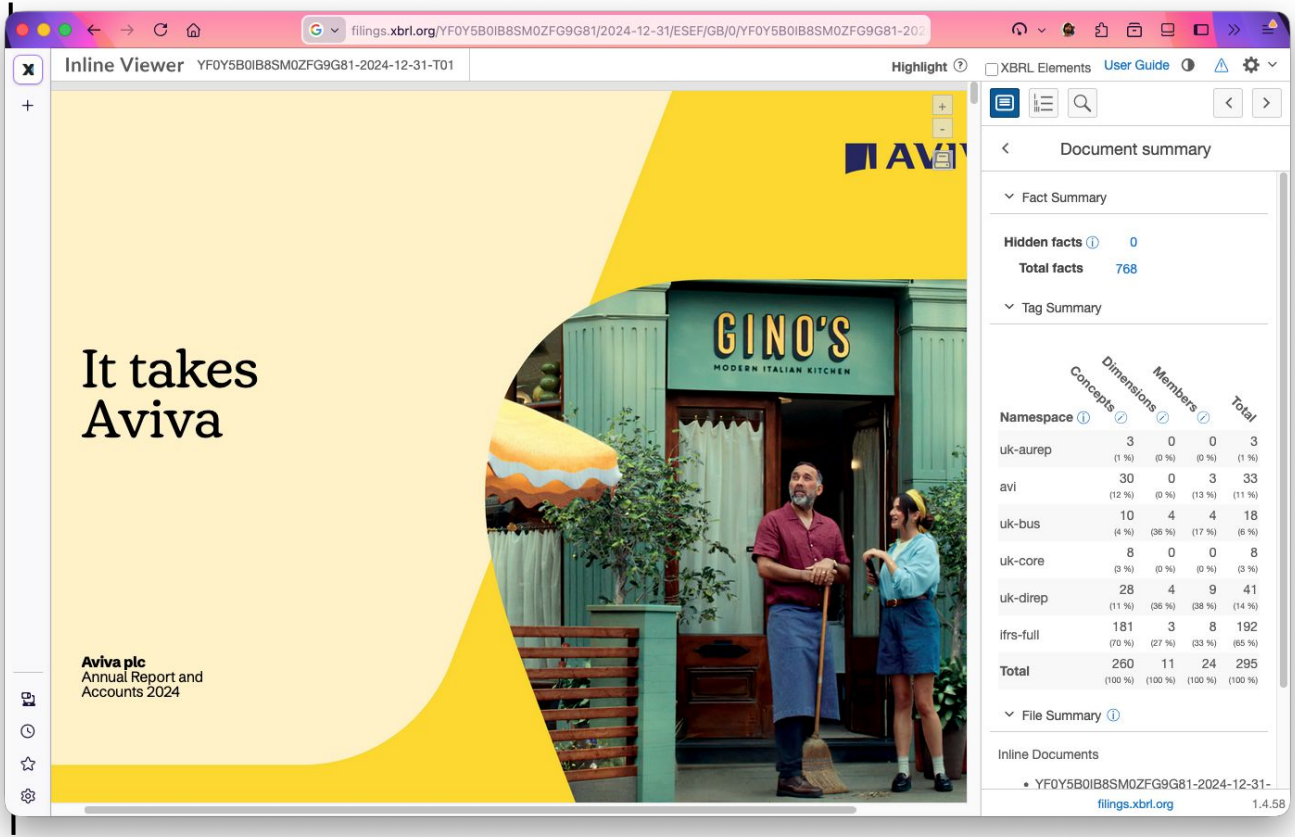


Created by Cherry
from Noun Project

Argument	Consequences
Report because it’s the law.	Large fines, and jail time if you don’t play ball, or say untrue things.
Report to help raise money.	Missing out on cheap green finance to grow your business.

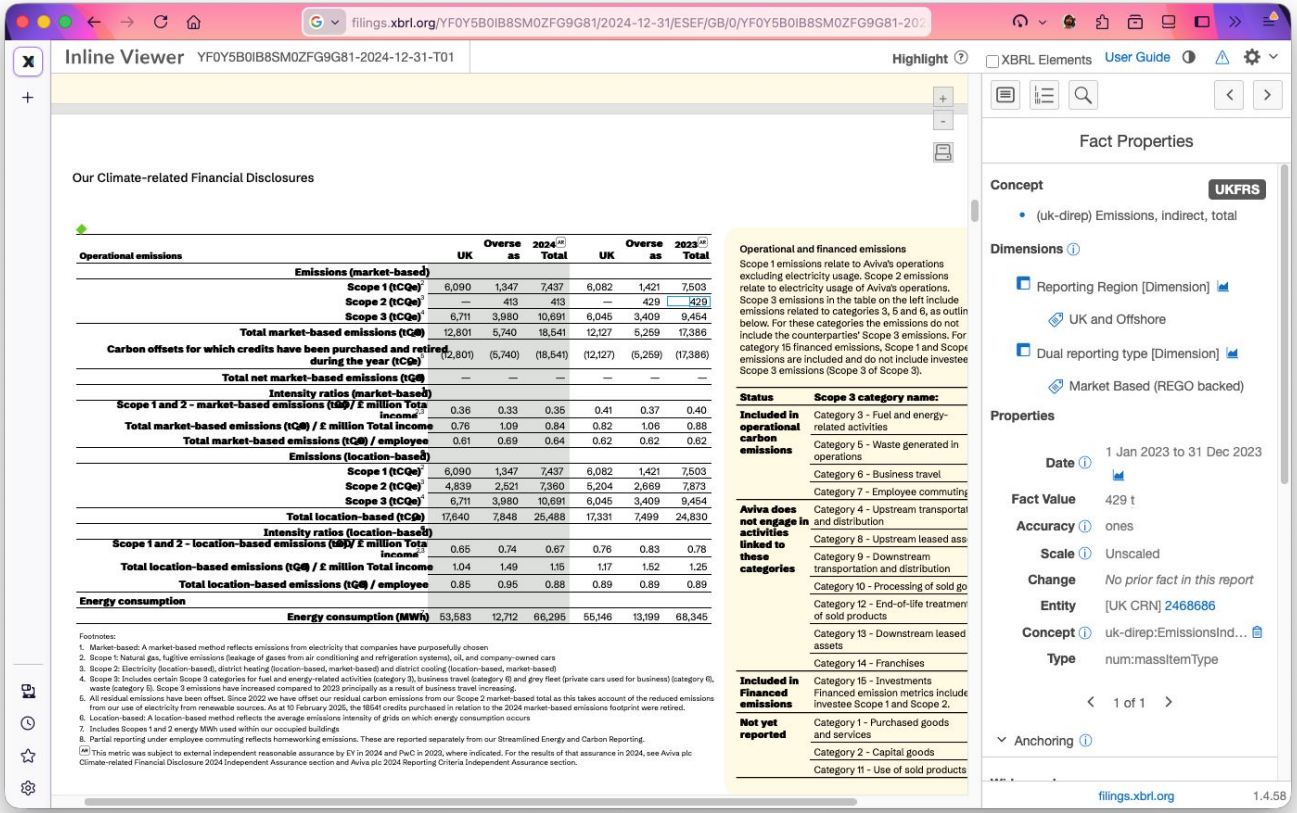
Companies share shiny ESG reports all the time.

What if they had actually useful, linked, comparable information in them?



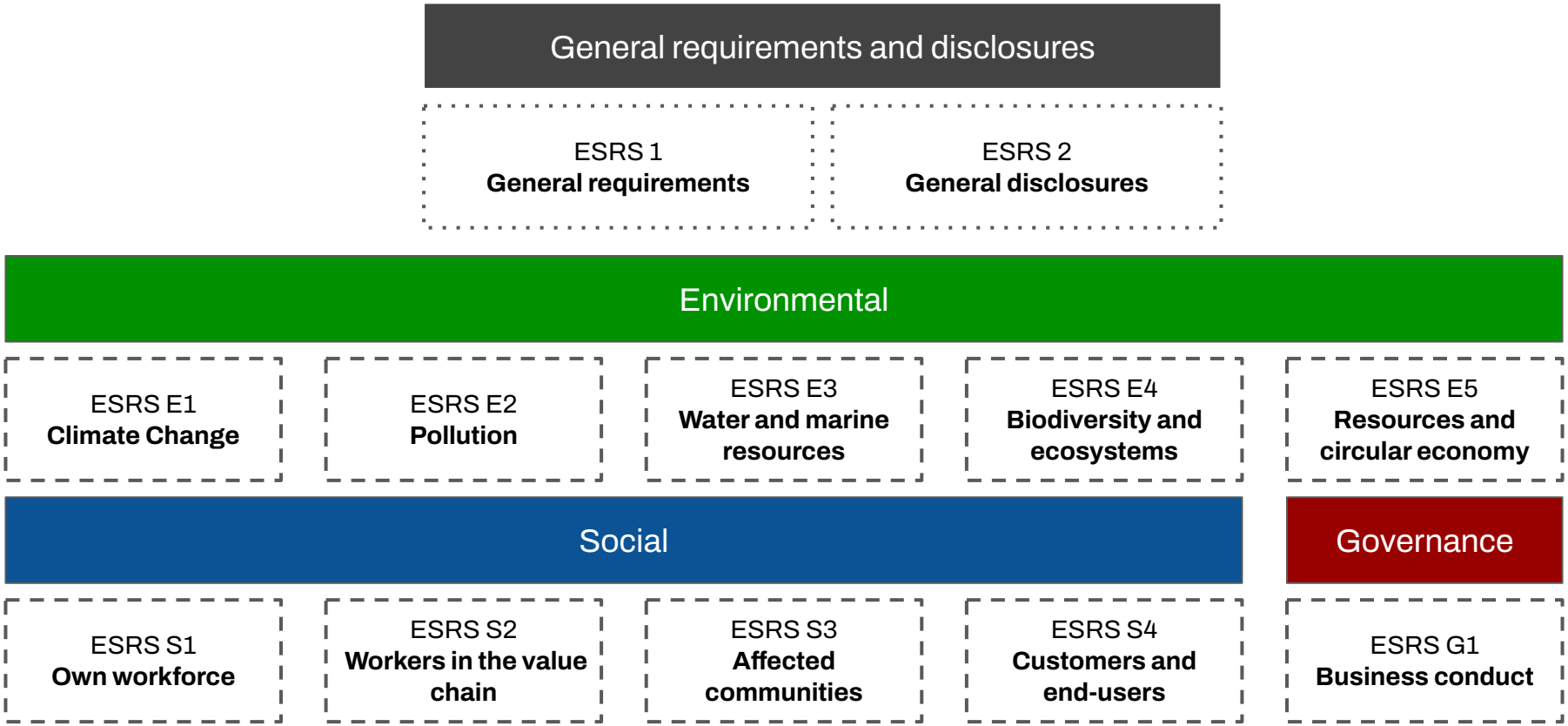
Linking straight to a disclosed datapoint:

scope 2 carbon emissions



ESRS - European Sustainability Reporting Standards

ESRS - European Sustainability Reporting Standards



Omnibusifcation

Noun:

When transparency in a sector is placed into limbo for years because of ~~regulatory capture by entrenched players~~ *“efficiency and competitiveness”*

What if we’re not able to rely on the CSRD? Help us figure out a plan B.

5

Wrapping up

Key things I want you take away

- The web lets us make ***specific claims and link to data to back it up***. We should design with that in mind!

- **BUT** it's not enough to just disclose the data to back up these claims. Claims and data need to be ***discoverable***, to people and to robots.

- We are looking for people to work with on ***extending carbon.txt validation*** to support new claims in the field of digital sustainability. **Talk to us!**

Thanks!

This deck is online, with links and more

https://thegreenweb.org/events/ecocompute-2025/

chris@greenweb.org
www.linkedin.com/in/mrchrisadams
mastodon.social/@mrchrisadams

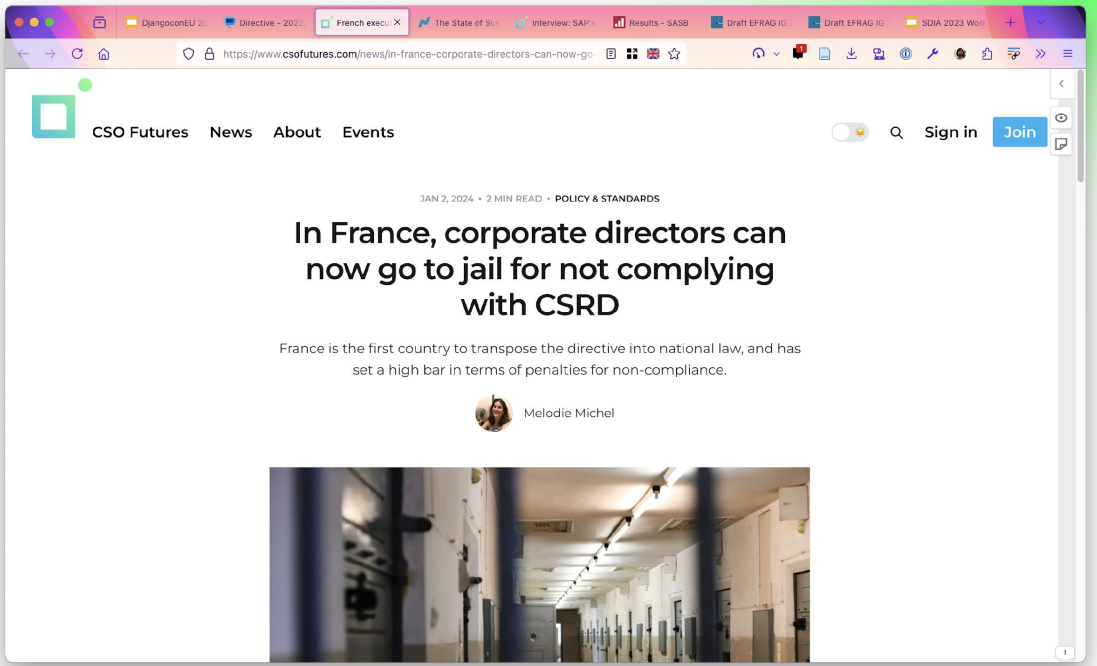
https://carbontxt.org

P.S. Come to my table at the Innovation Cafe after lunch! I'm there for 3 hours 😅

Appendix
Dropped slides

6

liberté egalité CSRDé



https://www.csofutures.com/news/in-france-corporate-directors-can-now-go-to-jail-for-not-complying-with-csrd/

Jargon soup in the CSRD

CSRD reporting uses the same **XBRL** language as other structured filings by companies.

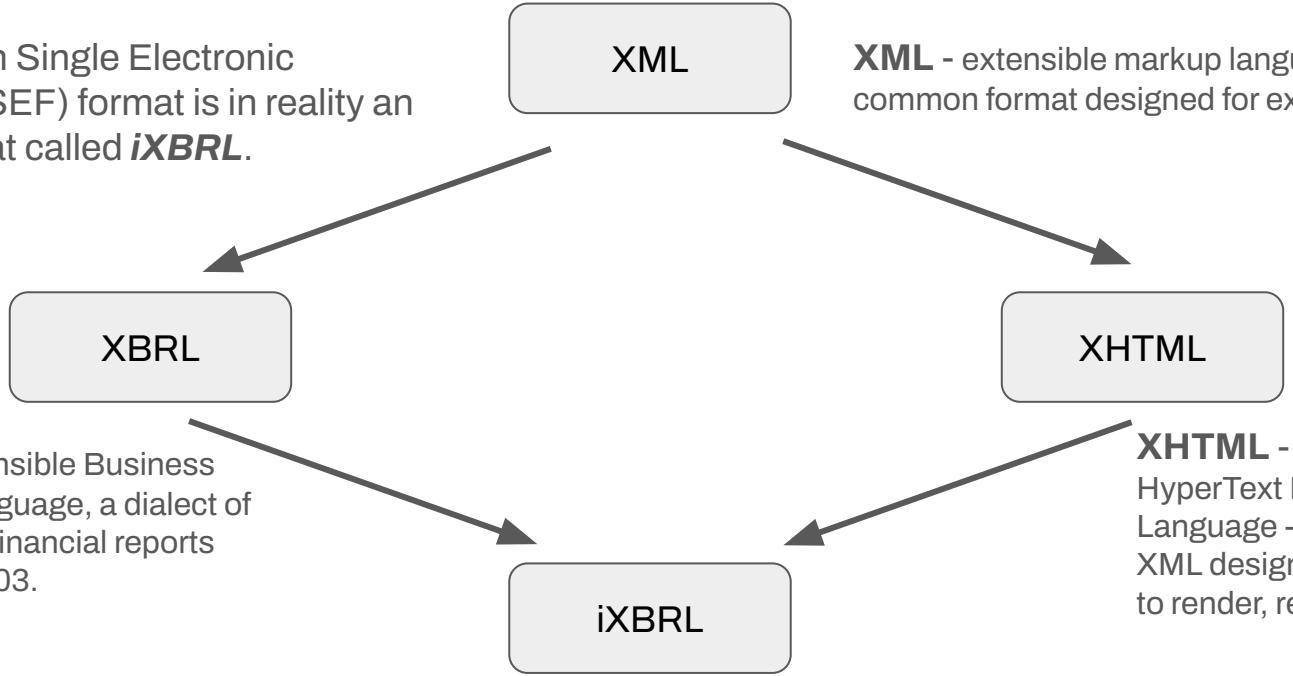
It uses a **XBRL Taxonomy** - a restricted catalogue of terms to refer to the kinds of data required.

For the **CSRD**, there is an **ESRS** (European Sustainability Reporting Standards) **taxonomy.**

Annual reporting in the should follow the **ESEF** (European Single Electronic Reporting File format),

The fancy ESEF thing is really just HTML in a trenchcoat

The European Single Electronic Reporting (ESEF) format is in reality an existing format called ***iXBRL***.



XML - extensible markup language. A common format designed for exchanging data

XBRL - Extensible Business Reporting Language, a dialect of XML used for financial reports released in 2003.

XHTML - Extensible HyperText Markup Language - a dialect of XML designed for browsers to render, released in 2001.

iXBRL - inline XBRL. An XHTML document with XBRL metadata embedded. Widespread use from 2010, by the UK, EU and USA.

The SEC database in the USA, EDGAR, also uses this XBRL thing.

It has an official validator and renderer, with guidance on how to navigate errors.
As soon as your submission is validated, it goes into a public RSS feed of all filings.