Building a greener web

Web sustainability for designers and developers

Senior Front End Developer at

Ada Mode

COP28 UAE

Switch to Low Carbon Version

العربية

United Nations Climate Change

About | Visitor Information | Blue Zone | Green Zone | Partners | Media Hub | Connect

COP28 MOBILIZES OVER $57 BILLION IN FIRST FOUR DAYS, SETTING THE PACE FOR A NEW ERA IN CLIMATE ACTION

Eight pledges and declarations also receive historic support with three more to be announced in the coming days

→ Learn More

Waiting for play.google.com...

Elements | Console | Sources | Network | Performance | 38 | 5 | 3

Preserve log | Disable cache | No throttling

Filter | Invert | Hide data URLs | Hide extension URLs

All | Fetch/XHR | JS | CSS | Img | Media | Font | Doc | WS | Wasm | Manifest | Other | Blocked response cookies

Blocked requests | 3rd-party requests

50 ms | 100 ms | 150 ms | 200 ms | 250 ms

Name	Status	Type	Initiator	Size	Time	Waterfall
en/	200	document	Other	1.8 kB	Pen...	

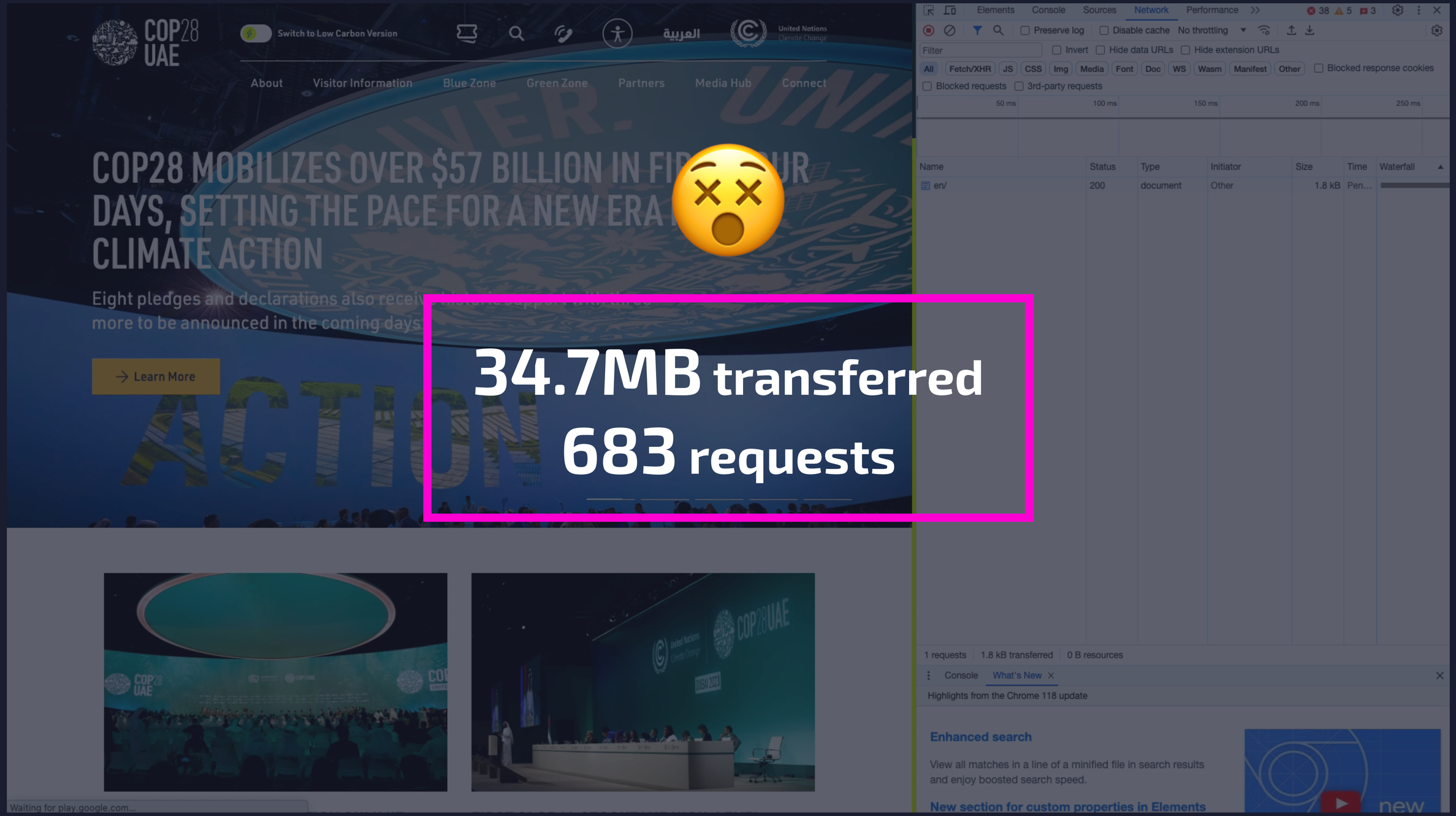
1 requests | 1.8 kB transferred | 0 B resources

Highlights from the Chrome 118 update

Enhanced search

View all matches in a line of a minified file in search results and enjoy boosted search speed.

New section for custom properties in Elements


COP28 UAE
Switch to Low Carbon Version
العربية
United Nations Climate Change
About
Visitor Information
Blue Zone
Green Zone
Partners
Media Hub
Connect
COP28 MOBILIZES OVER $57 BILLION IN FI UR
DAYS, SETTING THE PACE FOR A NEW ERA
CLIMATE ACTION
Eight pledges and declarations also rece
more to be announced in the coming days
Learn More
ACTION
34.7MB transferred
683 requests
Elements
Console
Sources
Network
Performance
Preserve log
Disable cache
No throttling
Filter
Invert
Hide data URLs
Hide extension URLs
All
Fetch/XHR
JS
CSS
Img
Media
Font
Doc
WS
Wasm
Manifest
Other
Blocked response cookies
Blocked requests
3rd-party requests
50 ms
100 ms
150 ms
200 ms
250 ms
Name
Status
Type
Initiator
Size
Time
Waterfall
en/
200
document
Other
1.8 kB
1 requests
1.8 kB transferred
0 B resources
Console
What's New
Highlights from the Chrome 118 update
Enhanced search
View all matches in a line of a minified file in search results and enjoy boosted search speed.
New section for custom properties in Elements
new
Waiting for play.google.com...

COP28 UAE

Switch to Low Carbon Version

العربية

United Nations Climate Change

About | Visitor Information | Blue Zone | Green Zone | Partners | Media Hub | Connect

COP28 MOBILIZES OVER $57 BILLION IN FIRST FOUR DAYS, SETTING THE PACE FOR A NEW ERA IN CLIMATE ACTION

Eight pledges and declarations also receive historic support with three more to be announced in the coming days

→ Learn More

Waiting for play.google.com...

Elements | Console | Sources | Network | Performance | 38 | 5 | 3

Preserve log | Disable cache | No throttling

Filter | Invert | Hide data URLs | Hide extension URLs

All | Fetch/XHR | JS | CSS | Img | Media | Font | Doc | WS | Wasm | Manifest | Other | Blocked response cookies

Blocked requests | 3rd-party requests

50 ms | 100 ms | 150 ms | 200 ms | 250 ms

Name	Status	Type	Initiator	Size	Time	Waterfall
en/	200	document	Other	1.8 kB	Pen...	

1 requests | 1.8 kB transferred | 0 B resources

Console | What's New ×

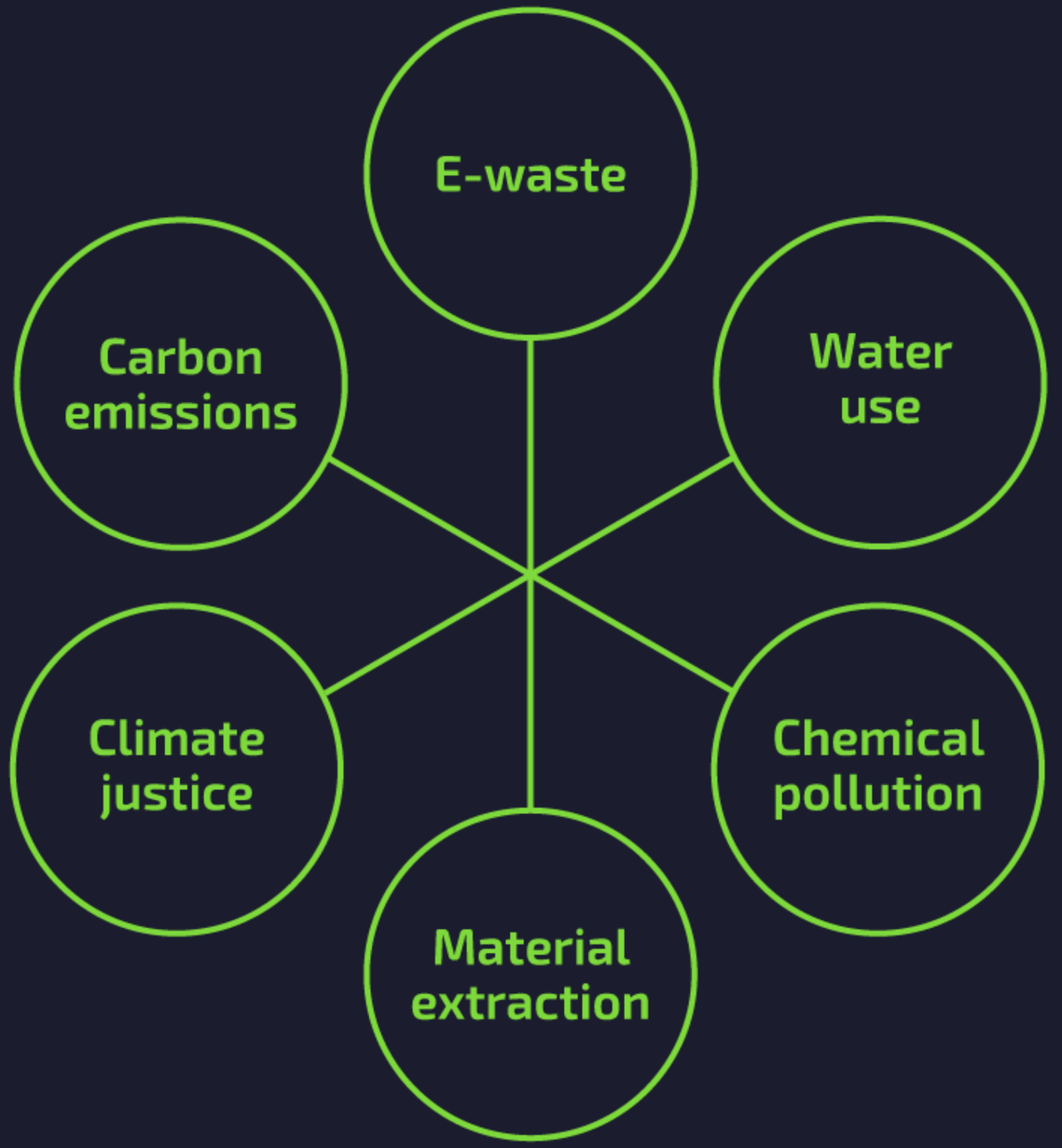
Highlights from the Chrome 118 update

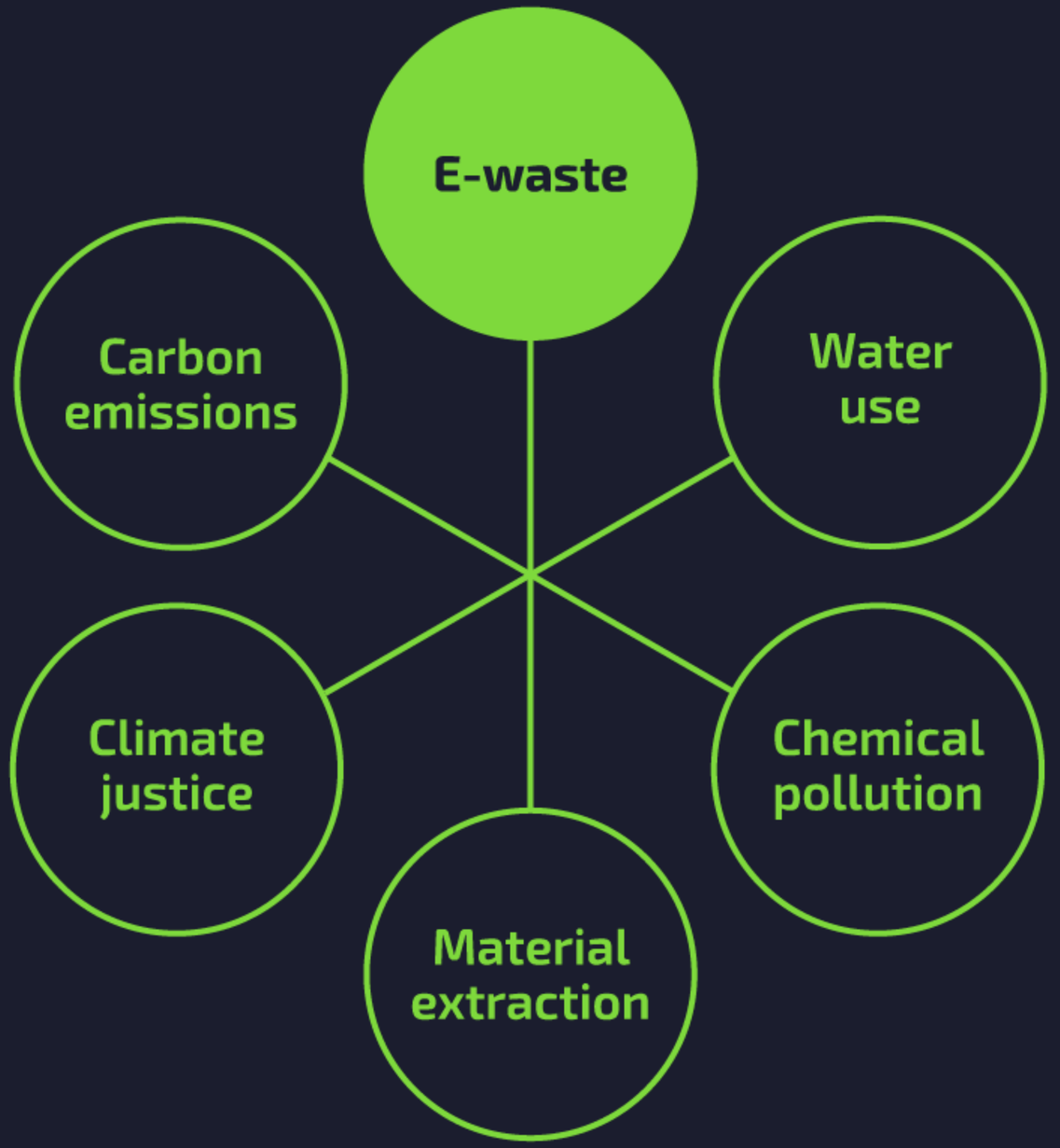
Enhanced search

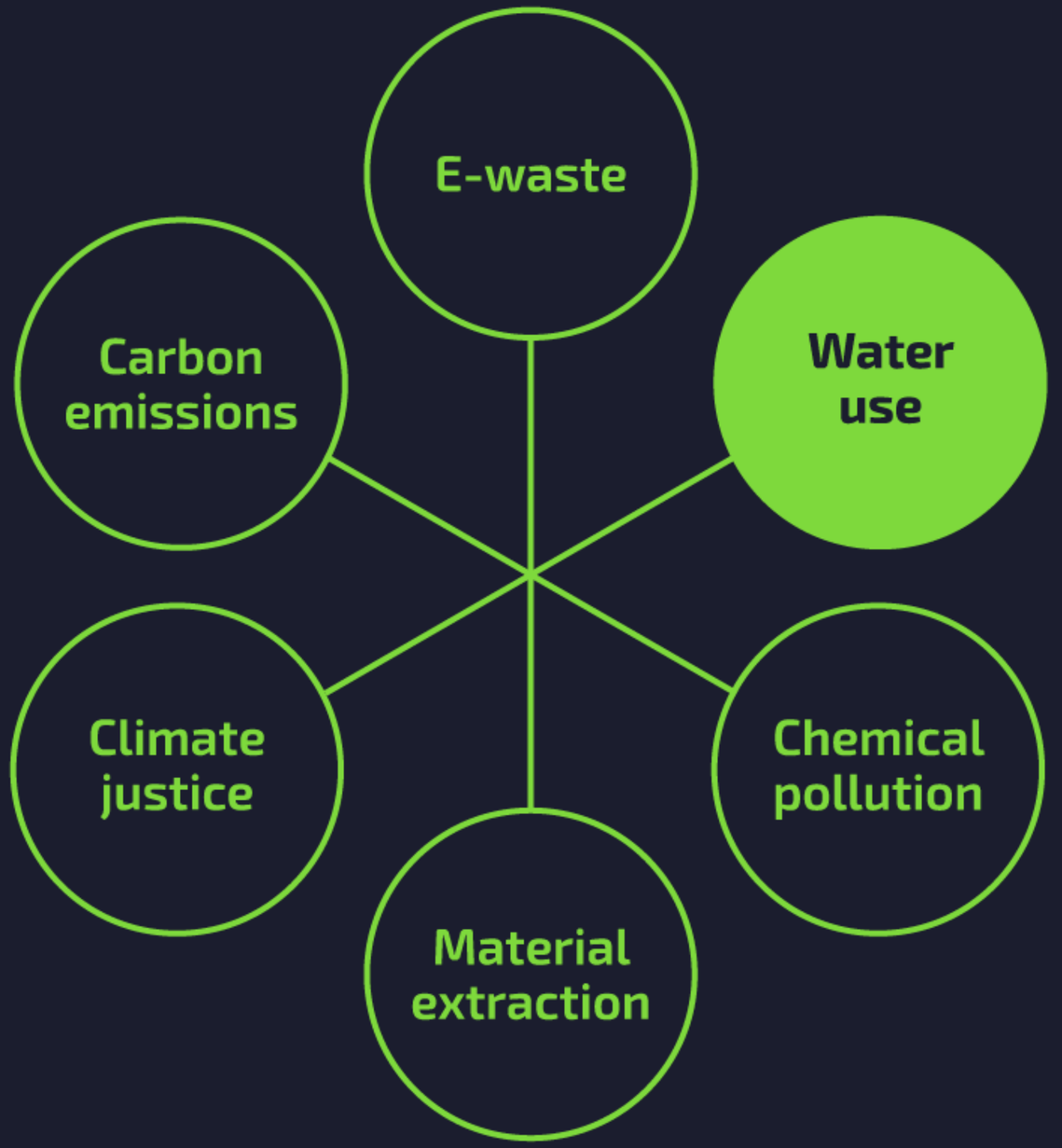
View all matches in a line of a minified file in search results and enjoy boosted search speed.

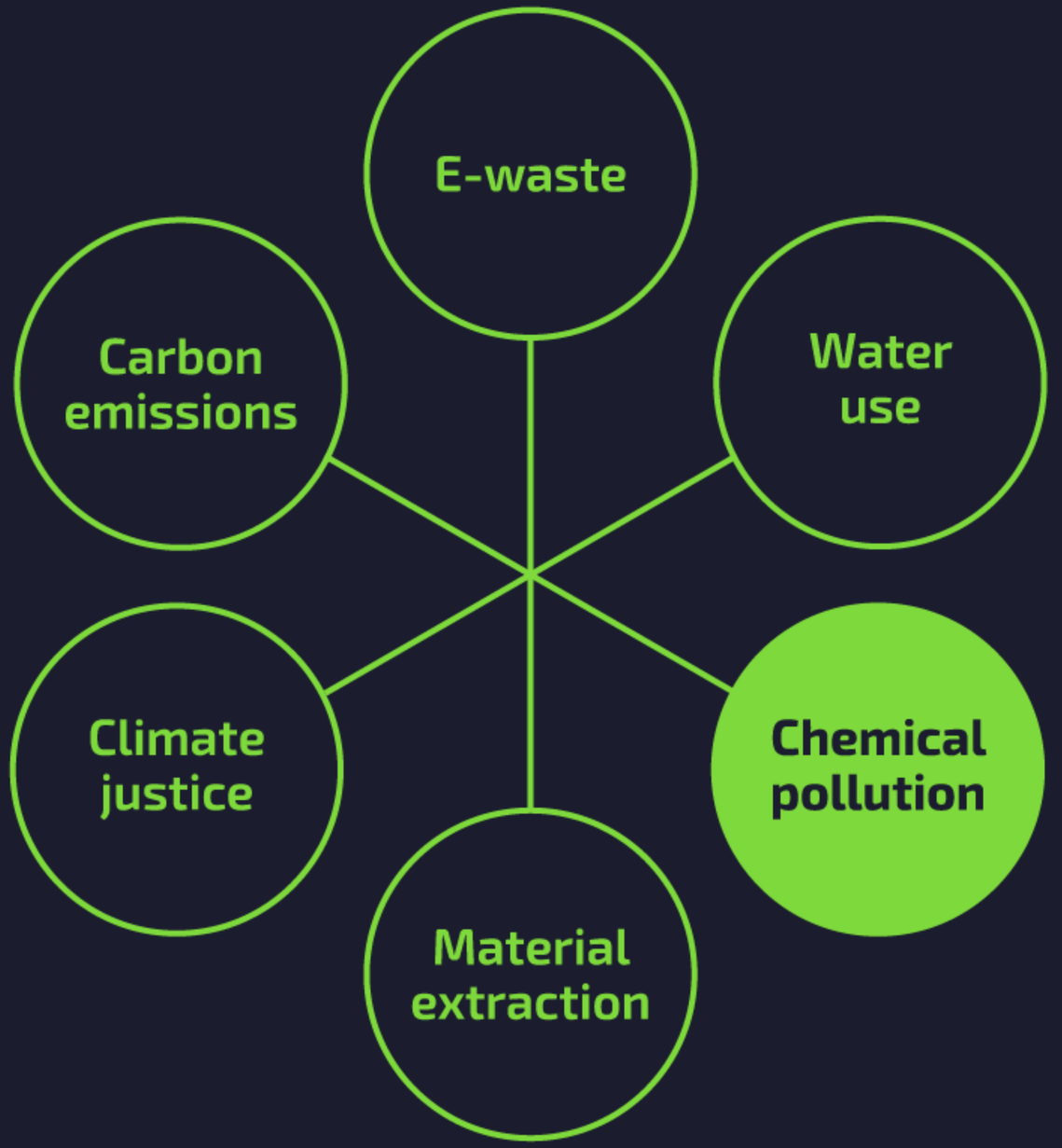
New section for custom properties in Elements

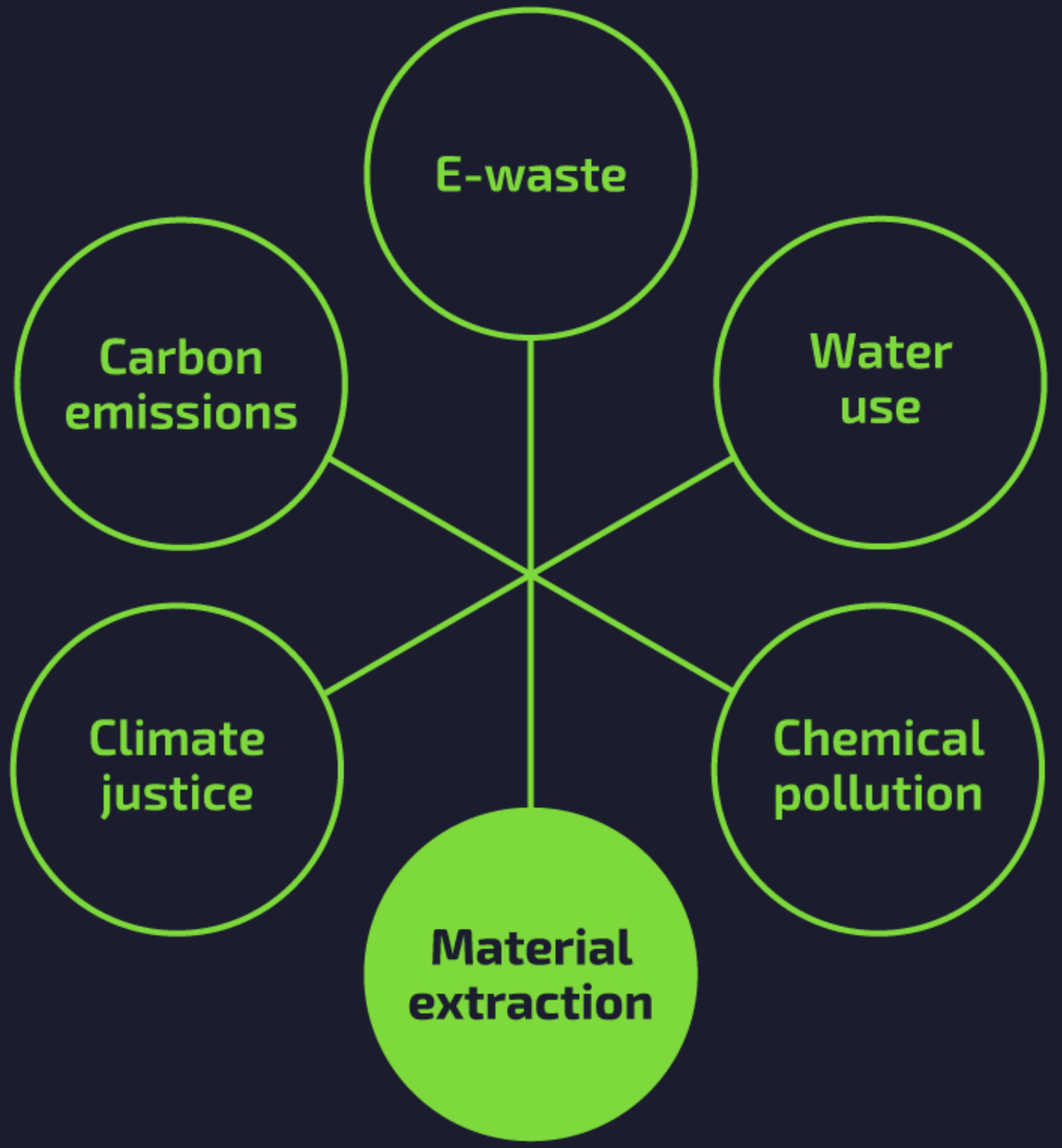
https://bbc.in/35mLuxM

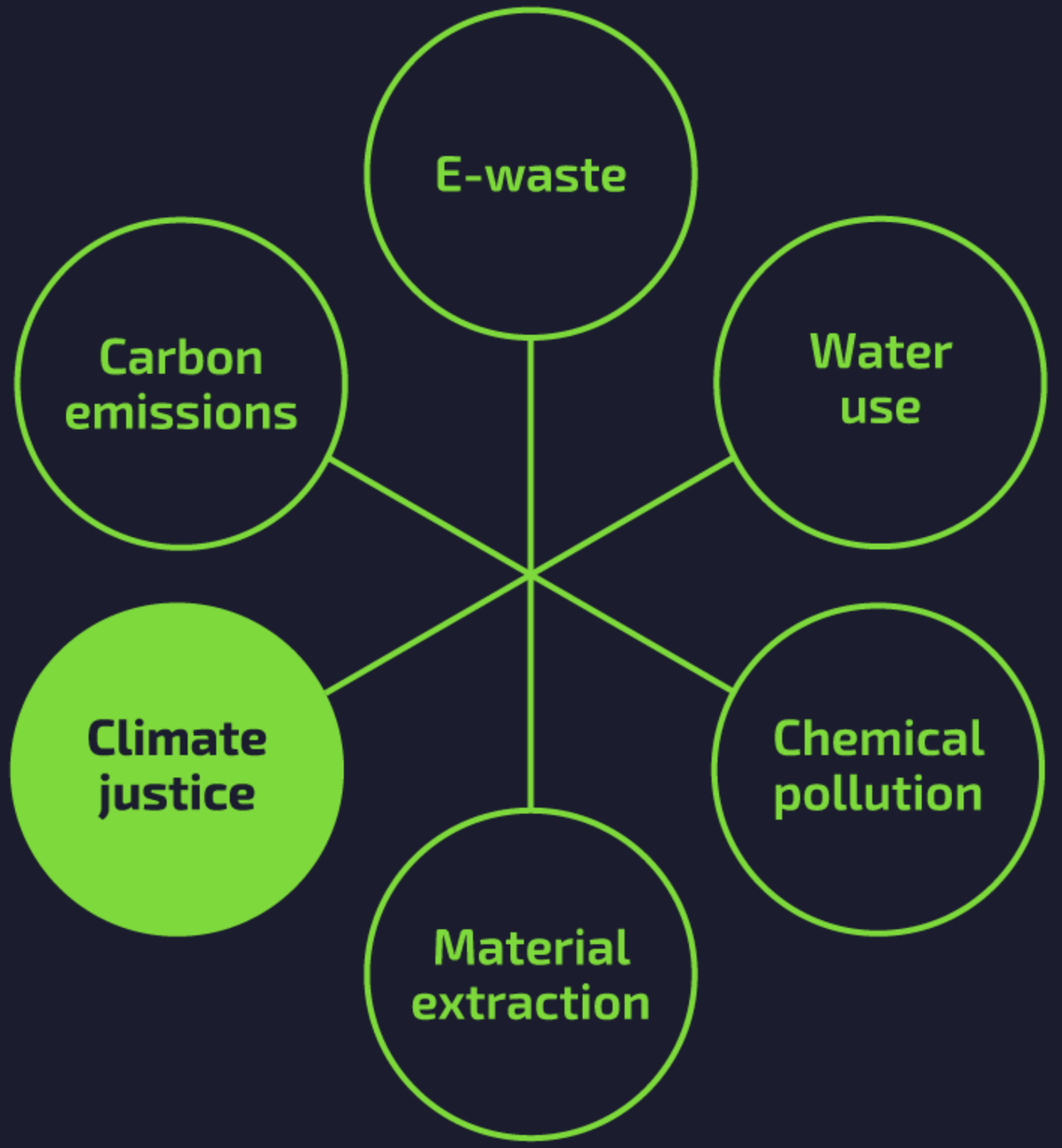

E-waste
Carbon emissions
Water use
Climate justice
Chemical pollution
Material extraction

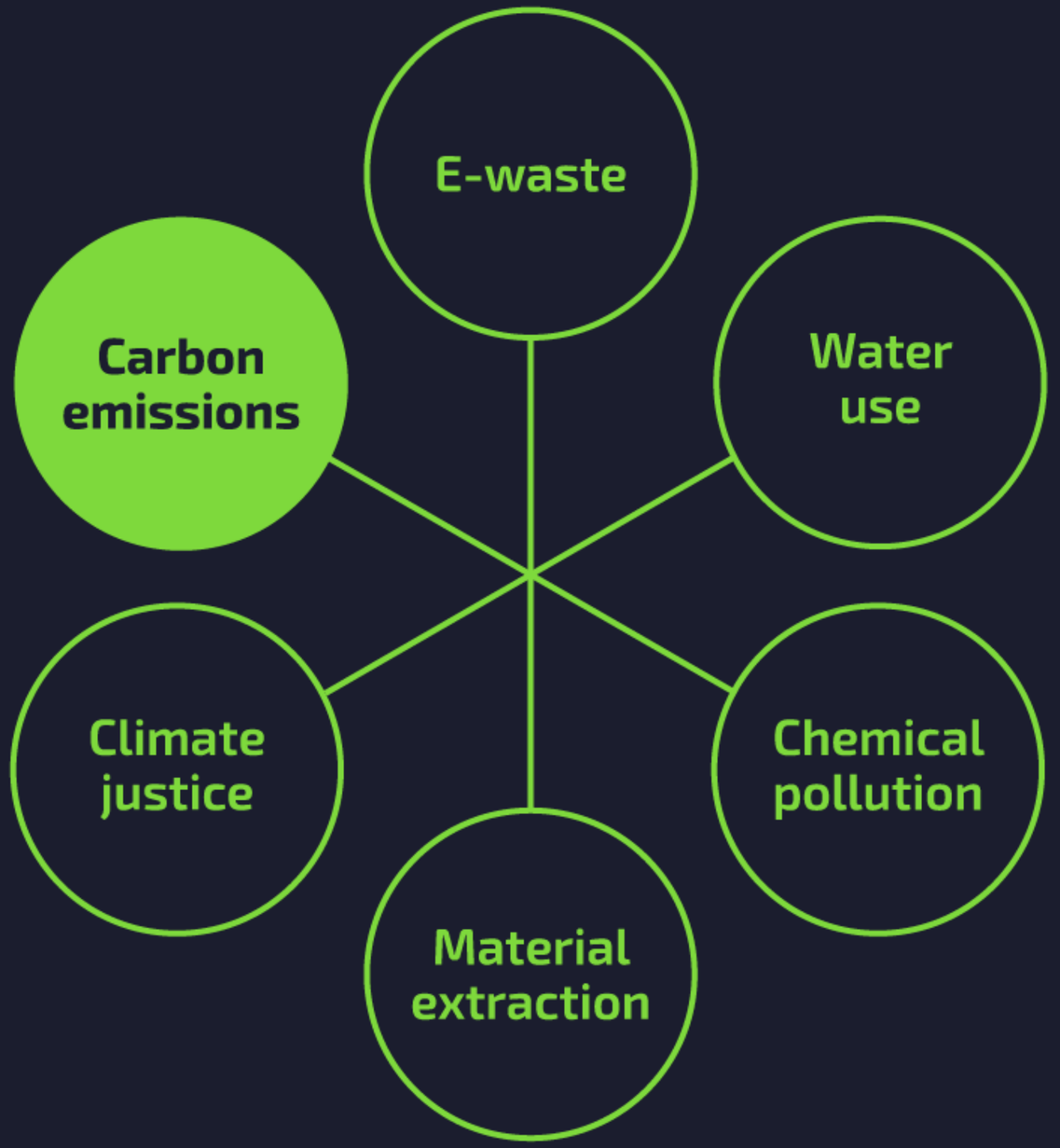

E-waste
Carbon emissions
Water use
Climate justice
Chemical pollution
Material extraction


E-waste
Carbon emissions
Water use
Climate justice
Chemical pollution
Material extraction


E-waste
Carbon emissions
Water use
Climate justice
Chemical pollution
Material extraction


E-waste
Carbon emissions
Water use
Climate justice
Chemical pollution
Material extraction


E-waste
Carbon emissions
Water use
Climate justice
Chemical pollution
Material extraction


E-waste
Carbon emissions
Water use
Climate justice
Chemical pollution
Material extraction

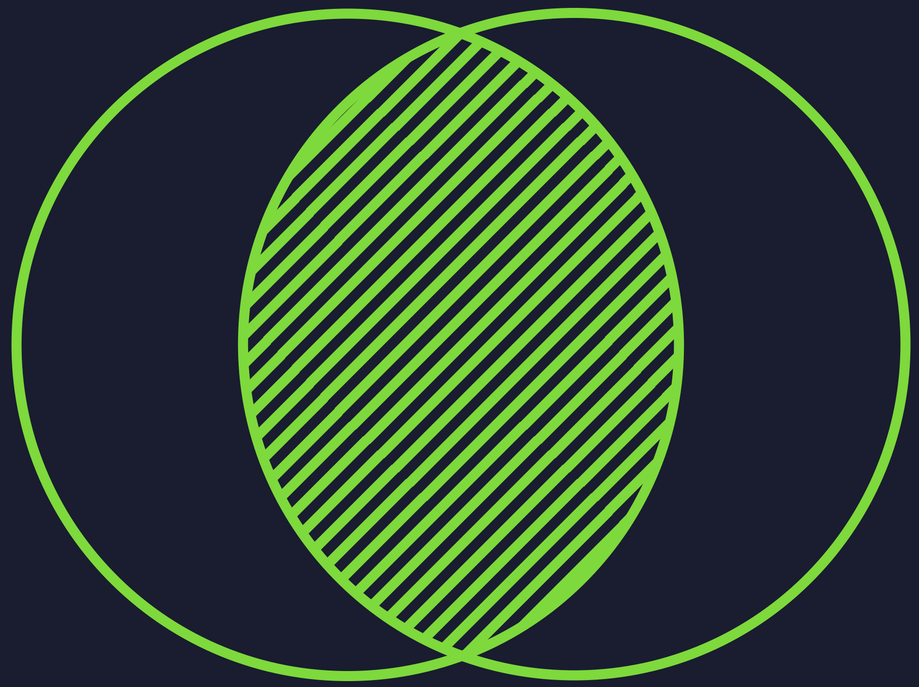
Device manufacture

Infrastructure

Device use

https://bit.ly/3rIfZWc

Fast websites

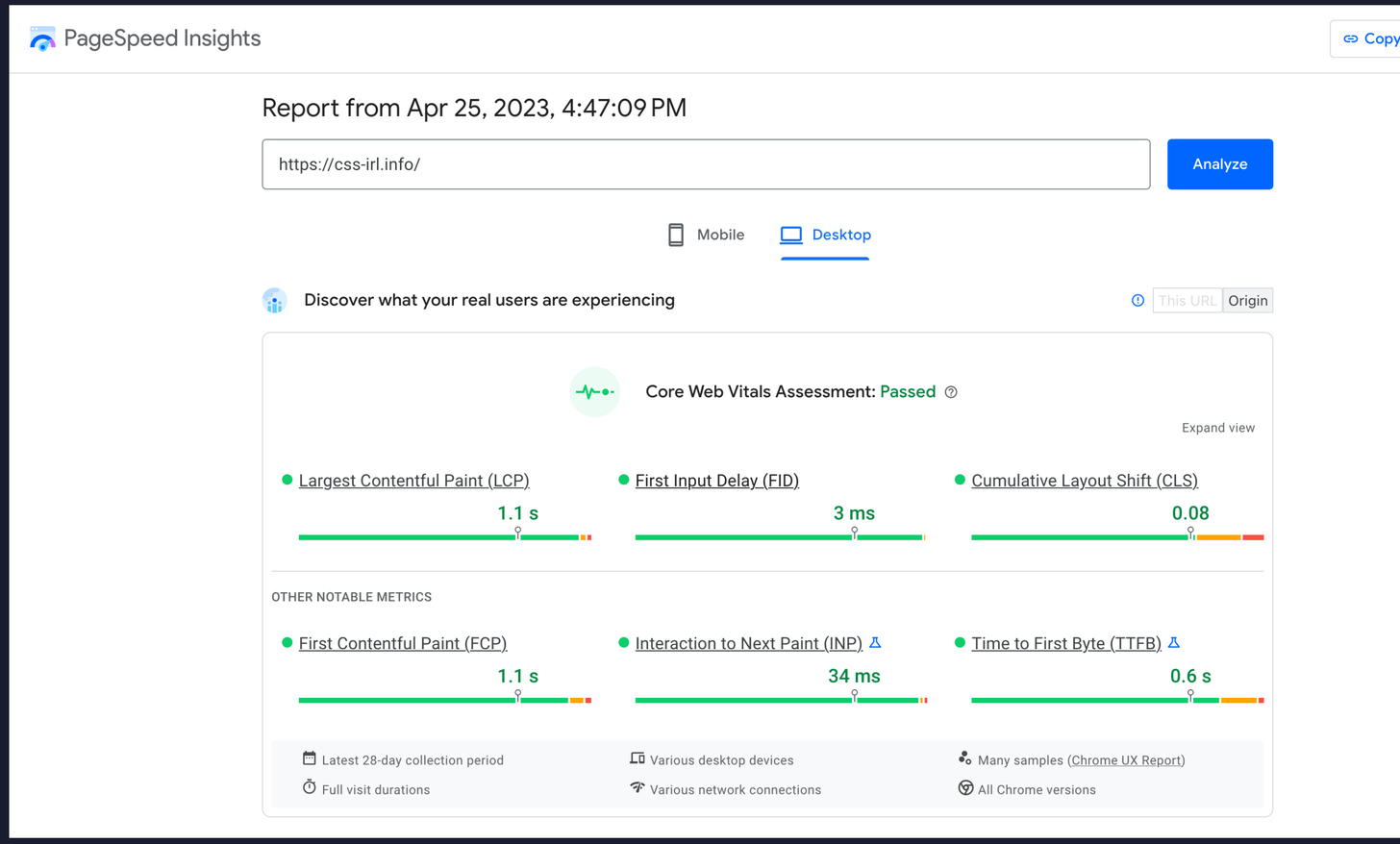


Low-carbon websites

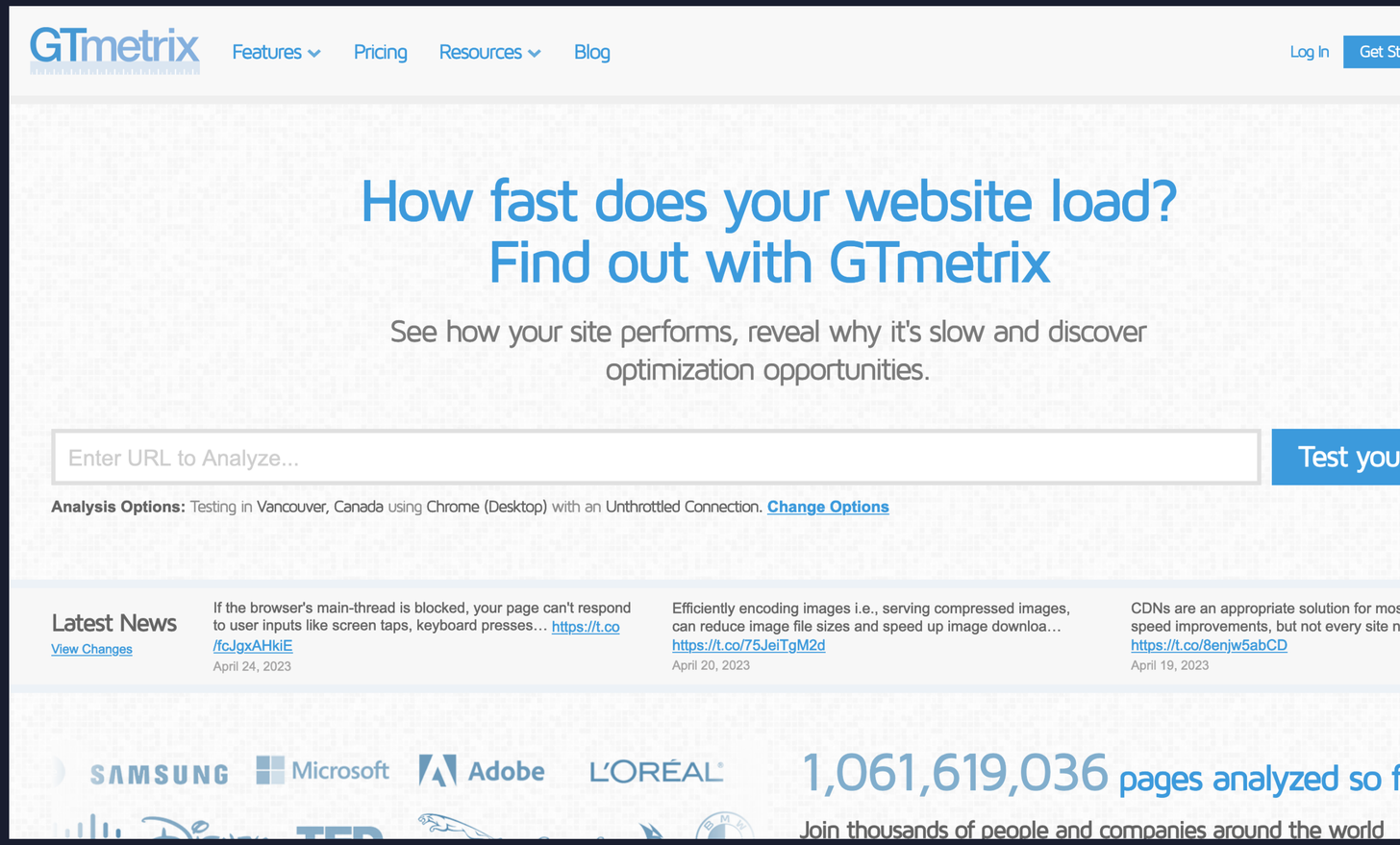
WebPageTest

WebPageTest

PageSpeed Insights



- WebPageTest
- PageSpeed Insights
- GTMetrix



Core Web Vitals

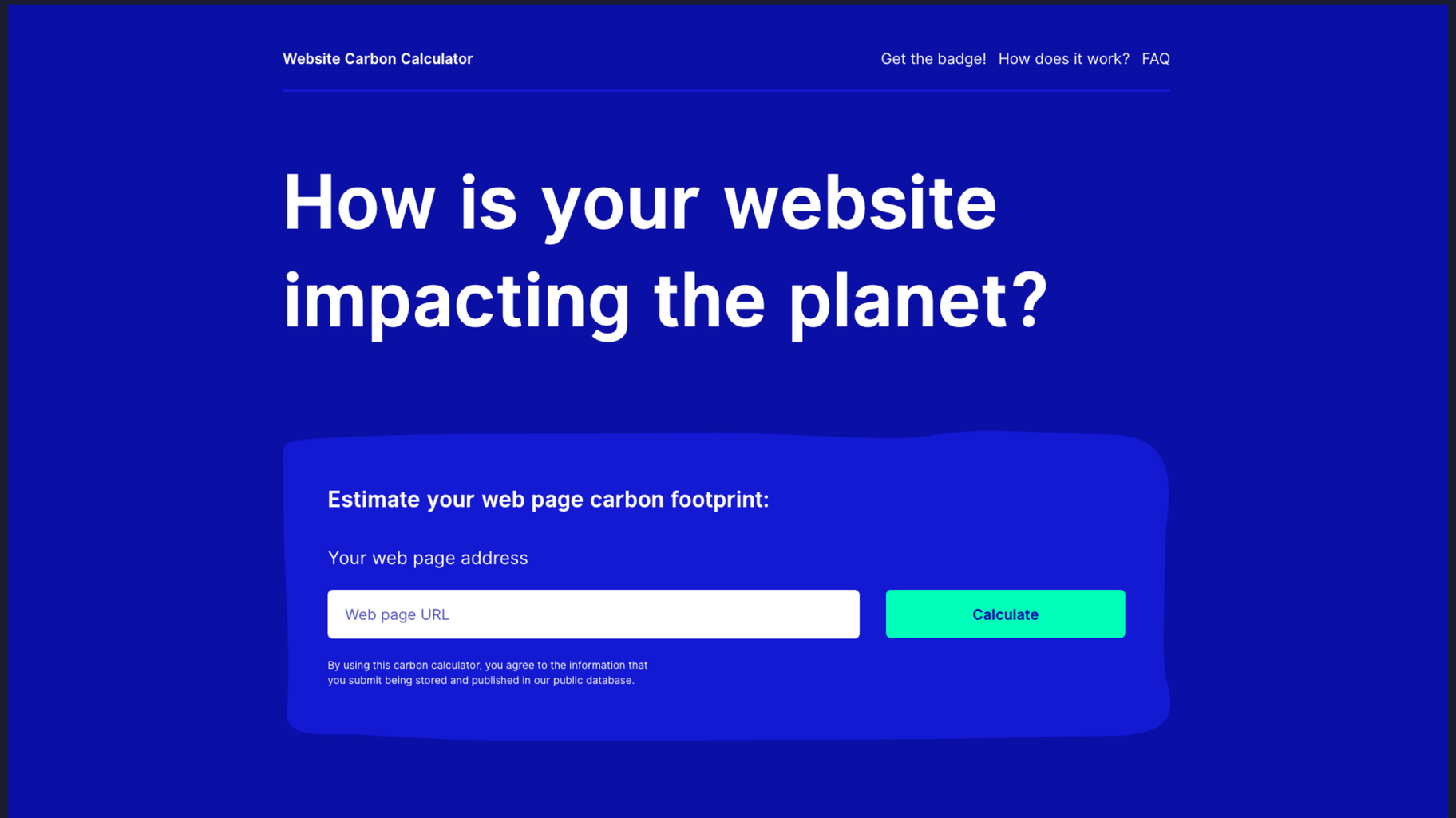
LCP
Largest Contentful Paint

FID
First Input Delay

CLS
Cumulative Layout Shift

Carbon budgets

websitecarbon.com



css-irl.info produces

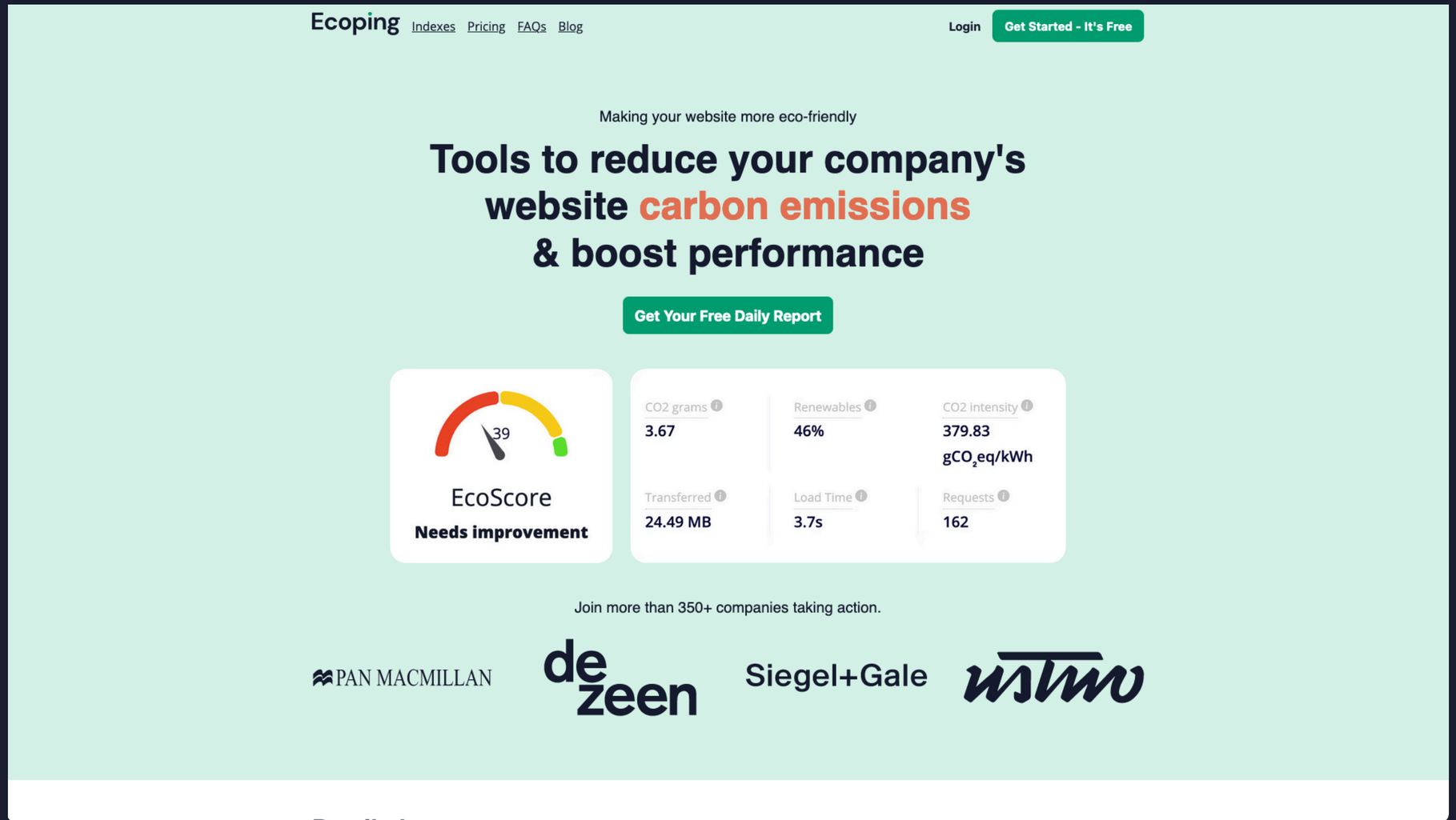
7.28kg of CO2 equivalent.

The same weight as 0.05 sumo wrestlers and as much CO2 as boiling water for 987 cups of tea

8 billion bubbles

Woah, that's a lot of bubbles!

ecoping.earth



digitalbeacon.co

Beacon

https://css-irl.info

First visit

CO2 0.086g SIZE 116.53 KB

Return visit

CO2 0.081g SIZE 109.64 KB

Overall this web page is rated as amazing when it comes to its carbon footprint

This website is hosted using renewable energy or carbon offsets.

EMISSIONS CALCULATOR

Monthly visits

10000

New / Returning (%)

40% 60%

Total: 832.90g PER MONTH

This is equivalent to:

Driving 0.60 miles in a Tesla Model S

Watching 1 hours of Netflix (in HD)

At least 1 trees would be needed to offset the CO_2 in a year

A PRODUCT BY ALINE, PART OF YARD GROUP 2021 V1.7.1 BETA BEACON@ALINE.TO

Images

43%

Bytes transferred

30%

Requests

Source: https://httparchive.org/reports/page-weight

Use fewer images

- Use fewer images
- Use smaller images

556kb

-41%

326kb

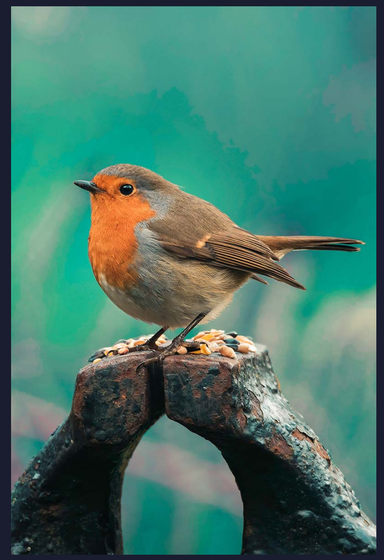
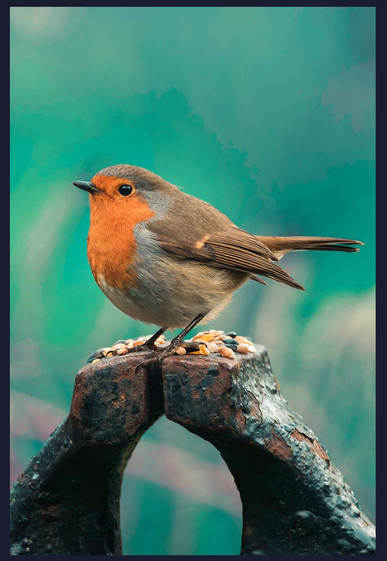


Photo: unsplash.com/@aarngiri

- Use fewer images
- Use smaller images
- Optimise

326kb



-69%

100kb

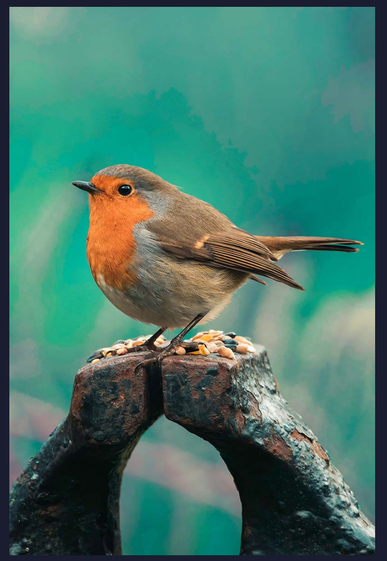
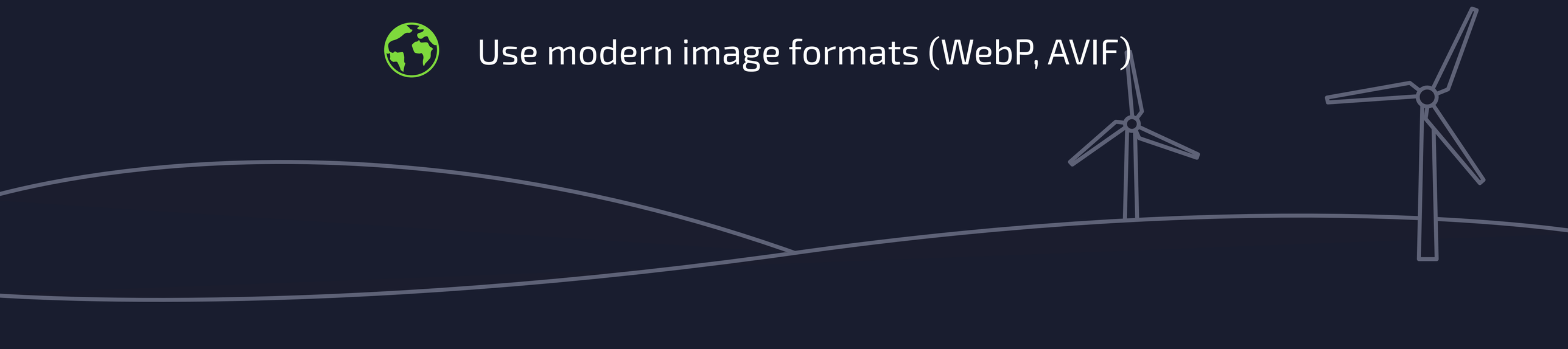


Photo: unsplash.com/@aarngiri

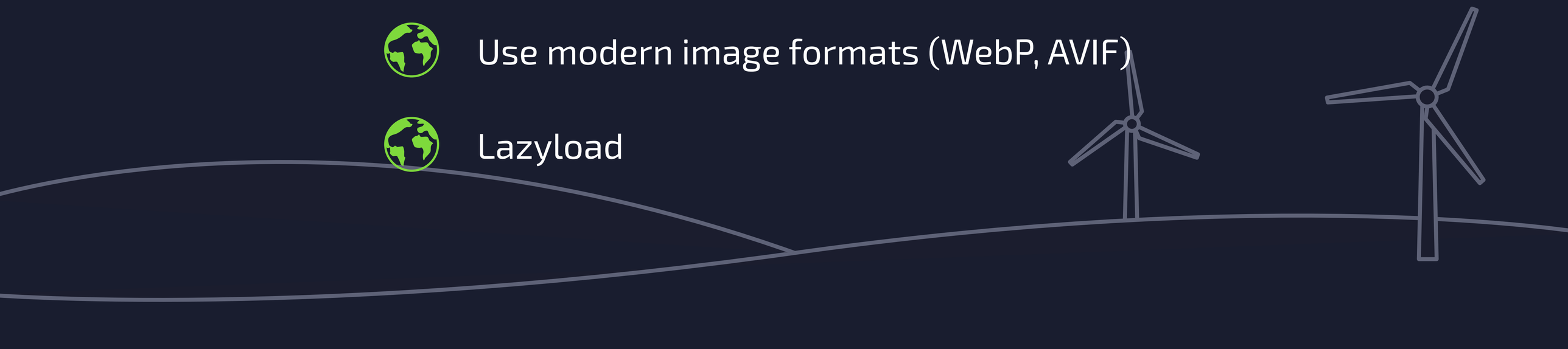
- Use fewer images
- Use smaller images
- Optimise
- Serve the right images for the user's device

- Use fewer images
- Use smaller images
- Optimise
- Serve the right images for the user's device
- Use modern image formats (WebP, AVIF)



```
<picture>
  <source
    type="image/webp"
    srcset="robin.webp 400w…"
    sizes="(min-width: 1200px) 50vw, 100vw">
  <img
    srcset="robin.jpg 400w…”
    src=“robin.jpg"
    sizes="(min-width: 1200px) 50vw, 100vw"
    alt="…">
</picture>
```

- Use fewer images
- Use smaller images
- Optimise
- Serve the right images for the user's device
- Use modern image formats (WebP, AVIF)
- Lazyload



```
<img srcset="..." src="robin.jpg" alt="..." loading="lazy" />
```

Fonts

Use fewer fonts

- Use fewer fonts
- Consider variable fonts

Variable font example

Lorem ipsum dolor, sit amet consectetur adipisicing elit. Placeat tenetur maxime impedit accusantium illum excepturi quis odit magni exercitationem pariatur veniam fuga, vel veritatis fugit, consequuntur assumenda quisquam, perferendis dolorem.

Heading 2

Lorem ipsum dolor sit amet, consectetur adipisicing elit. Ea sint illo quo consequatur hic expedita vero doloremque dignissimos itaque veniam architecto, id alias, quia repudiandae dolore eaque et est nulla?

> **“Lorem ipsum dolor sit amet consectetur adipisicing elit. Minima ab qui voluptatum asperiores natus perferendis repellat, recusandae rem inventore adipisci similique dicta.”**

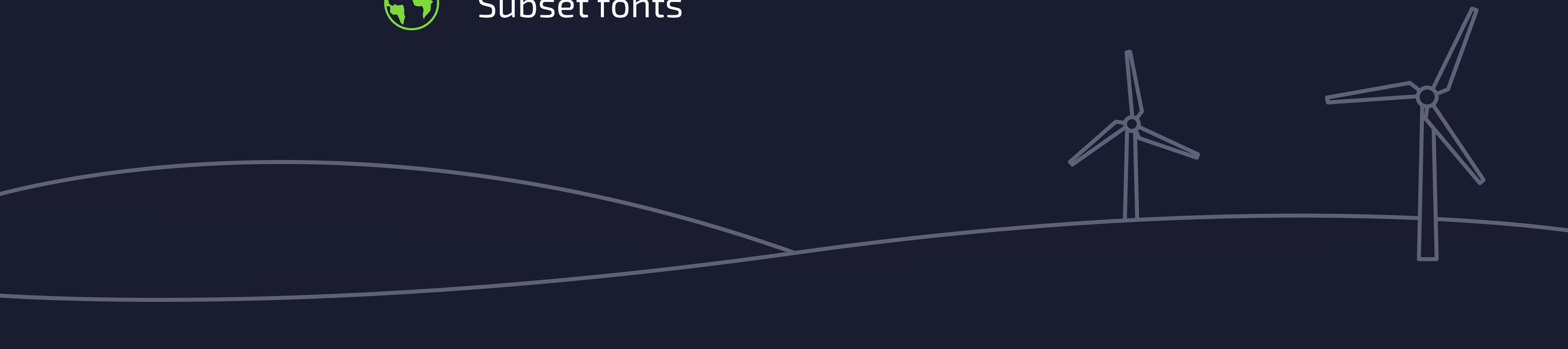
Heading 3

Lorem ipsum dolor sit amet consectetur adipisicing elit. Voluptate unde eveniet veritatis blanditiis pariatur obcaecati non debitis minus temporibus sunt, rem eius iure aliquam

- Use fewer fonts
- Consider variable fonts
- Use modern font formats (e.g. WOFF2)

github.com/google/woff2

- Use fewer fonts
- Consider variable fonts
- Use modern font formats (e.g. WOFF2)
- Subset fonts



w3.org/TR/IFT

W3C Working Draft

TABLE OF CONTENTS

1 **Introduction**
1.1 Patch Subset
1.2 Range Request
1.3 Technical Motivation: Evaluation Report

2 **Opt-In Mechanism**

3 **IFT Method Selection**
3.1 IFT Method Fallback

4 **Patch Based Incremental Transfer**
4.1 Font Subset
4.1.1 Font Subset Definition
4.2 Data Types
4.2.1 Encoding
4.2.2 Primitives
4.2.3 ProtocolVersion
4.2.4 SparseBitSet
4.2.5 IntegerList
4.2.5.1 Delta Encoding
4.2.5.2 Zig-Zag Encoding
4.2.5.3 UIntBase128 Encoding
4.2.6 SortedIntegerList
4.2.7 RangeList
4.2.8 FeatureTagSet
4.2.9 AxisSpace
4.2.10 Objects

Incremental Font Transfer

W3C Working Draft, 28 June 2022

▼ **More details about this document**

This version:
https://www.w3.org/TR/2022/WD-IFT-20220628/

Latest published version:
https://www.w3.org/TR/IFT/

Editor's Draft:
https://w3c.github.io/IFT/Overview.html

History:
https://www.w3.org/standards/history/IFT

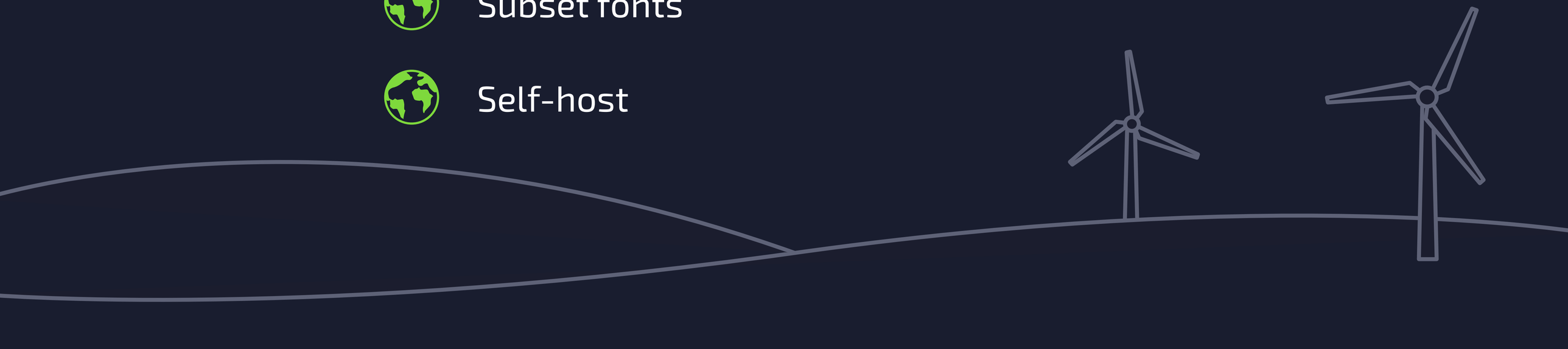
Feedback:
public-webfonts-wg@w3.org with subject line "`[IFT] … message topic …`" (archives)
GitHub
Inline In Spec

Editors:
Chris Lilley (W3C)
Myles C. Maxfield (Apple Inc.)
Garret Rieger (Google Inc.)

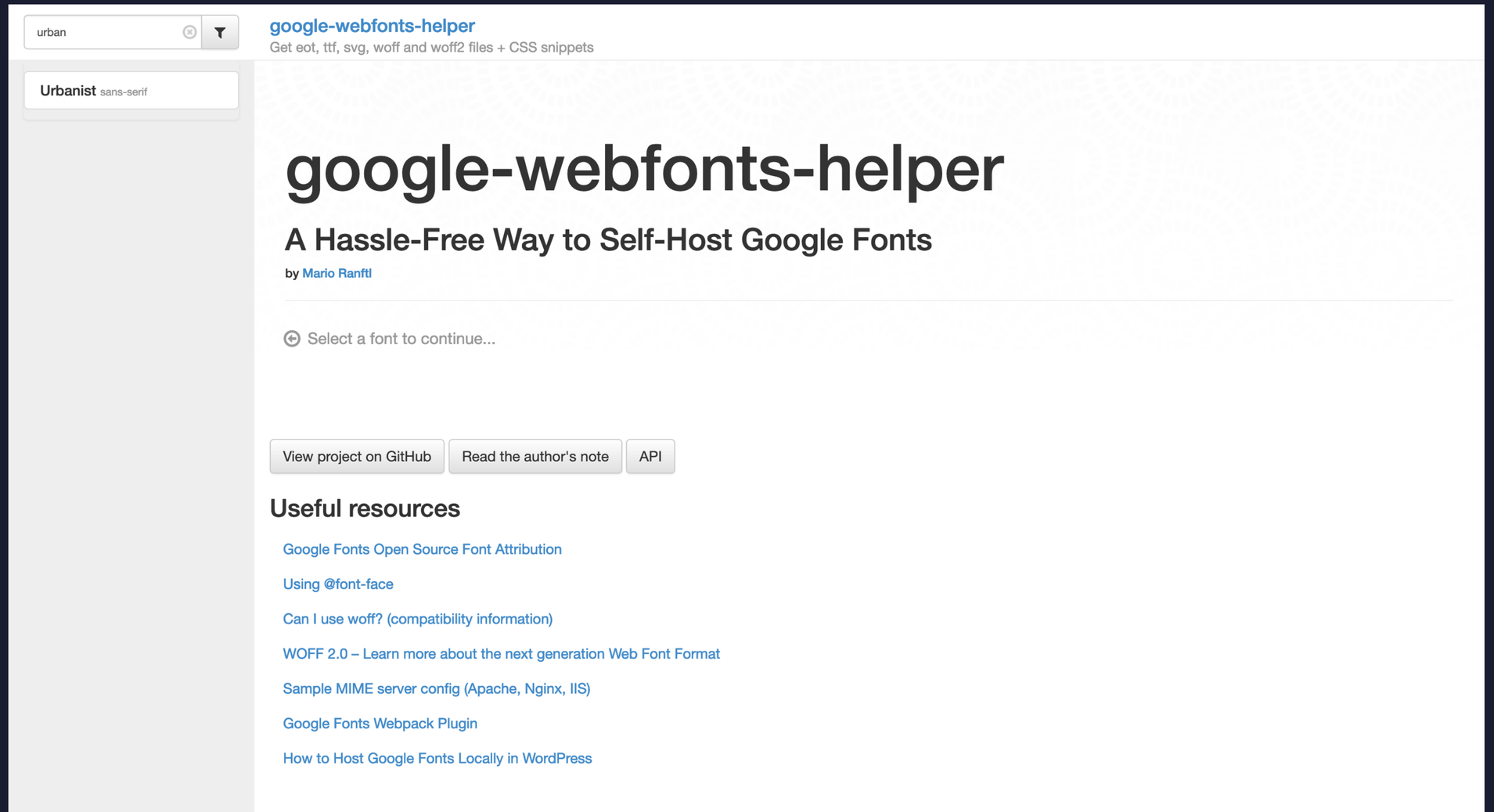
Copyright © 2022 W3C® (MIT, ERCIM, Keio, Beihang). W3C liability, trademark and permissive document license rules apply.

Abstract

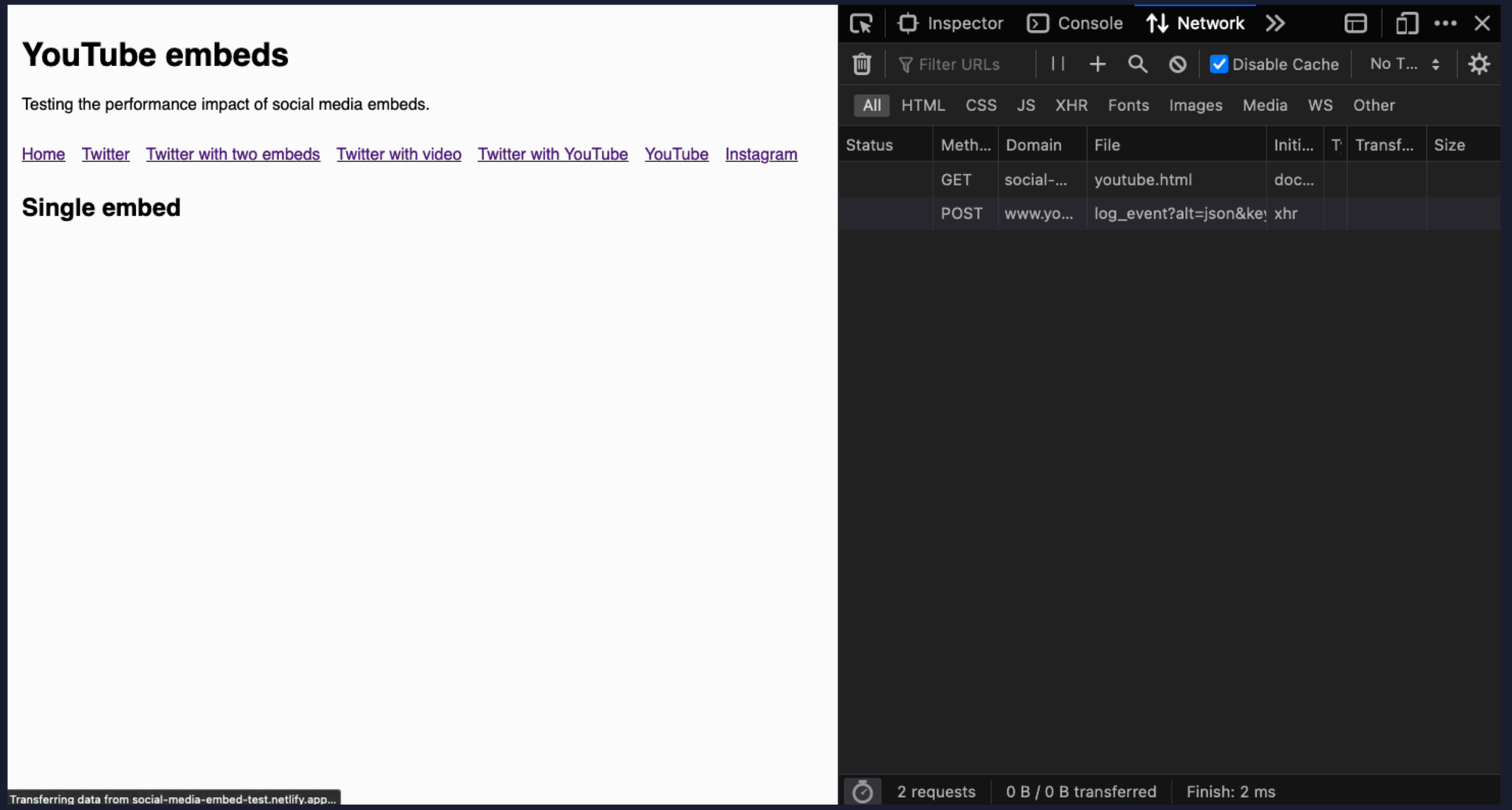
- Use fewer fonts
- Consider variable fonts
- Use modern font formats (e.g. WOFF2)
- Subset fonts
- Self-host



gwfh.mranftl.com/fonts



Third-party embeds


YouTube embeds
Testing the performance impact of social media embeds.
Home Twitter Twitter with two embeds Twitter with video Twitter with YouTube YouTube Instagram
Single embed
Transferring data from social-media-embed-test.netlify.app...
Inspector Console Network
Filter URLs
Disable Cache
No T...
All HTML CSS JS XHR Fonts Images Media WS Other
Status Meth... Domain File Initi... T Transf... Size
GET social-... youtube.html doc...
POST www.yo... log_event?alt=json&ke xhr
2 requests 0 B / 0 B transferred Finish: 2 ms

Avoid embeds

- Avoid embeds
- Defer loading if possible

- Avoid embeds
- Defer loading if possible
- Lazyload

- Avoid embeds
- Defer loading if possible
- Lazyload
- Import on interaction

github.com/paulirish/lite-youtube-embed

readme.md

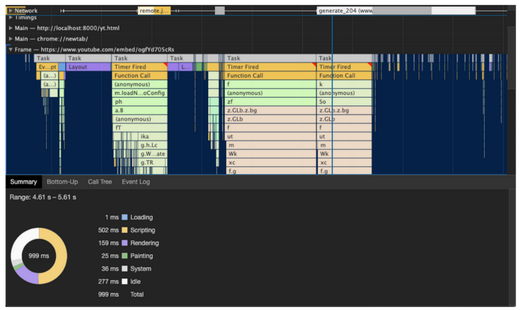
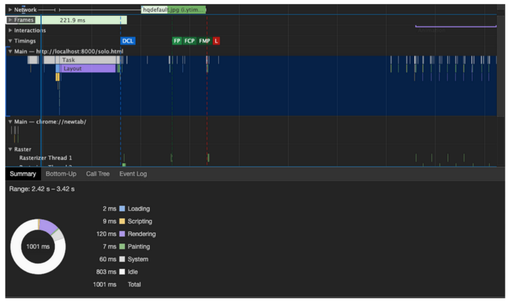
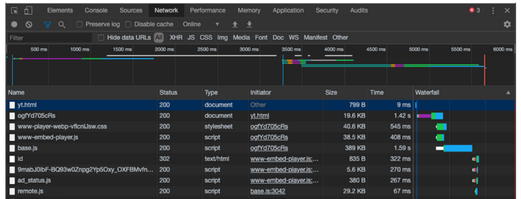
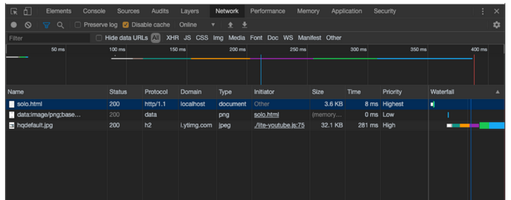
Lite YouTube Embed npm v0.2.0

> **Renders faster than a sneeze.**

Provide videos with a supercharged focus on visual performance. This custom element renders just like the real thing but approximately 224× faster.

Demo: https://paulirish.github.io/lite-youtube-embed/

Comparison

Normal `<iframe>` YouTube embed	`lite-youtube`
	
	

Used by 644

+ 636

Contributors 19

+ 8 contributors

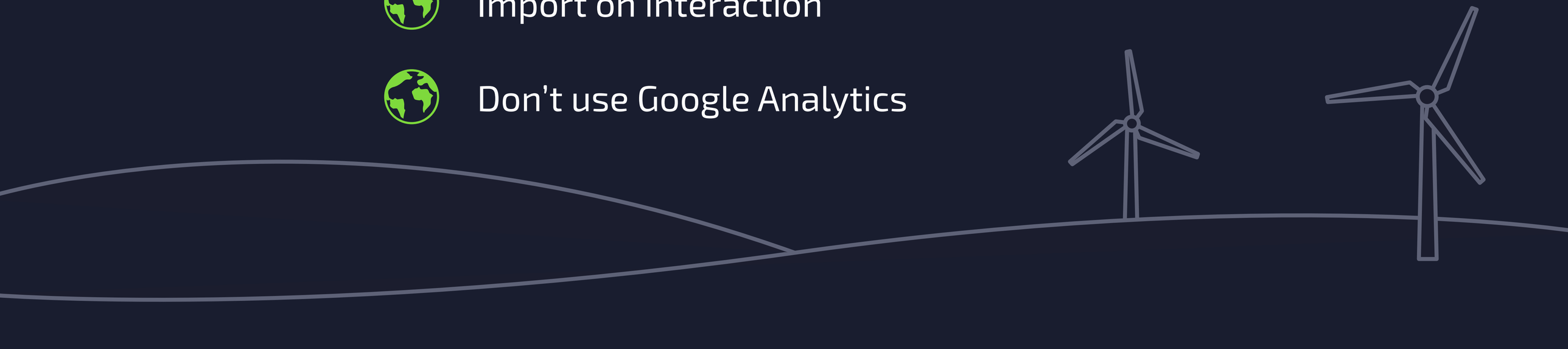
Environments 4

- Preview Active
- github-pages Active
- Production Active
- staging Abandoned

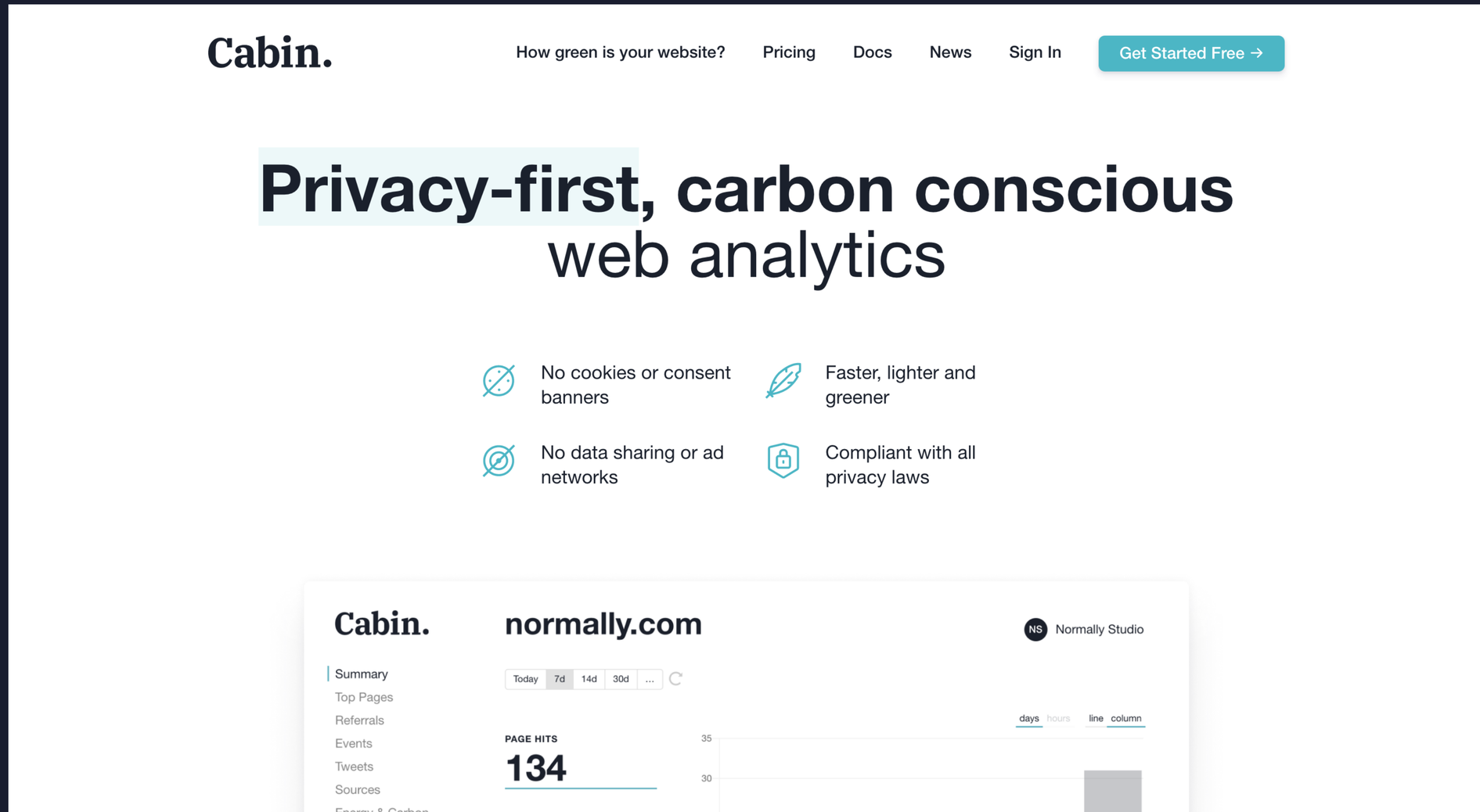
Languages

- JavaScript 48.0%
- HTML 35.4%
- CSS 16.6%

- Avoid embeds
- Defer loading if possible
- Lazyload
- Import on interaction
- Don’t use Google Analytics



withcabin.com



usefathom.com

fathom analytics/

Features Why Fathom Pricing Resources

Sign in Free trial

The Google Analytics alternative without compromise

New Filter your dashboard by event completions

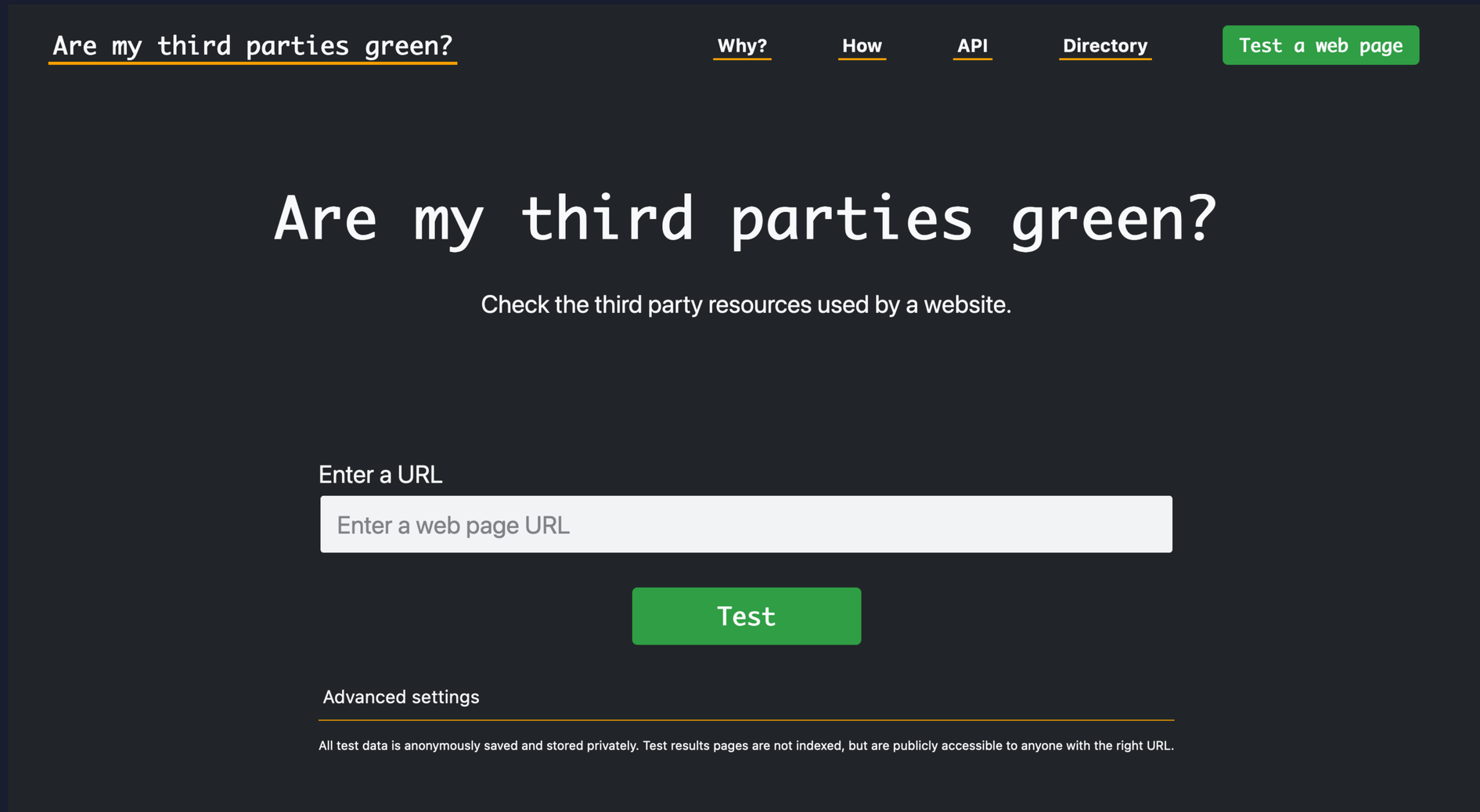
For the longest time, website analytics software was seriously bad. It was hard to understand, time-consuming to use, and worse, it exploited visitor data for big tech to profit.

Fathom is a Google Analytics alternative that doesn't compromise visitor privacy for data. We revolutionized website analytics by making them easy to use and respectful of privacy laws (like GDPR and more).

View a live demo Get started for free

30 day free trial No cookie notices required GDPR Compliant

aremythirdpartiesgreen.com



Not all bytes are created equal

Use less Javascript

© Andy Bell andy-bell.co.uk

Design for less JS

- Design for less JS
- Use native APIs

- Design for less JS
- Use native APIs
- Do you need to transpile?

- Design for less JS
- Use native APIs
- Do you need to transpile?
- Embrace the platform!

A BOOK APART
№ 39
Jeremy Wagner
RESPONSIBLE JAVASCRIPT
FOREWORD BY Estelle Weyl
RESPONSIBLE JAVASCRIPT
Jeremy Wagner
RESPONSIBLE JAVASCRIPT
Jeremy Wagner

Optimise all the things

Caching

bit.ly/40B38ou

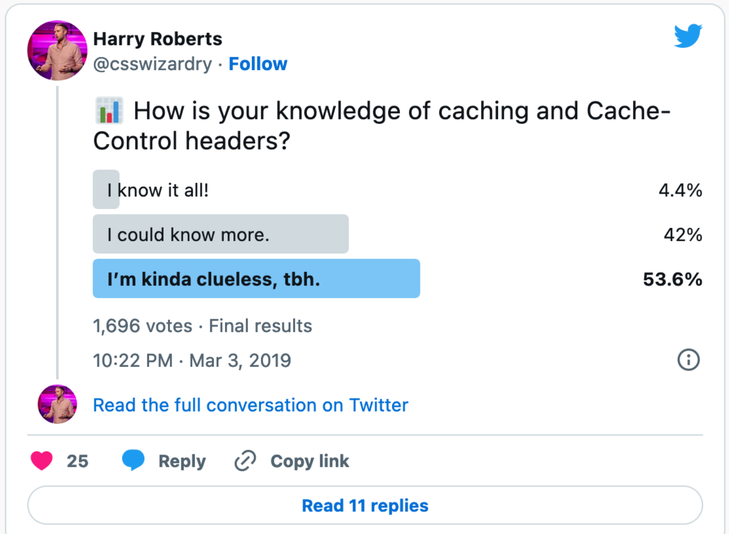
Home About Services Speaking Case Studies Contact

4 March, 2019

Cache-Control for Civilians

Table of Contents

The best request is the one that never happens: in the fight for fast websites, avoiding the network is far better than hitting the network at all. To this end, having a solid caching strategy can make all the difference for your visitors.



Hi there, I'm Harry. I am an award-winning **Consultant Web Performance Engineer**, **designer**, **developer**, **writer**, and **speaker** from the UK. I write, Tweet, speak, and share code about measuring and improving site-speed. You should hire me.

Follow @csswizardry

Arrange a **consultation**.

Projects

- Caching
- Minification and compression

- Caching
- Minification and compression
- Tree-shaking

- Caching
- Minification and compression
- Tree-shaking
- Code splitting

Static import

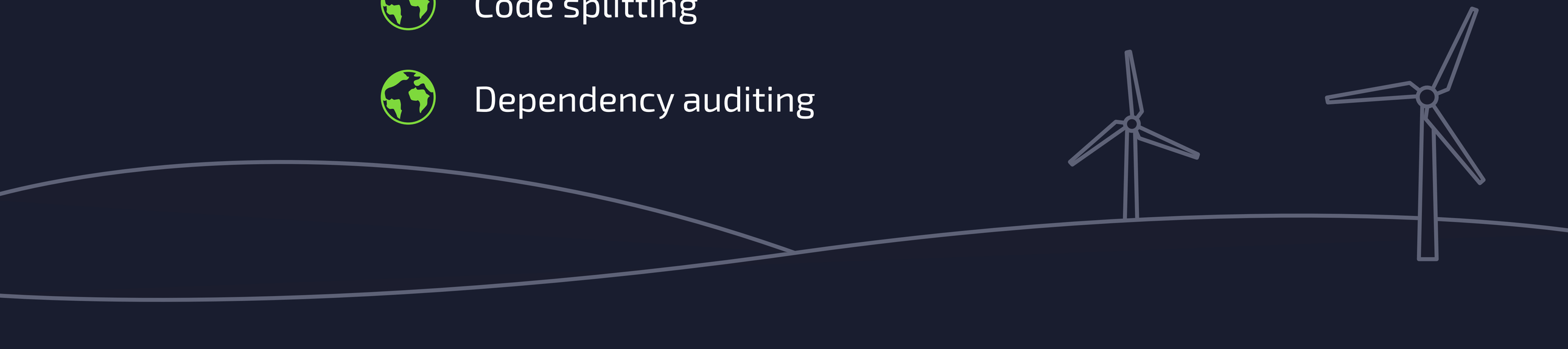
```
import { Auth } from "@aws-amplify/auth";

const user = Auth.currentAuthenticatedUser();
```

Dynamic import

```
import("@aws-amplify/auth").then(({ Auth }) => {
  const user = Auth.currentAuthenticatedUser();
});
```

- Caching
- Minification and compression
- Tree-shaking
- Code splitting
- Dependency auditing



Device
manufacture

Infrastructure

Device use

Device manufacture

Infrastructure

Device use

Device
manufacture

Infrastructure

Device use

Device
manufacture

Infrastructure

Device use

Low-energy colour scheme

User journey

Device
manufacture

Infrastructure

Device use

Renewable energy

thegreenwebfoundation.org/directory

THE GREEN WEB FOUNDATION

INSIGHTS TOOLS SERVICES PARTNER UP ABOUT DATASET LOGIN

Towards a fossil free internet by 2030

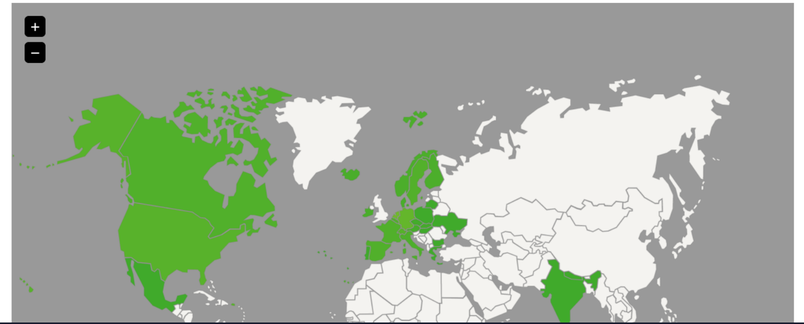
The Green Hosting Directory, as used by the apps

On this page, you will find our Green Hosting Directory.

For every country, the list starts with Partners: the hosting companies that provide proof of their green claims.

This service is provided free of charge for green hosters that can be identified through AS numbers and/or IP ranges.

Are you missing a green hosting provider in this list? Please register yourself or ask them to register with us.



Timing

branch.climateaction.tech

branch | ISSUES | ABOUT | DONATE | OPEN CALL | Climate Action .tech

? GRID INTENSITY VIEW: LOW ▾

Magazine for a Sustainable and Just Internet for All

Issue 4: The Open Climate Edition

SUMMER 2022

branch.climateaction.tech

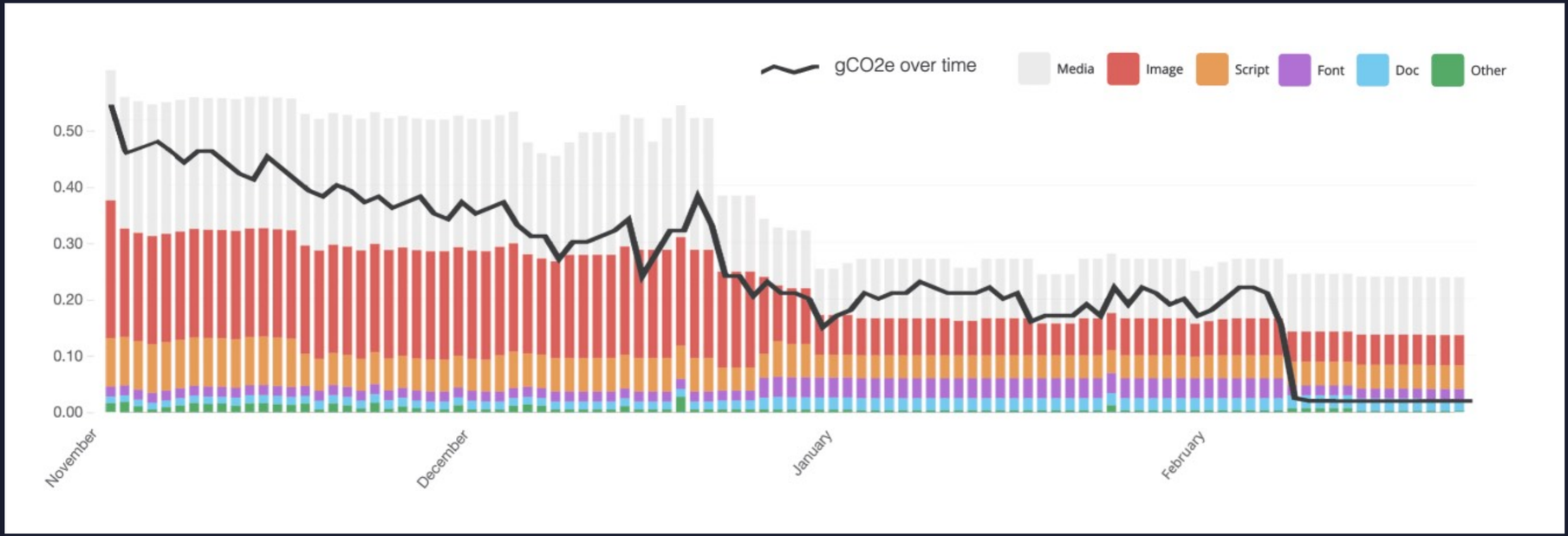
Location

Case study: UsTwo

https://bit.ly/3N8uWgD

Case study: UsTwo

0.54gCO2e → **0.02gCO2e**

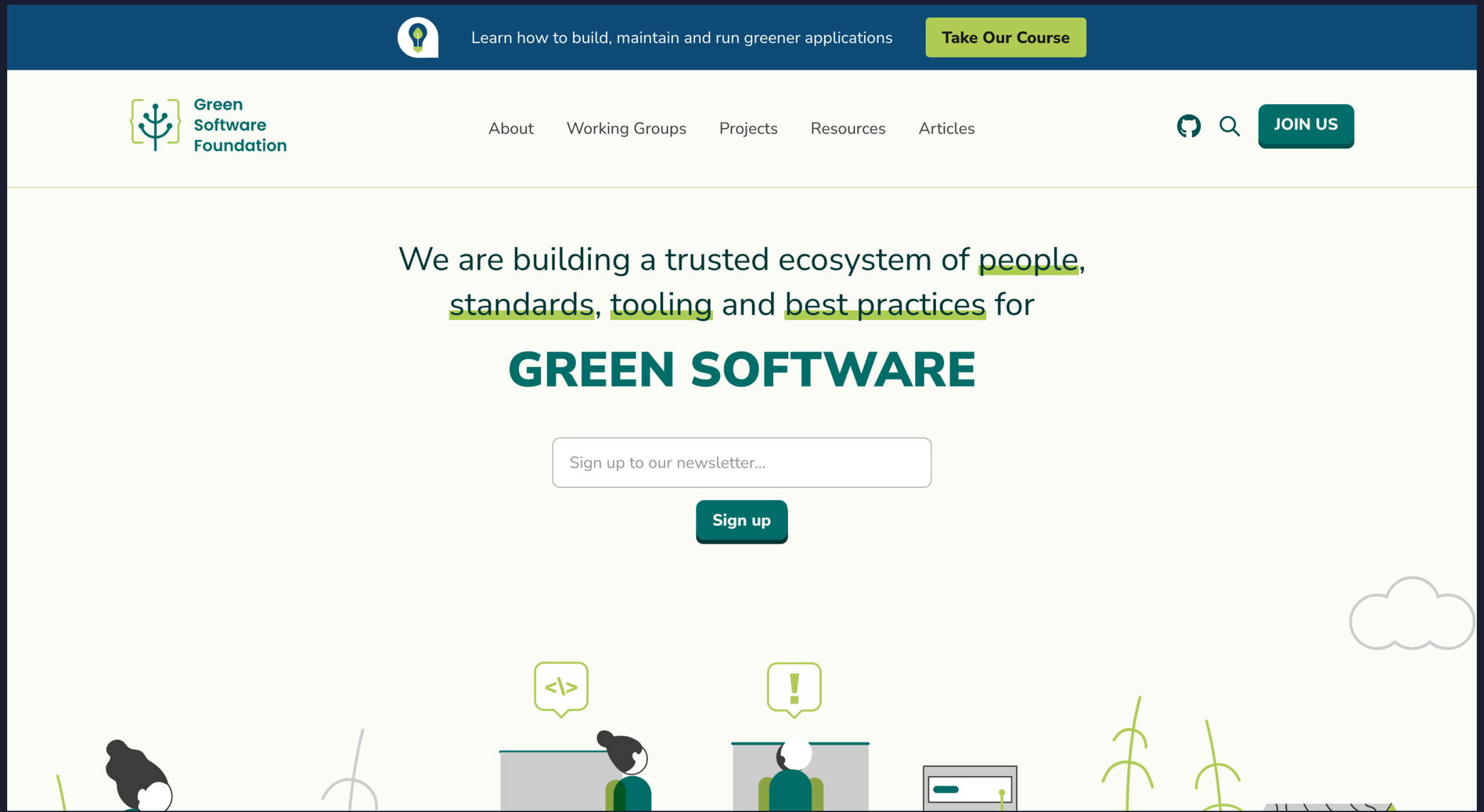


https://bit.ly/3N8uWgD

45% to 99%

carbon reduction

greensoftware.foundation



Developer tooling

If I was a better programmer, I'd write a script that shows you the cumulative CO_2 you've generated every time you type `npm install` .

Eric Bailey

https://bit.ly/3KH98VI

Consider a static site

- Consider a static site
- Don’t run optimisations in development

- Consider a static site
- Don’t run optimisations in development
- Remove unused dependencies

- Consider a static site
- Don’t run optimisations in development
- Remove unused dependencies
- Reduce complexity

Shaving off a single kilobyte in a file that is being loaded on 2 million websites reduces CO2 emissions by an estimated 2950 kg per month.

Danny van Kooten

https://bit.ly/3nX93Up

Why do our individual actions matter?

Photo: pexels.com/@pixabay

Amplify our voices

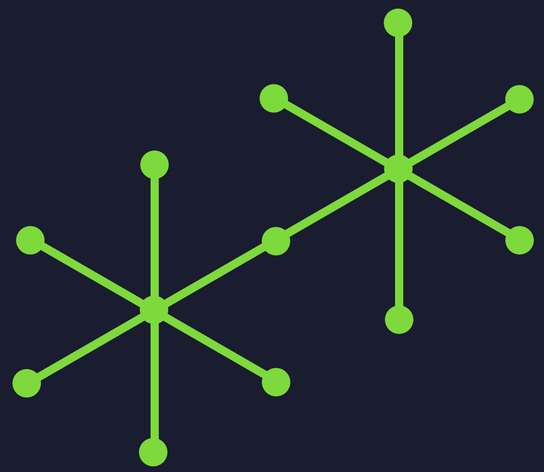
Lead by example

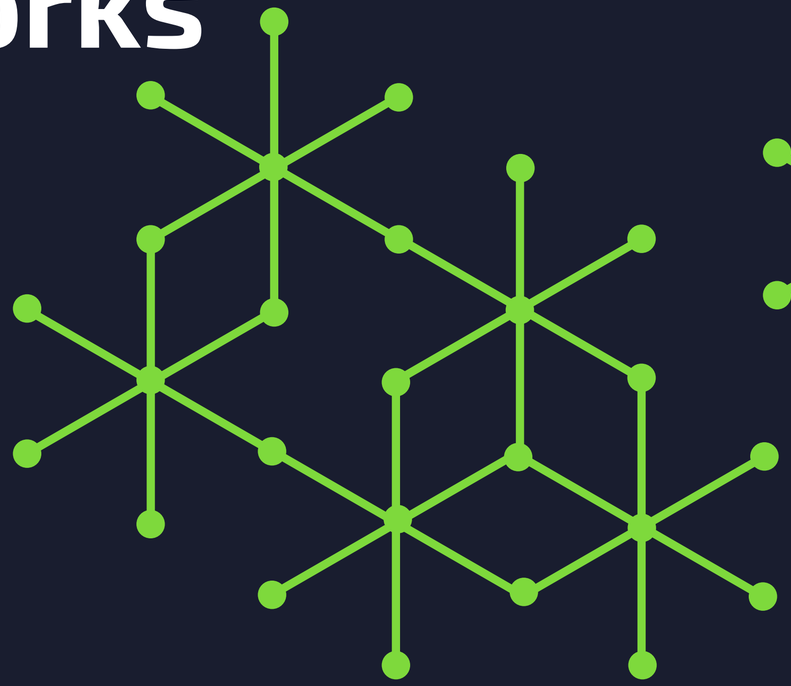
Regulation

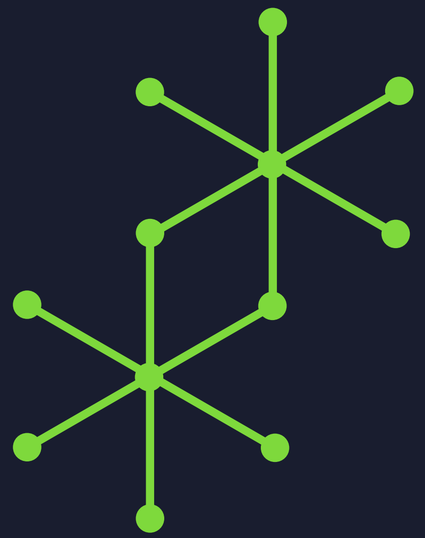
Cultural revolutions don’t happen because of systems change; they happen when a group of people voice a compelling story that propagates across society and becomes a social norm.

https://bit.ly/3nZs48x

Networks



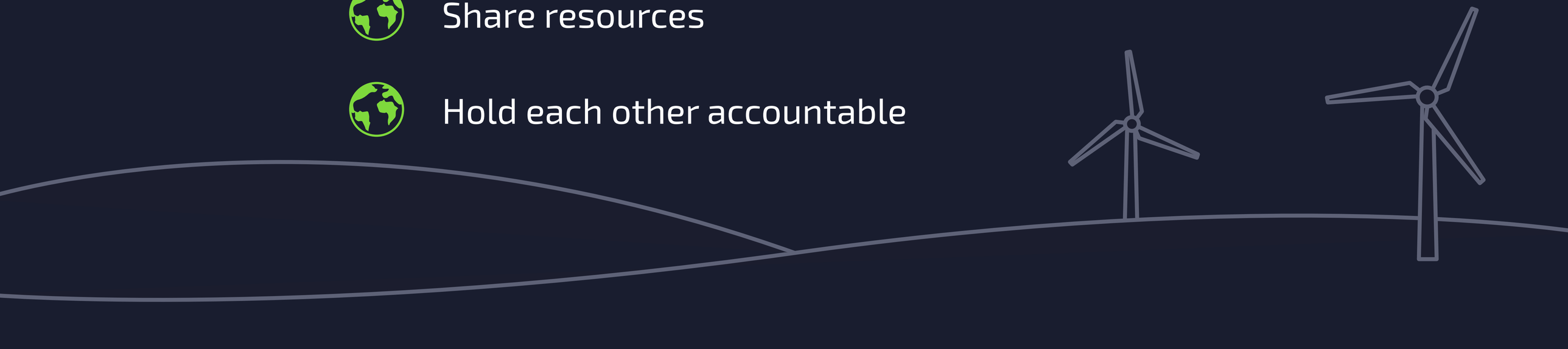




Elon Musk isn't going to
solve climate change

Form a workplace action group

- Support each other to take climate action
- Push the climate agenda and greener practices within your organisation
- Share resources
- Hold each other accountable

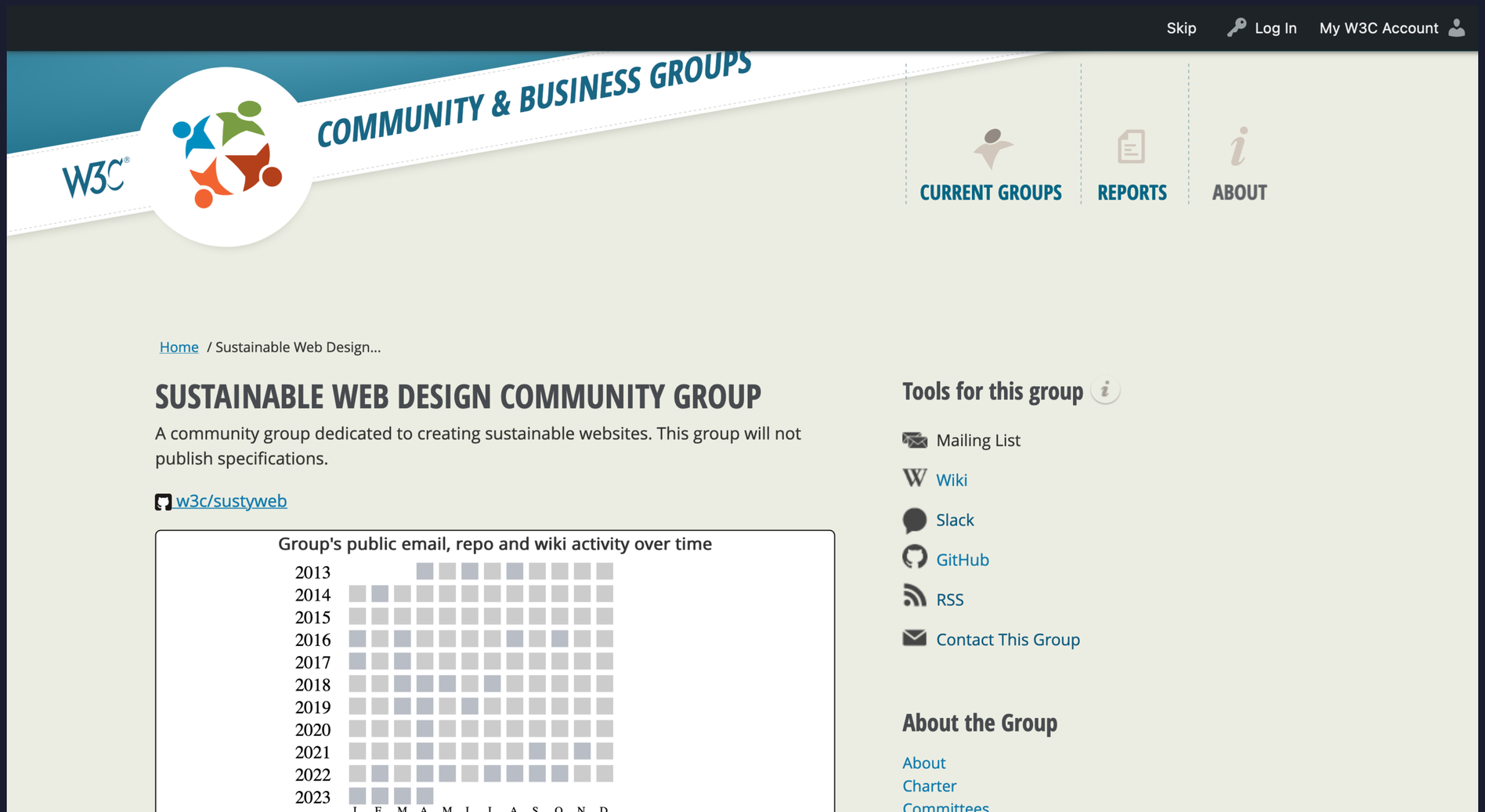


Share your learning

- Write
- Speak at events
- Share on social media

Climate Action .tech

w3.org/community/sustyweb



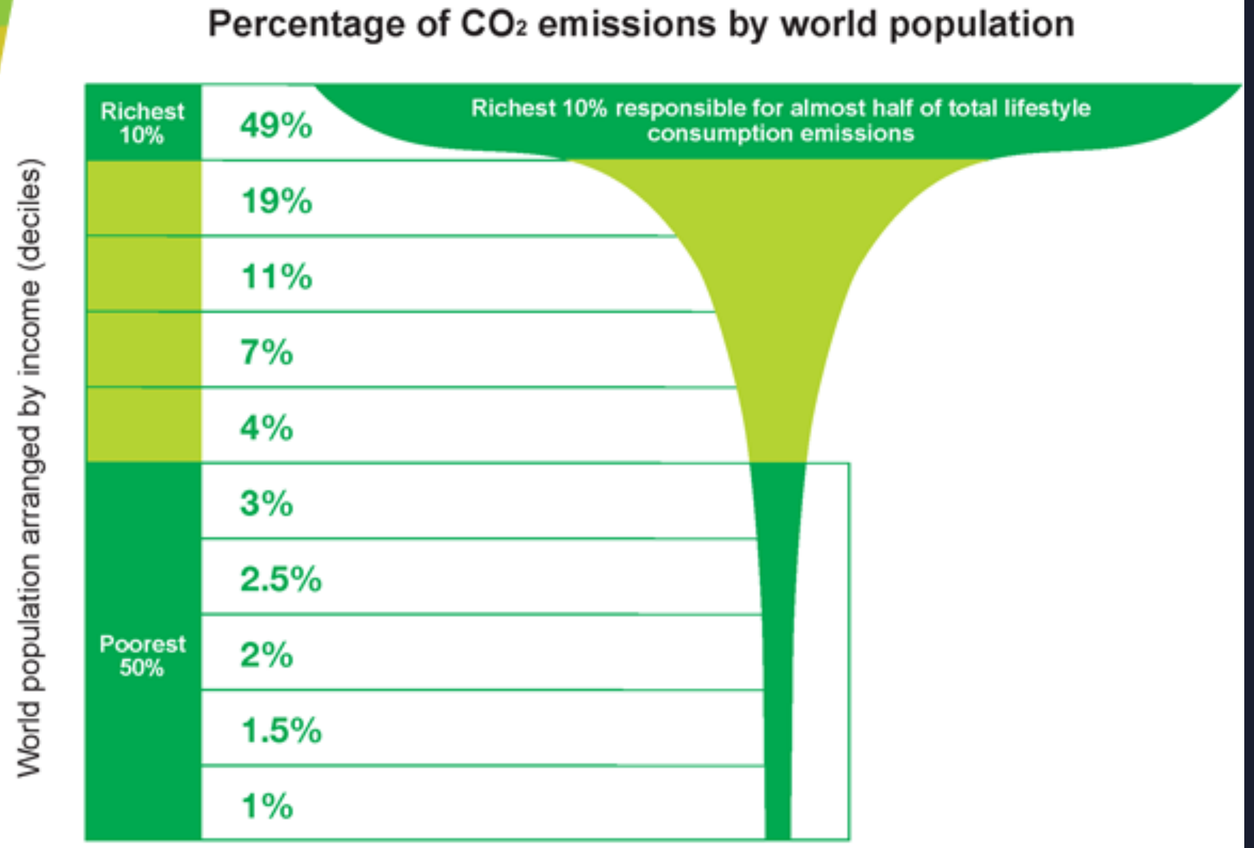
Recognising our power
+ privilege

THIS IS FOR EVERYONE

OXFAM

The poorest **50%** is only responsible for around **10%** of total lifestyle consumption emissions.

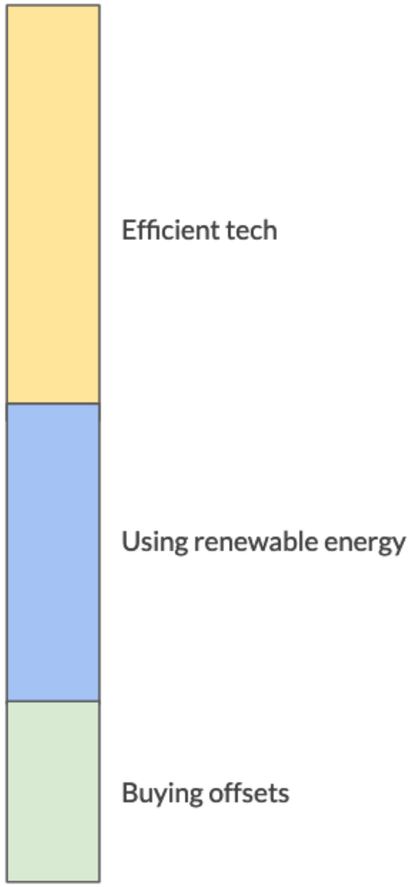
OXFAM MEDIA BRIEFING:
EXTREME CARBON INEQUALITY



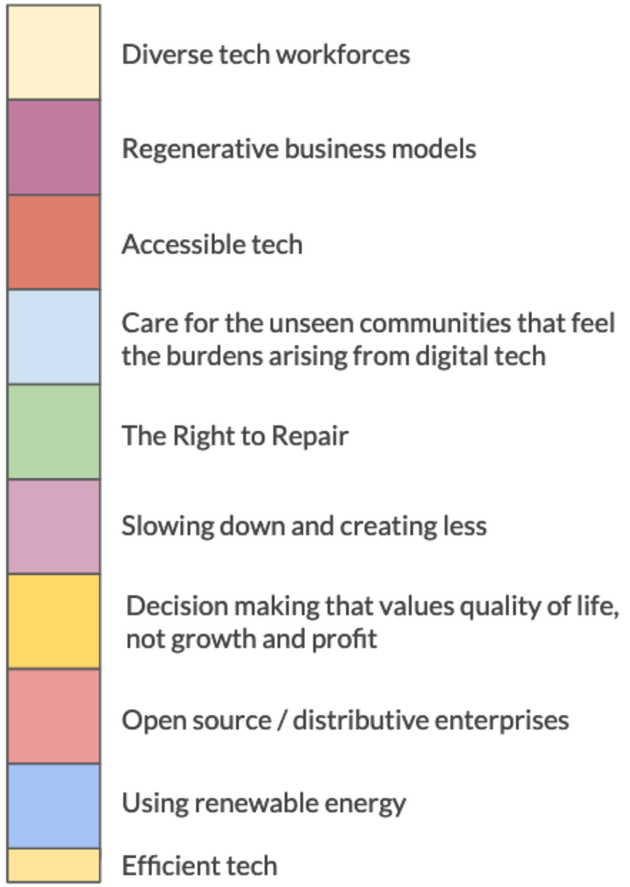
https://bit.ly/35HxOxx

Sometimes less is more

What people think building a sustainable internet means



What it's more about



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

Hope doesn’t preclude feeling sadness or frustration or anger… Hope is not optimism. Hope is a discipline… we have to practice it every single day.

Mariame Kaba

https://bit.ly/3Noy2NK

planet
THIS IS FOR EVERYONE

Thank you

css-irl.info/tags/web-sustainability