

The Low-Carbon Web Design Guide



Introduction

It might seem that websites have no physical impact since everything is stored in the 'cloud'. However, every website visit, video stream, and online action generates carbon emissions.

For websites to work, they rely on servers, networks and devices that can collectively use a lot of energy.

THE IMPACT

The internet causes **3.7%** of global carbon emissions¹. Here's how it compares to other sources.



Air travel causes **2.5%** of global carbon emissions².



The UK is the **27th largest polluter** of carbon emissions in the world³.



If the internet were a country, it would be the **4th largest polluter** in the world⁴.

Making websites more energy-efficient not only helps the environment but also makes them faster and easier to use. This leads to better visitor experiences and business results.

The following guide will show you how to make your website both greener and perform better.

¹ Source: <https://sustainable-business.guide/2022/10/06/the-surprising-carbon-footprint-of-the-internet/>

² Source: <https://www.iea.org/energy-system/transport/aviation>

³ Source: https://edgar.jrc.ec.europa.eu/report_2024?vis=co2tot#data_download

⁴ Source: <https://www.sustainablewebmanifesto.com/>

Planning



Set Clear Goals

The average website has too many pages, menus, and pop-ups that don't add value. Before creating or updating a website, decide:

- What is your website's purpose?
- Who your audience is?
- What are your key goals?
- What is your product or service's value proposition?
- Who your competition is?



Make Navigation Simple

A well-organised website helps users find what they need quickly, using fewer clicks and less data. Try to make it as easy as possible for them to get from A to B.



"VIP" Content Only

Check your website and remove anything that isn't useful - extra pages, images, videos, or animations. The more content your website loads, the more energy it uses. Too much content also makes websites 'bloated' so they become slower and harder to use.



Use Good SEO & Clear Writing

SEO (Search Engine Optimisation) helps people find the right pages faster. Clear, to-the-point copywriting helps users get the information they need without wasting time scrolling through irrelevant text. Quality over quantity.

Design



Less is More

A clean, easy-to-navigate website reduces unnecessary clicks and loads faster. Don't clutter pages with too much content - leave some blank space so your website looks more organised and readable.



Limit Fonts

Using [system fonts](#) (already installed on most devices) reduces the amount of data required to load your website. If you need custom fonts, use only one or two styles (e.g., regular, bold, italic) and keep it simple. Ideally, self-host these fonts rather than relying on third-party services such as [Google Fonts](#).



Use Fewer Images

A picture can tell a thousand words, but too many images and illustrations can slow websites down. Only use images that add real value.



Use Dark Mode

Dark mode reduces energy consumption on OLED and AMOLED screens by displaying fewer bright pixels. Offering a dark mode alternative will lower power consumption.



Avoid Videos If Possible

Videos are one of the most energy-intensive elements on a website. Replace videos with images, illustrations or short text to get your message across with less impact on the environment.



Write Efficient Code

Best coding practices help websites run faster and use less energy. Minimise unused JavaScript, CSS, and third-party libraries to reduce page size, load time and energy consumption. Use [native browser technologies](#) where possible.



Use Modern File Formats

Using the right file formats makes websites load faster and use less energy.

- WebP and AVIF images retain high quality while having smaller file sizes, reducing data usage by 25–50% compared to JPEG and PNG⁵.
- WOFF2 is a font format that is 50% smaller than TTF, making fonts load quicker and improving website speed, accessibility, and energy efficiency⁶.

⁵ Source: <https://www.smashingmagazine.com/2021/09/modern-image-formats-avif-webp/>

⁶ Source: <https://css-tricks.com/snippets/css/using-font-face-in-css/>

⁷ Source: <https://www.dannyvankooten.com/blog/2020/website-carbon-emissions/>



Use Lazy Loading

This means images and videos only load when needed (when the user scrolls to or even interacts with them). This website optimisation technique reduces data transfer, decreases server load and improves performance, especially on mobile devices.



Remove Extra Code

Just like regular housekeeping, you should keep your website tidy by routinely removing unnecessary code and optimise essential code to make your website faster, easier to maintain, and more energy-efficient.

This will save you money and time in the long run by making your website more scalable⁷.

Hosting



Use a Green Host

A green web host uses renewable energy instead of fossil fuels. You can check if your host is green using the [Green Web Foundation](#).



Enable Caching

Caching saves copies of web pages so they don't have to reload from scratch each time someone visits. If your CMS allows it, turn on Static Site Generation or similar caching technologies to make pages load up to 10 times faster. These techniques can drastically reduce emissions per page load, making your website more sustainable.



Use a Content Delivery Network (CDN)

When your audience is global, hosting in one location isn't always practical. A CDN stores copies of your website and assets in different locations around the world. This means users get content from the closest server, reducing the physical distance that pages and assets must travel. They also optimise images and fonts to ensure a faster, more sustainable user experience.



Keep Servers & Software Updated

Regularly updating software and servers improves speed, security, and efficiency. Newer versions are optimised to use less energy by putting less strain on servers and keeping everything running smoothly.



Remove Unused Content

96.55% of internet content never gets visited on Google⁸. If content isn't useful or needed, delete it to keep your website lighter, faster, and more sustainable. This will also improve user experience and search performance by eliminating unnecessary clutter.



Monitor Performance

Use tools like [PageSpeed Insights](#) or [GTmetrix](#) to find areas where your website could be improved and reveal opportunities to reduce energy consumption. More advanced tools like [Screaming Frog](#) can identify problematic pages and assets providing you with granular insights.

Website Sustainability Guidelines

A guide on designing, developing and delivering websites with sustainability in mind.

[View Resource](#) →

The Green Web Foundation

A global directory of verified green hosting providers.

[View Resource](#) →

The Sustainable Developer Directory

Directory of sustainable web developers, freelancers and agencies from around the globe.

[View Resource](#) →

Sustainable Web Design

Community and research-led guidelines for greener websites.

[View Resource](#) →

Green Software Foundation

Focuses on energy-efficient coding practices and carbon-aware computing.

[View Resource](#) →

Website Sustainability Audit

Receive a comprehensive report on how to reduce the carbon emissions of your website.

[View Resource](#) →

⁸ Source: <https://ahrefs.com/blog/search-traffic-study/>