

**Decarbonising the planet,
one Umbraco upgrade at a time**



Hi, I'm Rick 🖱️

Development Team Lead
at Nexer Digital

Umbraco Sustainability Community Team

Umbraco MVP



UMBRACO MVP

NEXER



NEXER

A human-centred research, design and development company that designs digital products and services that help people live and work better.



Sustainability

**Sustainability is a
big deal, right?**

3.7%

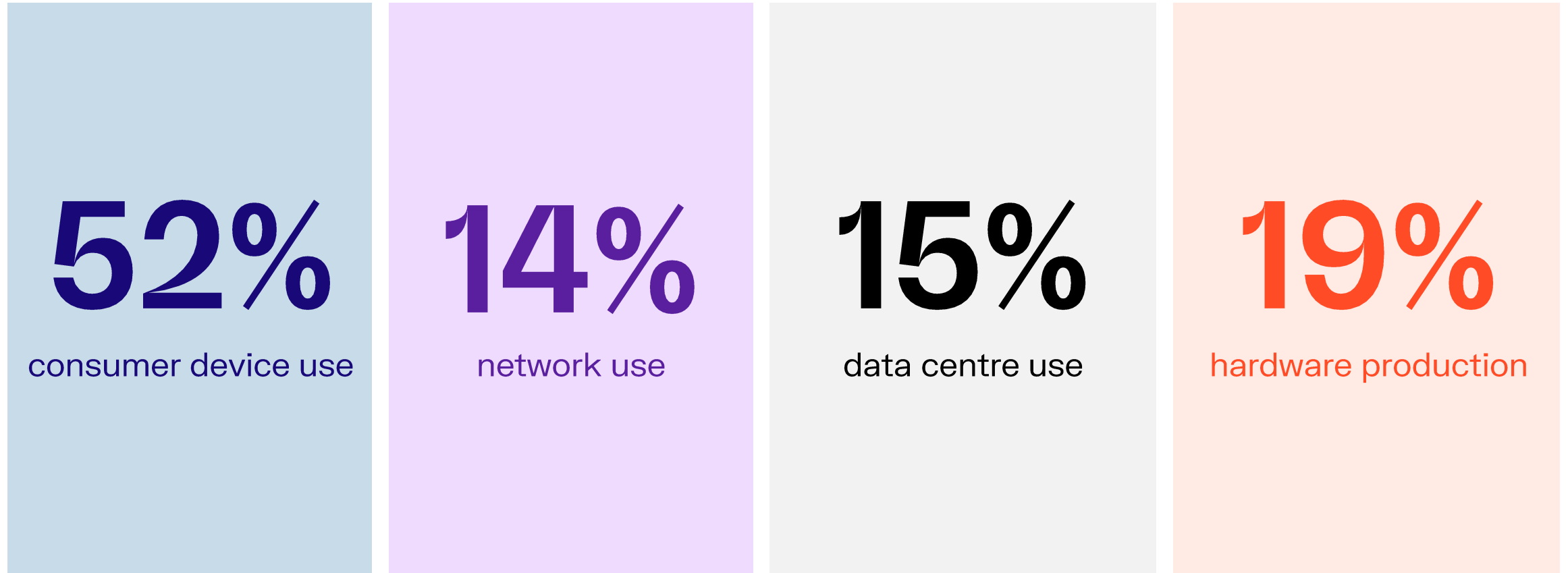
”

The carbon footprint of our gadgets, the internet and the systems supporting them account for about **3.7%** of global greenhouse emissions, according to some estimates. It is **similar to the amount produced by the airline industry globally...** and these emissions are predicted to **double by 2025.**

”

If the Internet was a country, it would be the **4th largest polluter.**

Carbon emissions based on usage



Carbon emissions based on usage

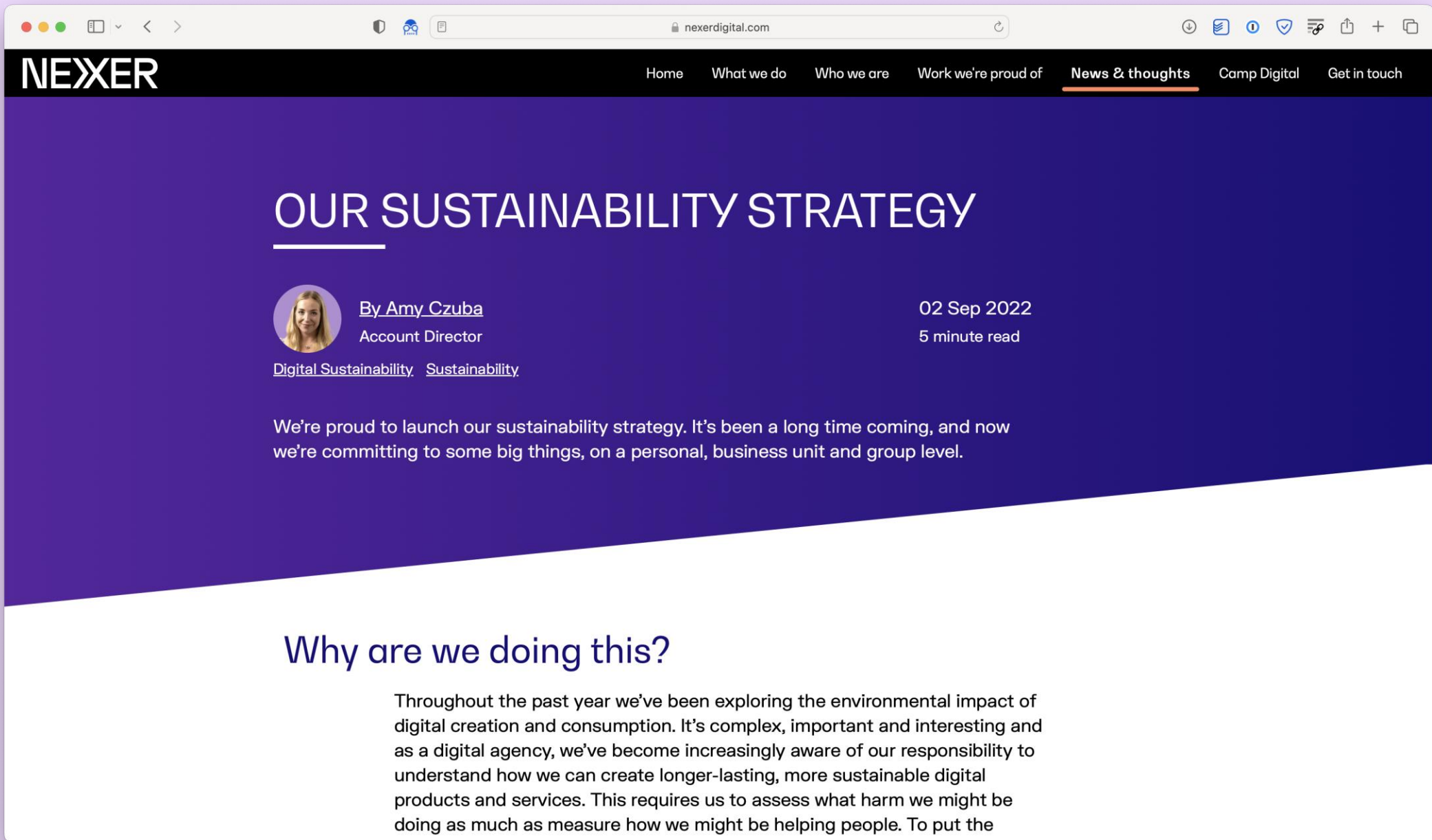
14%

network use

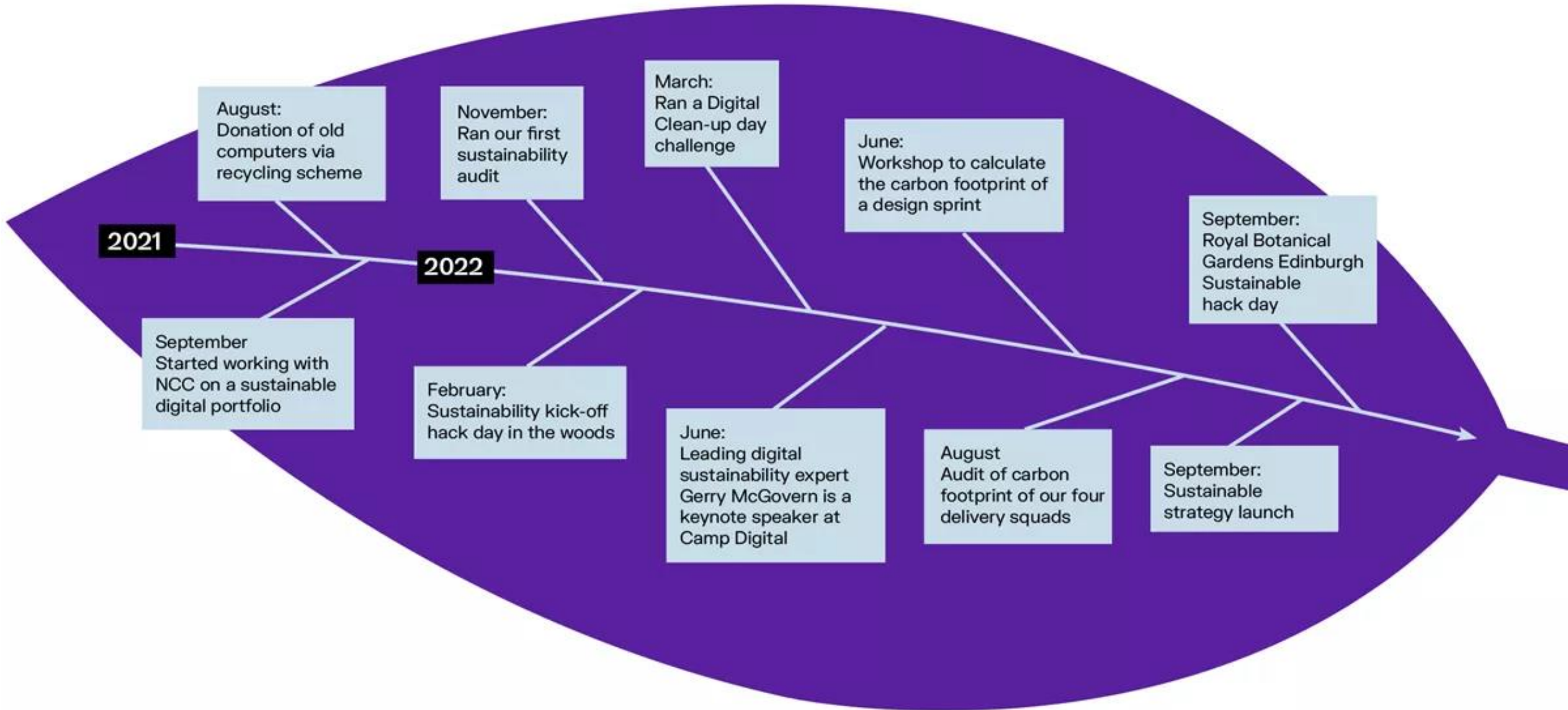
15%

data centre use

We started a **sustainability journey** as a company at the end of 2021, **launching our own sustainability strategy** in September 2022.



Source: <https://www.nexerdigital.com/news-and-thoughts/our-sustainability-strategy/>



nccgroup[®]



Browser address bar: nccgroupplc.com

Customer Portals ▾ Cyber Incident Response

nccgroup

What We Do + Who We Are + Sustainability + Investor Relations + Careers + Newsroom 🔍

Your business. Our solutions. Your resilience.

Share price
173.15p ▼

Last updated
16 February 2023 at 11:34am

Check share centre

Source: <https://www.nccgroupplc.com>

NEXER



🔒 nccgroupplc.com



👤 Customer Portals ▾

Cyber Incident

group[®]

What We Do +

Who We Are +

Sustainability +

Investor Relations +

Careers +

News

Your **business.**
Our **solutions.**
Your **resilience.**

At the beginning of 2022, we proposed a roadmap of **work focused on sustainability**.




umbraco



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Microsoft | .NET Blog DevBlogs Developer Technology Languages .NET Platform Development Data Development Theme Login

Performance Improvements in .NET 5


Stephen Toub - MSFT

July 13th, 2020 | 60 | 0

In previous releases of .NET Core, I've blogged about the significant performance improvements that found their way into the release. For each post, from [.NET Core 2.0](#) to [.NET Core 2.1](#) to [.NET Core 3.0](#), I found myself having more and more to talk about. Yet interestingly, after each I also found myself wondering whether there'd be enough meaningful improvements next time to warrant another post. Now that .NET 5 is shipping preview releases, I can definitively say the answer is, again, "yes". .NET 5 has already seen a wealth of performance improvements, and even though it's not scheduled for final release until [later this year](#) and there's very likely to be a lot more improvements that find their way in by then, I wanted to highlight a bunch of the improvements that are already available now. In this post, I'll highlight ~250 pull requests that have contributed to myriad of performance improvements across .NET 5.

Setup

[Benchmark.NET](#) is now the canonical tool for measuring the performance of .NET code, making it simple to analyze the throughput and allocation of code snippets. As such, the majority of my examples in this post are measured using microbenchmarks written using that tool. To make it easy to follow-along at home (literally for many of us these days), I started by creating a directory and using the `dotnet` tool to scaffold it:

```
mkdir Benchmarks
cd Benchmarks
dotnet new console
```

[Feedback](#)


rickbutterfield.dev

Rick Butterfield About Blog Speaking

Umbraco Unicore first impressions

5 SEPT 2020 | 4 MINUTES TO READ

On Thursday 3rd September, Umbraco HQ announced the first alpha of Unicore, Umbraco v8 running on .NET Core!




What is Unicore?

Unicore is Umbraco's project to get the CMS running on .NET Core. As mentioned in the live stream, the first commits happened in November last year, and they reckon they're about half way through the project as a whole.

The image shows a browser window displaying the Umbraco website. The URL in the address bar is umbraco.com. The navigation menu includes: umbraco, Explore Umbraco, Products, Pricing, Partners, Learn Umbraco, Contact Us, Sign in, and a search icon. A blue button labeled "Try for free" is positioned on the right side of the navigation bar.

Introducing Umbraco 9

The friendly open-source .NET5 (ASP.NET Core) CMS

 Written by
Bjarke Berg


The Eagle has landed - we're now on planet (and Cloud) 9!! As of today, Umbraco is a fully-fledged .NET 5 (ASP.NET Core) CMS - as one of the first CMS' on the market! This is the fruition of years of hard work by Umbraco HQ and a monumental community effort. Running on the latest technology brings a host of benefits now and ensures a solid foundation for staying technologically relevant for years to

Published: September 28, 2021

Read time: 9 min. read

Category: Products

Umbraco 9 .NET 5
.NET core open source
community



”

Due to the noticeable performance gains in the new framework, you should see your new Umbraco projects be even faster, less resource-intensive, and more scalable.



Around the same time other people were **benchmarking performance of Umbraco versions 8 and 9.**

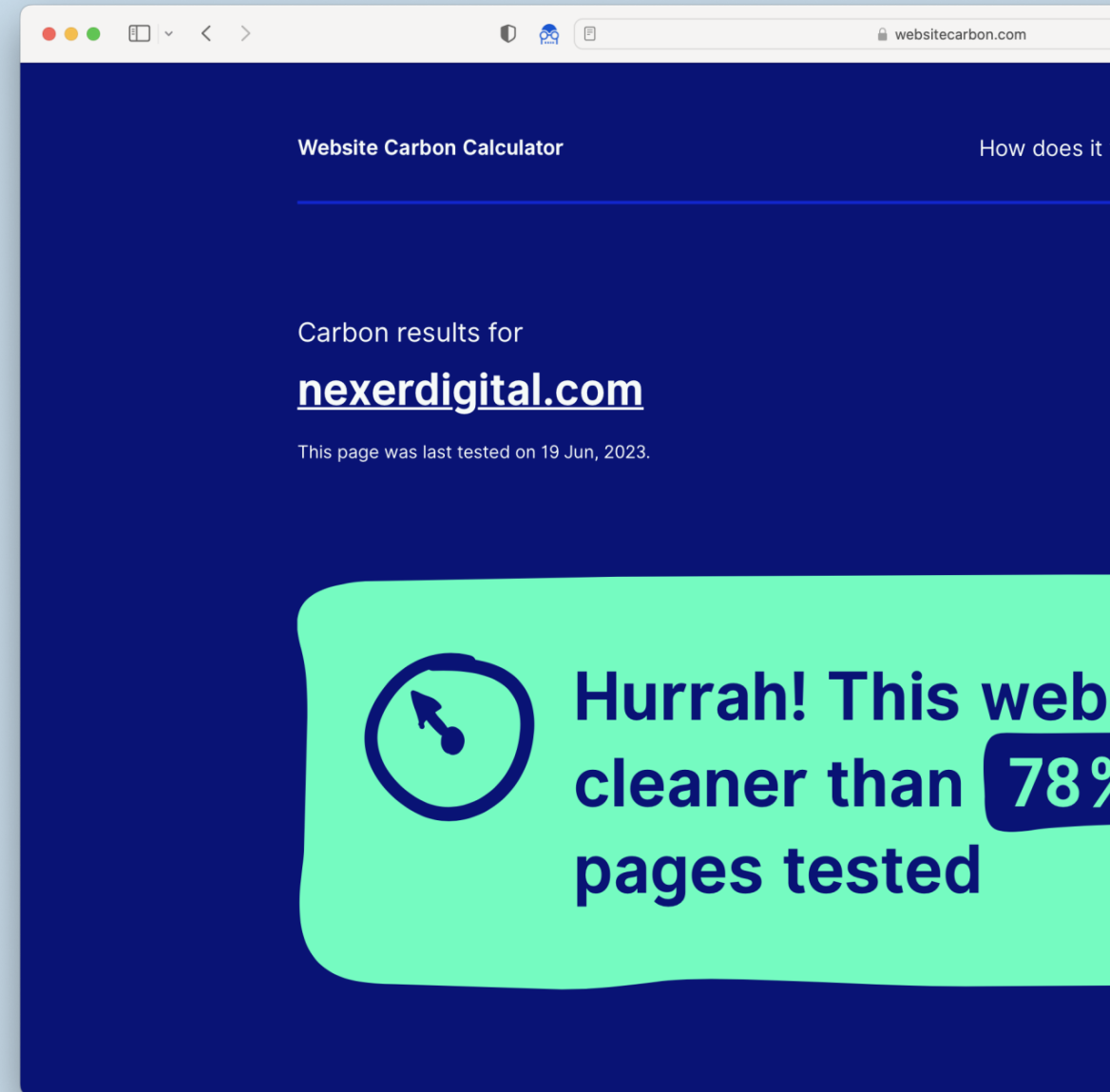
P2V2 Test Results

P2V2	v8 Windows	v9 Windows	v9 Linux
Requests Made	1,095,495	1,493,398	1,441,666
HTTP Failures	0	0	0
Peak RPS	465.86	936.43	851.14
Avg Response Time (ms)	406	30	67
Estimated Price per month	£ 217.63	£ 217.63	£ 120.24








Everything was pointing towards double the performance, so we posed the question...
what could this mean for carbon usage?

Using the **Website Carbon Calculator** tool by Wholegrain Digital, we reviewed 8 of the top landing pages and in page size, according to Google Analytics.




The screenshot shows a web browser window with the URL `websitecarbon.com`. The page title is "Website Carbon Calculator" and there is a link "How does it" in the top right. The main content area displays "Carbon results for **nexerdigital.com**" and a note "This page was last tested on 19 Jun, 2023." A large green callout box contains a circular icon with a cursor and the text "Hurrah! This web cleaner than **78%** pages tested".

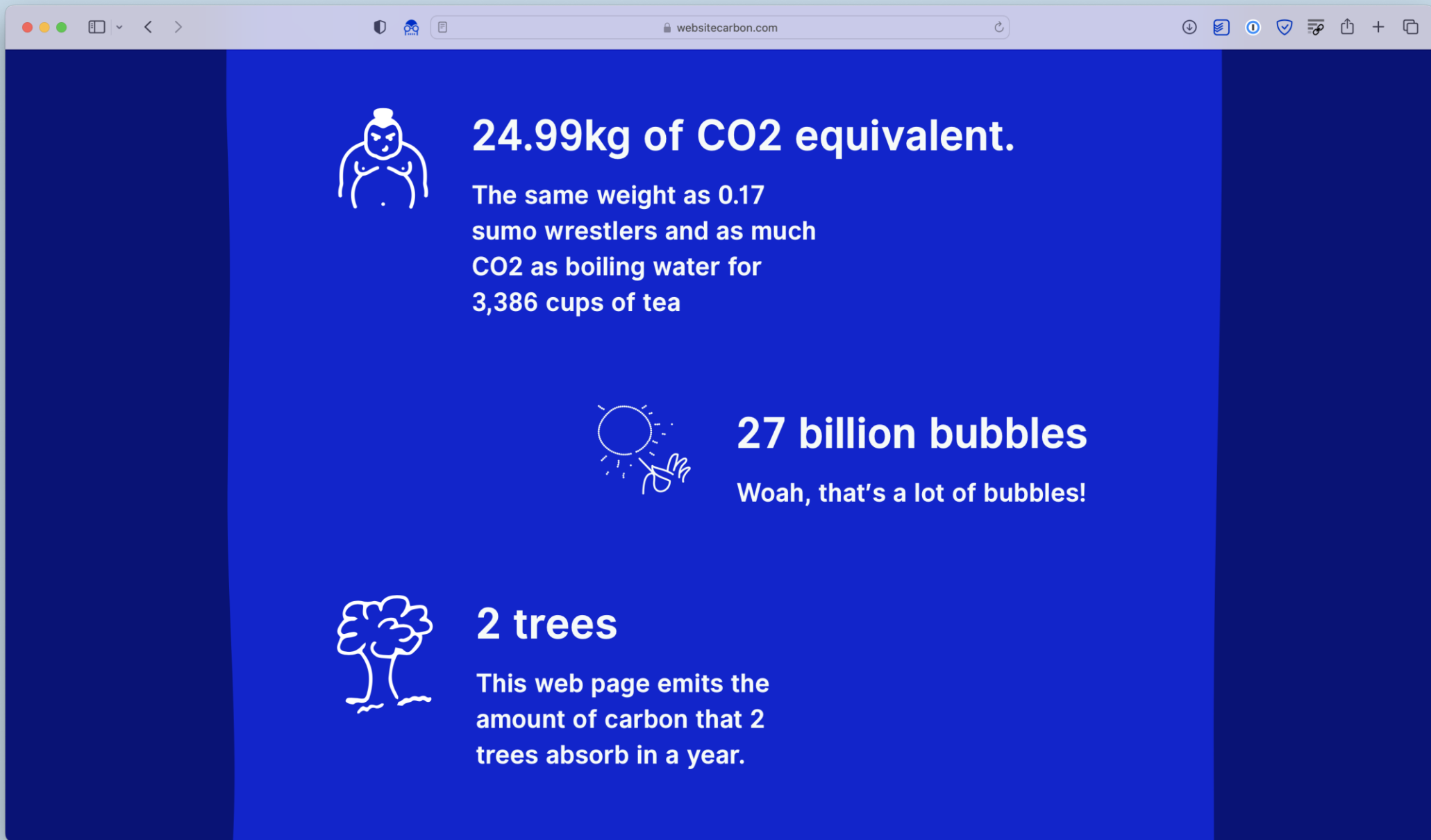
Website Carbon Calculator How does it work? FAQ Get the badge! API Consultancy

Carbon results for
nexerdigital.com Share     

This page was last tested on 19 Jun, 2023.



Hurrah! This web page is cleaner than **78% of web pages tested**



Our Approach



Umbraco upgrade

**Azure resource
decommissioning**

**Carbon usage
tracking**



Easy, right?!

File Home Insert Draw Design Transitions Animations Slide Show Record Review View Help

Record Present in Teams Share

Undo Clipboard Slides Font Paragraph Drawing Editing Voice Designer Pickit

- 1 UMBRACO 9 UPGRADE GUIDE
- 2 STEP BY STEP GUIDE
 - Clone a v8 database
 - Create a new Umbraco 9 solution
 - Pick your v8 solution as the v8 database
 - Run the solution to upgrade the database
 - Set up module generator
 - Copy over Views folder
 - Copy over other content files
 - Install packages
 - Migrate custom code/projects
- 3 PREREQUISITES
 - From any version of v8, you must go to v8.1 first then v9
- 4 CREATING A NEW SOLUTION
- 5 V8 TO V9 MIGRATION
- 6 UPGRADE THE DATABASE



skrift.io


skrift. magazine

ISSUES AUTHORS WRITE ABOUT CONTACT

< ISSUES




HOW I UPGRADED MY UMBRACO V7 PROJECT TO UMBRACO V11

TECHNICAL

 Author
Nurhak Kaya

Published
Issue No 90 • 03 Jan 2023

Read Time
6 Minutes

Is It Time for Upgrades?

With the Umbraco v7 fast approaching [its End Of Life on September 2023](#) and v8 entering [its security-only phase on February 2024](#), it is time to upgrade Umbraco v7 and v8 projects to the latest version of Umbraco.

By moving your projects to the latest version of Umbraco, you will directly benefit from the latest performance and security improvements of Umbraco CMS and .NET 7 as well as many new features of them, including a lot of fantastic Umbraco packages.

But considering [there is no direct upgrade path from Umbraco v7 to Umbraco v8](#), then how can you do your Umbraco upgrades?

This is a question that I asked myself many times.

youtube.com

umbraco community day nurhajak kaya

Umbraco Community day

Ultimate Guide to Upgrade your Umbraco v7 and v8 Projects to v11

Nurhak Kaya

#UmbracoCommunityDay

Ultimate guide to upgrade your Umbraco v7 and v8 projects to v10+ - Nurhak Kaya

Lowlands.Community
838 subscribers

Subscribe

2

Share

Clip

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All From your search Computer Science

Mutemath - The Fight [Live]

Source: <https://www.youtube.com/watch?v=Ok9OaSvK3OI>

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THE RESULTS

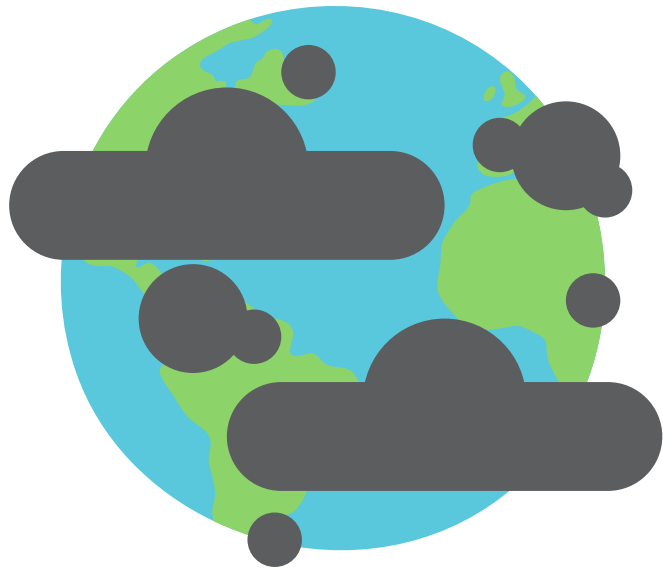


NCC Group homepage

CO₂ produced per page view

April 2022

0.57g



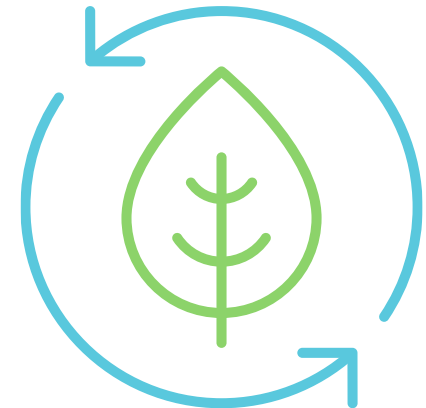
September 2022

0.24g



Reduced by

58%



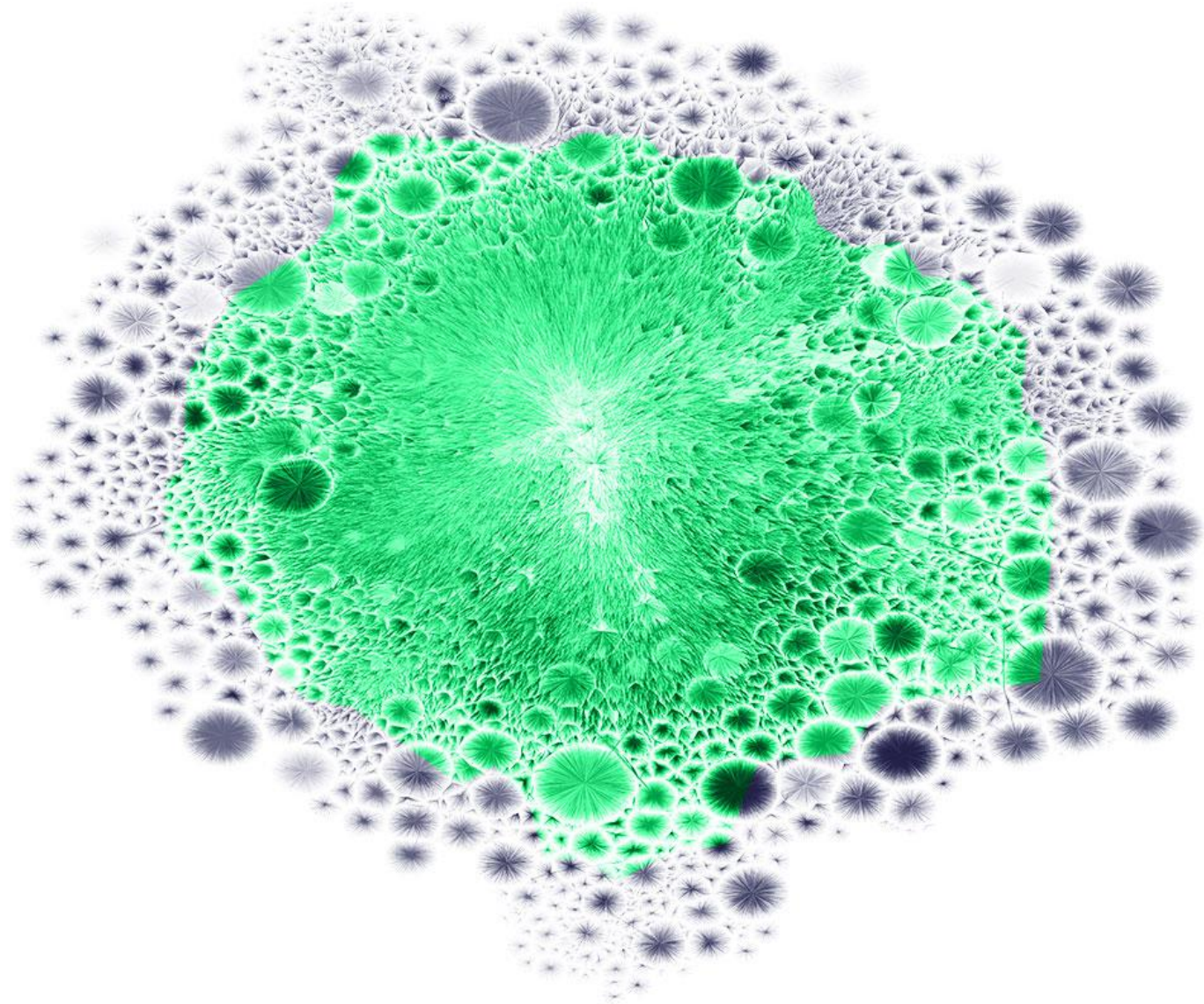
NCC Group homepage

Now cleaner than

74%

of all web pages tested
with the Carbon Calculator

66% cleaner in April 2022

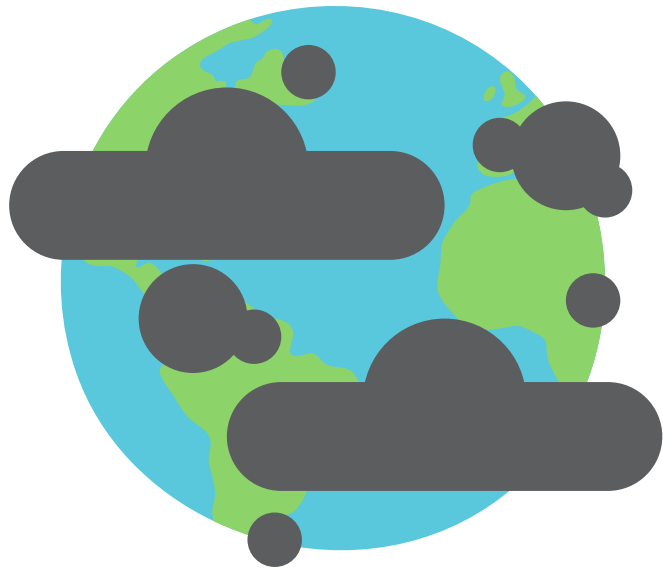


Visible landing page (Singapore)

CO₂ produced per page view

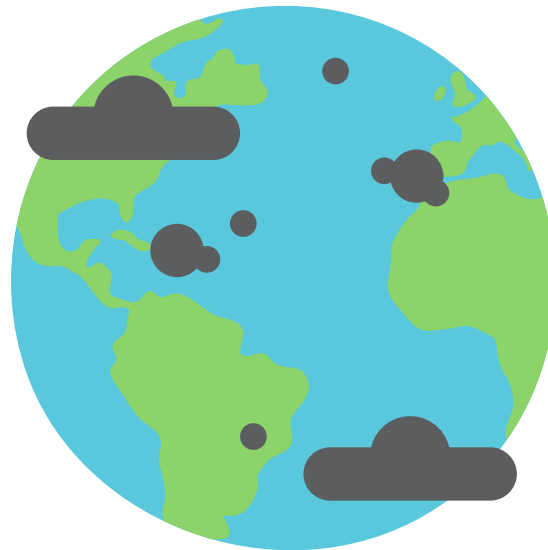
April 2022

3.5g



September 2022

1.75g



Reduced by

50%



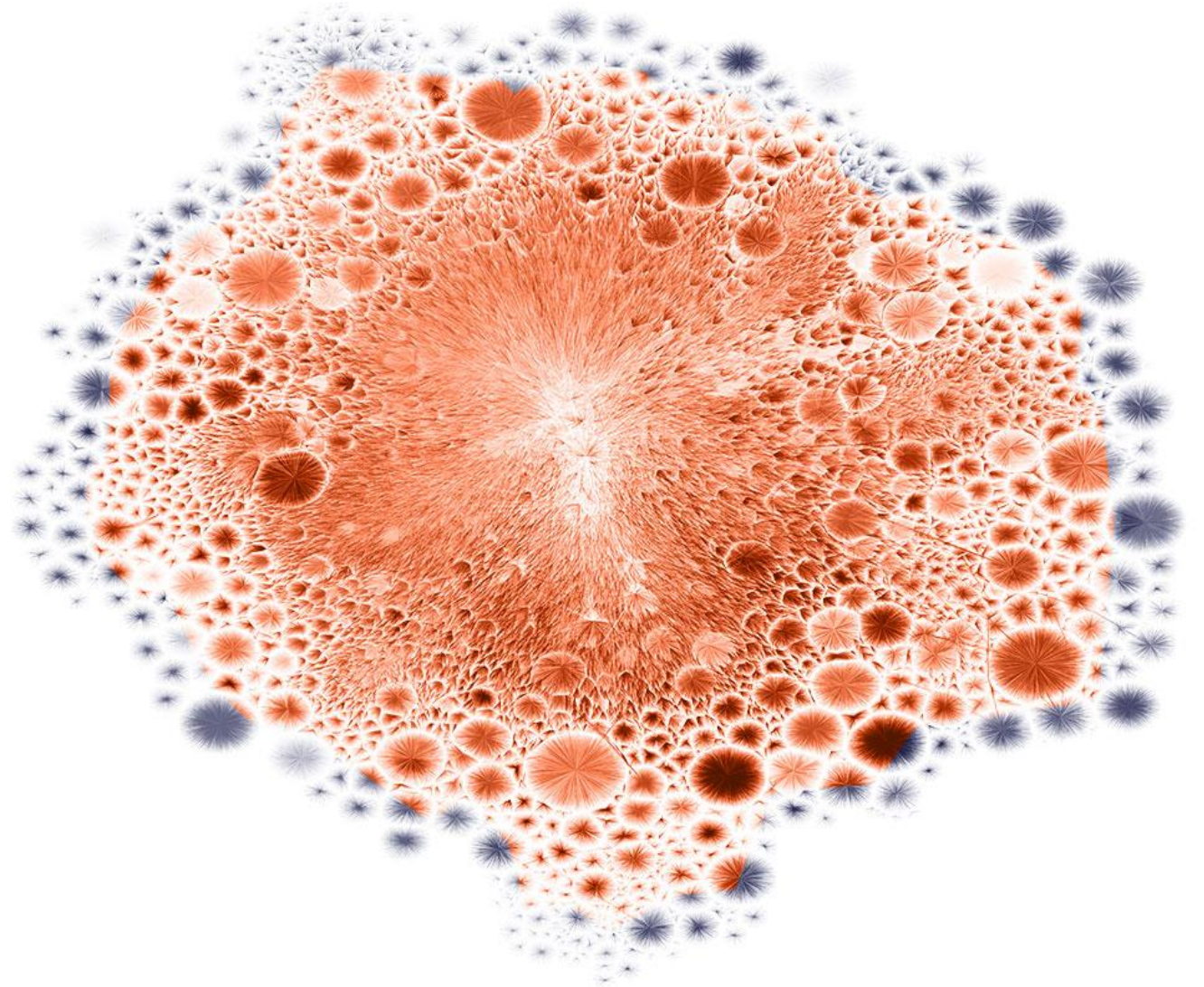
Visible landing page (Singapore)

Now dirtier than

87%

of all web pages tested
with the Carbon Calculator

89% dirtier in April 2022

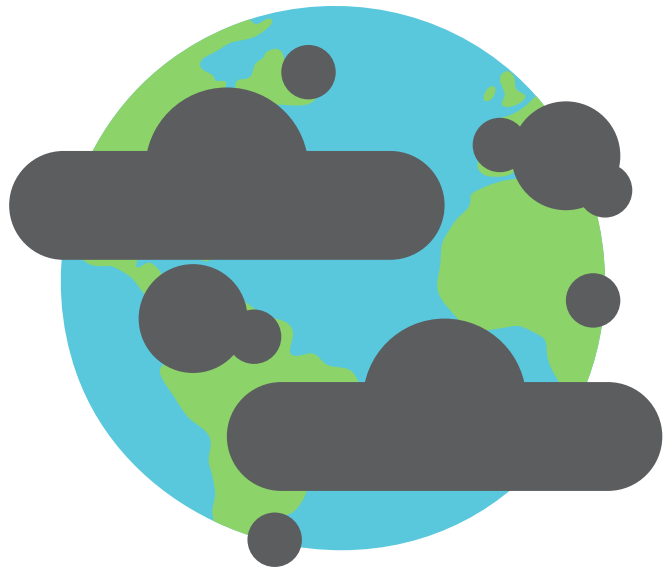


Remediate service page (UK)

CO₂ produced per page view

April 2022

1.77g



September 2022

0.98g



Reduced by

45%



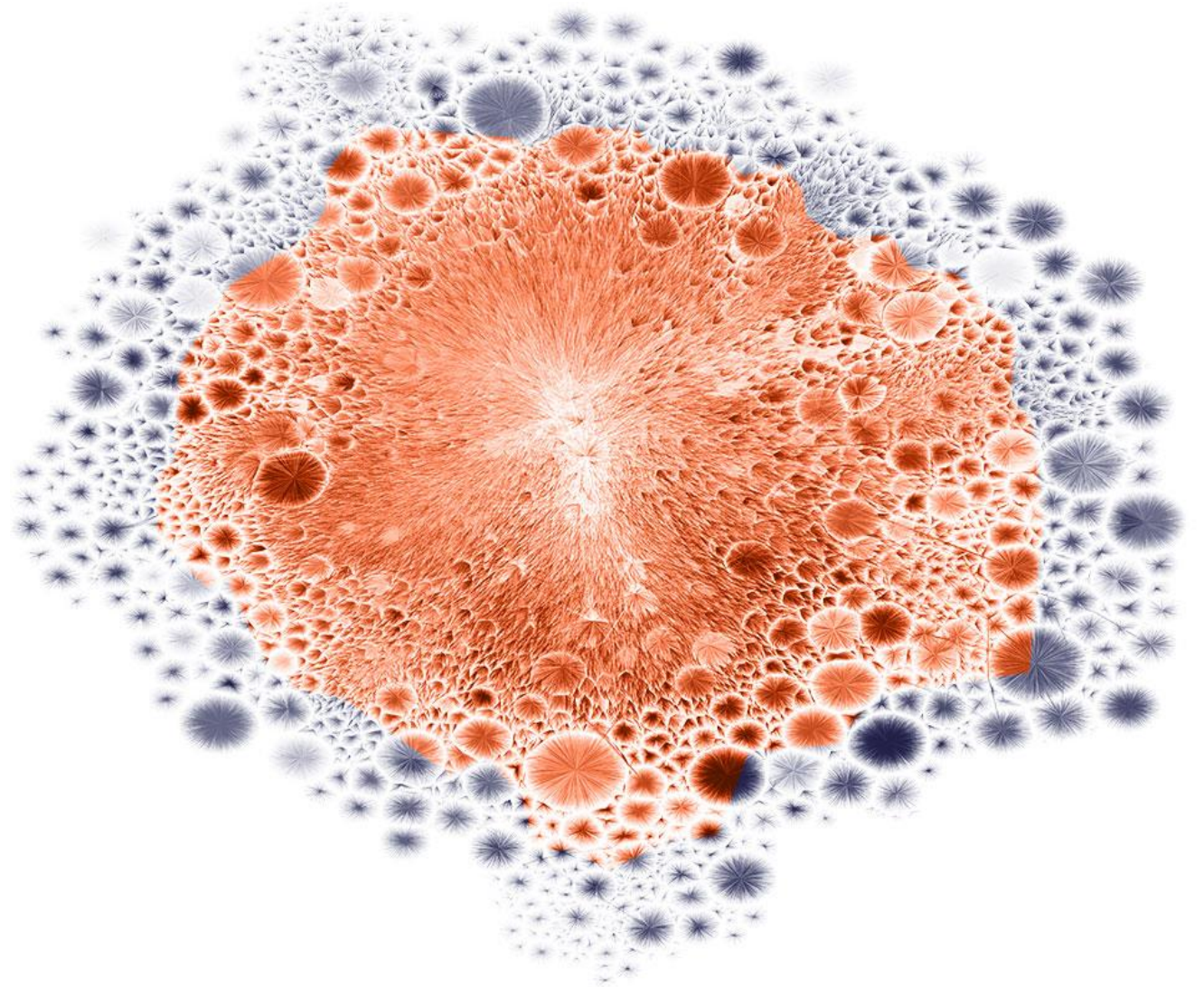
Remediate service page (UK)

Now dirtier than

75%

of all web pages tested
with the Carbon Calculator

72% dirtier in April 2022

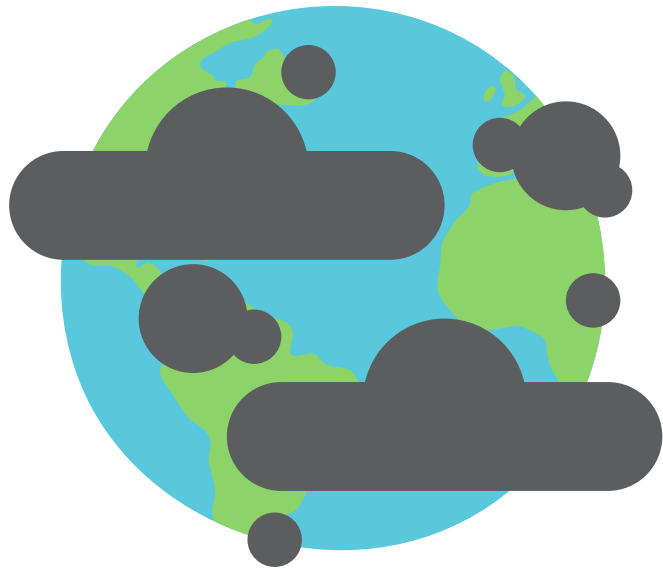


Finance and professional services (UK)

CO₂ produced per page view

April 2022

1.01g



September 2022

0.4g



Reduced by

61%



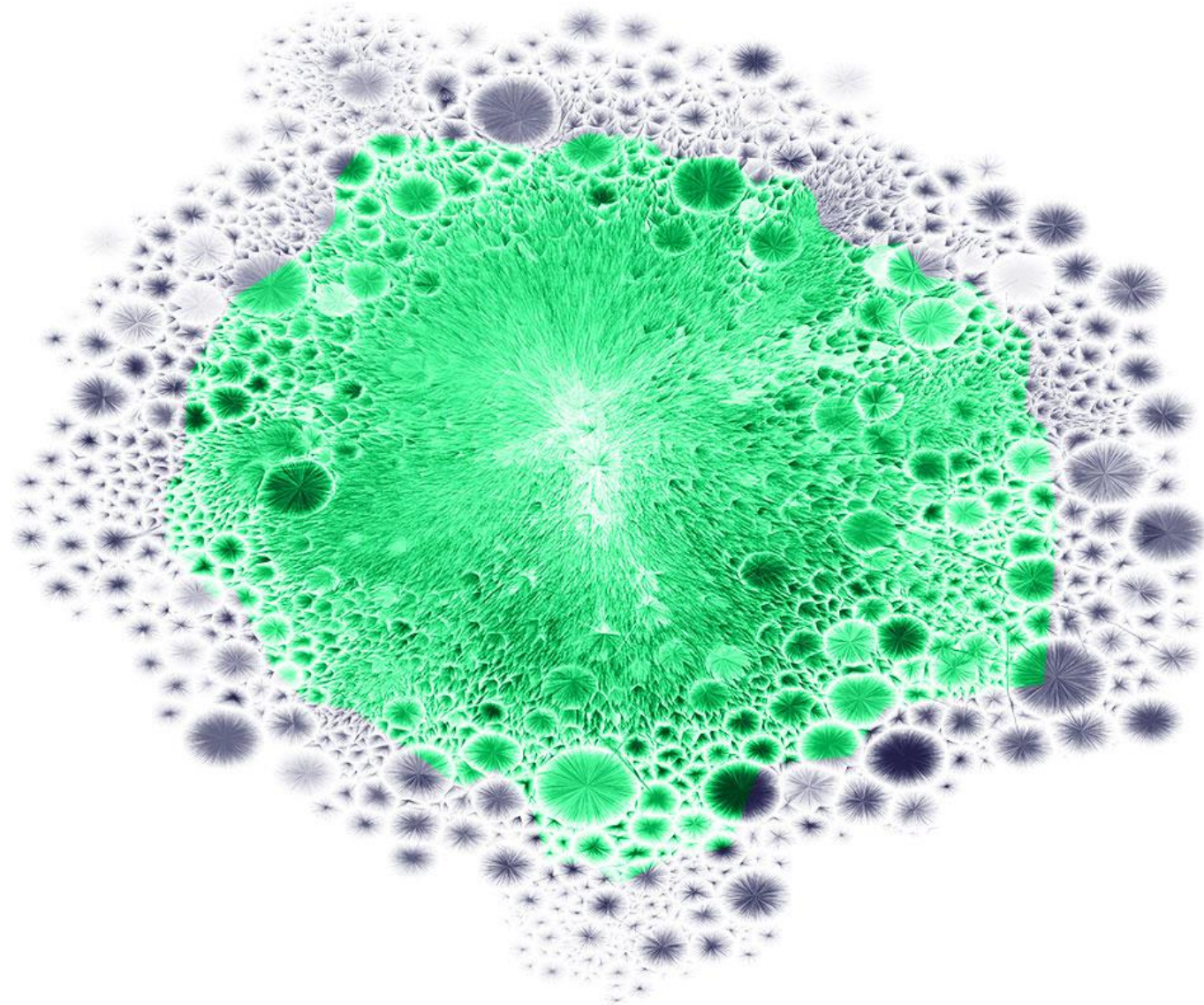
Finance and professional services (UK)

Now cleaner than

58%

of all web pages tested
with the Carbon Calculator

53% dirtier in April 2022

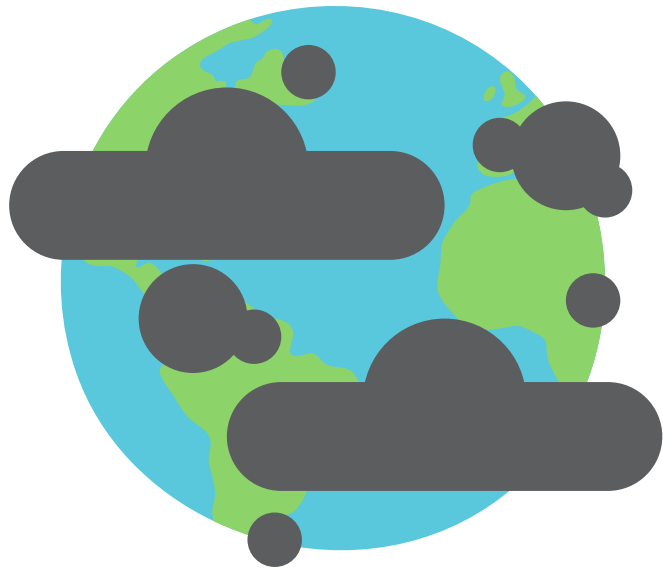


Webinar: Whitebox pentesting page (UK)

CO₂ produced per page view

April 2022

0.99g



September 2022

0.49g



Reduced by

51%



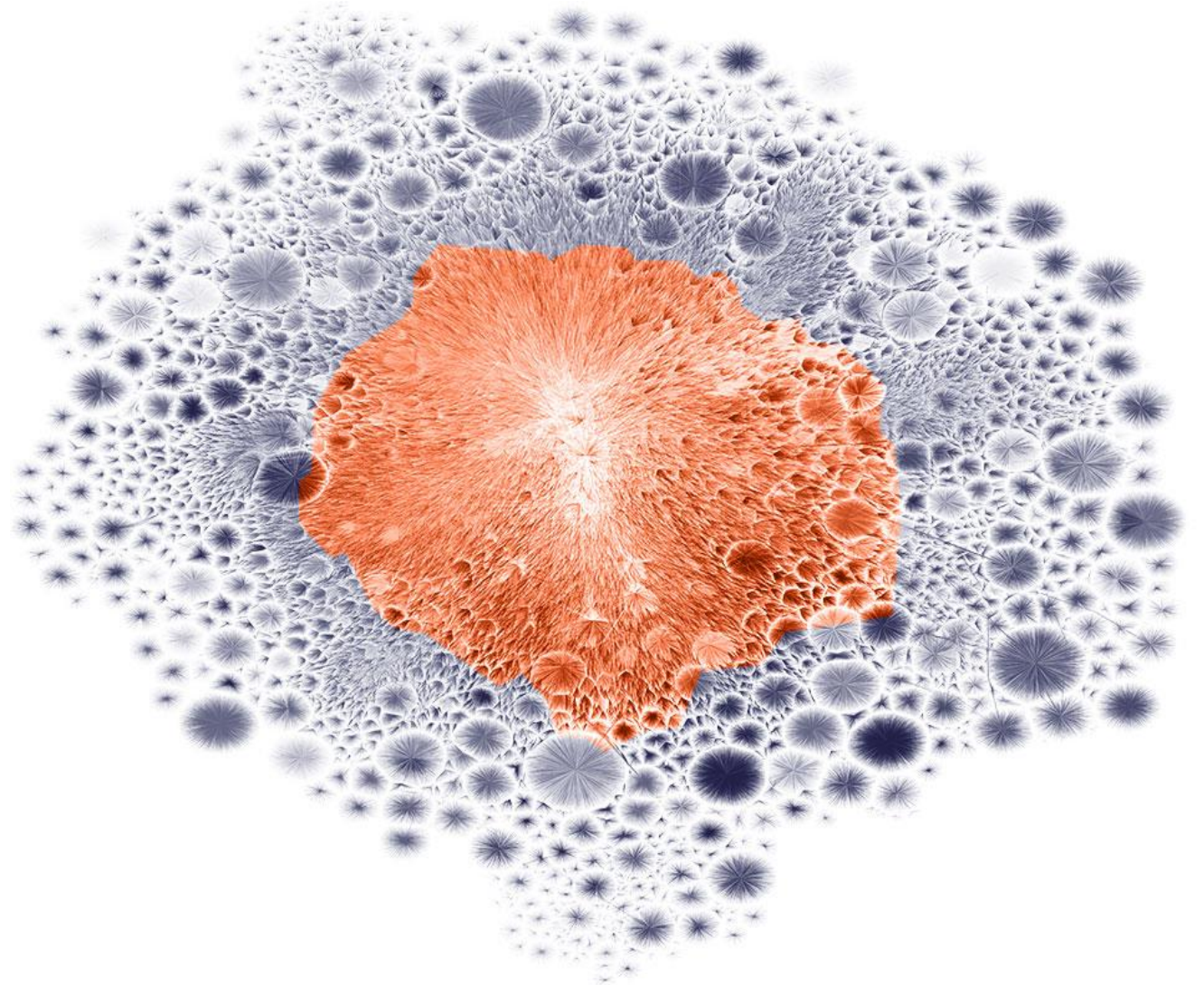
Webinar: Whitebox pentesting page (UK)

Now dirtier than

51%

of all web pages tested
with the Carbon Calculator

52% dirtier in April 2022

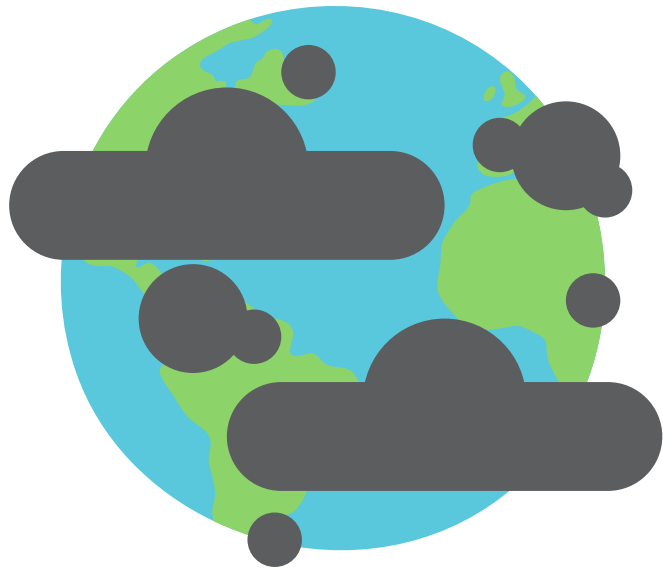


Training services page (UK)

CO₂ produced per page view

April 2022

0.53g



September 2022

0.24g



Reduced by

55%



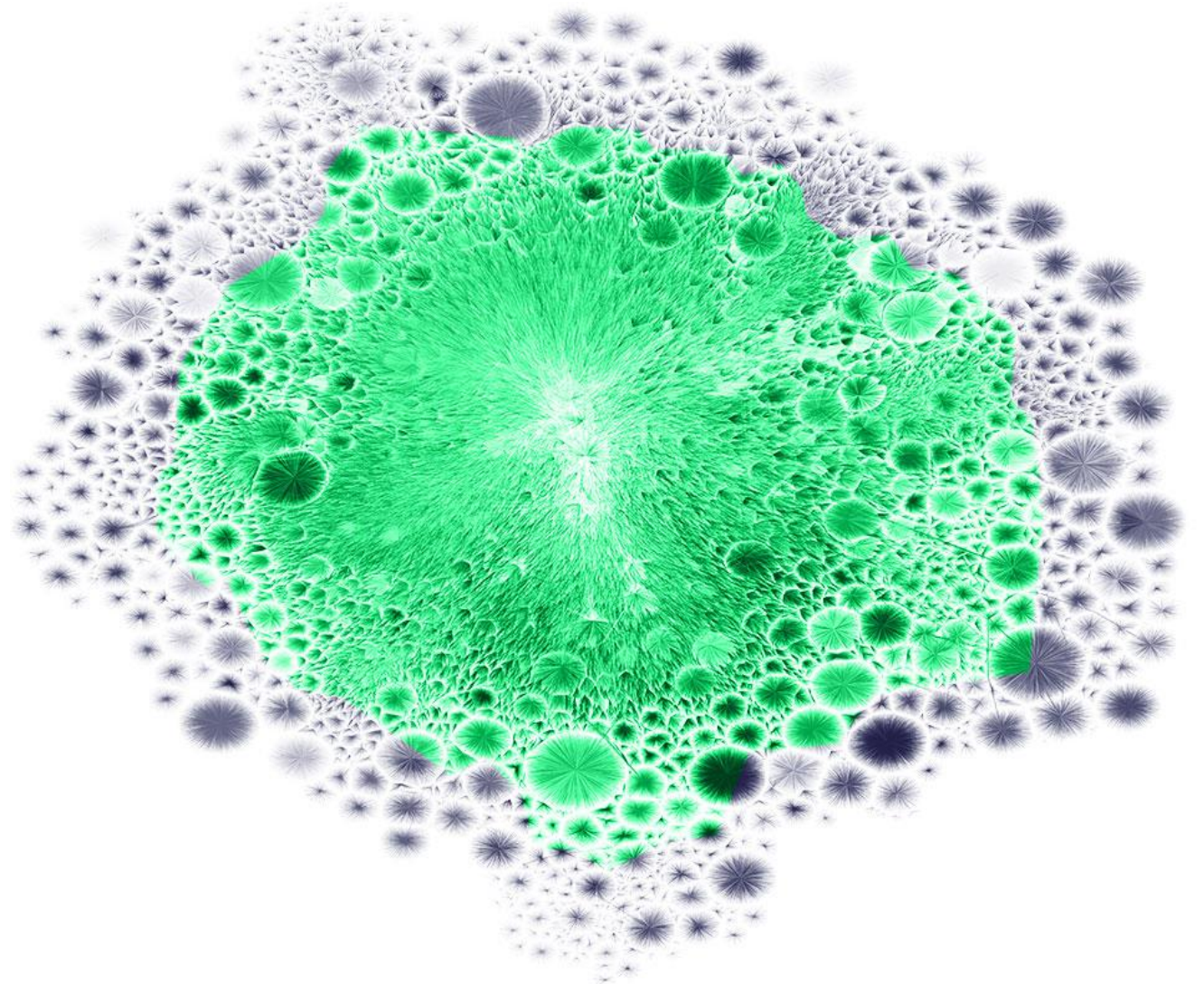
Training services page (UK)

Now cleaner than

75%

of all web pages tested
with the Carbon Calculator

68% cleaner in April 2022

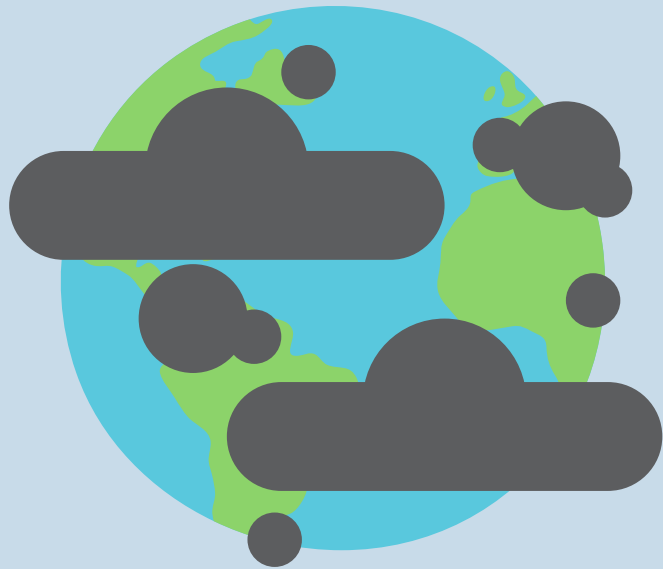


Site average

CO₂ produced per page view on average

April 2022

1.23g



September 2022

0.60g



Reduced by

51%



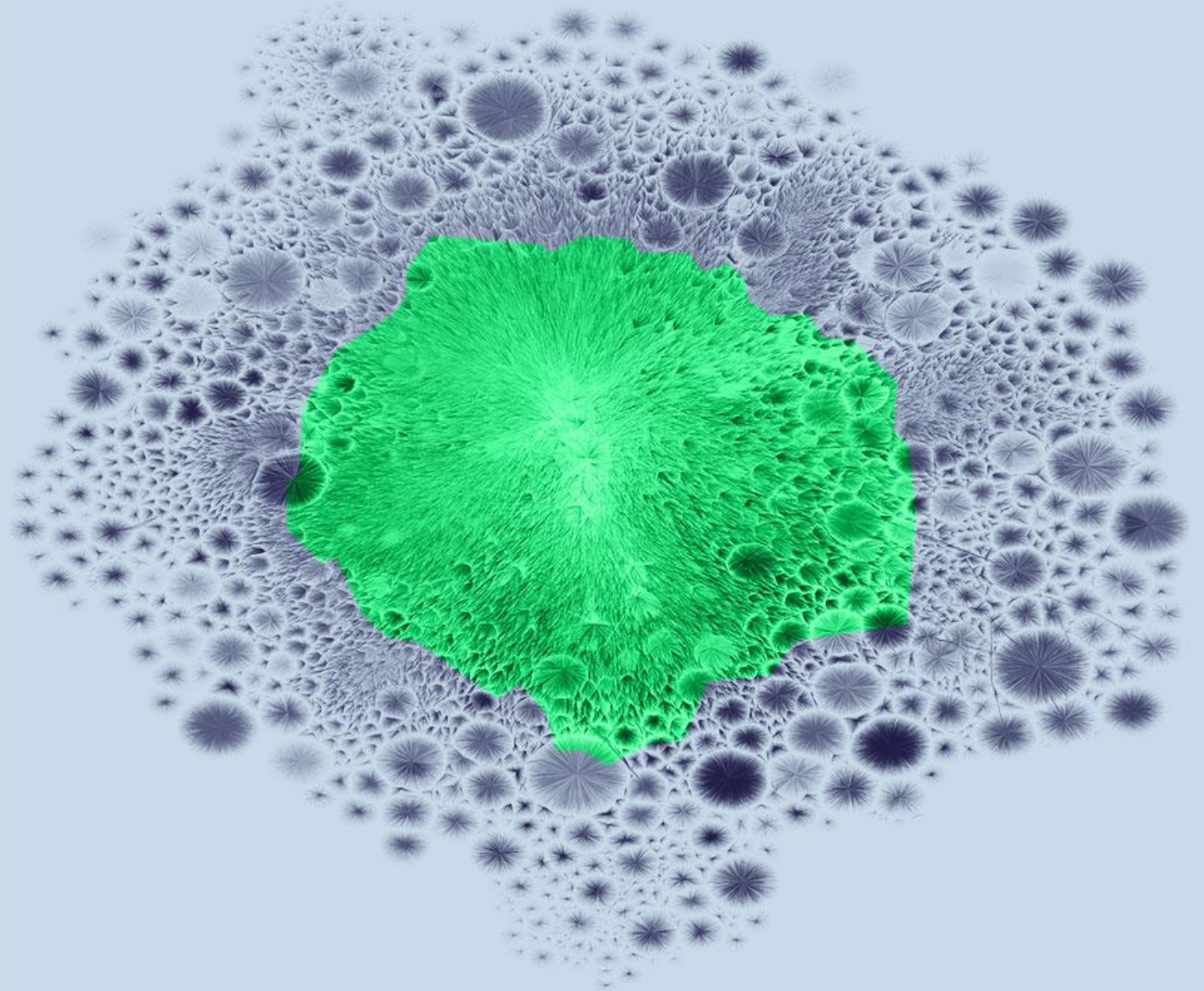
Site average

Now cleaner than

53%

of all web pages tested
with the Carbon Calculator

49% cleaner in April 2022

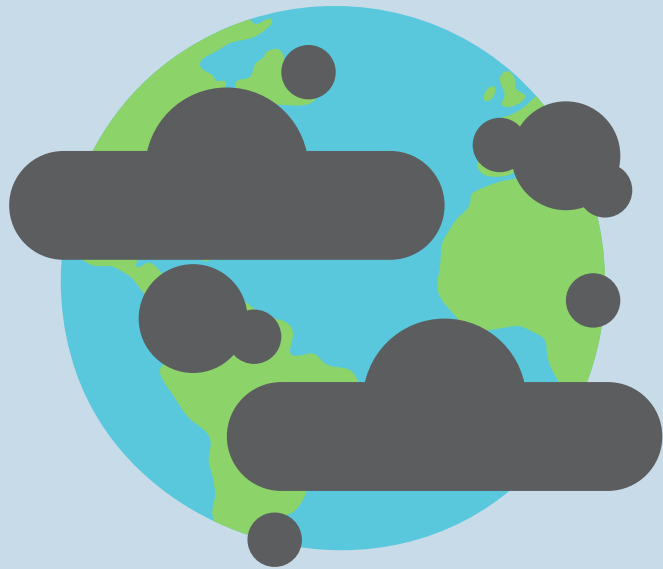


Site average

CO₂ produced per page view on average

April 2022

1.23g



March 2023

0.57g



Reduced by

56%



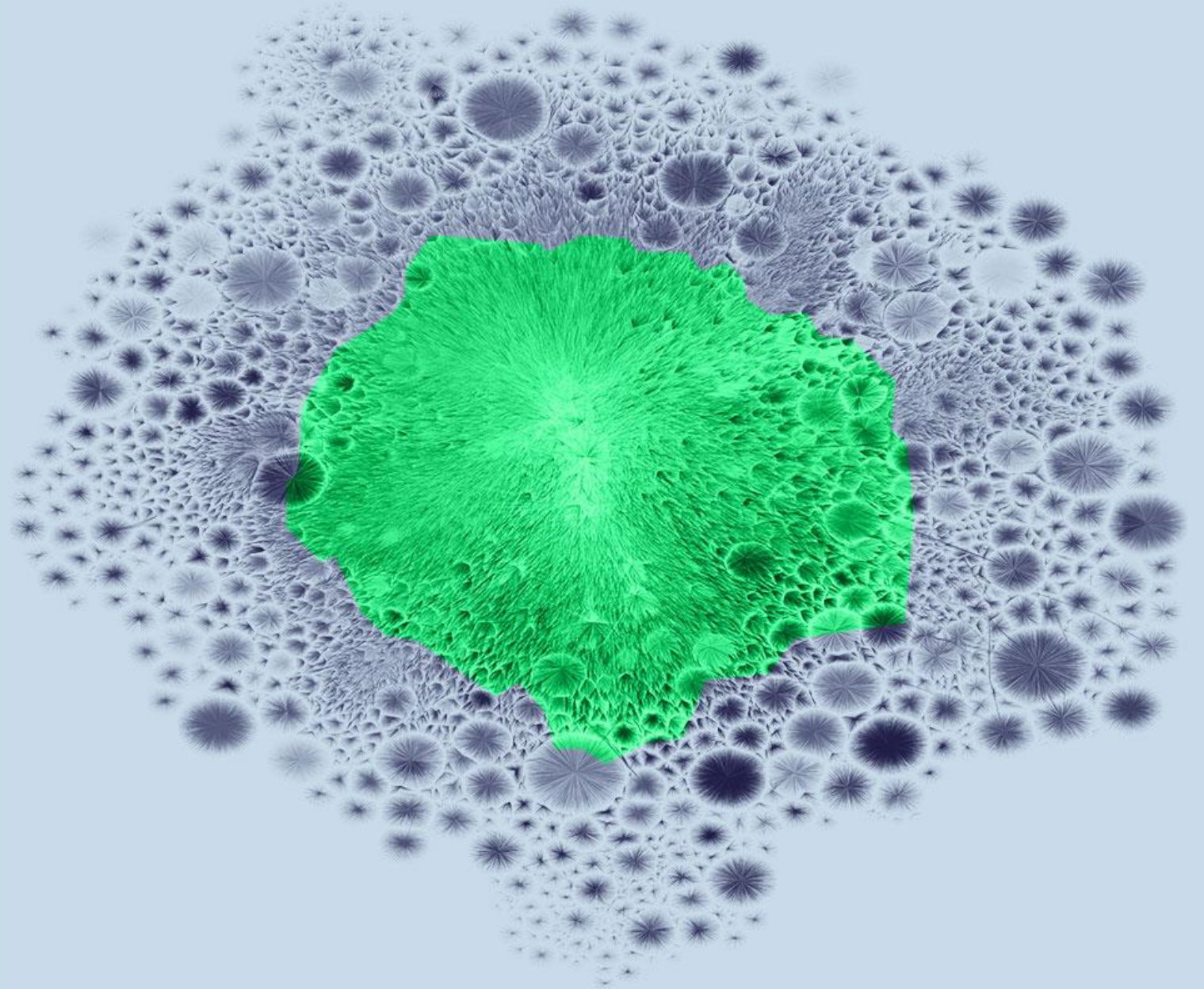
Site average

Now cleaner than

54%

of all web pages tested
with the Carbon Calculator

49% cleaner in April 2022



Environment continued

Eco-design in practice

We are building a network of climate change champions across our business and our aim is to empower colleagues to unleash their creativity and own our net zero journey. An example of this in action sits within the corporate affairs function, where our Global Head of Digital Communications, working with our digital partners Nexer, is leading the development of sustainable UX and development practices for our corporate and business websites.

This eco-design approach, anticipating and taking action to minimise negative environmental impacts, also contributes to our governance approach to security as well as improving our user experience and supporting our growth strategy through increased efficiencies.

Getting started

We performed a sustainability audit, which enabled us to set benchmarks for future improvement measures – this included capturing the carbon footprint of our eight key website pages, chosen by their size and number of visits.

We already use Microsoft Azure for hosting, which uses green powered servers, using c.50% renewable power to power its data centres. We've started to look at Microsoft's Emissions Impact Dashboard, so that we can scrutinise usage, and start to make some logical recommendations to reduce our impact, based on what the data is telling us, scaling down on resources where we can, in line with users' behaviours on the site.

This broader range of insights has enabled us to consider where to invest development and in FY23 we will:

- Upgrade our Umbraco Content Management System and hosting, which will run on less powerful hardware in Microsoft Azure with the same performance, leading to both cost and energy savings
- Redesign website pages and components, based on these broader data insights, so users can find content quicker, in fewer clicks. We'll also use this data to explore what devices people are using and whether there is an opportunity to make design decisions, such as device dark mode



Sustainability offers us the opportunity to be innovative and to challenge traditional design methods and thought processes that not only reduce our impact on the environment but create greater value for all our stakeholders.”

Kai Kurihara

Global Head of Digital Communications



12 July 2022



Rick Butterfield 12/07/2022 08:50

Cheers to everyone who's been involved in the NCC Consolidation project over the many months it's been happening. We've gone live this morning in possibly the most pain free release I've ever been involved in (trying not to jinx it here 🤞) and Kai is very happy!



15



1

2 replies from Amy and Mar

↩ Reply

umbraco

Modern Umbraco is
at least

50%

more efficient

https://twitter.com/Nexer_Digital 1587804731203780608

cooegard

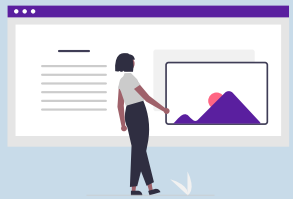
What's next?



Dark mode

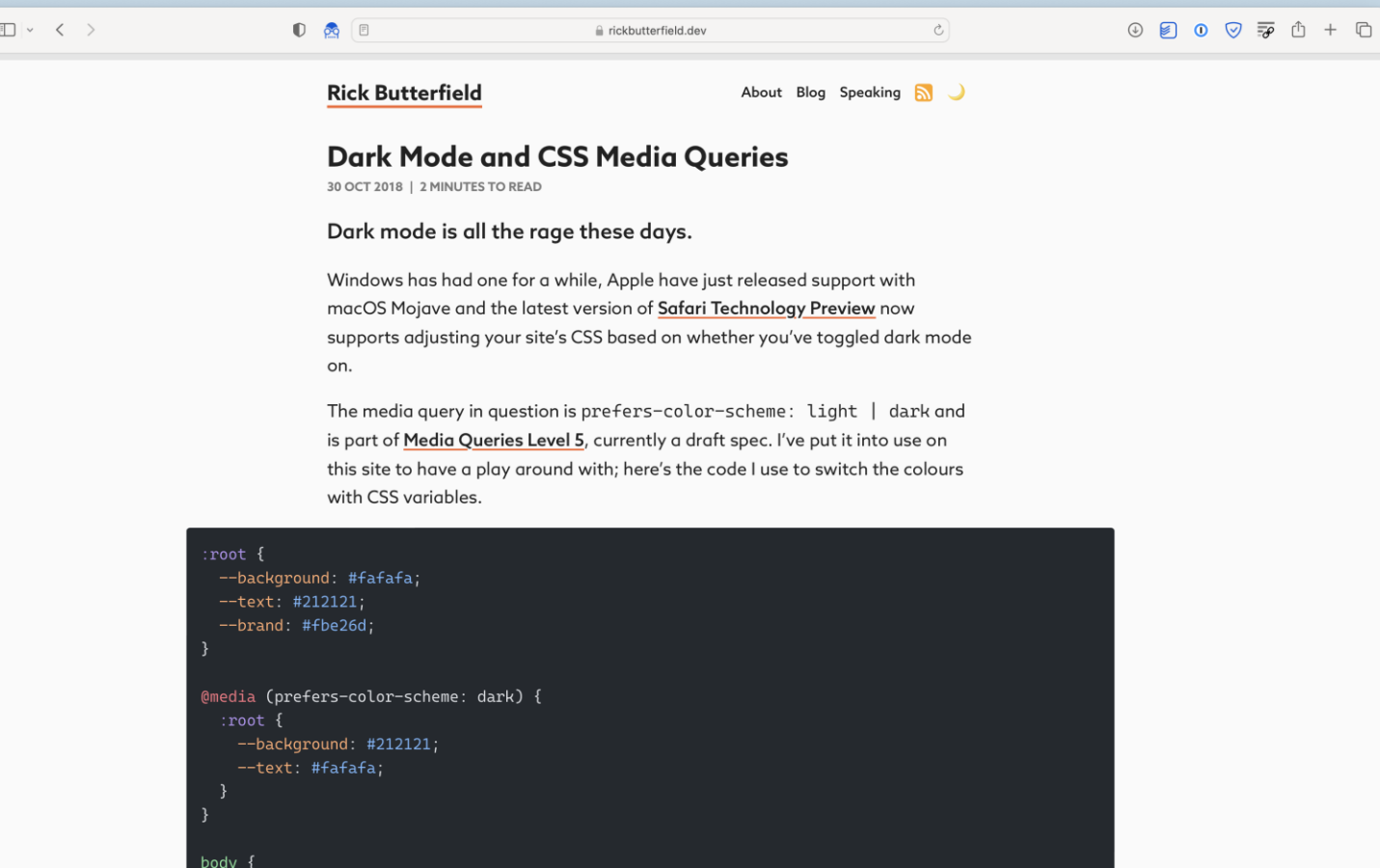


Keep tracking our carbon usage



Building carbon aware websites

Dark mode

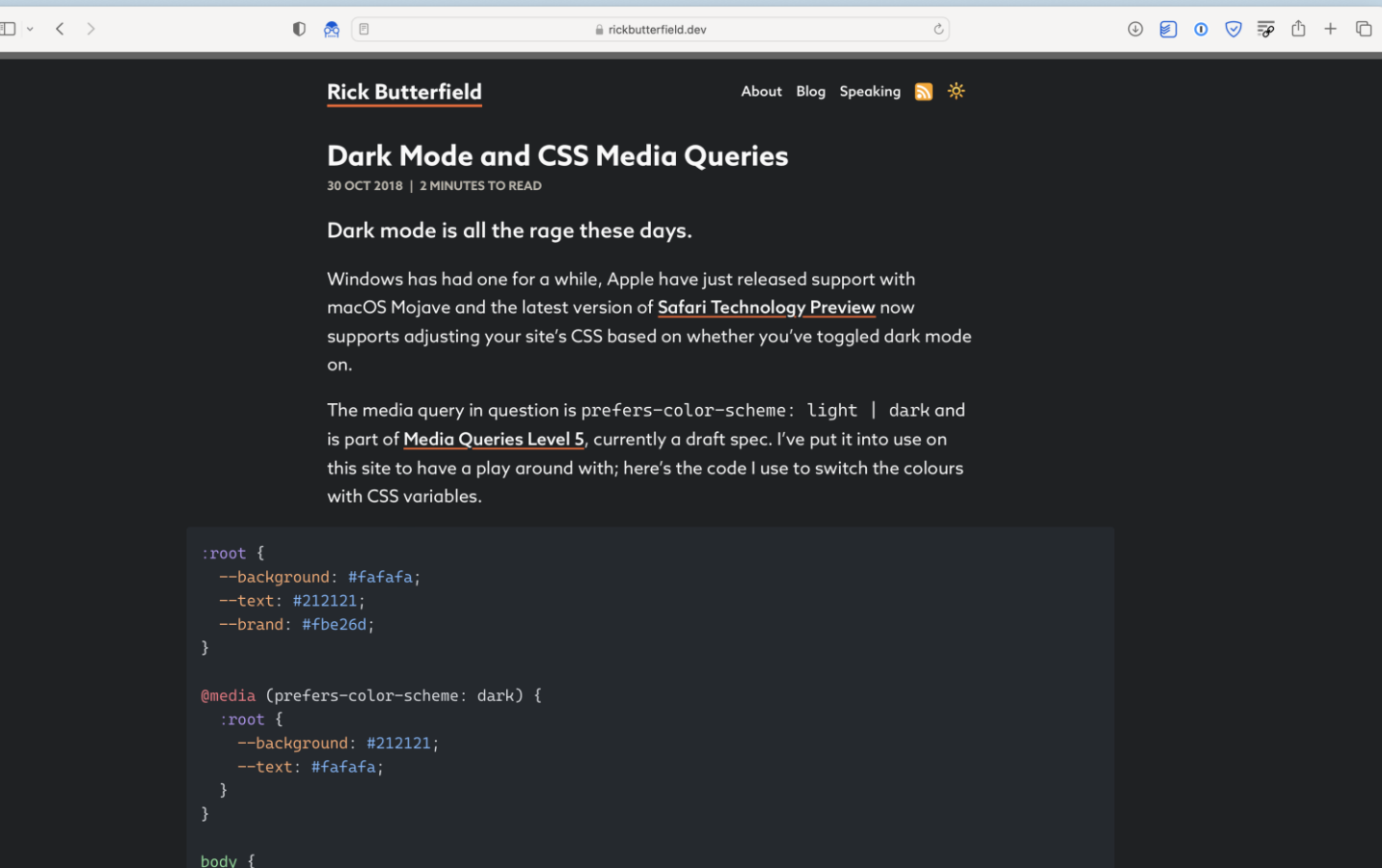


“Switching from light mode to dark mode at 100% brightness saves an average of 39%-47% battery power”

Purdue University study

Source: <https://rickbutterfield.dev/blog/dark-mode-css-media-queries/>

Dark mode



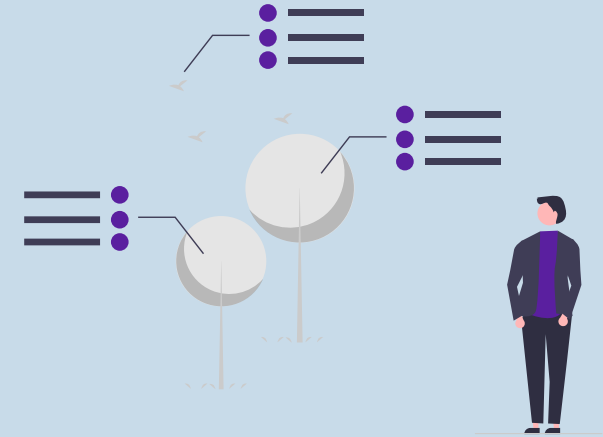
Source: <https://rickbutterfield.dev/blog/dark-mode-css-media-queries/>



“Switching from light mode to dark mode at 100% brightness saves an average of 39%-47% battery power”

Purdue University study

Keep tracking our carbon usage



Calculate your cloud footprint

Estimate your carbon emissions—and emissions you've already saved—related to using Microsoft Azure and Microsoft 365 cloud services. Make targeted decisions to help create new efficiencies around cloud usage.

Cloud carbon tracking for your path to net zero

Using Power BI template apps and consistent, third party–validated carbon accounting, the Emissions Impact Dashboard for Azure and the Emissions Impact Dashboard for Microsoft 365 help you measure your Microsoft Cloud–based emissions and estimate emissions avoided by using the cloud.

[App for Azure >](#) [App for Microsoft 365 >](#)

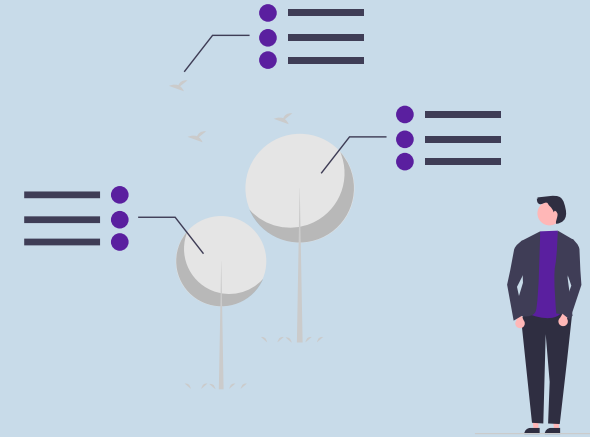
The screenshot shows a web browser window with the Microsoft Sustainability page. The main heading is 'Calculate your cloud footprint'. Below it is a sub-heading and a paragraph of text. A large image of a laptop displays a dashboard with various charts and data points. At the bottom of the page, there are two blue buttons with white text: 'App for Azure >' and 'App for Microsoft 365 >'. The browser's address bar shows 'microsoft.com'.

The Emissions Impact Dashboard for Azure gives you transparency on the carbon emissions generated by your usage

Microsoft

Source: <https://www.microsoft.com/en-us/sustainability/emissions-impact-dashboard>

Keep tracking our carbon usage



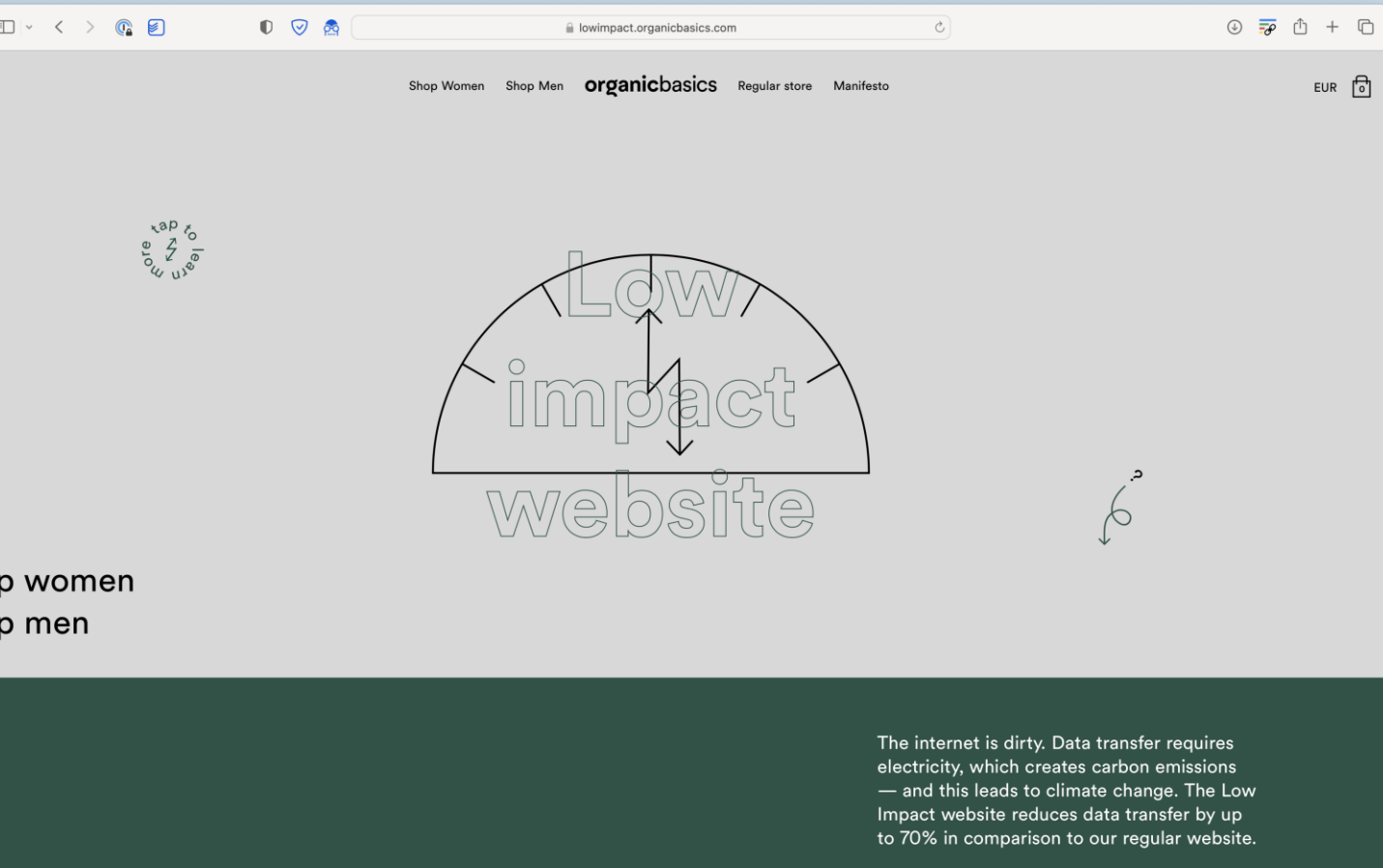
A screenshot of a web browser displaying a Microsoft Learn article. The browser's address bar shows 'learn.microsoft.com'. The page title is 'Cloud for Sustainability API (Preview) overview'. Below the title, it says 'Article • 01/09/2023 • 5 minutes to read • 2 contributors'. There is a blue 'Feedback' button. A light blue box with a warning icon and the word 'Important' contains the text: 'Some or all of this functionality is available as part of a preview release. The content and the functionality are subject to change.' Below this, the main text reads: 'Microsoft Cloud for Sustainability provides APIs to access emissions data related to your Azure usage. Accurate carbon accounting requires good information from partners, vendors, and suppliers. The Cloud for Sustainability APIs give you transparency on the carbon emissions generated by your usage of Azure. Microsoft's carbon accounting extends across all three scopes of emissions with a methodology validated by Stanford University in 2018. It uses consistent and accurate carbon accounting to quantify the effect of Microsoft cloud services on customers' environmental footprint. Details of the API are listed in the Microsoft Cloud for Sustainability API reference. They include additional information about operations, parameters, and responses.' A list of links is provided: 'Get started with Cloud for Sustainability APIs', 'Sample queries', 'Assign permissions', 'Manage instances', 'View API usage', and 'FAQ'. On the right side of the article, there is a section titled 'In this article' with a list of links: 'Get started with Cloud for Sustainability APIs', 'Sample queries', 'Assign permissions', and 'Manage instances', followed by a 'Show more' button with a downward arrow.

**Consistent and accurate
carbon accounting to
quantify the effect of
Microsoft cloud services
on customers'
environmental footprint.**

Microsoft

Source: <https://learn.microsoft.com/en-us/industry/sustainability/api-overview>

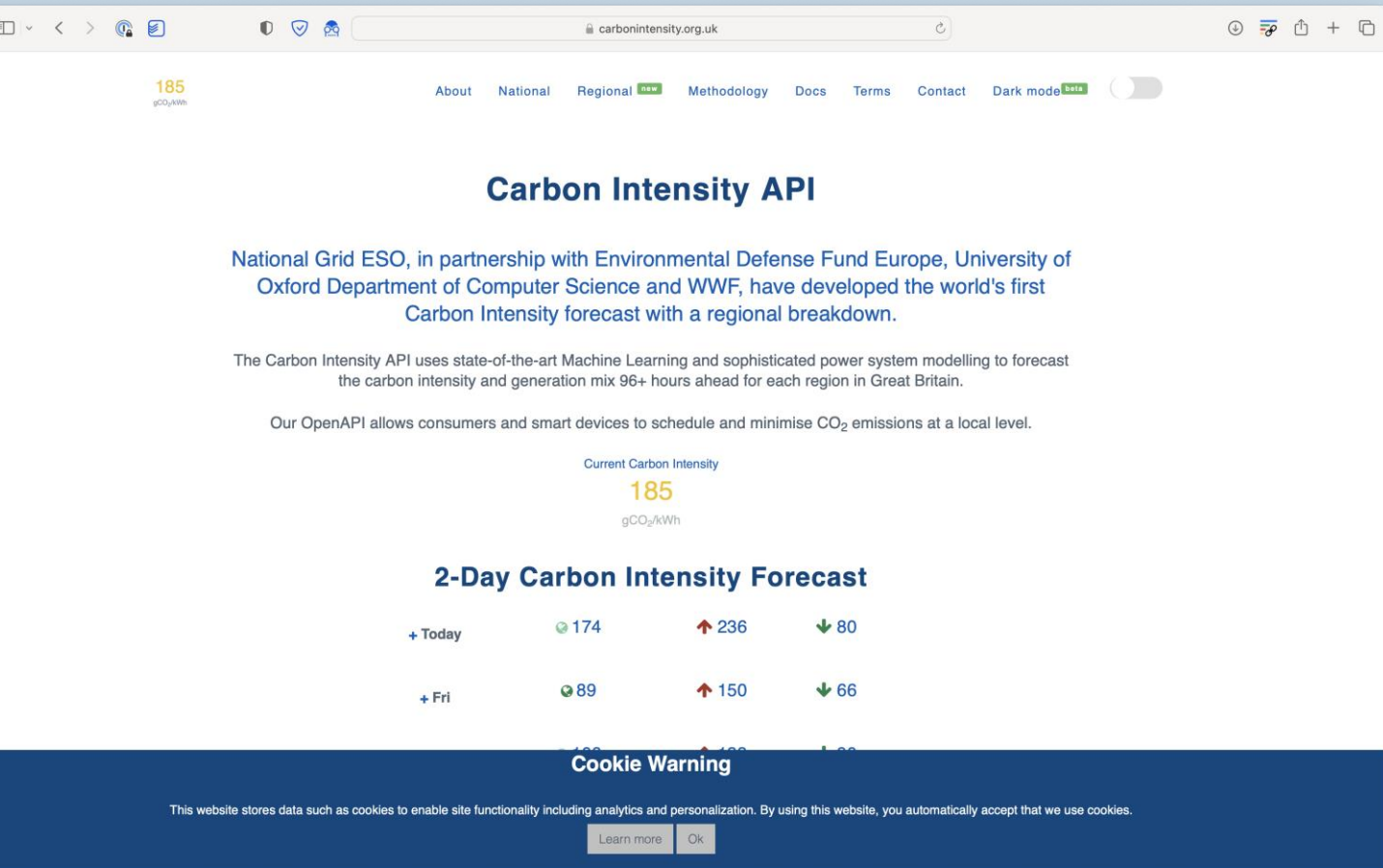
Building carbon aware websites



The Low Impact version of our website reduces the carbon emissions associated with online shopping by up to 70% in comparison to our regular site. This is done by getting rid of most of the data-heavy elements like images and videos.

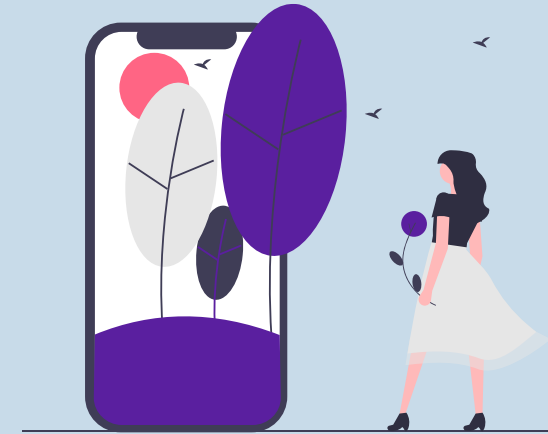
The Low Impact Website

Building carbon aware websites



The screenshot shows the Carbon Intensity API website. The current carbon intensity is 185 gCO₂/kWh. The 2-day forecast shows a decrease to 174 gCO₂/kWh today and 89 gCO₂/kWh on Friday.

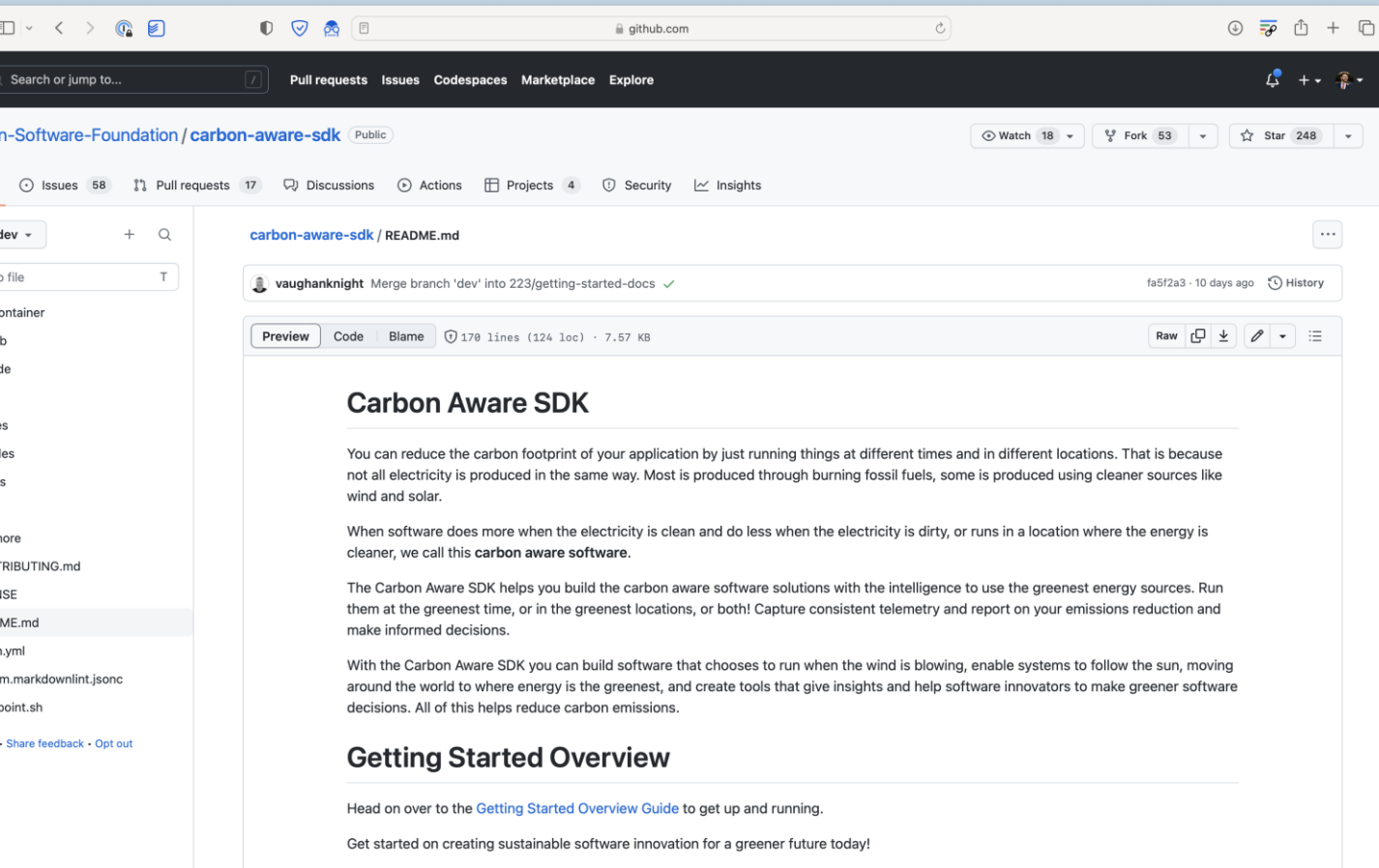
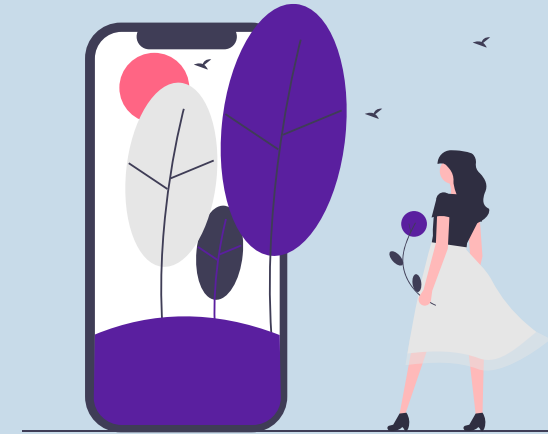
Day	Current Carbon Intensity (gCO ₂ /kWh)	Change
Today	174	↓ 11
Friday	89	↓ 85



“Our OpenAPI allows consumers and smart devices to schedule and minimise CO₂ emissions at a local level.”

National Grid

Building carbon aware websites

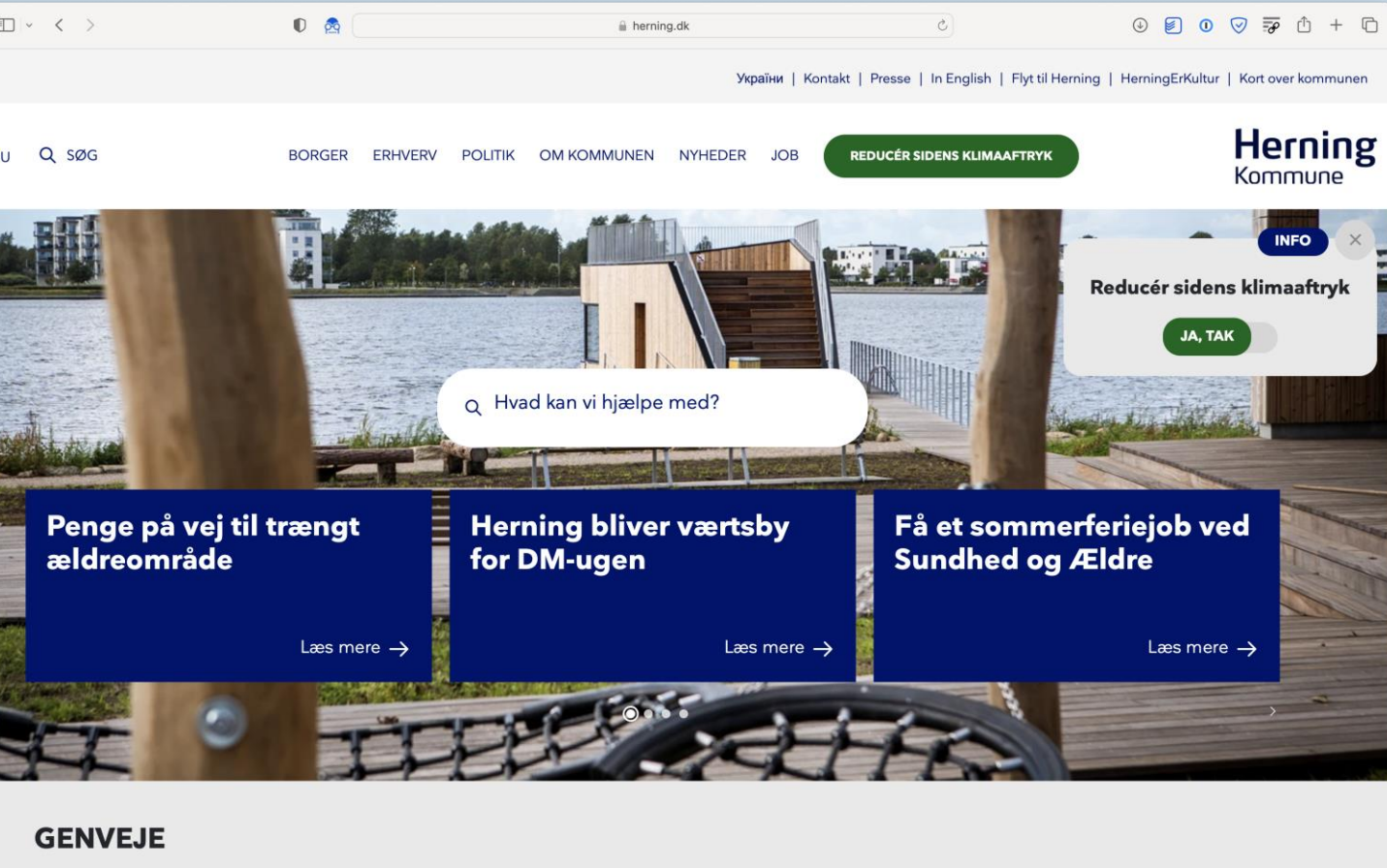


“When software does more when the electricity is clean and do less when the electricity is dirty, or runs in a location where the energy is cleaner, we call this carbon aware software.”

National Grid

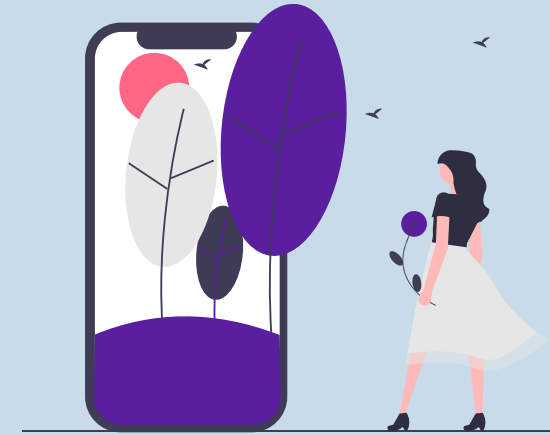
Source: <https://github.com/Green-Software-Foundation/carbon-aware-sdk>

Building carbon aware websites



“On average, the CO2 footprint is reduced by approximately 30% when a website user presses the button Reduce the page’s climate footprint , and up to 70% on very data-heavy pages.”

Building carbon aware websites



України | Kontakt | Presse | In English | Flyt til Herning | HerningErKultur | Kort over kommunen

BORGER ERHVERV POLITIK OM KOMMUNEN NYHEDER JOB **NORMAL VISNING** Herning Kommune

Reducér sidens klimaaftryk

Tak fordi du valgte vores **Reducér sidens klimaaftryk**.
Nu reducerer du i snit CO₂-aftrykket med 30 % for hver sidevisning og op imod 70 % på sider med mange billeder.

Hvad kan vi hjælpe med?

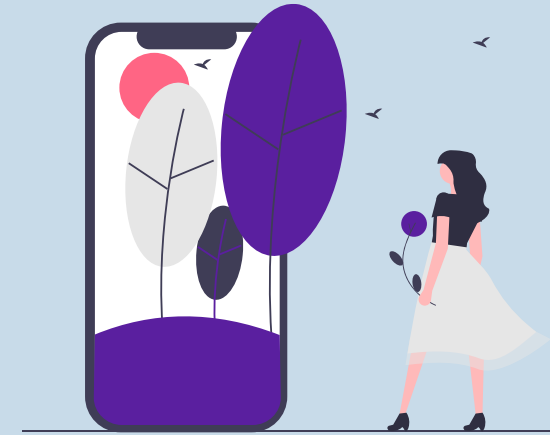
Penge på vej til trængt ældreområde Læs mere →

Herning bliver værtsby for DM-ugen Læs mere →

Få et sommerferiejob ved Sundhed og Ældre Læs mere →

“On average, the CO₂ footprint is reduced by approximately 30% when a website user presses the button Reduce the page’s climate footprint , and up to 70% on very data-heavy pages.”

Building carbon aware websites



A screenshot of the boohoo.com website. The browser address bar shows 'boohoo.com'. The website header includes 'boohoo', 'WOMENS', 'MENS', and a search bar. A pink banner at the top reads 'APP EXCLUSIVE - ALL THESE TOPS £6 AND UNDER + FREE STANDARD DELIVERY!*'. Below this, a navigation menu lists categories like 'SALE', 'NEW IN', 'ALL CLOTHING', 'DRESSES', 'TOPS', 'SUMMER', 'DENIM', 'OCCASION WEAR', 'SHOES & ACCESSORIES', 'SHOP BY FIT', and 'BRANDS'. A large promotional banner features a woman in a blue and yellow bikini lying on a beach, with the text '20% off almost everything'. An 'ENERGY-SAVING MODE' overlay is visible, with a toggle switch labeled 'ENERGY SAVER' turned on. The overlay text reads: 'With just one click you can reduce the energy used by this website. Whether you're on website or app, just flip the switch! We'll dim the screen throughout the website and remove images where possible for a lighter, faster experience.' At the bottom, a pink banner promotes 'boohoo premier unlimited next day delivery for a year + exclusive free returns | now £9.99 on the app was £12.99'.

“With just one click you can reduce the energy used by this website. Whether you’re on website or app, just flip the switch! We’ll dim the screen throughout the website and remove images where possible for a lighter, faster experience.”

Building carbon aware websites



A screenshot of the boohoo.com website homepage. The browser address bar shows 'boohoo.com'. The website has a pink and white color scheme. At the top, there's a navigation menu with 'WOMENS' and 'MENS' tabs, and a search bar. Below the navigation, there's a banner for '20% OFF ALMOST EVERYTHING!*' with a 'SHOP NOW' button. To the right of the banner, there are links for 'download now' and 'SAVING ENERGY'. Below the banner, there's a section for 'boohoo premier' with 'unlimited next day delivery for a year + exclusive free returns | now £9.99 on the app was £12.99'. At the bottom, there are five product categories: 'new in', 'sale', 'festival looks', 'boohoo PANTONE', and 'holiday shop', each with a corresponding image of models.

“With just one click you can reduce the energy used by this website. Whether you’re on website or app, just flip the switch! We’ll dim the screen throughout the website and remove images where possible for a lighter, faster experience.”

Source: <https://www.boohoo.com>

How can we decarbonise the planet, one Umbraco upgrade at a time?

The screenshot shows a web browser window with the URL umbraco.com. The navigation bar includes the Umbraco logo, links for 'Explore Umbraco', 'Products', 'Pricing', 'Partners', 'Learn Umbraco', and 'Contact Us', a 'Sign in' link, a search icon, and a 'Try for free' button. The main content area features a large hero image with the text 'Meet the new community Sustainability Team'. Below this, the author is identified as 'Written by Lasse Fredslund'. The main text of the post begins with 'I'm so happy to be able to present our new Community Sustainability Team - the first-ever official team in Umbraco dedicated to working only on sustainability initiatives in Umbraco. After a whole lot of interviews with applicants, I can guarantee that there are a lot of good ideas ready to be worked on.' To the right, a metadata box displays 'Published: May 24, 2023', 'Read time: 7 min. read', and 'Category: Community', with tags for 'community' and 'sustainability'. A blue chat icon is visible in the bottom right corner of the page content.

COOL

THANK YOU



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