Have you considered the carbon footprint of your website?

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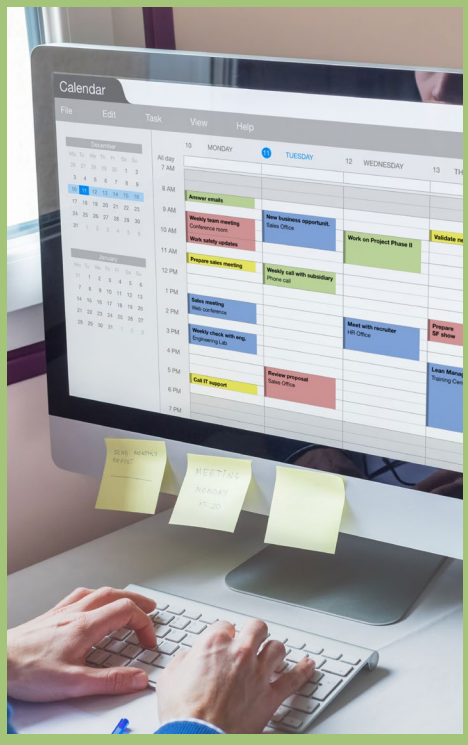
THE CHARTERED INSTITUTE OF ECOLOGY AND ENVIRONMENTAL MANAGEMENT (CIEEM) IS THE PROFESSIONAL BODY FOR ECOLOGISTS AND ENVIRONMENTAL MANAGERS WORKING TO MANAGE AND ENHANCE THE NATURAL ENVIRONMENT IN THE UK AND IRELAND.



It's estimated that global information and communication technology (ICT) accounts for around 4% of global CO2 emissions. The internet is annually responsible for emissions equivalent to Germany (the world's 7th largest polluter) and is more polluting than the civil aviation sector. Emissions stem from various components including data centres, networks, use of devices and manufacturing.

A few months ago we were shocked to find that our website produced more carbon than 64% of web pages tested by websitecarbon.com. After working with our web developers Fat Beehive, we have now switched to a 100% renewable energy host and made some behind the scenes improvements (without affecting your experience of using the site) so that we are now producing less carbon than 71% of web pages tested.

This summary of actions, produced by Fat Beehive for CIEEM, sets out the changes we have made and will continue to work on to reduce the environmental impact of running our website. We hope that this will inspire others to tackle some of the perhaps lesser-known sources of greenhouse gas emissions in business operations, without sacrificing the experience of customers and other users.

Web Performance

Image compression

The first way in which we set out to reduce our website's carbon footprint was by converting photo imagery to next generation image formats such as WEBP or AVIF to aid in compression and delivery. In other words, compressing images will increase site performance as they will still look the same to the website visitor, but will take less energy to render. Therefore this is a great way to reduce energy, and carbon

production throughout the site without changing design or the user experience of your site. CIEEM has swapped all web images to new generation formats.

You can also consider a switch of imagery style to more hand-drawn, vector based imagery. We have not yet taken this forward but are considering how we could factor this into our brand style.

Embedded Video
Embedded video will load the whole video player, ready to play a video on the press of the play button. To reduce energy use on loading, this can be replaced with a placeholder image with a play button attached. On loading the page, only the placeholder image is loaded and on pressing the button a call is made to load in the video player - reducing the payload of the page and its energy footprint.

Network request review and localisation of fonts
By reviewing and reducing the network requests on page load, you can both increase a site's performance and reduce its carbon footprint.

One way in which this can be done is by hosting your font locally (if possible) and reducing the number of custom fonts. Although this solution's carbon impact is not as large as the other suggestions, it's good practice to increase your site's performance and it will contribute to the overall reduction of your site's carbon impact. CIEEM has localised fonts and reviewed our network requests.

Caching
In terms of energy use and speed of loading, avoiding the network for loading requests is far better than hitting the network at all. Caching static resources on the browser can dramatically speed up website navigations and return visits. They also reduce the network energy consumption required to serve a site. Our developer recommended adding cache control rules and setting longer caching times on static items.

Content Delivery Networks (CDNs) transfer huge amounts of data around the world through a network of distributed data centres. Caching static content closer to end users via a CDN helps with performance and reducing the amount of electricity required for data transmission. This is especially the case if your site is serving a global audience. The energy used by these data centres is still a large contributor to digital carbon emissions, so consider your provider's sustainability policy and plans.

Lazy load (images)
Another way to reduce the site's impact is to implement lazy load images. This change would not change a visitor's experience on your site, as they cannot see the images pending loading below the fold (below the fold is the content below the site's top section of the site, users have to scroll down the page to view this content.) Again, the implementation of lazy load would reduce the number of network requests, thus reducing your site's carbon footprint.

CIEEM has implemented lazy load images.

Hosting

Hosting accounts for about 15% of a website's carbon footprint. So, hosting your site on a green provider can go a long way to reducing your site's footprint. In the review of the CIEEM website, moving our hosting to Google Cloud from Amazon Web Service was prioritised as an effective way of lowering the site's carbon impact and sending a message to the wider industry about providing greener website hosting. This was because Google Cloud has achieved 100 percent renewable energy across all of its operations, including its data centres. Amazon has announced plans to reach net zero by 2040 but a clear plan for this is not yet available. Our provider may not be best for you and the situation may change over time so do check with your web developer!

Screen and Colour

OLED screens present an opportunity for digital designers to save energy. Darker colours require less energy to illuminate, with black being the lowest energy colour and white being the most energy intensive. Blue pixels use approximately 25% more energy than red and green pixels. Building in dark mode options to your site would allow users running their operating systems in dark mode to utilise the function. Dark mode saves roughly 3-9% of battery life across OLED screen phone usage, if users are charging their phones less then this will lead to a reduced energy use overall (although not quantifiable by the organisation).

In summary, we cannot be sure that these actions will all be necessary or the best options for your websites, but they provide a useful starting point for CIEEM and hopefully others on how to address some hidden greenhouse gas emissions in our move towards net-zero by 2030.