The climate impact of digital content

For those of us who came of age alongside the Internet, digital was presented as the ultimate in innovation and progress. It was going to be a shiny, paperless, sci-fi utopia. After all, digital was free and clean and harmless, right?

Not exactly.

Our digital content is just bits and bytes of data. Data is nothing more than energy. And energy—at least for the foreseeable future—has a carbon footprint. Direct connections can be made between every web page, email campaign, app, or video, and the corresponding carbon emissions.

"How bad can it be?"

One of the most common questions is "If I've never heard about the impact of digital content, how bad can it be?"

- It's estimated that digital content contributed between 2.1% and 3.9% of the total annual greenhouse gas emissions.[1] This is comparable to the aviation industry, which reportedly accounts for 2.4%.[2]
- Video requires 75x the energy and emissions of audio. A half-hour video recorded at YouTube quality is approximately 1.73 GB.[3] A half-hour podcast will use only 23 MB of data.[4]
- Video-off meetings use only 4% of the energy of video-on meetings.[5]
- Apps can be measured in two ways: the size of the app itself, and the energy required for use. With 2 billion active users,[6] downloads of the Instagram app have generated more than 60,000 metric tons of emissions, before it's ever used. If every active user spends just 15 minutes per day on the app at an estimated 10 MB of data per minute, that's more than 100,000 metric tons of emissions generated per day.
- AI—the shiniest, newest form of content creation—is an environmental nightmare.[7]

How can we measure it?

Current estimates suggest that it takes a little less than 1 kilowatt hour (kWh) of energy to move 1 gigabyte (GB) of data (0.81 kWh/GB).[8]

If we know the size of the digital file—any digital file, from web pages to emails, videos to podcasts—and the number of times it's downloaded, we can assess the carbon impact.

I'll use web pages as a universal example. In modern web design approximately half of the page weight is imagery.[9] If you don't know this information for your site, you can use

the Pingdom calculator to identify file size and weight of page components,[10] and SimilarWeb to identify annual hits.[11]

Home page size	4 MB
Annual hits	1,000,000
Subtotal	**4,000,000 MB**
Convert MB to GB	4,000 GB
Multiply by 0.81 kWh/GB	3,240 kWh energy used
Enter 3,240 kWh into the EPA Greenhouse Gas Equivalencies Calculator[12]	**2.3 metric tons emissions generated**

How do we mitigate it?

When creating new content, we need to ask a very important question: how can we most effectively balance the needs of our audience with the impact to the planet? For example, a 2-minute video has the same impact, regardless of content. But a product setup or troubleshooting tutorial has more value for the audience than quick cuts of smiling faces in meetings interspersed with drone shots of corporate headquarters.

- Can this video be an image? Can this image be text? How can we reduce the weight of what we create?
- Do our images show our products in action, or are they stock art? (Think "woman looking at mobile phone" on your bank home page, but not any indication of what sets their banking app apart.)
- Can we release our podcast less frequently? Could it be half the length?
- Do we need to send our customers daily, image-intensive emails?

Thoughtful content creation and curation can reduce our planetary impact.

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