Title: The Hidden Carbon Footprint of Digital Asset Management

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The Hidden Carbon Footprint of Digital Asset Management

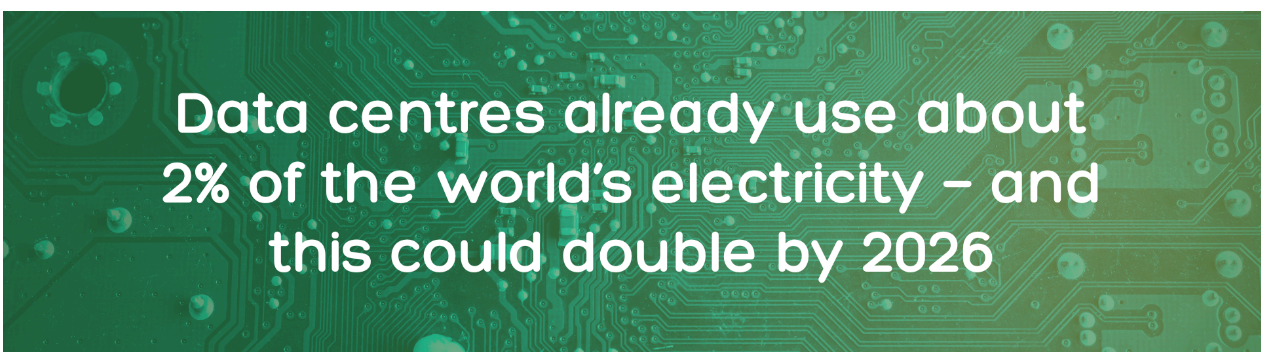
For many people, the word *digital* is often associated with *sustainability*. After all, digital asset management (DAM) systems reduce printing, paper usage, and physical storage. However, while digital workflows may appear greener, they depend on a large, energy-intensive infrastructure that has a significant environmental cost. This hidden carbon footprint is rooted in the servers, networks, and cooling systems that support our digital assets, presenting a growing challenge in an age of cloud storage and constant connectivity.

The Environmental Cost of Digital Assets

Media scholar Allison Carruth describes the “digital cloud” as a misleading metaphor. People often imagine the “cloud” as an invisible online space that holds our data. In reality, the cloud is made up of large physical buildings called data centers that run 24/7. These servers store, send, and back up files, which requires electricity, cooling, and maintenance (Carruth, 2014).

Carruth argues that the image and idea of the “cloud” hides the real energy systems behind it. She highlights that every digital action such as streaming, uploading, or saving a file depends on energy from data centers, power grids, and global networks. In her words, the cloud “obscures the micropolitics of energy” by making digital consumption feel immaterial and detached from the environment (Carruth, 2014).

In the context of digital asset management, this illusion is especially insightful. Most modern DAM platforms such as Bynder, Brandfolder, Widen Collective, and Adobe Experience Manager operate on cloud infrastructure. Therefore, every uploaded, downloaded, or duplicated file is processed and stored within data centers that must run indefinitely. Although these systems may improve collaboration and accessibility, they rely on large amounts of electricity to maintain. In fact, according to the International Energy Agency (IEA), global data centre electricity consumption reached approximately 460 terawatt-hours (TWh) in 2022. This is equivalent to about 2% of total worldwide electricity use. The IEA further projects that this figure could double by 2026, with data centres, including those supporting artificial intelligence, consuming between 620 and 1,050 TWh globally. (Shebila, 2025) (Independent Evaluation Group, 2025)



How DAM Systems Contribute to Digital Emissions
Because most modern Digital Asset Management (DAM) systems operate in the cloud, their environmental impact is closely tied to the energy demands of global data centers. DAM systems handle every step of an asset's lifecycle, from creation and ingestion to long-term storage and retrieval (El Asaleh, 2025). Each of these life cycle stages consumes energy in different ways:

- **Ingestion**: Uploading large media files, especially videos or high-resolution photography, transfers data through multiple networks and servers.
- **Storage**: Cloud-based DAMs, often run through Software-as-a-Service (SaaS) models, store files redundantly in multiple geographic locations to ensure backup and access.
- **Retrieval and sharing:** Repeated downloads, previews, and version updates demand continuous processing power.

This workflow is efficient for collaboration but can lead to unnecessary duplication and long-term storage of unused assets. According to the 2024 United States Data Center Energy Usage Report, U.S. data centers alone consumed around 176 TWh of electricity in 2023, comparable to the annual consumption of entire mid-sized nations (Shehabi et al., 2024).

Metadata, Formats, and Infrastructure
Metadata makes assets searchable and organized across systems. However, each metadata record adds small amounts of information that multiply across millions of assets. Metadata stored in both files and databases increases storage load (El Asaleh, 2025).

File formats are also important as video and multimedia assets are among the most resource-intensive to process, convert, and archive. Even a short high-resolution video can take up gigabytes of storage which require cooling and power to keep it accessible. Moreover, the more creative files a company manages, the greater its digital carbon footprint becomes.

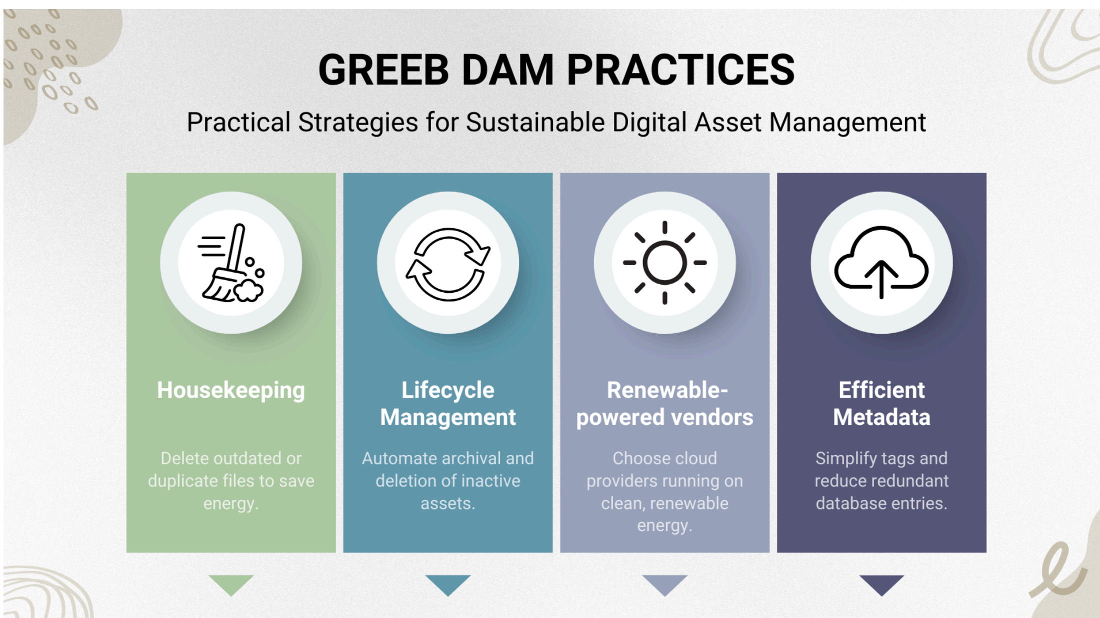
The infrastructure supporting these assets (servers, routers, backup systems, and cooling units) forms the physical foundation of DAM (El Asaleh, 2025). Cloud-based DAMs delivered through Software-as-a-Service (SaaS) models rely on large-scale data centers operated by providers such as Amazon Web Services or Google Cloud. These facilities consume not only electricity but also significant amounts of water for cooling.

Sustainability and the Future of Green DAM
Fortunately, the conversation is shifting toward sustainability in digital infrastructure through green DAM practices, strategies that aim to reduce the carbon footprint through energy efficiency, renewable energy adoption, and responsible data management (Buyya et al., 2023).

Implementing Green DAM practices within cloud infrastructure can help organizations reduce their reliance on carbon-intensive energy systems while maintaining efficiency. Sustainability in DAM also means addressing other environmental pressures such as water use. Many large data centers consume “up to 5 million gallons per day” for cooling, especially those supporting energy-intensive computing and AI workloads (EESI, 2025). These impacts highlight the importance of adopting sustainable ways to store, retrieve, and manage digital assets.

Organizations can implement several practical strategies to make their DAM systems more environmentally responsible:

- **Regular digital housekeeping**: Remove outdated or duplicate assets to reduce storage needs and unnecessary power consumption (Shehabi et al., 2024) (El Asaleh, 2025).
- **Lifecycle management**: Automate archival and deletion of inactive files to prevent excessive data replication (Buyya et al., 2023).
- **Choosing renewable-powered vendors**: Work with cloud providers committed to renewable energy and transparent sustainability reporting, such as Bynder that operates within Amazon Web Services (AWS) and targets 100% renewable energy for its operations (and net-zero by 2040 via The Climate Pledge). (Gorokhova, 2025) (AWS, 2025)
- **Efficient metadata practices:** Simplify metadata fields, use automation responsibly, and limit redundant entries to lower database load (El Asaleh, 2025).



By combining these practices, organizations can reduce their digital carbon footprint while maintaining efficiency and accessibility. As Buyya et al. (2023) explained, integrating sustainability into digital infrastructure is not just a technical improvement but a cultural shift toward more responsible innovation.

The Ethics of Awareness

At the core of Carruth's argument is the need for visibility. The cloud's energy consumption becomes dangerous because it is invisible to most users. Likewise, DAM professionals, designers, and content creators rarely consider the ecological weight of a "simple" upload. As Carruth suggests, understanding the materiality of digital systems forces us to think more critically about how our creative industries intersect with global energy politics (Carruth, 2014).

This awareness aligns with the mindset taught in the Data Asset Management course in the Graphic Communications Management program, which emphasizes understanding not only how DAM systems function but also how they impact broader social and environmental systems. By recognizing this connection, professionals can design digital asset workflows that balance productivity with responsibility.

Making the Invisible Visible

Digital Asset Management helps organizations work faster and smarter. However, efficiency should never come at the expense of environmental sustainability. Considering that most DAM systems are cloud-based, they depend on extensive physical infrastructure that regularly consumes power and water on a global scale. As technology continues to advance and AI continues to grow, adopting Green DAM practices is crucial in preventing the rise of emissions, supporting renewable energy use, and striving towards making digital asset management sustainable in the long term.

By viewing DAM through both a technical and ethical lens, we can identify and understand the hidden costs of our digital world and take meaningful steps toward change. The challenge, as Carruth reminds us, is not only to innovate but to make the invisible visible.

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