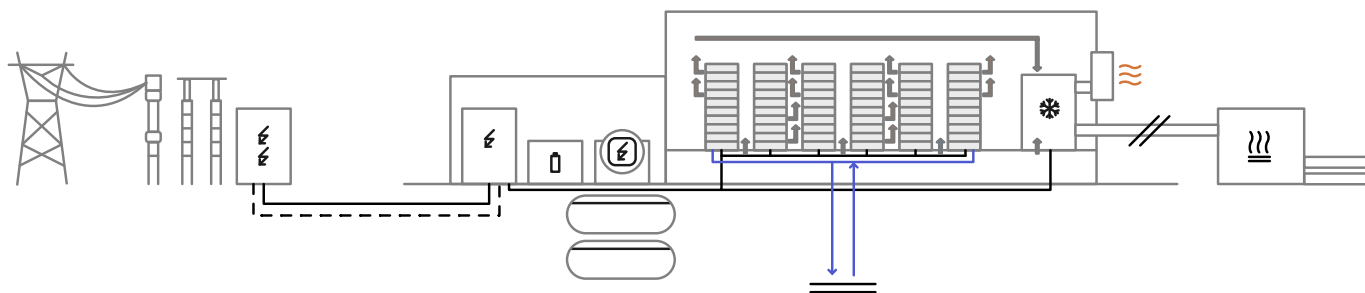


DCWatch: A Common Framework for Transparency in the Data Center Industry



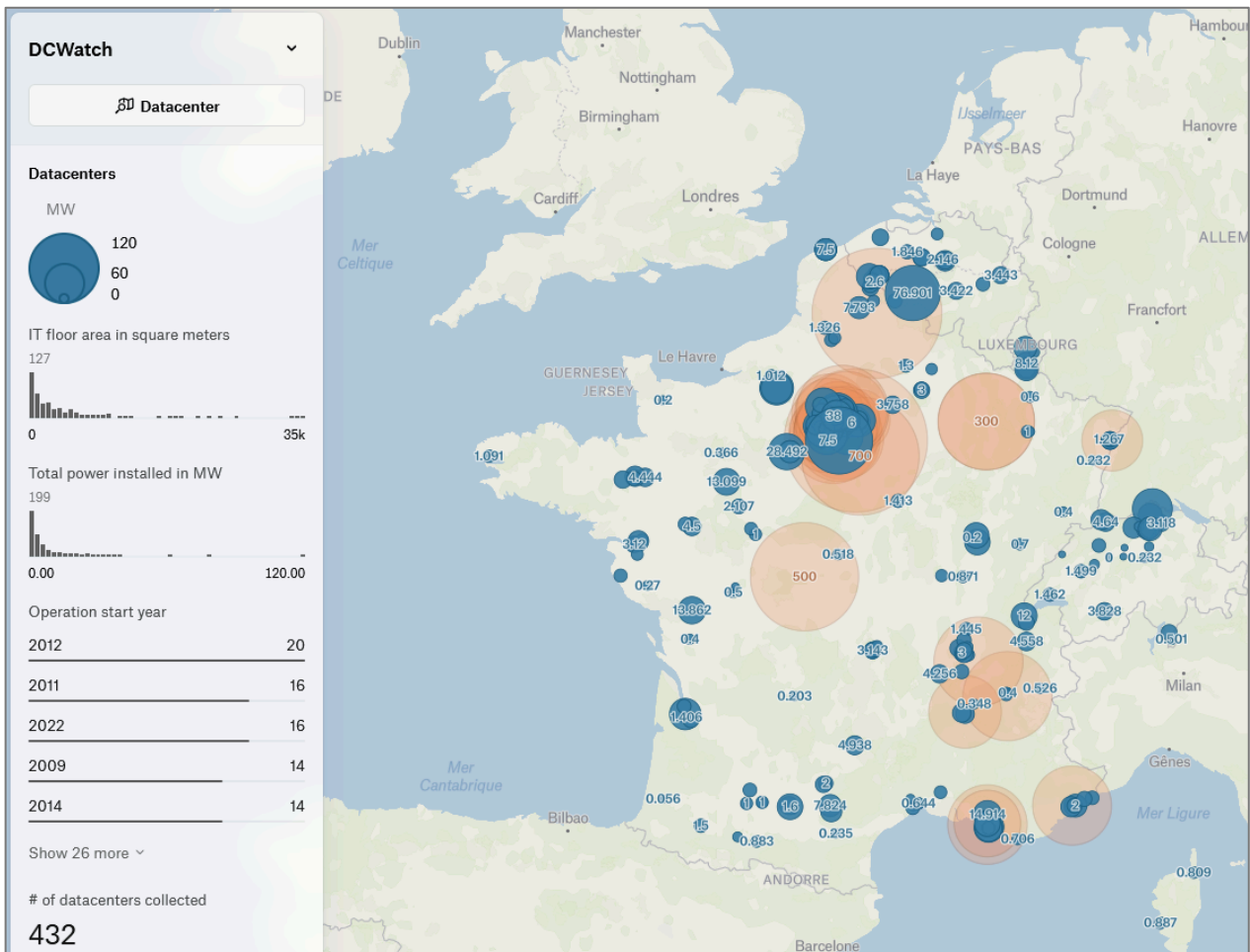


Executive Summary

The boom in generative artificial intelligence has accelerated the deployment of digital infrastructure in France, Europe, and around the world. Data centers, the cornerstones of this transformation, are creating growing tensions: energy and water consumption, land use pressure, sovereignty issues, and environmental impacts throughout their value chain.

Given the lack of transparency in the sector, Hubblo is developing DCWatch, a collaborative digital platform designed to map, estimate, and analyze the impacts of data centers at the national, European, and global levels. Initially supported by ADEME, the project is now seeking public and private funding to sustain, expand, and deepen its analyses.

Operating data centers	Data centers projects	Total power collected	Total floor area collected
434	86	Operating: 2600.0 MW Projects: 7414.6 MW	Operating: 1969.3625 km2 Projects: 342.289 km2



First version of the DC Watch map



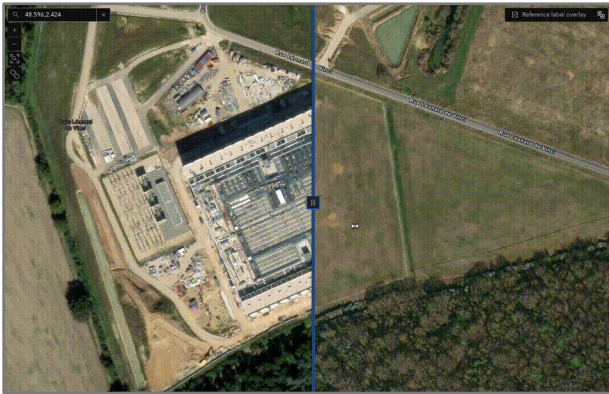
Background and Challenges

I.1. Sectoral Tensions

The rise of generative AI has triggered a wave of massive investment in global digital infrastructure, with France being one of the main beneficiaries in Europe.

This trend is accelerating: major new projects are announced every quarter, requiring significant land areas and electrical capacity across the country.

Data centers are now a full-fledged land-use planning issue, at the intersection of energy, environmental, economic, and digital sovereignty policies.



Satellite view (ESRI) of the Cloudhql data center, which has replaced farmland in Lisses, Essonne

I.2. Local and global impacts

At the local level, data centers consume critical resources:

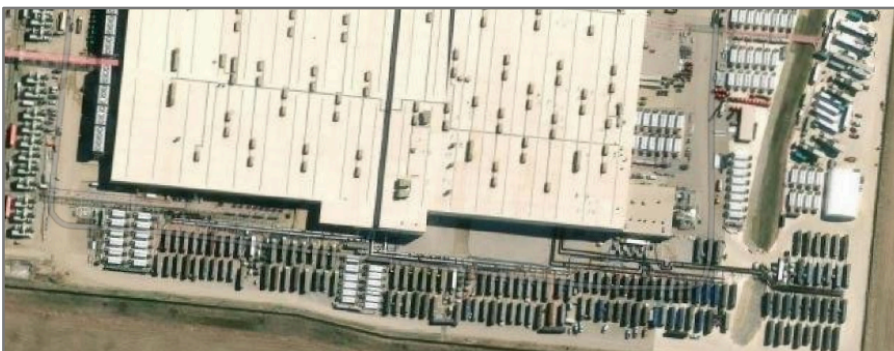
- Energy: A large facility can consume as much energy as a city of X residents
- Water: Server cooling consumes water resources, which can lead to conflicts over water use in certain regions.
- Land: The construction of these facilities creates tensions with other industrial, urban, agricultural, or natural land uses.
- On a global scale, these infrastructures contribute to the intensification of digital value chains: the extraction and refining of rare metals, greenhouse gas emissions, and the risk of shortages of electronic components.

I.3. Ssovereignty challenges

A significant proportion of the data centers operating in France are owned by non-European entities, rely on components sourced primarily from Southeast Asia, and are built on software layers often developed outside the European Union. This reality raises strategic questions regarding infrastructure resilience, data protection, and technological dependence.

Sectoral opacity that hinders public oversight

Despite these challenges, the sector remains largely opaque. The available data on the number, location, installed capacity, and actual energy consumption of data centers is fragmented, incomplete, or inaccessible. This situation hinders local governments, government agencies, and civil society organizations in their ability to manage, regulate, and anticipate trends in the sector.



xAI's Colossus I is powered by gas-fired generators rather than the electrical grid, which causes local pollution (air quality) and global pollution (greenhouse gases).



DCWatch: An open platform for transparency in the sector

III.1. Overview

DCWatch is a collaborative, open-source, and freely accessible mapping database dedicated to data centers. It is based on a rigorous open-source intelligence (OSINT) collection process and incorporates a model for estimating several key indicators: installed capacity, electricity and water consumption, and land footprint.

DCWatch aims to serve as a shared reference platform enabling public and private stakeholders to visualize, analyze, and anticipate the trends in data center deployment and their impact across the country.

III.2. A first working version

An initial version of DCWatch, co-funded by ADEME and now self-funded by Hubblo, is available for France. It includes:

- A documented, reproducible, and auditable data collection process based on open sources
- A model for estimating impact indicators (installed capacity, energy consumed, water used, land footprint)
- Forecasts on the evolution of France's data center infrastructure through 2030
- A public mapping interface, freely accessible to any citizen or organization.

III.3. A community open to citizen participation

DCWatch is designed as a digital commons: any citizen, community, or organization can contribute to the database through a documented, transparent, and monitored process.

External contributions must undergo a review process to ensure the reliability and consistency of the published data.

A database based on open sources

DCWatch relies on OSINT methods that use only data from open sources.

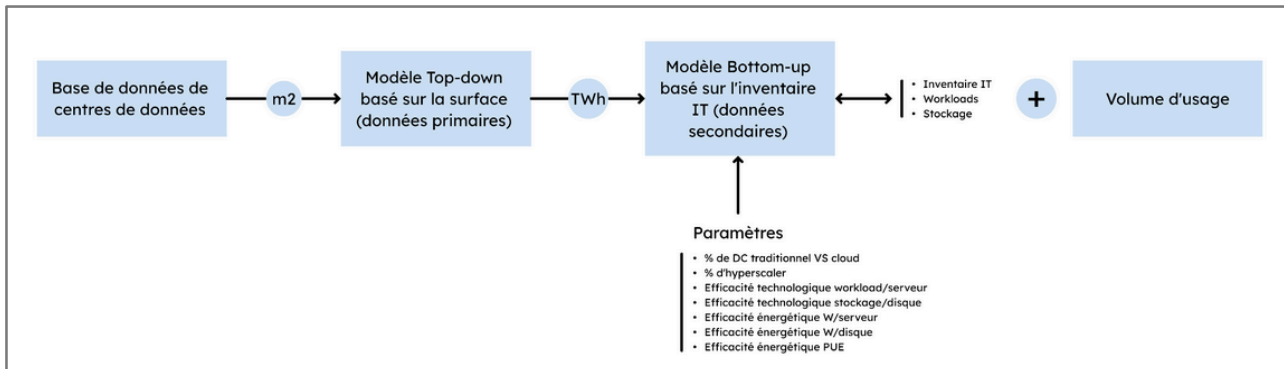
Satellite imagery



Cadastral data and business registries



Research



Diagrams of the indicator estimation model



III.4. The first users and contributors have already been identified

Several organizations and groups are already active users and contributors to the commons.

- Researchers
- Journalists
- Nonprofit organizations
- Engineering firms

Search for funding

In order to ensure the long-term sustainability and expansion of DCWatch, while deepening our understanding of the impacts of data centers, we are seeking funding—whether through public or private contracts, grants, responses to requests for proposals or calls for projects, or any other form of support.

We propose three areas of focus for the project:

Axis 1 - Ensuring the sustainability of the commons

Axis 2 - Expand the database

Axis 3 — Analyzing and generating knowledge

Section IV

Axis 1 — Ensuring the sustainability of the commons

IV.1 Ensuring data quality and reliability

DCWatch’s credibility depends on the quality of the data it aggregates. To maintain a high level of reliability, all external contributions must undergo a structured review process conducted by a group of qualified reviewers. This process includes verifying primary sources, ensuring consistency with existing data, and validating the estimates produced by the models.

Sustaining this process requires the establishment and management of a network of reviewers (institutions, sector experts, researchers) as well as the maintenance of a team dedicated to the editorial coordination of the database.

IV.2 Maintenance in Operational Condition (MOC)

The database, data collection tools, estimation models, and mapping interface form a technical system that requires ongoing maintenance: fixing bugs, responding to user questions, managing open-source contributions, and so on. This ongoing maintenance represents a regular workload necessary to ensure the service’s availability and sustainability.

IV.3 Develop a more advanced analysis interface

The current version of DCWatch provides a map-based visualization of the data. To empower public decision-makers in their understanding of local dynamics related to data centers and to meet the specific needs of local governments and state agencies, plans are in place to enhance the existing interface by adding more advanced analytical features. These features will be selected in consultation with end users and funding partners.



Satellite view (Google Maps) of two data centers at OpenAI’s Stargate I site in Abilene, Texas. The red marker indicates the gas-fired generators.



Axis 2 — Expand the database

V.1 Continuous monitoring and updating of French data

The data center sector is evolving rapidly, particularly in France. Announcements of new projects, capacity expansions, or project cancellations occur on a regular basis. A continuous monitoring system is necessary to ensure that the database in France remains comprehensive and up-to-date, systematically incorporating new information from public sources, building permits, regulatory filings, and corporate communications.

V.2 Geographical coverage: Europe and worldwide

Expanding DCWatch to the European and then global level is a key focus of the project. This expansion requires adapting the data collection method to the specific regulatory and documentation requirements of each country. It also involves establishing partnerships with local and European organizations that share the same goals of transparency.

European coverage will, in particular, enable comparative analyses among Member States regarding the dynamics of installation and the associated environmental impacts.

V.3 Community engagement and citizen training

DCWatch's scaling up also depends on the ability to engage citizen and institutional contributors across all regions. We aim to organize data collection training workshops for citizens, local organizations, and local government officials to equip them with the tools to document the digital infrastructure in their communities.

These workshops will be based on a documented educational methodology tailored to a non-specialist audience. The educational resources produced will be made available to the public to facilitate the development of this type of workshop worldwide.



Satellite view (Google Maps) of the Digital Reality MRS 2, MRS 3, and MRS 4 sites in

V.4 Extension of the estimation model

Our goal is to expand the impact indicator estimation model to include new indicators, specifically:

- Operational and embedded carbon footprint (raw materials, manufacturing, distribution, and end-of-life)
- Metal footprint
- Multi-criteria footprint across the entire infrastructure lifecycle (PEF LCA)
- The specific characteristics of AI-dedicated data centers (GPU-intensive, high power density, etc.)

This expansion will significantly refine impact analyses and inform forward-looking research on the evolution of the sector's environmental footprints in France, Europe, and worldwide.



Satellite view (ESRI) of the Equinix PA12 expansion site in Argenteuil



Axis 3 — Analyzing and generating knowledge

In addition to building the database, DCWatch aims to provide in-depth analyses of industry trends to support public policymakers and researchers. Several priority areas that Hubblo could address have been identified.

IV.1 Analysis of land use

This analysis aims to characterize the nature of the land currently and historically occupied by data centers: agricultural land, natural areas, industrial zones, and economic activity zones. It would help assess the pressure on land resources exerted by the sector and inform discussions on land-use planning policies, particularly in relation to debates on land-use conflicts.

IV.2 Regional statistical analyses

Statistical analyses at various geographical levels (municipal, departmental, regional, national, and continental) would make it possible to map out imbalances in infrastructure deployment, identify areas of tension, and inform digital development strategies at both the local and national levels.

IV.3 Sector-specific economic analyses

An analysis of the sector's economic dynamics could complement the environmental dimension of DCWatch and provide useful information to public policymakers. This involves, in particular, examining the concentration of land and infrastructure ownership, as well as the actors involved in data center operations (construction, operation, etc.).

IV.4 Audit of operators' claims of effectiveness and sustainability

Data center operators publish various metrics, including energy efficiency metrics such as PUE (Power Usage Effectiveness) and sustainability metrics such as annual electricity consumption and carbon footprint. DCWatch can be used to audit these disclosures, assess their reliability, identify any discrepancies, and contribute to the discussion on transparency in the sector.

IV.5 Customized analyses for local governments and state agencies

DCWatch is also designed to be utilized to address specific analytical needs identified by local governments, state agencies, or other public organizations. These analyses can, for example, be used to support decision-making in specific contexts, such as permit reviews, the development of master plans, territorial impact assessments, and so on.



Satellite view (Google Maps) of the Credit Mutuel data center construction site in Fauverney

What DCWatch is not

DCWatch is not a proprietary tool but an open-source digital resource licensed under the ODbL. The project does not aim to monetize the data. Furthermore, DCWatch does not aim to become a benchmarking tool for data center operators to help them set up future data centers.



Section IIIIV

About Hubblo

Hubblo is an organization in the process of transitioning to a cooperative (SCOP), whose mission is to help public and private organizations understand and reduce their digital-related environmental impacts.

As a co-author of several leading academic reports and publications on the environmental impacts of digital technology, Hubblo actively contributes to the state of the art in this field and collaborates with a network of recognized institutional, academic, and industrial stakeholders.

We put knowledge creation at the service of local governments, government agencies, and digital organizations to provide them with informed guidance as they navigate the systemic risks of digital technology.



Forecast of data center energy consumption trends in the short, medium, and long term from 2024 to 2060



Study of the environmental impacts of manufacturing the GPUs used by leading AI models.



Study of material inflows in the digital sector.

Partners and customers



Contact

If you are interested in supporting part of the project or would like additional information, please contact us at the following address: bpetit@hubblo.org.

We are available to present DCWatch during a discussion, meeting, or presentation