THE FOOTPRINT LEFT BY CLOUDS

Data centres and inequalities

Cover embargo

Data centres are an essential pillar of the infrastructure underpinning the development of the latest model of artificial intelligence. Until recently, these facilities went unnoticed, but in recent years they have become a topic of controversy. On the one hand, data centre rollouts are shrouded in intense public relations campaigns that highlight the huge investments and supposed capacity to create jobs and develop other economic sectors. On the other hand, active criticism and resistance movements have emerged warning about how the centres break their promises and the high price that communities pay.

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1. Why do we need to know the footprint that ‘clouds’ leave?

As we will see in this paper, the ‘cloud’ is one of the artificial intelligence (AI) industry’s most powerful metaphors. Similarly, the reality that it reflects – the data centres themselves – represents one of the industrial activities most closely linked to the rapid expansion of technological development

Data centres are a critical cog in the gears of the artificial intelligence industry. They are the sites that store and process the vast amounts of data that language models need to sustain generative artificial intelligence tools, as AI has become more industrialized, popular and mainstream in recent years. This expansion of generative artificial intelligence is touted as a lifeline for the tech sector, which after COVID-19, was facing the need to scale up its activities. The promise of spectacular developments based on artificial intelligence has attracted unprecedented investment into a very select group of tech giants.

As a *Bloomberg* article bluntly noted in November 2024: ‘What’s clear is that in two years, the biggest beneficiaries of the kind of AI that will one day “benefit all humanity”’ (this has been one of the technology's selling points) ‘are a handful of tech firms’. The six largest have seen their market capitalizations grow by more than $8 trillion’ (Olson and Silverman, 2024).

Despite the uncertainties surrounding artificial intelligence, starting with its profitability, large corporations keep promoting this trend of attracting capital, announcing high investments that feed the markets’ expectations (Weise, 2025). Part of this investment is earmarked for increasing computational capacity by building data centres (Bank Overground, 2025). This logic falls in line with the accumulated wealth described in the Oxfam report entitled ‘Resisting the Rule of the Rich’ (Maitland et al., 2026). It is no coincidence that most of the billionaires identified in that report sit on the boards of big tech companies.
At the same time, the construction of these facilities is accompanied by important public relations campaigns, though they are increasingly embroiled in considerable controversy. Narratives swing like a pendulum between huge investment figures and the data centre industry’s high resource demand; or the alleged advantages of data centre rollouts and their environmental and social impacts. This paper aims to investigate these factors so that we can start to have a better idea of the real social value of the data centre industry and its multiple associated costs. To this end, we examine two case studies in distinct geographical contexts currently experiencing rapid data centre expansion: the Mexican state of Querétaro and the Spanish autonomous community of Aragón. Through this analysis, we aim to deduce patterns and indicate differences, in order to build an informed, critical opinion about this situation.

2. What do we mean when we talk about the cloud?

The ‘cloud’ is one of the cornerstones of a narrative that the technology industry is intentionally promoting. When we speak about ‘cloud’ services, users picture a mental image that reinforces the intangible idea of the digital environment. It seems that data and data processing, and everything else that happens on the internet, behind the computer screens, takes place in an ethereal limbo, a hazy place that cannot be pinned to a concrete, physical space. However, the commercial name ‘cloud’ refers to all the computational services where data are stored and processed remotely, i.e. in places other than the user’s location.

As the researcher Ana Valdivia (2024) notes, the site where all these operations take place is not a cloud but rather an industrial warehouse, or more so, one of thousands of industrial warehouses spread across the world. As such, more than a metaphorical figure, the ‘cloud’ is a marketing/advertising strategy that leads users to lose sight of the tonnes of cement, steel and all other materials that form the complex digital infrastructure (Holt & Vonderau, 2015), including data centres, submarine cables and satellites, among others.

Beyond the metaphor, the physical expansion of this cloud can also be seen as part of the US national security strategy. A study commissioned by Oxfam México found that the recent infrastructure rollout on Mexican soil is in line with President Trump’s plans to consolidate what he describes as ‘global technological dominance’ over other powers. The document entitled ‘Winning the Race: America’s AI Action Plan’ recognizes that technical and regulatory conditions in the United States hinder infrastructure being built in the country as fast as needed. In this sense, technology is no longer neutral. It is a critical infrastructure at the heart of global dispute.

The facilities that the technology industry calls the ‘cloud’ are places that enable many of our daily interactions with technology. For example, all the photos we decided not to keep on our phones, our purchase histories on digital stores, our fingerprints to get into the gym and bank transactions are all stored in an industrial warehouse somewhere in the world. That so-called ‘cloud’ is a very real place where thousands of processors are operating so that an algorithm can recommend us the next series we should watch on a platform, check if we are the person who purchased a flight during the airport check-in process, indicate whether a blemish on our skin is cancerous, decide which driver will be assigned a trip on a rideshare platform or determine whether a human figure is an enemy soldier in a conflict area and order a drone strike.

What are data centres?

Although other types of infrastructure are necessary for the ‘cloud’ to operate, its existence mainly depends on data centres. In recent years, all computing and storage services have gradually moved to the ‘cloud’, creating a growing need for these types of facilities. Artificial intelligence, cryptocurrencies, online gaming and audio and video streaming services take their material form in data centres.

Paola Ricaurte defines data centres as the factories of the digital economy. A data centre is not a static information storage space, but rather an active industrial facility that processes large amounts of data. At first glance, they are impenetrable walled-off enclosures hosting servers that are running non-stop, twenty-four seven.

Although they may seem identical, we must understand that this infrastructure is changing based on different needs. A data centre that stores information is not the same as one used to train or keep a generative artificial intelligence model running. The latter require high-performance graphic processors that generate a lot of heat. Fans are no longer enough. Instead, they need liquid cooling systems that require millions of cubic litres of water and exorbitant amounts of electricity. Today's 'cloud' is, in fact, a gigantic electric heater that is permanently turned on over us.

New formats have become increasingly more common, such as hyperscale data centres and colocation centres. They tend to be larger facilities, with greater processor density, a greater need for stability (i.e. little variation in the power supply) and very low latency (i.e. minimal transfer time for data to go from one point to another). All this translates into greater resource consumption, i.e. electricity needed to operate and water to cool the sheer amount of heat generated by all these devices working non-stop. In turn, the consequences are more profound: these facilities produce more carbon dioxide (CO_2) emissions due to their intense operations and generate more electronic waste as electronics need to be replaced more frequently given their heavy use.

Certain figures and estimates underscore the importance of this industrial activity. In March 2026, there were 11,084 data centres in 174 countries across the world, around 40% of which are on US soil.[1] Estimations from different consulting firms are not always consistent, but in any case, the figures are astronomical. While some claim that the global demand for data centre capacity could increase threefold by 2030 (Noffsinger et al., 2025), others indicate that 100 GW of data centre capacity will enter into operation between 2026 and 2030, which would double the current global capacity and entail a 14% annual growth rate (Jones Lang LaSalle [JLL], 2026). Something similar happens with the investment required to reach that level of growth, which could be anywhere between almost $7 trillion ($5.2 trillion for facilities directly related to artificial intelligence and $1.5 trillion for data centres with other functions) (Noffsinger et al., 2025) and $3 trillion (JLL, 2026). However, all the analyses do agree that the demand related to the increased use of artificial intelligence will continue to occupy that growth until reaching between 50% (JLL, 2026) and 70% (Noffsinger et al., 2025) of data centre activity.

What role do data centres play in the artificial intelligence industry?

The system of facilities comprising the data centre complex is key to the artificial intelligence industry. These data centres act like the sector's digestive system. They are where artificial intelligence tools' 'metabolic' process takes place, through which algorithms process given datasets to produce an output. Furthermore, the process of training artificial intelligence tools takes place in that very same data centre system, which involves providing it all the information that enables advanced statistics models

[1] Data collected on 11 March 2026 from Data Center Map (https://www.datacentermap.com/). Screenshot available via the following link: https://oxfam.box.com/s/0qmirrycfpttq0tup5gxcevcrmgg5bi5

to carry out suitable operations and enter the necessary corrections to those operations.

Despite that fundamental role, this is one of the stages of the artificial intelligence life cycle that contributes the least added value, and is perhaps only comparable with the mining of the materials required to build the electronics that the system requires. This is one of the points on which this document aims to shed more light: to what extent do these types of infrastructure represent a substantial contribution to society? Different lines of research fall in line with other prior approaches in highlighting that the societal contribution is minimal.

As the economist Cecilia Rikap notes, 'These data centres do not create jobs or productive chains'; in other words, they do not act as a magnet to attract other productive activities. The majority of the highly specialized activities, such as research into neural networks and algorithms, do not take place in data centres. Likewise, other job activities linked to artificial intelligence, such as data work, do not happen there either. Business innovation and development solutions that can be associated with the digital economy do not need to be carried out near data centres. A good part of resource usage (energy and water) and the consequences (emissions and noise) does in fact occur in the region. Thus, data centres function as technological enclaves where the system's 'digestion' takes place, but the true benefits are reaped far from the noise and heat of the servers.

What is the logic behind data regions?

To understand why data centres are concentrated in certain places, we first have to consider the corporate geography of the cloud. Big tech companies are dividing the world into 'data regions'. The logic behind this division is based on hyperconcentration and redundancy. The companies promoting data centre rollouts need favourable conditions to ensure that the facilities operate smoothly and to maximize their investments. These needs, which include access to other infrastructure, environmental conditions and a specific administrative framework, explain why data regions are created, in other words, data centres are concentrated in a given area, as is happening in the Mexican state of Querétaro and in the Spanish autonomous community of Aragón.

Data centres are not isolated buildings, rather they are groups of multiple interconnected data centres that are close to each other (known as clusters), but which are sufficiently separated to ensure that a disaster does not shut them all down at the same time. Clustering has two goals: on the one hand, lower latency, which entails being closer to the large nodes of users and major communications infrastructure and, on the other, operational independence, which refers to creating zones where nothing can stop the service.

However, this technical logic creates cumulative pressure on the region: by massively concentrating the infrastructure, requirements are also intensified. The power supply has to be continuous, as the facilities cannot stop operating. In turn, data centres require cooling systems that use water to dissipate the heat that the servers generate. That leads to saturating the local water and power infrastructure, creating areas that are essentially sacrificed in the name of global digital efficiency. Although the figures are only partial, certain evidence points us in that direction. For example, a large data centre can use close to 19 million litres of water per day, which is the same as a city with between 10,000 and 50,000 residents (Yáñez-Barnuevo, 2025).

In a more familiar example, the power requirements to operate a data centre can throw

off the entire balance of energy production. This is what is happening in Aragón. The Autonomous Community is currently an electricity exporter due to its extensive adoption of renewable energies. However, the data centre projects under way (together with the green hydrogen projects) could make the community's energy demand multiply between sixfold and fifteenfold, meaning that Aragón would shift from an energy exporter to an importer (Torrubia et al., 2026).

The exponential growth of infrastructures is facing needs and difficulties. To cite one of them perhaps one of the most obvious, data centres need vast amounts of electricity to ensure the facilities can operate. Some analysts have forecast that the global energy demand for data centres will grow approximately 16% annually between 2023 and 2028, implying that growth would be 33% faster than between 2020 and 2023 (Lee et al., 2025).

In the same way, positive reception from local governments, convinced of the supposed benefits of establishing this industry as a source of investment and development, is an added bonus. This positive reception, together with the management of the administrative mechanisms to promote industrialization, tend to afford the companies sponsoring data centres priority access to land or local service networks, favourable urban zoning, tax breaks and streamlined administrative procedures, depending on the case (Pradilla, 2025).

As if that were not enough, these companies choose the regions with the most favourable or non-existent regulatory frameworks, which range from specific data centre legislation to environmental regulations. The lack of specific laws on these matters generates a legal grey area that some of data centre players see as an opportunity.

3. A formula for entering a region

Geographic spaces do not become preferred locations for data centre development by mere coincidence. In reality, different experiences across the world all share common elements that almost seem like a formula. First, a narrative of progress is crafted that presents data centres as drivers of industrial development and job creation. Then, the legal and tax frameworks are adapted and tailored to facilitate the establishment of technology companies or existing administrative instruments are used. Finally, there is a lack of transparency regarding information on data centres' actual operating costs to avoid public oversight and social scrutiny. Below, we will detail the steps of this formula. Below, we will detail the steps of this formula.

Promises

Data centre rollouts are usually announced alongside intensive public relations and communications campaigns, in which the companies promoting the facilities promise a wide array of benefits upon their arrival in the region. The government agencies supporting the projects act as a mouthpiece for these narratives while local media outlets, for the most part, amplify the promises made by the companies and echoed by those local and regional authorities.

Investments

The first element is visual and narrative. Before the first brick is laid, the region must be reimagined as a commodity. In Mexico, along Federal Highway 57, advertisements have started to appear with the words 'Building Growth Together', leading the way to walled-off industrial parks which house the data centres.

Data centres require a complex physical infrastructure: large buildings with sound security systems that include fences, walls and surveillance, power supply mechanisms that include alternative backup sources in case of interruptions and complicated cooling devices. The acquisition of land, construction of buildings, procurement of devices and commissioning of all that machinery is costly, which is why such projects are referred to as substantial investments. The companies announce billion-dollar investments that attract the attention of the media, institutions and society, particularly when carried out in regions where industrial development funding has traditionally been scarce.

Creating jobs

Job creation is a recurring promise when the arrival of data centres is announced. Selecting areas that have experienced deindustrialization or population drain ensures that the news about job creation is well received. Tech companies do not present data centres as stockpiles of cables and processors, but rather as beacons of modernity that light the way towards development.

Many of the administrative benefits, subsidies and other forms of access to advantageous conditions are contingent on certain job creation figures. Often, the promise of employment vanishes after the construction phase: data centres are capital and energy intensive, but do not require a permanent workforce. Additionally, while industry promises a wealth of opportunities, the arrival of these tech giants entails real estate pressure that threatens the generational legacy of agricultural communities.

Joining a promising sector / creating an innovative ecosystem

'Campus' and 'ecosystem' are some of the terms companies use for these projects, with the aim of creating the illusion that their initiatives will attract other economic activities. Communication campaigns strive to frame these facilities in a region as a gateway to the forefront of an industry that sees itself, above all, as an industry of the future. From the perspective of the communication strategies of the companies promoting these projects, having a data centre in your region places the towns or regions at the cutting-edge of technological innovation and catapults the region towards a future of development and progress. However, the work carried out in data centres does not necessarily require an environment of highly complex, technical industries, nor does it attract innovation and tech-related work or training spaces to the area.

Building these data centres even creates what some geographers have called 'enclave urbanisms' where high tech live in isolation, walled off from the surrounding rural economy. Far from promoting the creation of sources of employment or technological education, this fragmentation of the region displaces the local population and extracts resources from the communities.

Forecasting resource usage (water and energy) and emissions

Publicly unveiled data centre projects claim to be models of efficiency, particularly in terms of energy and resource usage.

The efficiency narrative is usually supported by technical indicators such as Power Usage Effectiveness (PUE), which companies use to report near zero energy waste. Despite this, the optimization per unit does not truly reflect the mass scale of the total requirement: at the global level, this industry used 415 TWh in 2024, which is equivalent to the energy used by the whole of Japan. Technical efficiency does not hinder the data centres from signifying a substantial increase and growing demand which exert pressure on the existing power infrastructure.

The data centre industry tends to select regions with ample availability of renewable energies. Although not an essential condition, it is highly prized. Having renewable energies at hand, data centres can present themselves as mostly non-polluting, to the extent that most of the energy they use comes from clean sources. In parallel, the technical explanation of the systems within the facilities focuses on the efficient use of water for cooling.

Despite the preference for clean energies, the mass arrival of these centres can have a displacement effect, where the tech companies hoard the available renewable energy, while the population faces increasing local power grid failures. In terms of water, while Amazon Web Services (AWS) claims that its centres do not use water for cooling (About Amazon team, 2025b), Microsoft holds permits to extract up to 25 million litres annually on a single campus in Querétaro (Jiménez Arandía and Dib, 2025). This high demand for water is authorized in a state where 95% of its territory was at the highest drought level in April 2025 (La Voz de Querétaro, 2025).

On numerous occasions, the figures that were initially provided have been amended (typically upwards) after the project was approved or, at the very least, miscalculations have been acknowledged. That said, such does not typically lead to changes in the concession of the corresponding permits. Likewise, the terms of the debate concerning that idea of efficiency rarely change. The companies' communications convey the idea that the data centres consume as little as possible, but typically no questions are raised as to whether the net increase in resource usage e is really necessary or beneficial to society.

Carbon dioxide emissions are not a common talking point in the public relations for data centre projects. When emissions are mentioned, optimization is usually the focal point, as occurs with energy and water consumption. The companies claim that they are producing the least emissions possible and that, often, they are carbon neutral (meaning that emissions will be offset rather than not produced). When quantifying these emissions, it is common practice to only include those resulting from the facilities' usual operations, overlooking the emissions that the activity of such infrastructure inevitably generates elsewhere, for example, in producing the energy required to power the data centres.

This lack of transparency is continually reinforced by the use of 'trade secrets', which hinders public access to granular consumption data and often makes it easier for 'miscalculations' to be overlooked without regulatory consequences. On questioning the social benefits, a profound gap arises between the promises and the actual costs. The cost is borne by the deindustrialized or depopulated communities, while corporate data

sustainability is prioritized over the survival of local life.

Access to benefits offered by government agencies

The glamour of the tech industry and the prestige and image that this sector has created are another attractive talking point for government agencies when they announce the arrival of investors to a region. This has allowed these projects to access administrative mechanisms designed to attract investments and industrialization. Each region has its own mechanisms, but in most cases, the same elements are used to entice these companies, clear the way for their arrival and facilitate project rollouts. .

Tax incentives

Tax incentives are one of the classic tools employed by governments to attract companies. These incentives can take many forms. They may involve anything from waiving certain municipal taxes or fees to exemptions from state taxes.

In a similar vein, governments may grant direct subsidies. In some cases, the initiatives to set up data centres gain access to 'grants' or subsidies linked to job creation, for instance. In such cases, expectations regarding results are usually relatively low.

Accessing land and rezoning in the region

While not the most obvious benefit, because authorities do not always have discretionary power to allocate land, there are instances in which governments have secured land access for companies, sometimes without them having to pay to occupy it. These cases are often justified by the common good the facilities are expected to bring the region. These types of benefits are the most commonplace when large-scale framework agreements are established so that a company can gain a foothold in a region as a bridgehead, striving to pin the region on the world map of data regions.

More typically, the mechanisms for attracting industrial investment include being able to streamline administrative processes related to urban rezoning in the region. These tools are sometimes seen as a way of mediating in cases where a project of interest, such as the installation of a data centre, exceeds municipal limits or affects more than one local government. In practice, this allows land rezoning, includes thereby benefitting the companies promoting the facilities.

Facilitating administrative processes

Government agencies positively receiving data centre plans undoubtedly helps to streamline the numerous administrative procedures required to implement a complex infrastructure like a data centre. From the time a project is approved until the building permits are granted or the processors are switched on, the public authorities' complicity offers quick alternative pathways, saving the companies from delays that could cost them money and dissuade them from the convenience of setting up in a region. In certain cases, delays or lengthy processes are not the result of the government agencies operating slowly, but rather of efforts to ensure correct and meticulous procedures. When government agencies prove to be willing bedfellows, alternatives for these cases

can also be found.

Environmental impact studies

Environmental impact studies have been one of the final measures to ensure the protection of the region and the right to a healthy environment for the communities that live in it. Throughout the years, it has become accepted that industrial investments have to ensure that the environmental impact is kept to a minimum thanks to the advocacy and efforts of residents and environmental movements. However, in certain regions that have become targets of the data centre industry, legal requirements for environmental impact studies have become more lax. One of the last safeguards for local communities has begun to weaken so as not to hinder industrial investment.

Although environmental impact studies are tools to protect the people, Paola Ricaurte finds that they are applied in a flexible manner or the compliance standards have dropped. Arbitrary or lax application of the law allows companies to work while evading their carbon neutrality and transparency commitments, sacrificing the right to a healthy environment in favour of digitalization and foreign investment.

Other active industrial political actions

The desire to persuade the companies sponsoring large data centres has led authorities in certain regions to include the coverage of additional data centre needs into negotiations. Ensuring a road that will easily reach the facilities is no longer enough, because in most cases, that has already been achieved. By contrast, an institutional commitment to securing companies' access to water sources, for example, can be an enticing offer. In the same way, planning for other complementary infrastructure for data centre operations, such as reinforcing renewable energy production, can help the companies that sponsor data centres reach a decision about a territory.

Positive reception from the authorities, the local people, the press and civil society

Large data centre projects typically shy away from bad press. As we have seen in the previous sections, their arrival in specific regions is typically accompanied by important communications and public relations campaigns. The companies that sponsor these facilities strive to appear as allies of the region, hence the appealing promises, big investments and job creation (Gobierno de México – Presidencia de la República, 2025; Gobierno de Aragón – Presidencia de Gobierno, 2025).

In 'Materializando las nubes: Resistencias tecnoecologistas contra los Centros de Datos', Aurora Gómez Delgado (2025) claims that 'the promise of jobs is a key that opens three doors: the door for authorization from local and regional governments, the door for local acceptance, and the door for tax breaks'. Taking that same framework, the communications campaigns of big data projects aim to positively influence four social actors: authorities, who can show the investments as achievements; the people, renewing their hopes for a future in regions that are usually disadvantaged; the press, which boasts material conveying exciting narratives; and civil society, apart from the movements resisting these infrastructures, which appears as a stakeholder willing to be 'courted'.

Authorities' positive reception has been discussed several times in previous sections, and surely there is no need to insist on the matter to improve understanding. Something similar happens with the local residents. Although they will have to bear the brunt of a large part of the negative impacts, it is clear that a discourse based on supposed benefits and being able to once again dream of a better future can be a positive incentive, especially in regions affected by poverty, depopulation, loss of investment or unemployment. Meanwhile, the press can be pushed into a precarious situation as it may also enthusiastically welcome the chance to convey hopeful messages, marked by the gleam of modernity, progress and technological innovation. Similarly, the appearance of new advertisers or economic players that can help sustain their business model, which is constantly on the verge of ruin.

It is within civil society that these projects have encountered the strongest objections and the most significant resistance movements. However, the public relations campaigns of the larger scope initiatives also include actions to curry the favour of local civil societies, beyond the formal response. For that, these strategies involve relationship-building actions, financial support for specific projects, partnerships with local organizations to develop certain components or tools that are seen as philanthropy, which encourage favourable news in the local media outlets.

4. Querétaro and Aragón: similarities and differences

The data centre industry follows the same pattern when it sets up or expands in a specific region, regardless of the geographical location. In the past, becoming a sector with an enormous growth rate has worked, so the formula for creating data regions has undergone very few modifications.

This is neither neutral nor purely technical; it is due to geopolitical interests that often reproduce historical inequalities. Paola Ricaurte notes that the rollout of this type of infrastructure can be understood based on neocolonial logic. The regions of the Global South, such as Querétaro, are included in the digital economy not as beneficiaries of the technology, but rather as resource providers (land, water and energy) who are affected by environmental externalities, following a pattern of expansion that prioritizes corporate profitability over regional sovereignty.

By examining two of the regions that have been attracting the industry's attention in recent years, we will better understand the formula concept and highlight its impact on local communities. This comparison highlights similarities and differences between two regions separated by more than 9,000 kilometres: the Mexican state of Querétaro and the Spanish autonomous community of Aragón.

From promises to facts

Fulfilling the promises made during the project presentations does not have so much to do with the companies' honesty and sincerity, but rather that the content of those promises provides access to benefits offered by government agencies. Whether through

formal administrative mechanisms or agreements and accords with authorities, the characteristics that the projects advertise aim to justify the advantages provided by the government agencies. Furthermore, these advantages typically involve forgoing resources, whether in the form of land, tax revenues, priority access to public services or public investment planning. In this sense, they are giving away contested resources that clash with the needs of the communities. In this race for resources, the supposed shared development is prioritized.

Actual employment creation

In Aragón's case, the experience of the data centres' impact is still limited. The majority of the facilities that form the future data region are in the planning stage, either undergoing public comments for administrative approval or pending construction. However, the few examples that we have already offer important information. In the report entitled *El precio de las nubes: La expansión de los Centros de Datos en Aragón,* the collective Tu Nube Seca mi Río (your cloud is drying out my river) describes the case of the three AWS data centres that have been operating in the community for more than three years. When they were first presented, they were named projects of general interest for Aragón (*Proyecto de Interés General de Aragón* [PIGA]), which is the autonomous community's governmental mechanism to attract investment. At that time, it was assured that the data centres would create 1,300 jobs.

The report not only highlights proactive obfuscation concerning the actual employment figures, but also the difficulties several mass media outlets have faced when trying to access the information. The figures are so unclear that the same journalist, in the same media outlet, cited an external source which estimated between 150 and 225 employees in total between the three centres one year after the site started operations (Heras Pastor, 2023), and, two yet stated that the company had assured that there were the total staff reached more than 100 employees (Heras Pastor, 2024) two years after commissioning. The Tu Nube Seca Mi Río report notes that confidential sources have indicated that approximately '20 people per shift' work in each of the facilities.

These figures are far removed from the 1,300 jobs announced in 2019 and shed considerable doubts about the 6,800 new jobs that accompanied the PIGA's final approval for the 'AWS Region Expansion Project in Aragón', which was granted in August 2025. This 'expansion' project entails the construction of five new centres in the next ten years.

This gap in estimated and actual jobs is repeated in Mexico. While 1,300 jobs were promised in Aragón, in Mexico, corporations such as AWS promised the creation of 7,000 full-time jobs after one year (About Amazon, 2025); Google assured 117,000 jobs by 2030 (Gupta, 2022) and Microsoft published that it would create nearly 300,000 jobs by 2028 (News Center Microsoft Latin America, 2024). However, Paola Ricaurte found that this industry is capital intensive, but not labour intensive. In other words, a significant volume of temporary employment is created during the construction phase, but once it is over, an average data centre offers 200 jobs, as the figures from Aragón show. In Querétaro, the promise of employment served as balm for the community; a tool that promises prosperity in a vulnerable region.

Actual resource usage (water and energy)

Resource usage is, to some extent, linked to the environmental impact studies that some

regulations require to approve the rollout of data centre projects. That is the case in Aragón, for example. In other cases, disclosing resource usage – fundamentally water and energy – is related to an emerging social concern about the environmental impact of this type of infrastructure. People are starting to become more watchful of the increased need for scarce resources while, at the same time, companies are resorting to greenwashing strategies.[2] Artificial intelligence has traditionally been presented as the ultimate ally in the fight against climate change and this is incompatible with the voracious nature of data centres, which act as its digestive system.

With regard to the projects promoted in Aragón, two matters related to water and energy have become evident: the first concerns the size of the demand for resources that the facilities require; and the second is about the conflict between the initial forecasts and the actual resource consumption. Concerning the first issue, the Tu Nube Seca Mi Río report refers to the new energy plan published by the autonomous government, which considers that the data centre sector alone will take up half of the community's energy demand in 2030. We cannot lose sight of the fact that in 2024, 90% of Aragón's power production came from renewable energies, allowing data centre sponsors to claim that their facilities use only 'green' energy, while neglecting to address the impact of a substantial increase in demand.

In Mexico, this increased use of resources coincides with the existing pressure on the infrastructure. While the market for resources is likely to be cornered in the future in Aragón, in the town of Colón, individual projects, such as those of CloudHQ, will have an initial capacity of 190.26 MW in its six data centres, which is the same as the annual consumption of 420,000 households. During his presentation in September 2025 to the Mexican president Claudia Sheinbaum, the company's director of operations announced that the campus will reach an electrical load of 900 MW, equivalent to the consumption of 2.6 million average households per year (Ricaurte, 2025). To solve this issue, the government has assumed an active facilitator role, making public investment to strengthen the state's power grid, financed with public funds to benefit private companies that operate data centres. This happens while local communities face increased electrical outages.

The second issue related to the facilities' consumption refers to the difference between the initial resource usage forecasts and declarations and the actual figures, which is seen paradigmatically in the approval process of the 'AWS Region Expansion Project in Aragón'. In December 2024, the company promoting the construction of the facilities submitted a modification to its environmental impact study. The company requested that a 48% increase in water consumption in the centres be taken into account with regard to the figures established in the documentation that had originally been submitted. Thus, the maximum consumption would go from 36.4 to 53.9 million litres annually in each of its three complexes. The reasoning was due to an increase in the forecast for hot days, which would entail a greater use of the centres' system cooling mechanisms (Pasqual, 2025). In other words, the climate crisis will lead to an increase in the temperatures and the company will need to use more water to prevent the processors from overheating. At the time, the project had already been provisionally approved and not even this modification, nor the objections from environmental organizations, prevented its final approval in August 2025.

[2] As the United Nations explains, greenwashing, the name given to deceptive tactics behind environmental claims, involves 'misleading the public to believe that a company or other entity is doing more to protect the environment than it is': https://www.un.org/es/climatechange/science/climate-issues/greenwashing

In Querétaro, there is also a problem concerning water usage. While AWS claims that its centres do not use water for cooling (About Amazon, 2025b), Microsoft holds permits to extract up to 25 million litres annually at just one campus in Querétaro (Jiménez Arandía and Dib, 2025). This high demand for water is authorized in a state where 96.3% of its territory was at the highest drought level in June 2024 . Faced with this situation, the government has promoted the El Batán project (Buconi, 2025), an infrastructure initiative that aims to supply treated surface water to the people, while ensuring access to well water for the data industry.

Local wealth creation

In addition to creating employment, other mechanisms for producing local wealth could include attracting other economic activities that could strengthen the industrial sector and diversify the economy. The tax revenue from the large companies that promote those projects could also be a source. In short, it is essential to ask whether the arrival of data centres truly translates into benefits for the communities where they operate.

In Aragón, the minimal levels of job creation have already been highlighted in a previous section. With regard to attracting other economic activities, it could be argued that still has not occurred due to the early stage of the initiatives. Therefore, we can only focus on tax revenues.

The Spanish autonomous community's experience reveals an insightful result on this matter. The use of the PIGA mechanism involves an exemption from some municipal taxes, in other words, the taxes that local governments collect. Specifically, this concerns the Tax on Buildings, Installations and Construction (ICIO in Spanish) and the building permit fee. The two concepts represent around 5% of the projects' budget (Oquendo and Iñigo, 2025). This exemption has been highlighted in the information regarding several of the projects promoted in the region and those which the autonomous government has granted the benefits set forth in the PIGA (ElDiarioAragón, 2025; Heras Pastor, 2025; Ecologistas en Acción, 2025).

The highlighted tax benefits have been a strain on the government's resources since the very beginning. Ever since discussions began on the PIGA approval, which paved the way for the first AWS data centre installation, the Town Council of Villanueva de Gállego, one of the towns where the infrastructure was to be built, already filed an objection. The town council demanded €3.5 million for municipal fees from which the multinational was exempt, which would entail a considerable economic windfall for the town's coffers (Heras and López, 2020; Bayona, 2020).

In Mexico, the government of Querétaro has exempted data centre companies from having to present the Environmental Impact Statements (EIS) and from paying taxes for greenhouse gas emissions. The reasoning is that, as the data centres are built on industrial parks, it is taken for granted that these parks already have their own EIS. In addition, it is argued that data centres only generate indirect emissions, hence they should not be subject to paying such taxes. However, Paola Ricaurte shows how data centres are in fact responsible for direct emissions of compounds such as carbon dioxide, methane, hydrofluorocarbon, perfluorocarbon, sulphur hexafluoride and nitrogen trifluoride.

There are a wide variety of tax breaks, which include: exemptions from deferred taxes on imported equipment, reduced property tax for a given number of years, environmental tax exemptions, preferential electricity tariffs or value added tax exemptions on certain

inputs (Baptista and McDonnell, 2025). This has impeded the local residents from being able to assess whether the sacrifices on tax matters are compensated by social and employment benefits. In this sense, while data centres present themselves as drivers of wealth creation, the lion's share of the widely touted economic benefits for the host community are mainly generated during the construction phase.

Competition for resources (between the infrastructure and local communities)

In Aragón, there is still no clear competition for resources, likely due to the limited experience and because the areas are sparsely populated. Despite that, the Tu Nube Seca Mi Río report points out two relevant topics. On the one hand, the presence of data centres and even the usage putting a strain on the power grid's capacity discourage other sectors and hinders access for other industrial activities. On the other hand, electricity costs for residents may rise, for example, as the companies transfer their operating costs to other grid users.

In Querétaro, competition for resources is a daily reality for the local people. Towns such as Colón and El Marqués are already facing increased power outages, the result of a saturated power grid. This has led the state to have to intervene with public resources to ensure the power required for the upcoming data centres (Staff Industry & Energy Magazine, 2025). One of the companies linked to this sector, CloudHQ, has indicated that the local authorities attribute the power supply problems to poor maintenance. Likewise, local farming communities are not only competing for water, but also see how the new public infrastructure is designed to serve the walled-off cloud, which is diverting the resources they depend on for their livelihoods.

As the researcher María Lorena García told Lorena Rios, the market for land is being cornered and dispossession is taking place through fraudulent and violent means. This process started in Colón with the construction of an airport involving the purchase of communal lands under the pretext of progress which, for residents of the town Viborillas, ended up being an ‘abuse’. While the state facilitates lands for industries, the shareholders of the common lands lose their ability to grow crops. They are left unprotected against a market that prioritizes the installation of grand corporations over the social ownership of the land.

This handing over of land is reflected in statements by the community landholders who argue how the industrial market pressure forced them to sell their plots at a loss for fractions of what they are really worth. Administrative discretion to allocate land takes shape in an unequal negotiating position where the capital of the investors displaces the original landowners, who end up leaving their communities, unable to compete against the tech industry.

In turn, the rezoning that the data centres have caused usually ends up fragmenting the region. In the town of Colón, Querétaro, the data centres are fenced off, meaning that croplands have been forced to coexist with server farms, electricity substations and roads built for industry. Far from improving the local surroundings, this rezoning has enabled the hoarding of resources, which are exclusively used by data centres. María Lorena García notes that the new roads and utility networks do not lead to the communities nor do they improve connectivity. Instead they are designed to serve only the walled-off cloud fortresses.

The impact on the region

Comparing the regions reveals certain differences and some similarities. In Aragón, conflict surrounds tax transparency and managing a power grid that provides and supplies the energy required for both the sector and the people. In Querétaro, the data centres are already operating under a colonial logic of extraction. The region is used to provide critical resources (land, water and energy) against a backdrop of climate vulnerability.

Neither of the cases prove major benefits for the communities hosting this industry. Data centres bring with them major economic promises, transform local conditions and take advantage of lax and permissive regulatory conditions, but generate very few tangible returns for the regions where they are established. Other industrial policy measures, public investment initiatives and the allocation of public resources are being redirected in a way that has not proved capable of meeting the expectations they raise. As they take advantage of somewhat vulnerable situations in regions which have experienced depopulation or deindustrialization, it would not be an exaggeration to say that data centres operate as digital economy enclaves in communities that were never asked whether they wanted to be involved or how they wished to do so.

Different regulations

In Querétaro's case, the problem is not a lack of laws to regulate the data centres' negative impacts, but rather that governments are choosing not to apply them. As has been shown previously, data centres are being classified as service companies to circumvent environmental standard compliance while specific guidelines and parameters have not yet been developed for this type of industry. This points to a lack of targeted public policy, but also laws being misused.

Furthermore, 'trade secrets' or 'commercial confidentiality' are prioritized over the duty of transparency regarding environmental impact studies. Unlike Aragón, where instruments such as the PIGA allow at least a stage of public discussion, Querétaro's authorization process is opaque, as it is based on private agreements between the local governments and the companies. This lack of information and spaces for discussion not only weakens the rule of law, but also deprives local communities of the legal tools needed to defend their region and exercise their right to a healthy environment.

In this sense, in Spain, the government is drafting an energy efficiency regulation for data centres in line with the European legislation. The collective Tu Nube Seca Mi Río and other environmental organizations have stated their concerns that data centres are being approved at a faster rate in order to sidestep specific future legislation. In any case, this regulatory context is prompting calls for a moratorium on new projects until the legal framework is complete and consolidated.

5. Conclusion

Data centre expansion clearly reveals that the so-called 'cloud' is not an intangible or neutral phenomenon, but rather a deeply rooted infrastructure that creates new **sacrifice**

zones in the name of the global digital 'development'. Both in Aragón and Querétaro, the concentration of these facilities generate cumulative pressure on water, energy, land and other public goods, transferring the environmental and social costs to local communities that do not take part in the strategic decisions or receive the associated economic benefits. The digital economy, far from being detached from the region, is sustained precisely on intensive exploitation.

The suspicion that the motives behind the data centre boom is a new wave of real estate speculation is a valid concern. In Aragón's case, it seems that these companies seek regions that have come to be known as 'empty Spain', in reference to the depopulation and the decline in farming activities in certain rural areas and, as a result, the loss of hope for the future. There, land has become one of the area's last assets and can be acquired at very low prices. Furthermore, tech companies no longer appear in the recent project proposals, but rather investment funds and large Spanish companies linked to the construction sector. In turn, the most recent drive for data centres in Mexico has taken place in regions with scarce water availability, but where local elites are closely connected to the real estate industry. This leads one to think that the investment in data centres may actually have little to do with technology and be more related to **real estate speculation** in areas where the land is cheap or where it is not expensive to displace the people living there and to make them bear the environmental costs of the centres' operations.

The comparative analysis shows that the **actual cost of data centres** goes far beyond what the companies' narratives and initial official assessments reflect. The immense and growing power and water usage, the direct and indirect greenhouse gas emissions, the overburdening of public infrastructure, and the use of tax resources to sustain private investments comprise a systematic transfer of value from the public and community towards large technology corporations. These costs are also deliberately underestimated and obscured through optimistic estimates that are later corrected upwards without regulatory consequences. This makes it difficult to be able to take informed decisions about investment guidance and public policies.

Faced with these impacts, the **benefits for the host regions end up being minimal and disproportionate**. The empirical evidence dispels the promises of employment, innovation and economic revenue: this industry is capital intensive, but poor at generating stable employment, production chains and tax revenue. Data centres operate as extractive enclaves in the digital economy, where the system's 'digestion' takes place locally, while the added value is reaped elsewhere, far from the heat, the noise and the scarcity left in their wake.

This imbalance is exacerbated by the **lack of structural transparency with which the industry operates**, hidden behind trade secrets and lax or deliberately unenforced regulatory frameworks. The lack of access to detailed information about resource usage, emissions, actual employment figures and tax conditions hinders democratic oversight and makes public participation mechanisms meaningless. Commercial confidentiality thus prevails over the collective right to know, assess and question projects that irreversibly transform the regions and the living conditions of the people who live there.

Given this perspective, we inevitably **need strong, specific and binding policies** that regulate data centres for what they are: industrial infrastructure with large-scale environmental, social and economic impact. This entails establishing clear transparency standards, effective limits on resource usage, rigorous environmental assessments, real accountability mechanisms and tax frameworks that avoid socializing costs and privatizing profits. Regulation does not mean putting a stop to digitalization, but rather

challenging its course. It means collectively deciding whether the cloud will continue expanding as a device that extracts resources and sacrifices certain regions whether it can, at last, be brought into line with the public interest, economic justice and the wellbeing of the regions. Regulating the sector can be addressed from different spheres, from water or energy usage to greenhouse gas, noise and waste emissions (Ye, 2025). The European Union boasts certain regulations designed to regulate the sector, such as the Directive on energy efficiency (EU/2023/1791), which establishes that facilities must disclose consumption data based on their size, though it is hindered by serious transparency hurdles. Meanwhile, the approval process of the Spanish Royal Decree, which regulates data centres' energy efficiency and sustainability ground to a halt in September 2025, after the public comment phase.

Recommendations for a public policy concerning data centres

To reverse the opaque, extractive logic that currently characterizes data centre expansion, we need to make headway towards a **digital transparency framework.** This entails the creation of mandatory public records in which companies must report their actual and estimated water and energy usage, the direct and indirect emissions associated with operations, the jobs they have effectively created and all the tax and administrative benefits they have received in a standardized and verifiable manner. Trade secrets cannot take precedence over the collective right to information when critical resources and common goods are at stake. The agreements signed with governments must be public and undergo audits and the regularly issued reports must be subject to independent auditing and sanctions in the event of underreporting or subsequent corrections that substantially alter the conditions under which the projects were approved.

Similarly, public policy must set **clear and binding limits for resource usage**, especially water and electricity, that go beyond relative efficiency metrics and address the sheer scale of demand. These limits must be defined based on the resources available in each region, including future climate scenarios and ensuring, through legal principle, that human, agricultural and community usage is prioritized over digital industry use. In regions experiencing water stress or overloaded power grids, new data centre authorization should be suspended or subjected to temporary moratoriums. We must demand that companies submit plans to progressively reduce their overall usage, while ensuring that technical optimization cannot serve as an alibi for unlimited infrastructure growth.

Environmental assessments form another central cog in effective regulation, but only if they are reformulated to respond to the specific nature of data centres. We need to recognize data centres as their own industrial category and subject them to specialized environmental impact assessments, even when they are located in previously authorized industrial parks. These assessments must consider the cumulative impact of data centre clusters, the complete life cycle of the infrastructure (from construction through to electronic waste management), and the indirect effects associated with power generation. The public must participate early on, in an informed manner with a real capacity to have an impact on the design or approval of the projects, including the possibility to revise, modify or revoke permits if the operating conditions change substantially.

In tax matters, it is essential to build **appropriate redistributive tax frameworks** that correct the current socialization of costs. Automatic tax breaks must be abolished and replaced by schemes that progressively tax the intensive usage of resources, actual emissions and land usage. Incentives, when they exist, should be strictly contingent on verifiable compliance with social and environmental objectives, such as creating stable employment or effectively reducing impacts. Furthermore, the creation of regional compensation funds, funded by the industry itself, would ensure that resources could be allocated to remedying environmental damages, strengthening public infrastructure and improving water and energy sustainability for the affected communities.

Finally, it is necessary to introduce an innovative policy that obliges tech companies **to explicitly disclose the potential damage associated with the intensive use of digital infrastructure** in a similar fashion to healthcare warnings on products such as tobacco. This could take shape in the demand for visible, standardized warning labels on digital services, search engines, artificial intelligence platforms or cloud-based computing products, providing information about their water and energy usage, the associated emissions and the impacts on the region arising from specific searches, model training or computational processes. This measure does not seek to make users individually responsible, but rather to debunk the myth of the cloud's intangible nature, highlight the digital economy's material footprint and create social and political pressure so that the reduction of harm does not fall on individual choices, but rather on structural transformations of the industry.

Wagering entire regions, their public resources and their industrial future on the expansion of data centres involves assuming a structural risk that optimistic tech narratives work hard to hide. The rapid growth of this infrastructure is underpinned by a speculative bubble surrounding artificial intelligence, fed by the promise that all human activity must be mediated, optimized and monetized by computational systems that are increasingly intensive in terms of energy, water and materials. This leads us to believe that AI is inevitable and omnipresent, that it must be embedded in every device and enmeshed in each everyday interaction, while its costs for society, the environment and local regions are intentionally silenced.

Against this backdrop, it is vital to question whether data centres constitute a sound industrial development strategy or a fragile and contingent wager on an artificially inflated demand, whose benefits remain concentrated in the hands of a select few corporations while the impacts are widespread. Governments and societies cannot allow themselves to fall for **technological mirages**. Reproducing the old logic of socializing costs and privatizing profits in new digital garb is neither innovation nor progress, but rather a political abdication of responsibility to govern the economy in favour of the public interest.

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Notes

Oxfam Discussion Papers

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