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Where Cloud Meets Cement

A Case Study Analysis of Data Center Development

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EXECUTIVE SUMMARY

The rapid expansion of artificial intelligence (AI) and cloud computing is driving a global surge in data center development. These facilities of vital internet infrastructure are often framed as opportunities of local economic growth. Yet neighboring communities, researchers, and activists highlight their hidden costs: water monopolization, local business disruption, toxic emissions, noise pollution, exorbitant energy consumption, and negative impacts on community quality of life.

Over five months, four researchers at The Maybe conducted a case study analysis of five data centers across Chile, the United States (US), the Netherlands, Mexico, and South Africa. Through stakeholder interviews and secondary analysis, this report explores: How are government agencies and technology companies shaping data center development? What strategies do local communities use to resist data centers' harmful impacts? What resources do activists, advocates, and researchers need to strengthen advocacy?

This report highlights key insights, recurring challenges, and recommendations for funders, policymakers, and researchers working to address the environmental, social, and political impacts of data center development.

Insights from our case studies include:

1. **Data centers are strategic assets subject to geopolitical power dynamics and national agendas.** There is a considerable pressure on local policymakers and local communities to adopt data center developments without consultation or information about their potential impacts.
2. **The narratives surrounding data center development are driven by companies and governments.** Companies strategically market data center development projects by overpromising their economic and ecological benefits and offering financial incentives. In a few case studies, the narratives about environmental considerations were inaccurate and so extensive that we presume they were intentional.
3. **Data center development is happening quickly.** Data center development moves quickly, with opaque bidding processes and no centralized rules or standards for evaluating projects' environmental impacts. Despite organized efforts to uncover information, various incentives and tactics protect companies' interests. A lack of information is the norm, across all case studies.
4. **In the absence of critical reporting and publicly available information, communities are left to independently gather data.** This task is often undertaken by advocacy organizations, investigative journalists, or a few dedicated individuals volunteering their efforts. All cases reveal that the process of information discovery is onerous. Even when this process is successful, it remains difficult to assess the impact of a data center development.

Based on these findings, we highlight five recommendations to increase the flow of information and support communities and local governments. They are:

1. Increase information and resources for local governments and communities so that they are better positioned to identify and counter corporate greenwashing narratives.
2. Ensure community consultation is meaningful.
3. Provide material support to communities resisting data center development. This should include resourcing strategic litigation and investing in research and investigative journalism.
4. Demand key information is proactively made publicly available.
5. Increase multistakeholder and cross-movement convening.

You can read them in full on page 44.

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INTRODUCTION

The global demand for data centers is increasing at an unprecedented rate – driven by a reliance on big data, expansion of cloud computing, and rise of artificial intelligence (AI) technology. Data centers are large facilities that house infrastructure to support and power digital applications and data.[1] As of 2025, there are over 10,000 data centers globally, and estimates indicate that this number could at least double within the next five years.

[1] See appendix for a detailed definition of data centers.

As nations vie for dominance in the 'AI race,' rapid data center expansion has become a cornerstone of perceived technological advancement. From President Trump's announcement of the $500 billion Stargate data center project and the UK government's designation of data centers as 'critical national infrastructure,' to Colombia's incentivizing of data center development via 'Free Trade Zones.'

However, data centers are not only infrastructural developments; they are increasingly sites of social, political, and environmental conflict. Increasingly, environmental reports, communities, policymakers, local governments, and advocacy groups are revealing the range of harmful impacts data centers can have on their surrounding environments. Namely, the added financial, environmental, economic, and social strain to local communities.

For instance, data centers:

- add strain on the electrical grid and can impede the construction of new housing, as seen in London
- limit economic diversification by occupying areas that could support other industries, as observed in the Netherlands
- emit noise and air pollution, as seen in the US
- limit access to water in drought-ridden regions, such as Mexico and Chile.

Emerging research shows how data centers consume vast amounts of electricity, energy, and water. Studies have found that data center companies underreport their carbon emissions by as much as 662%, and projections estimate that by 2030, data center-related emissions in the US alone could contribute to over 1,300 premature deaths annually.

A Note On Language

Data centers come in various forms—such as enterprise, colocation, edge, and hyperscale—each differing in scale and function. This report specifically focuses on hyperscale data centers, which are characterized by their high energy consumption and rapid expansion. Their growth is driven in large part by accelerating trends in digitalization, generative AI, and cryptocurrency mining. For clarity and conciseness, we use the term data centers throughout this report to refer exclusively to hyperscale data centers. For more context, you can read more about the different types of data centers in the Appendix.

Goals of the report

The primary goal of this report is to aggregate cross-landscape information and examine trends in data center expansion and community resistance.

To do this, we carried out secondary research and interviewed communities, researchers, journalists, and advocates. This enabled us to gather detailed insights into both micro and macro trends across five regions – Chile, the US, Mexico, the Netherlands, and South Africa.

Focusing on specific case studies, we explore **how** different data center locations are influenced by government decision-making; **what** strategies data center companies[2] leverage; **when and where** environmental, social, and economic impacts are recorded; and **which** tactics communities use to oppose data centers.

This landscape is characterized by gaps in information. Thus, understanding both the strategic motivations behind data center expansion and the resistance it generates will be critical going forward. We hope this report shapes effective multi-stakeholder approaches to data center development in the future, improving data center impacts for local communities.

This project was commissioned by the AI Collaborative and led by The Maybe.

[2] For the purposes of this report, 'data center companies' includes companies that develop data centers for use by others, such as Equinix, as well as traditional technology companies who develop data centers for their own uses, such as Meta and Google.

Methods

Our methodology was structured into four distinct phases. **Phase I** was a comprehensive landscape analysis of data center development and the key stakeholders addressing data center-related issues. **Phase II** focused on in-depth case study research, four researchers each investigating a specific data center case.[3] Recognizing the limitations of publicly-available information on data centers, **Phase III** supplemented the secondary source research with semi-structured interviews, to gain deeper insights from those highly engaged in-country. Finally, **Phase IV** included a cross-case study analysis to highlight high-level themes and identify recommendations connected to these themes. These high-level recommendations are for multi-stakeholders including (but not limited to): funders, policymakers, and communities curious about improving data center impacts.

[3] One researcher investigated two data centers.

Limitations

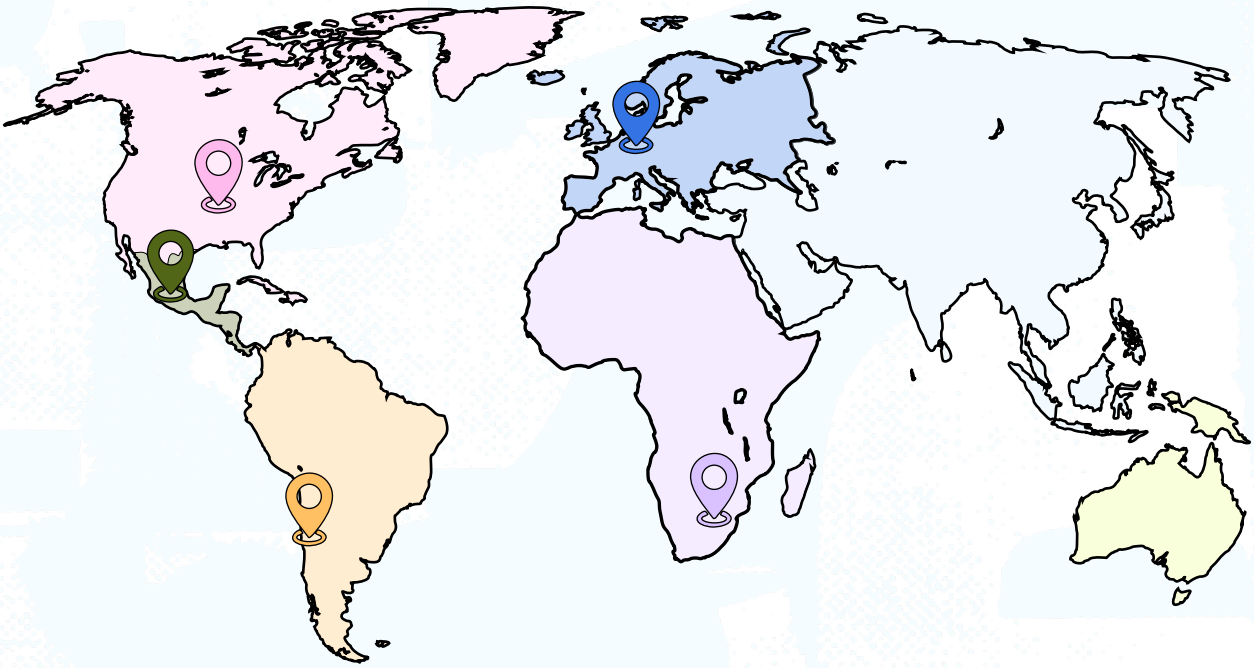
The primary barrier to a more comprehensive report is the lack of publicly-available information about data centers worldwide. For many existing, planned, or proposed data centers, there is very little information about their development, energy usage, water consumption, permitting process, role of government, and community advocacy efforts. This is both the result of a lack of transparency from companies and governments, as well as a lack of media coverage on the topic, especially in Africa and Asia.

Moreover, we are keenly aware of the context-specific nature of data center developments and resistance. While we provide insight into high-level trends, case study analysis runs the risk of decontextualizing key factors (i.e., community history and social relationships, ecological climate, intent and approach of the data center development, government incentives, etc). We acknowledge these limitations and describe our methodology in more detail in the Appendix.

CASE STUDY ANALYSIS

The following case studies cover a range of urban and rural towns, climate zones, regulatory frameworks, data center development models, and geographic contexts – including the Global Majority. They also include varying levels of 'success' in community resistance, ranging from preventing development prior to construction to ongoing opposition.

We begin with cases where community resistance is most extensively documented, moving toward cases where information on community resistance is more scarce.



1. **Chilean activists negotiate with Google**
   Cerrillos Data Center in Santiago, Chile

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Case study 1

SANTIAGO, CHILE

Chilean activists negotiate with Google

By Emma Prest

Company	Location	Size (sq ft)	Status	Compute	Cost
Google	**Santiago, Chile**	**2.47 million**	**Project under revision**	**Unknown**	**$200 million**

Summary

Google's 2019 proposal for a large data center in Santiago, Chile, faced significant community backlash. As Chile faces a prolonged drought, local residents were outraged over the amount of water the data center was expected to consume. The community's resistance to the data center included hiring an environmental lawyer, staging protests, rallying the community, and engaging in a prolonged back and forth with Google themselves. Google ultimately agreed to implement a system that would reduce the data center's water consumption. Meanwhile, an environmental tribunal ruled that Chile's environmental evaluation agency had mishandled the project's approval process, requiring Google to restart its plans.

Context

For decades, the Chilean government has actively sought foreign investment in digital industries, carefully implementing policies to cultivate a favorable business environment for data center construction.

As a result, Chile has emerged as a key hub for data centers in Latin America. Its capital, Santiago, currently hosts 22 operational data centers, with an additional 28 under development. According to Google, the country offers "an ideal combination of reliable infrastructure, a highly skilled workforce, and a strong commitment to transparent and business-

friendly regulations," positioning it as a competitive site for global technology investments. Google's first South American data center opened in 2015 on the outskirts of Santiago.

In addition to being relatively stable politically and economically, Chile is well connected to the undersea cables that transport data across the sea bed – a crucial new connection is being built between Santiago and Sydney, Australia. The Chilean government went so far as to recently create a national data center plan to ensure their regulatory environment is streamlined for data center construction.

In 2019, Google announced it would open its second Chilean data center in Cerrillos, a neighborhood in the south of Santiago.[4] Measuring 2.5 million square feet, this second center was set to be twice the size of the first, and consume vast amounts of water in a country suffering from persistent drought.

[4] With a population of 90,000 residents.

Environmental impact

Given that Chile has been experiencing a country-wide drought for the last 15 years, the data center's water use was the predominant concern among local residents. Water levels in the aquifers[5] that supply Santiago have been dropping rapidly and residents in Santiago have faced restrictions on their consumption of water. The aquifer providing water to Cerrillos was so low it had been declared a no-go zone for new water extractions, so the local community was understandably anxious about the impact the new data center would have on their local water supply.

[5] An aquifer is a body of permeable rock or soil in which groundwater is stored or through which groundwater flows.

Other environmental risks were identified, such as groundwater contamination, as the data center was projected to store more than 800,000 liters of diesel fuel to run backup electric generators. However, this was deemed to be a secondary concern.

The community also shared a more abstract concern - they did not want to become the warehouse for the Global North's data. They wanted scarce local resources to be used for local needs, not to help a multinational company provide services to users in more affluent countries.

Government role and strategies

The last three governments of Chile, led by a mix of right wing and left wing parties, have worked to attract data centers to the country. Chile is competing with Brazil to attract investments from US tech companies. President Piñera announced in 2018, "we want Chile to be a protagonist, a pioneer and hopefully the capital in terms of data processing, storage and transmission" at an event launching the expansion of Google's first data center in the country.

A key regulatory authority responsible for approving data center construction in Chile is the Environmental Evaluation Service (Servicio de Evaluación Ambiental, or SEA). This agency oversees environmental impact assessments and ensures that proposed projects comply with national environmental regulations.

Companies must submit an environmental impact statement outlining their plans and potential environmental impacts of their project which is publicly published on the SEA website. In the case of the Cerrillos Data Center, Google's public Environmental Impact Statement projected that the data center would use 7.6 million liters of water daily.[6] This is equivalent to the annual water use of the 80,000+ inhabitants of Cerrillos.

The publication of Google's impact statement catalyzed significant community activism. MOSACAT, the community group resisting the center requested that the project be submitted to public consultation, but the request was rejected as they missed the deadline by one day.[7] They believe that the SEA was likely under pressure from the national government to fast track approvals and describes the SEA as a politically-managed institution.

According to an in-depth investigation carried out by CIPER, the SEA made serious flaws and omissions when evaluating the viability of the project. A key point of contention involved uncertainty surrounding the water rights acquired by Google. The company purchased water rights on the private market for hundreds of thousands of dollars, but it remained unclear whether these rights corresponded to water actively in use. This raised concerns about whether the new data center would exacerbate pressure on local groundwater supplies – an issue that was never definitively clarified. Initially, Chile's General Directorate of Water (Dirección General de Aguas, DGA) requested clarification from

[6] Google's Environment Impact Statement was filed by Inversiones y Servicios Dataluna. When Google became interested in working in Chile, they established this Chilean company to handle all of their business in the country. Dataluna is owned by Mesh Specialities Inc. and Massif LLC, both of which are registered in Delaware – a US state known for its lack of corporate transparency and low tax rates.

[7] The SEA decided that the project could proceed with an environmental impact declaration (DIA), not an environmental impact study (EIA). The latter would have been more onerous and would have required more participation from citizens.

Google regarding the potential impact. However, following a leadership change within the agency, the DGA ultimately granted Google permission, and the SEA approved the project without a comprehensive assessment of its impacts on the local aquifer.

At first, the mayor of Cerrillos, Arturo Aguirre Gacitúa, was supportive of the data center project and held private meetings with Google. However, after the results of a local referendum indicated that the community opposed the project, the mayor reversed his stance. He has since stated that he regrets not having warned his community of the environmental impact of the data center.

Community role and strategies

Initially, the community welcomed Google's plans to establish a data center in Cerrillos, anticipating job creation and economic investment. However, after reviewing Google's Environmental Impact Statement and becoming aware of the substantial water consumption required for the facility's operation, local residents came together and formed MOSACAT, a grassroots organization to stop data center development in Cerrillos. Their goal was to oppose the construction of the data center in Cerrillos in its initial design and persuade Google to use more water efficient technology.

The group was organized and experienced, as many of the members had grown up hearing stories of resistance against the Pinochet dictatorship. The opposition to the Cerrillos Data Center unfolded amidst a time of broader political unrest and social mobilization. In 2019, nationwide street protests broke out, culminating in a new constitutional referendum in 2020. During this time, MOSACAT leveraged their experience in grassroots mobilization and the momentum of the political unrest to target the Cerrillos Data Center.

MOSACAT used three noteworthy strategies:

1. **Traditional activism**
   MOSACAT employed traditional grassroots activism by engaging in community dialogue, public demonstrations, disruptive protests, and legal advocacy.

They brought the community together to discuss their concerns, listen, and collaboratively decide how to proceed. Residents were immediately worried about the implications on their already fragile water supply, and this issue quickly became the unifying topic. They put up engaging posters[8] [Figure 1], held stalls at local markets, arranged a tour of the neighborhood, organized protest songs, shared their demands at community events, and covered a highway with anti-Google posters to coincide with the travel route of a Google representative.

Additionally, MOSACAT hired an environmental lawyer to represent their interests against Google and the various government agencies. MOSACAT (and simultaneously the Cerillos municipality) was able to file an appeal that challenged the SEA's authorization of the data center.

[8] MOSACAT used a skull to represent the data center project, representing ideas of looting and piracy in the face of imminent drought, corporate abuses and extractivism of water resources.

[9] The other 51% was split among the other multiple choice answers.

2. A local referendum

MOSACAT persuaded the local government to include a question about the data center construction in the local referendum. As a result, almost half (49%) of the voters said they opposed the construction of the data center – a significantly greater percentage than the other possible answers received.[9] Although the vote was non-binding, it forced the local government of Cerrillos to reassess its stance and, ultimately, prompted the local government to reverse its position.

3. Dialogue with Google

MOSACAT activists meticulously examined the available information, particularly Google's Environmental Impact Statement. They brought their numerous questions to a meeting with Google's Chilean representatives at Dataluna but received limited responses. MOSACAT spent the next 18 months meeting different Google staff explaining their concerns, and listening to Google's explanations. Ultimately, their sustained efforts led to a concession from Google in 2022. Google eventually agreed to amend the data center design in favor of a cooling system that used less water.

Figure 1. Resistance poster from MOSACAT

Source: MOSACAT

Company role and strategies

Despite public outcry, Google made few public comments and opted for meetings with the community in private. At the start, Google downplayed the amount of water that the data center would use, saying, "The water rights that the project will use, with the most demanding assumptions, represent less than 0.8% of the rights granted by the authority in that aquifer." A few miles from Cerrillos, in Santiago, Google announced the launch of a new cloud region called 'The Green Cloud.' The company claimed that it would operate with the highest percentage of carbon-free energy, thanks to the renewable energy deals in the country.

With the Cerrillos project stalled, Google is turning its attention to Uruguay, where it is now building its second Latin American data center. Google has made some efforts at making environmental reparations where their first Chilean data center is located in Quilicura. They have planted an urban forest[10] to offset the center's carbon emissions and supported local women entrepreneurs to learn digital skills.

[10] The forest is reportedly dry and in need of water.

Outcome

Today, Cerillos data center construction has yet to commence. MOSACAT's vigorous activism and persistent dialogue with Google persuaded the company to change plans. In 2024, an environmental tribunal court partially reversed the SEA's Environmental Qualification Resolution[11] that authorized Google to construct the data center and declared that Google must take into account climate change. While Google still plans to build a data center in Cerrillos, the company must return to the drawing board,[12] and will need to submit a new environmental impact assessment to the SEA.

In 2024, Chile organized a multi-stakeholder consultation to create its first national data center plan. MOSACAT was invited to take part in the working group. Among MOSACAT's demands were: data centers in Chile should not consume water in their cooling systems; energy should be from renewable sources; centers should be carbon neutral; key data should be made open; and data centers must compensate communities. However, in alignment with their core mission, MOSACAT withdrew from the group because they felt the resulting plan would neither sufficiently benefit the environment nor serve the interests of the Chilean people.

[11] An Environmental Qualification Resolution is the final administrative decision issued by the SEA determining whether a project complies with environmental regulations.

[12] They are redesigning a cooling system for the Cerrillos Data Center, in favor of an air-cooling alternative.

Case study 2

PECULIAR, MISSOURI, US

Small town blocks a $1.5 billion data center by targeting their local government

By Hanna Barakat

Company	Location	Size (sq ft)	Status	Compute	Cost
Diode Venture (for clients Iron Point Partners and Iconiq Capital)	**Peculiar, Missouri, US**	**300,000**	**Cancelled**	**Unknown**	planned **$1.5 billion** investment

Summary

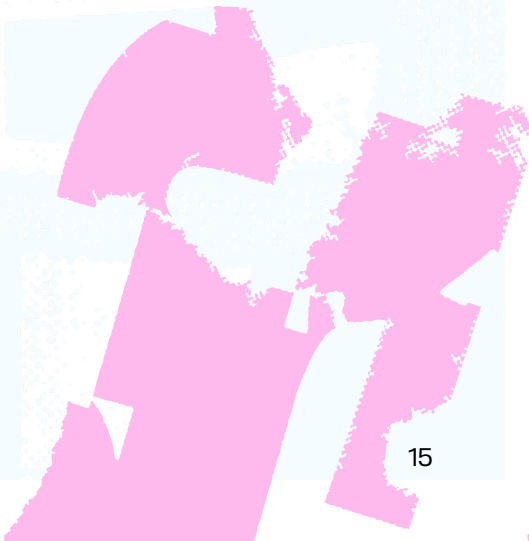
In a small town in Missouri, US, local residents resisted the development of Project Harper, a hyperscale data center proposed by Diode Ventures. Despite community dialogue efforts, the majority of the town remained unconvinced of the data center's benefits, expressing concern about environmental impact, noise pollution, surveillance, and social disruption. The community mobilized through a targeted social media campaign – directing their opposition not only at the company, but primarily at local government officials, and ultimately blocking the development.

Context

Peculiar, Missouri, is a small working-class town known for its winery and scenic golf course.[13] However, it has recently garnered national attention for its strong opposition to the development of a hyperscale data center.

[13] Has an estimated population of 4,600 people, 95% of whom are White.

In January 2024, residents received notice that Diode Ventures, a technology infrastructure development company owned by Black & Veatch, was planning a data center development. Diode was looking to create a $1.5 billion, 300,000 square foot data center complex in the heart of their community. The 'Harper Road Technology Park' – known as 'Project Harper' – was a colocation data center project that would provide infrastructure for Diode's clients, Iron Point Partners and Iconiq Capital.



In other words, Diode does not offer cloud computing services but handles the infrastructure operation, including construction development, engineering, bandwidth, and security.[14]

Like many other planned data center developments, Diode found Peculiar appealing due to attractive tax abatements, cheap land, low risk of natural disaster, and a local government willing to reward their industrial demands.[15] Before starting development, Diode needed the land re-zoned for industrial use. City officials quickly approved re-zoning of the development by adding a 'data center' definition into the existing light industrial zoning code and signed a Non-Disclosure Agreement (NDA).

Diode was also promised a 100% tax abatement vis-a-vis a Payment in Lieu of Taxes (PILOT) program. PILOT is a financial arrangement (or 'tax break') where data center operators pay the local government instead of paying property taxes. These payments are a corporate incentive because many local governments view data centers as valuable to their local economies.[16]

In this case, Diode executives promised to bring in new jobs and over a billion dollars in tax revenue for the town. These 'tax breaks' are not unique to Peculiar; Connecticut, Oregon, Missouri, and other states throughout the US have reported using similar programs.

Community concern and environmental impact

The community of Peculiar was concerned, having heard of data centers driving people out of neighboring communities in Nebraska, Iowa, and Virginia. As one resident said, "We don't want to be the next Data Center Alley."

Distrust amongst the community spread when a secretly recorded conversation between the mayor and city administrator was leaked to the community Facebook group, 'Don't Dump Data on Peculiar.' They felt strongly that "the trust bond with the government has been broken." In short, the community cited concerns of:

1. **Environmental damage.** Namely, noise pollution from the 24/7 low-frequency noise from HVAC cooling systems and water usage. Peaceful Peculiar, a group of concerned citizens, reports that the proposed 8 to 15 buildings will require 3.6 million to

[14] Diode's client is "IPI which is owned by Iron Point Partners, a private equity firm, and Iconiq Capital, a Silicon Valley investor whose clients include Meta's chief executive, Mark Zuckerberg, and the Twitter founder Jack Dorsey."

[15] According to Diode "areas in Kansas City and Missouri are attractive because of their state and local economic incentives."

[16] PILOT agreements vary in structure, but they operate under the assumption that the data center's presence will support the local community while offering tax relief to the companies involved.

6.75 million gallons of water per day. Air and light pollution are also key concerns. Missouri struggles with energy demands, as most of their energy comes from out of state. Geoff Marke, chief economist with the Missouri Office of Public Counsel states, "We're in (a) precarious position…. We don't have enough generation to meet our load before we start talking about AI data centers coming online."

2. **Community surveillance.** A fear of surveillance technology (via drones and security cameras) serving the needs of the data center left the community scared of constant observation, with one local resident sharing concerns about "living next to a maximum-security prison."

3. **Economic harms.** The community expressed concerns about the potential decline in property values for homes near the data centers, as well as residents in the downtown area potentially being driven away.

While the community's stance aligns with broader trends of NIMBYism, Eli Tan, who covered Project Harper for The New York Times, noted that the community consciously resisted being labeled as 'NIMBY,'[17] insisting their opposition was specifically against data centers and not all development. The truth, however, is more likely in between – they have been somewhat resistant to development in general, but their opposition to data centers was especially strong.

[17] NIMBY stands for 'Not In My Backyard,' and refers to the opposition by local residents to projects or developments located near their homes or neighborhoods.

Community role and strategy

Within a short period of time, thousands of people in the community came together to organize a strong resistance campaign against Diode and local government officials. The community developed a list of initial demands: they called on the mayor (Doug Stark) and the city administrator (Mickey Ary) to resign; and demanded a buffer zoning area, concealed power poles, and a solution to sound pollution.

The community used four noteworthy tactics:

1. **Learning from nearby data centers**
   Peculiar's resistance drew on the experiences of other US communities impacted by data center development. For instance, community members traveled to neighboring hyperscale data centers (i.e., campuses for Meta and Google in Nebraska and Iowa) to see the centers for themselves. The community Facebook

group lists detailed articles and commentary about data center developments in Idaho, Georgia, and Fort Worth. They even connected with the Virginia, Maryland, and Missouri chapters of the Sierra Club to protest the establishment of data centers in their town.

2. **Local investigation**
   In lieu of local reporters, the town took on investigative reporting themselves, requesting documentation of government records and secretly recorded meetings. The website Peaceful Peculiar acted as a hub for sourcing and distributing research about the impacts of data centers and distilling research into relevant statistics for talking points.

   However, the realities of uncovering information were embedded in the dynamics of small town politics. Eli Tan highlighted the town's tactics of "sensationalizing the data center." This included "outlandish rumors" about the mayor and city administrator, sharing misinformation on social media, and releasing secretly recorded interviews.

   But the town was corralled. Residents attended city council meetings in such large numbers that the meetings had to be moved to a bigger venue. The residents also hosted events and amplified their efforts on social media. While large technology companies attempt to develop data centers with minimal public attention, the town of Peculiar disrupted this silence.

3. **Organized social media campaign**
   The community's activism was organized through social media efforts like the Facebook group 'Don't Dump Data on Peculiar,' which has 1,000 members – equivalent to one-sixth of the area's population. They created educational videos on TikTok about the impacts of data centers, and used hashtags such as #ShameOnYouMickey #ShameOnYouDiode.

   The collective and decentralized spread of information allowed the community to keep up with rapidly developing issues. The Facebook group was able to create a sense of urgency, enabling them to take action – namely, locations of meetings, details on the town hall agendas, and a space to collectively vote about the next steps.

4. **Applying pressure to individual actors**
   As Eli Tan of the NYT reports, "The project pitted the people of Peculiar not just against large tech companies but also against their own local officials." Social media played a key role in mobilizing disdain

and distrust of local officials (including through sharing AI-generated songs and TikTok videos) [Figure 2]. The community Facebook group also distributed information about new individuals supporting Project Harper. For instance, one post, "Let me introduce you to Jim Haddock," describes his work efforts on Cass County Citizens for Government Transparency, which, according to the post, "is shadowing our Local and County Governments to Push the Multi-billion Dollar Bigtech Corp Industrial agenda here in North Cass county."

Although the vote to restrict data centers would be made by the six aldermen, the community's demands were heavily targeted at the city administrator and mayor. These targeted efforts can be seen throughout the community's comments at the Board of Aldermen city meetings.

Figure 2. AI-created images about local government officials

Source: 'Don't Dump on Peculiar' Facebook group

Government and company role and response

The local government and Diode position themselves as open to communication with the community. At first, Diode executives were in direct contact with residents who lived near the project, hosting a meeting with the neighbors who live within 300 ft of the site. The community shared that at the event, instead of speaking to the group as a whole, Diode set up small presentation stations for community members to ask questions individually. Community members shared that they "were getting different answers to the same questions, and in many cases, they [Diode representatives] were unable or willing to answer the questions at all." One member commented that a poster claimed that over the next 38 years, the data center would result in tax income that would "repair all roads." Faced with further pushback, the city administrator hosted a community conversation called 'Let's Talk Peculiar.' However, according to the Facebook group, 50 people showed up to participate and found the meeting was canceled.

The community applied pressure on the local government, adding strain on the relationship between the mayor's intentions to protect "future development that might want to come to Peculiar" and the alderman, who expressed regret about a lack of transparency with the community around signing the NDA.[18]

Mayor Stark publicly expressed his grievances on social media, addressing the anti-data center community as a "boisterous and ill-informed group" and accused them of "spreading misinformation about the project." The local government maintained the opinion that the data center was in the town's best interest, with the mayor writing, "This project could have potentially meant hundreds of millions of dollars in revenue to the city district, fire district, and the county" and "could have used those funds to improve our roads and other infrastructure."

The Kansas City Area Development Council went further to blame the community's "very public debacle" for damaging "the city's reputation and our ability to attract good, positive developments in the immediate future."

Outcome

In September 2024, after eight months of community activism, the Board of Alderman[19] voted to reverse the decision to add data centers to the light industrial ordinance, meaning they are no longer permitted in the city.[20]

However, the community's activism persists.[21] Other towns in the US that are subject to data center development are turning to the Peculiar community for support and advice. Notably, Diode (among other large tech companies like Google) are rapidly developing hyperscale data centers in areas surrounding Kansas City, Missouri.

Today, messages seeking advice flood the 'Don't Dump on Peculiar' Facebook page: *"I am hoping to learn from you all. I just found out that a 350,000 square foot data center is being proposed behind my property"* and *"I live in a small town in Bristol IN we are right in the middle of a fight to stop an 800,000 1.2 million square foot data center trying to land in our town… What is my next step?"*

Peculiar's strong resistance is a testament to coordinating collective action and empowering other communities faced with data center development across the US.

[18] The NYT reported that Robert Wells, the alderman, also "found it off-putting that Diode executives preferred to meet with no more than three of them at a time."

[19] The role of the alderman concerns city planning and approving permits for economic advances to city infrastructure.

[20] In response to the outcome, Diode Ventures stated that they "are not discussing specifics about Peculiar because there is no active application submitted, given the extended moratorium by city leaders."

[21] As of 01/01/25, the community is mobilizing for a new agenda: "(1) Removal of Doug Stark as Mayor, (2) Termination of Mickey Ary's [contract], (3) End contractual relationship with the attorney, (3) Add to governing document: No employee may sign a Non-Disclosure Agreement (NDA); immediate termination for violation, and finally (4) Requirement for City Manager: Must reside within the City Limits of Peculiar."

Case study 3

ZEEWOLDE, THE NETHERLANDS

Operation Tulip: How locals used Meta's platform to mobilize against their data center

By Chris Cameron

Company	Location	Size (sq ft)	Status	Compute	Cost
Meta	**Trekkersveld IV, Zeewolde, Netherlands**	**17.9 million**	**Cancelled**	**200 MW**	**€700 million**

Summary

In Zeewolde, the Netherlands, Meta pursued the development of a hyperscale data center, 'Operation Tulip'. Despite attempts by the company and local council to operate discreetly, residents and local journalists mobilized to organize protests, disseminate information on social media, and apply pressure on local government agencies. Their collective efforts garnered national attention, prompting The Hague to impose a historic nine-month moratorium on all data center development in the Netherlands.

Context

The Netherlands has emerged as a leader in the global tech sector. It houses 296 data centers provisioning service to over 1,000 companies and has been named 'Europe's Silicon Valley'. The Netherlands also prides itself on being a major renewable energy producer, with 53% of electricity production stemming from wind and solar energy. Amid its growing focus on profiting from AI and the semiconductor sector, the country is reallocating its renewable energy resources to power data centers, despite existing demands for energy at the municipal level.

The impact of the expanding tech market and its reliance on renewable energy infrastructure caused community concern that has driven a change in the data center policy landscape. In the Netherlands, there are regulations and

policies targeting data center development at the national, regional and local levels. These regulations were put into effect in part due to community organizing and data center resistance tactics from local communities.

Around 45 km from Amsterdam is the municipality of Zeewolde.[22] In 2020, Meta sought to develop the largest data center in the Netherlands – a hyperscale data center project named 'Operation Tulip.'

Meta claimed the data center would use renewable wind energy only and, in order to meet energy needs, researchers estimated that 138 wind turbines would need to be built, requiring an additional 86.4 million square feet of Zeewolde's land. Initial construction reports indicated the data center would use a water-recycling cooling system from a nearby canal to cool down its servers.

Government and company strategies

Residents of Zeewolde were first informed about the data center during a local council meeting; however, they were not provided with transparent information about the project. Meta operated under the covert name 'Operation Tulip', and used the shell company 'Polder Networks'[23] to purchase the initial land, with only a few key partners[24] informed on their plans. This included Zeewolde's alderman,[25] Egge Jan De Jonge, who played a significant role in advocating for the approval of the data center plan ahead of the municipal council vote.

Notably, the land proposed for development, Trekkersfeld IV, was previously zoned for constructing local businesses (including up to 3,000 jobs) and would need to be rezoned for the data center project. Despite the fact that the data center could only promise up to 410 jobs – an economic loss of 86% – the provincial government marketed Meta's project as essential to national interest.[26] Many believed this marketing strategy would help expedite the land sale by the Central Government Real Estate Agency (RVB).[27]

Angered by the lack of transparency and mobilized by farmers who were forced to sell their land to make way for the data center, the residents of Zeewolde came together to protest. In response to the public criticism, Meta hired a public relations strategy team, the Dutch Data Center Association.

[22] Zeewolde has a population of 24,000 people; located 45 km from Amsterdam, the Netherlands' capital.

[23] As the Netherlands has been named a haven for global tax abuse, shell companies have been implicated in issues related to tax evasion.

[24] The Zeewolde government created a 'Tulip' steering committee including De Jonge, Appelman (the provincial executive), civil servant members from Zeewolde, the engineering firm, Arcadis, the water board and the construction/development company, Horizon.

[25] The role of the alderman concerns city planning and approving permits for economic advances to city infrastructure.

[26] Data centers, in reality, employ at most 20 onsite jobs per center. There have been many instances of governments and data center associations exaggerating this number.

[27] Garnering broader support by the government would make it easier to implement without full consensus by the public.

The association claimed that Dutch data centers follow the "Verdringingsreeks" policy, which prioritizes water use first for public drinking water and then is directed to industrial purposes. The association also emphasized the importance of data centers in supporting national digital infrastructure. They pointed out that, despite some politicians' criticism of Operation Tulip's energy usage, the national government was ironically one of the largest commissioners of data centers in the country.

Community role and strategies

Residents formed a community organization, Sichting DataTruc, to leverage their position at municipality council meetings. The organization's most reported concern was the estimated consumption of renewable energy required to power the data center (1,380 KW per year).[28] Additionally, residents were worried that the water used in the data center cooling process would contaminate the neighboring water supply, endangering a rare species of fish that lived in the canal.[29] In response to environmental concerns, residents called on The Hague to develop a national data center policy plan to counteract the local council's monopoly on decision-making power.

In response to Sichting DataTruc's concerns, the Zeewolde municipality's steering committee commissioned an environmental impact assessment report. The report contained a list of agreements that Meta was required to meet in order to maintain environmental regulations, including: repurposing the residual heat from the data center as heating for the surrounding homes, incorporating solar panels for its energy consumption, and designing the space as "nature-inclusive."[30]

Demanding accountability from their government, the residents of Zeewolde researched, organized, and protested in opposition to Meta's plans until they had national attention.

The residents used four noteworthy strategies:

1. **Advice from nearby data center resistance**
   Sichting DataTruc was approached by a politician from North Holland, who had witnessed the expansion of data centers in his region and warned of the resulting strain on local natural resources. His advice was specific and focused: residents of

[28] Documents obtained from the Government Information Public Access Request (WOB) revealed that the Minister of Economic Affairs had arranged for Meta to have a private connection to the energy grid.

[29] No data was recovered on estimated water consumption and we were unable to find specifics for this occurrence.

[30] It also included a commitment to funding community programs and financing the data center construction in its entirety.

Zeewolde should voice their concerns as loudly as possible, leveraging social media to attract attention from both the media and government officials.[31]

2. **Organized social media campaigns**
   Zeewolde residents coordinated protests at the town hall and shared information using X and Meta's own platform, Facebook, to garner international news coverage of the issue. The community's online petition outlined the harmful impacts of the data center and demanded Meta cease all construction of the hyperscale infrastructure. It was signed by 5,000 residents. The community's criticism centered on Meta in particular, arguing that both the social media platform and the data center did not provide an essential service to Zeewolde.

   Notably, the organisers were not against data center development broadly and did not consider themselves data center abolitionists. The community organizers even suggested building it in different parts of the world "that needed more economic support"[32] – a community stance that aligns with broader trends of NIMBYism around data center developments.

Figure 3. Artist's rendition of Meta's hyperscale data center on Trekkersveld IV

Source: Municipality of Zeewolde

3. **Investigative journalism**
   As the social media backlash grew, local news outlets investigated claims from the municipal government and Meta. Omroep Flevoland filed a Government Information Public Access Request (WOB) to obtain confidential documents between the municipality, the province, and Meta, which detailed the data center's cooling systems, energy use, tax incentives, and project financing agreements with local officials and shell company 'Polder Networks' (at the time, they did not know Meta was behind the data center).

[31] This information came from an interview with Susan Schaap on 12/11/24.

[32] This information came from an interview with Susan Schaap on 12/11/24.

Local investigative journalism from Omroep Flevoland revealed Meta was the company behind the project. They drew upon engineers, researchers and architects to compare data center architecture models from Apple, Google, Amazon, and Meta and discovered a unique architectural footprint in each. They also hired an energy expert to assess the feasibility of Meta's proposed residual heat model, ultimately revealing that it was not viable. Local media investigations helped establish case evidence against Meta which was later used in an electoral bid against data center building by the political party, Leefbaar.

4. **Influenced local elections**
   The residents' distrust for their current government was an incentive for a new political party, Leefbaar, to gain popularity. Leefbaar's platform was strongly against data center building; their published report calculated the renewable energy use of the data center to be twice the amount of Zeewolde's total energy consumption from its entire population. In March 2022, after resounding support from residents in favor of Leefbaar's anti-data center approach, Leefbaar's alderman, Helmut Hermans, was elected as the new alderman and De Jonge was forced out of council.

Outcome

In June 2021, community resistance led to a temporary moratorium on new data center building permits. However, Operation Tulip was exempt from this moratorium because it had already been approved earlier that year. Shortly before Meta revealed itself as the new tenant in November 2021, the local council voted 11-8, with the mayor and alderman securing support for the undisclosed project. Despite this, part of the land was still owned by the province, and after strong opposition from the community, the province placed a hold on the land sale in December 2021, angering both the local council and Meta.

Following the March 2022 election, the newly elected council voted to reconsider the project, leading Meta to pause its construction plans. The company stated that they wanted to be "good neighbors" and paused in an effort "to do their own research and consultation." That same month, Meta revealed they were building a new hyperscale data center in the drought-ridden region of Castile-La Mancha, Spain, Operation Tulip became Operation Zarza.[33]

[33] For more information on community data center resistance in Spain see: Tu Nube Seca Mi Rio.

In June 2022, one year after the provincial moratorium, The Hague issued a nine-month national moratorium on new data center building permits. However, Meta's project in Zeewolde was again exempt, as the alderman had already received provincial approval for building permits in the previous year. Soon after, the real estate company revealed it would no longer sell the land to Meta based on their failure to meet the environmental agreements[34] and, without land permits, Meta officially pulled out of the project the following month.

The Zeewolde case garnered national attention by influencing national policy and elevating political awareness of the consequences of data centers to the highest court level. However, data center building continued in other parts of the Netherlands, including Hollands Kroon.[35] The Zeewolde case also highlights the continued challenges of ensuring data center regulations are met amidst continued labor disputes, environmental concerns, and human rights violations.

[34] Namely, the residual heat engineering and the application of solar panels.

[35] Just after, in August 2022, a local Dutch media investigation found that water use of just one of Microsoft's data centers in Hollands Kroon was 84 million liters/year – seven times the previously estimated amount.

Case study 4

QUERÉTARO, MEXICO

Data centers exacerbate water shortages for local communities

By Chris Cameron

Company	Location	Size (sq ft)	Status	Compute	Cost
Microsoft	**Querétaro, Mexico**	**215,300 and 258,300**	**Completed**	**25 MW and 31 MW**	**Unknown**

Summary

In Querétaro, Mexico, data center development is expanding rapidly, with projections exceeding $10 billion in investments over the next decade. Among these projects are Microsoft's data centers, Ascenty1 and Ascenty2. These developments exacerbate the ongoing drought and recurring power failures due to strain on the electricity grid. The government's privatization of water and manipulation of the Indigenous land system is met with ongoing resistance and investigative research into the data centers' water usage. However, despite protests, education and a public intervention at the Supreme Court of Justice, data center developments in Querétaro are expanding.

Context

In 2019, Mexico's former president, Andreas Manuel Lopez Obrador (AMLO), presented his vision for Mexico to become a leader in cloud infrastructure. Shortly after, Microsoft confirmed a $1.1 billion investment to create Mexico's first cloud region in Querétaro, Mexico. Located 183 km from Mexico City, lies Microsoft's twin data centers in Ascenty1 and Ascenty2 (built in 2020 and 2022, respectively).[36] These colocation centers are in a seismically stable region with a reliable fossil fuel energy supply, and are part of a growing national vision for scaling up transnational technology investment in the region.[37]

[36] The state of Querétaro has a population of 2.5 million people, its capital is Santiago de Querétaro and is located 183 km from Mexico City.

[37] Mauricio Kuri, leader of the right-wing National Action Party (PAN), was elected

Environmental impacts

Climate change has led to Querétaro having its worst drought of the century in 2024 with 14.8% of the population lacking consistent and potable drinking water. While water becomes an increasingly scarce and costly commodity, Microsoft's Ascenty data centers rely on water-intensive air cooling systems to regulate server temperatures. Municipal water for the data centers is sourced from the Valle de San Juan del Río aquifer which is at a 56.8 billion liter deficit.

The energy demands necessary to run these data centers is also a concern. The addition of Ascenty1 is expected to increase the Vesta industrial park's energy demand by an estimated 20%. This will lead to higher carbon emissions, as 70% of Querétaro's electricity is generated from fossil fuels at the El Sauz Power Station. In response to concerns from multinational companies about the reliability of Querétaro's power supply, the local government is building a second natural gas power station, El Sauz II, despite calls from industry experts for a shift to renewable energy.

Government role and strategies

In 2022, Governor Mauricio Kuri, a leader of the right-wing National Action Party (PAN), passed a law privatizing all water. This law puts private companies in charge of managing water distribution. Private companies can now sell water to other companies in the form of 'water concessions' directly supplied from the aqueducts. The water concession process is not new[38] and has contributed to decades of water crises in Mexico, exacerbated now by nearshoring from the incoming US AI infrastructure boom. The Querétaro government's prioritization of natural resources for nearshoring[39] has allowed only the most privileged sectors to benefit, widening the economic gap for the working class.

Information about Ascenty1's water concessions is accessible from the National Water Board's (CONAGUA) public files. On October 23 2023, Microsoft[40] registered a water concession for 25 million liters/year for Ascenty1 (equating to "24% of municipal water allocated for public and urban use" in Querétaro for the year). That same day an additional water concession was registered by a similarly named business under the same 'industrial' category[41] for 575 million liters/year. It is highly likely that Microsoft purchased the two water concessions[42] but when asked, CONAGUA could not confirm or deny

as Querétaro's governor in 2021 and plans to maintain AMLO's vision. Kuri, along with the secretary of sustainability, Marco Del Prete, had confidential meetings with US data center companies to instigate the creation of several data cloud regions in Querétaro.

[38] In 1992, the National Water Law, LAN, established an equivalence between national and transnational corporations and households in terms of water concession use.

[39] An outsourcing strategy for companies to relocate their production processes to a neighbouring country with lower operating costs.

[40] Under the registered name MICROSOFT 6394 MEXICO S. DE R.L. DE C.V.

[41] Under the registered name QVC S. DE R.L. DE C.V.

[42] Concessions would total 600 million liters/year, indicating Ascenty1 is using six times the entire municipal water allocation for the year.

the claim. This is an example of the covert strategies employed by data center companies to conceal their water consumption.[43] When asked by investigative journalists directly, how much water the data center would use per year, the government responded that "[we] don't have that data because [we] are not in power to request it." However, scientists have found that on average, a 1 MW data center will use 25 million liters/year of water, suggesting that Microsoft's 25 MW data center could use up to 625 million liters/year of water.

To further downplay the region's expansion into AI infrastructure, the local government stated that data centers "do not pollute," are not an industry, and, therefore, are exempt from environmental taxes. However, fossil fuel emissions and toxic e-waste technically classify data centers as polluting industries, highlighting loopholes and lack of accountability in Mexico's environmental laws. Additionally, the local government claimed that each of Microsoft's data centers would create 100 direct and 20,000 indirect jobs regionally. Two years after building had completed, only 17 people work at the two data centers in total, an economic loss of 83%.

Investigative journalists also discovered that the government offered public land at no cost to another data center company as a business incentive, indicating data centers interact with the ejido system.[44] The system that protects Querétaro's communal land actually prioritizes transnational corporations, allowing sales if the Indigenous communities vote in favor. As Indigenous communities, like the Maconí people, supply water from fresh-water springs on their land to the municipality's aquifers, the government extorts and profits off of Indigenous resources without repercussions. In 2006, the government signed a treaty with the Maconí people offering to improve their municipal infrastructure in exchange for water access to build Aqueducto II.[45] The government never followed through with the treaty and left the Maconí people in a newly drought-ridden area. This caused protests across the state and violence[46] against the Indigenous water protectors. After the government ordered private companies to take their water, the Otomi people created the Mexquititlán Indigenous Council. The council supports Indigenous communities in strategic litigation to reverse the 2022 water privatization law as their water supply continues to decrease substantially each year.

Finally, Querétaro residents uncovered that the government supplies the local population with treated sewage water,

[43] In Mexico, many corporations have purchased water concessions without changing the original concession name, increasing their water allotment without divulging their identity. Additionally, there is no regulation on industrial water use in Mexico, actual data center water use per year could exceed the registered concessions without repercussion. (This information came from an interview with Diana Baptista on 10/18/24).

[44] Around 51% of Mexico's land is communal land and managed under the ejido system which is governed by Indigenous communities. This system was altered in 1991 by the NAFTA agreement, prioritizing transnational corporations, to allow land sales if the Indigenous communities voted in favor.

[45] This is the state's main water source.

[46] The economic interests between transnational companies and cartel overlap and there have been incidents where the corrupt relationships between these groups have become apparent.

raising concerns about its potability. A report by Bajo de Tierra Museo stated that 76% of Querétaro's water sources are contaminated by industrial runoff, and the water is unfit for human consumption. This insight was deeply concerning, considering that the fresh aquifer water is, instead, allocated to data centers, which require filtered water for cooling processes.[47]

[47] Similarly in Taiwan, water is prioritized for the semiconductor chip manufacturing industry and local communities are fighting for their water rights amidst water shortages.

Community role and strategies

Community resistance to Ascenty1 and Ascenty2 highlights the intersection of Indigenous land rights, water justice, and digital infrastructure. Data center resistance is just one area of the ongoing fight for environmental justice.

Figure 4. Microsoft's Ascenty2 located in Querétaro, Mexico

Source: Thomson Reuters Foundation, Miguel Tovar. June 17 2024

The government uses intimidation techniques to conceal critical information on data centers including from many municipalities and rural communities in Querétaro who are directly affected by them. For instance, when community members have tried to build cases of litigation against data center development, local academics, at the University of Querétaro, a publicly-funded institution, have refused to help, fearing retribution. Intimidation has discouraged local journalists from reporting on community concerns related to data centers. In some cases, they only agree to cover these issues if offered substantial payment, as the risks make it necessary to justify the effort. Similarly, local journalists have not reported on community concerns with data centers and, in some cases, these journalists have even asked for payment to cover stories of community importance.[48]

[48] Requesting payment of up to $150,000 pesos or $7,500 USD in exchange for telling their story.

Efforts to suppress resistance extend beyond the government. Real estate companies have attacked communities, desecrated their ceremonial spaces and in some cases, pretended to be ejidatarios[49] so that they could vote in favor of the land sale. In 2022, 72 activists were murdered in Mexico. Over half were Indigenous land defenders, with many others being journalists and researchers helping with their cause. As a result, critical information on data centers has failed to reach

[49] Indigenous people who govern land under the ejido system and vote on communal land agreements.

many municipalities and rural communities in Querétaro. For instance, in the town of Colon, located directly beside Ascenty2, many residents surveyed had no idea what AI or a data center was.

Community demands and strategies

1. **Public intervention at the National Supreme Court of Justice**
   Voceras de la Madre Tierra is a community-led, environmental-justice-focused organization that is actively protesting data centers.[50] In July 2024, at the National Supreme Court of Justice, they made a public intervention against data center development in Querétaro. They made a plea to include water as a fundamental human right within state legislation. This intervention came after state violence during a 2023 protest. They also demanded (1) state leaders "stop the promotion of [Querétaro] as an environmental paradise for the installation of data centers;" (2) transparency of all information surrounding data centers, and (3) stricter regulations on water use by data centers including not compromising water availability and quality for the local population. According to Voceras de la Madre Tierra, the local government and data center companies did not respond to their court intervention.

2. **Organized protests**
   Protests for water rights in the state have been organized for over two decades but have been more frequent after the 2022 water privatization law.[51] In October 2023, the Maconí people organized a 10-day march and sit-in at the Plaza de Armas square to draw attention to the lack of water and infrastructure – both of which were promised in a treaty 17 years ago. The government conceded to pay for the infrastructure and to supply their communities with water trucks and electricity. Although Voceras de la Madre Tierra wants to mobilize against data centers, they believe there is not enough information available and the low number of protesters at a march would detract from the work they have done at the National Supreme Court of Justice so far.

3. **Legal support and education**
   Bajo de Tierra Museo is an organization that investigates companies, educates local communities about their water rights, and supports active litigation against the water privatization law. They have recently started

[50] Using Facebook to connect with the local community and spread awareness.

[51] A historically violent water protest occurred in 2023 between the Escolásticas and the state. The Escolásticas were protesting an ejido-adjacent land sale to a private owner who built a wall that blocked the Indigenous community's access to water and installed pipes to privatize water access with the intent to sell it back to them.

investigating data centers in the region after releasing a report on Querétaro's water supply in late 2023.

Outcome

The government of Querétaro announced their upcoming infrastructure improvement to sustain both the electricity grid and water demands. They also initiated the first reforms on the 2022 water privatization law, declaring, "the use of treated [sewage] water in industry and commerce be prioritized." Both efforts failed to meet the community organizations' demands.[52]

Meanwhile, technology companies are continuing to invest in Querétaro:

- Microsoft has plans for three new AI-focused data centers. The three data centers will involve a total investment of $1.3 billion USD and will each consume an additional 49.5 MW of energy per year.[53]
- Google will invest $1.2 billion USD into a new cloud region.
- AWS will invest $5 billion USD in Querétaro and launch a cloud region that will focus on machine learning and AI.[54]

Communities are calling for legal protections, environmental justice, and democratic consultation after repeatedly failing to seek recourse through existing laws. One existing law is the Escazú Agreement, a treaty in Latin America and the Caribbean that protects environmental and human rights, including land defenders. Although Mexico has signed and ratified the agreement, activists in Querétaro have been told: "in Querétaro, the Escazú Agreement is nonexistent."

Following Voceras de la Madre Tierra's public intervention at the National Supreme Court of Justice, the government has started relocating communities from their ancestral lands as their water sources have been depleted from government use.[55] However, Governor Kuri is celebrated by the media as a savior in addressing the "drought issue", failing to acknowledge the government's explicit role in displacing these communities.

> In the words of the Otomi people: "it's not a drought, it's exploitation."

[52] Their spokesperson commented that the legal framework on water rights needs a total rewrite as it is "flawed from birth."

[53] In March 2024, Microsoft withdrew its 2030 carbon neutrality goal, acknowledging that the targets required to meet it were currently unattainable.

[54] This announcement comes after an AWS press event where they claimed "they will not use Querétaro's water" for their data centers, in an effort to win community support and differentiate themselves from the other data center companies.

[55] The government intentionally prioritizes water for commercial use, as well as misallocation of Indigenous water sources for state-owned infrastructure use.

Case study 5

EKURHULENI, SOUTH AFRICA

Equinix's JN1: A success, but for who?

By Prathm Juneja

Company	Location	Size (sq ft)	Status	Compute	Cost
Equinix	**Ekurhuleni, South Africa**	**20,000 space for colocation data center; 100,000 total area**	**Phase 1 completed**	**4 MW + 690 cabinets (Phase 1); 20 MW + 3,450 cabinets (Phases 2 + 3)**	**$160 million**

Summary

In October 2024, Equinix launched a $160 million colocation data center, JN1, in Ekurhuleni, just outside Johannesburg, South Africa. JN1 is part of a larger effort which views technological infrastructure development in South Africa as a "strategic gateway to the global digital community." Despite being built in a region with already strained water and electricity supplies, information about JN1's environmental impact and community response to the development is scarce. In fact, many local residents were unaware of the center and its potential impacts, and media coverage was sparse. Equinix's JN1 illustrates a broader paradigm of data center development: characterized by a lack of transparency, limited information, and minimal community engagement, limiting the ability to understand its potential impacts.

Context

In April 2022, Equinix, a California-based Fortune 500 data center company, completed its acquisition of MainOne, a Nigerian data center company for $320 million. This gave Equinix its first four data centers in Africa – in Nigeria, Ghana, and Cote d'Ivoire – alongside a substantial and extensive subsea cable network.[56] Shortly after its acquisition, the company announced its plans to develop a $160

[56] Undersea cables are essential in enabling data centers to share large amounts of information across continents with minimal latency.

million colocation data center, JN1, in Ekurhuleni, South Africa.[57]

Data centers are playing a growing role in the economic conditions of South Africa, with an expected 2024 revenue of $471 million. However, South African data centers are an increasingly consolidating market, with the top five players, including Equinix, occupying about 50%.

JN1 is closely located, on low-flood and low-seismic risk land, to Johannesburg, the largest city in South Africa and the wealthiest city on the continent. Johannesburg is home to the African headquarters of many major technology companies and internet exchanges.[58] South Africa has by far the most data centers in Africa, with at least 200 MW of live capacity, much of which is in Johannesburg. Equinix describes the city as a "key economic center and a rapidly growing interconnection point" with a "thriving economy and talent pool" and the "preferred hub for regional operations for both local and foreign based companies."

> Equinix has argued that JN1, and its future efforts in South Africa, are a "strategic gateway to the global digital community."

Environmental impact

A lack of transparency and available information has made studying the concrete environmental impacts of JN1 on South Africans challenging.[59] However, when viewed in a broader context, a primary environmental concern of JN1 is its potential impact on the water shortages in Gauteng province, which contains Johannesburg and Ekurhuleni. Although Equinix, water utility companies, and the government do not publish water usage estimates, JN1 is primarily air-cooled and offers additional water cooling.

Gauteng faced water shortages long before the region's data center expansion, and their presence may further strain existing resources. Similarly, Ekurhuleni government's water department and water suppliers have warned of shortages in the region, with some city governments issuing usage restrictions to curb consumption.

South Africa also has multiple subsea cable connection points, and the JN1 site has partnered with cable owner SEACOM. Additionally, when completed, the 2Africa subsea cable project, which circumnavigates the coastline of Africa to interconnect Europe and the Middle East, will also have multiple connection points in South Africa, and Equinix is a technical partner of the project.

[57] JN1 officially launched in October 2024.

[58] Johannesburg is home to the Johannesburg Internet Exchange (JINX), a major internet exchange point (IXP) (i.e., where internet infrastructure companies meet to exchange traffic) and the oldest in Africa. JINX is the primary IXP partner of the JN1 site.

[59] This was noted both in an interview with researcher Samantha Ndiwalana, who engaged in efforts to contact water and electricity suppliers, and in our own research.

JN1 may also have an environmental impact due to its heavy use of electricity.[60] It is worth noting that the top-listed community issue in Ekurhuleni's 2024-2025 municipal budget document is "power outages." While Gauteng has had a surge of solar energy construction in recent years, it, like most of the country, still heavily relies on non-renewable sources of electricity.[61] In its spec sheet for JN1, Equinix says it is targeting 100% renewable energy coverage for JN1 by 2026, but we were unable to find any specifics about those plans, nor about its reliance on the local grid infrastructure.

Based on the publicly available information about JN1, we cannot draw conclusions about JN1's impact on water and electricity supply in the region, other than draw attention to the fact that JN1, as specced out, is likely to use substantial amounts of electricity, and may also use a considerable amount of water, in a region facing shortages of both utilities.

Government role and strategies

JN1 appears to have support from the national and local governments. The launch event for the data center was attended by Nkosindiphile Xhakaza, the city's mayor and Mondli Gungubele, the South African minister of communications and digital technologies. Its construction was supported by the Gauteng Growth and Development Agency, as well as the city government.

As Equinix is California-based, the US government is also a supporter of the center, with the US ambassador to South Africa speaking at the launch event about how JN1 represents "two nations working together to build the infrastructure that will build Africa's digital future." Equinix announced its plans for JN1 as a part of the US government's 'Digital Transformation with Africa' initiative in 2022.

While Equinix has framed its investment in the region as helping connect Africa to the world, it remains unclear whether JN1, Equinix's acquisition of the Nigerian company MainOne, or its increasing market share in the consolidating data center and subsea cable infrastructure of Africa will benefit communities. For its part, Equinix has claimed that JN1's construction created a "significant number of jobs for women and the youth," but we were unable to find any specifics for this claim. These types of investments – and rhetoric – which are often billed as 'helping'

[60] When completed, JN1 will have a 20 MW capacity. Assuming a worst-case of always operating at full usage, this equates to 175,200 MWh over a year, or approximately 1.13% of Ekurhuleni's annual electricity consumption, based on usage data from 2011 (last available).

[61] It is important to note that emissions from non-renewable energy sources for data centers vary in severity of environmental impact, with coal and oil producing the highest levels of harmful emissions, while natural gas generates somewhat lower emissions, though still contributing significantly to environmental impact. However, even if companies say data centers run on rewnables, many rely on backup generators that use diesel.

countries, are part of a broader trend of tech companies expanding their efforts in the Global South, often alongside steep incentives and cooperative regulatory structures. In a summary of conversations with residents near JN1, Samantha Ndiwalana mentioned that some residents were frustrated that industrial projects in the area, like JN1, come with promises for job creation, but do little to change the residents' economic reality.

The South African government has recently voiced concerns about data centers. In June 2024, the Department of Communications and Digital Technologies released a National Policy on Cloud and Data, which mostly clarifies the requirements and powers of existing regulation. The policy requires that data centers must be built according to existing environmental legislation and are forbidden on heritage sites or other specially designated land. Notably, it requests (but does not mandate) that due to resource constraints, data centers should reduce their dependence on the national power grid and local water supplies, and that priority should be given to data center projects that self-provision water and electricity.

Additionally, the policy suggests that, given consolidation concerns, the national Competition Commission should expand its work examining the data center market, asking authorities to conduct pre-emptive studies of market trends and identify/prevent anti-competitive behavior.

Community role and strategies

During the course of our English language search, which included an examination of local news outlets, keyword searches on social media platforms, and discussions with other researchers, we were unable to find any information about community resistance to the JN1 data center project or any other specific data centers in Johannesburg.

Researcher Samantha Ndiwalana, who spoke to climate activists in the region, as well as residents near JN1, surmised this as occurring for a few reasons. First, a lack of transparency about JN1 and other data centers in general. Second, a lack of information sharing and media coverage about data centers' potential environmental impacts (many residents were unaware of the data center and its potential impacts). Third, existing activists have a lack of time

and resources to expand their already pressing environmental justice work to include data centers, which make up only a small part of the water and electricity concerns in the area.

Although not explicitly linked to data centers like JN1, there have been widespread protests in Gauteng over the lack of available water for residents. Water in South Africa is unequally distributed, with deep roots in colonialism and apartheid; white residents hold 98.6% of individual-use water rights in the country. The current water shortages in Gauteng are expected to continue for weeks or months, and protests are focused both on the lack of short-term water access and a demand for long-term solutions to prevent repeated shortages. These protests have targeted specific officials and government buildings, and in some cases disrupted traffic. There is evidence that some of these protests have been effective, with providers increasing the availability of water tanks. We were unable to find any discussion of the role data centers may be playing in contributing to the water crisis in Gauteng.

Outcome

The first stage of JN1 has been completed and launched with celebration from national, international, local, and corporate leaders. The future expansion stages also appear to be on track, and Equinix has plans for $390 million further investment in building data centers in Africa over the next five years.

It remains to be seen if/how the South African government's evolving policy on data centers will impact JN1 and Equinix as a whole, and whether the unrest and harm of water shortages in the Johannesburg region will result in any changes to the project.

'GOOD' INTERVENTIONS

There is value in exploring 'good' models of community-powered data centers and digital infrastructures.[62] Building 'good' data center developments means (1) addressing systemic power dynamics, and (2) developing ecosocial data infrastructures that center community governance, sovereignty, and decision-making.

Decentralized computing models have been proposed and implemented at various scales. For instance, students at the Royal College of Art in London have designed micro data centers managed at the neighborhood or individual level. The French startup Qarnot has commercialized such a model by placing servers in Parisian homes, where residents receive free heating from excess server heat while Qarnot rents out computing capacity.[63] Similar ecosocial data center prototypes have been built in Sweden at the RISE Institute using the excess heat from servers in greenhouses to grow vegetables year round, and in the Basque Country at the Donostia International Physics Center, through powering a vermicompost[64] machine from their supercomputers' excess heat.

More collaborative models of internet infrastructure can be seen in rural Kentucky, where the People's Rural Telecommunications Cooperative provides free high-speed internet service to schools, libraries, hospitals, and homes. Redistributing decision-making power into communities allows for creative and regionally specific interventions. For instance, the Larrakia People in Australia developed the first Indigenous-owned and operated data center at the Charles Darwin University.

While such projects demonstrate innovative approaches to more sustainable infrastructure, many remain embedded in existing extractive energy systems. In Sweden, for example, some 'green' data centers are powered by wind farms built on the Sami territory dispossessed by the government. As exemplified by the case of Querétaro, Mexico, efforts for climate justice are inextricably linked to Indigenous rights.

We do have a positive vision, where data centers are developed through genuine community collaboration, operate with sustainable energy and water use, and generate necessary economic benefits for the regions they are situated in. Achieving this vision

[62] Our definition of 'good' includes limiting environmental harm and not taking resources from local communities. We offer this analysis to begin imagining an alternative, liberated future—one grounded in community wellbeing and environmental care.

[63] The company reimburses the cost of the energy consumed by the infrastructures while renting the computing capacity of the server.

[64] Worms use heat to generate fertile compost used in agriculture.

begins with addressing the exorbitant computing demands that hyperscale data centers support and a lack of transparency around their development.

ANALYSIS

We found three themes interwoven[65] throughout the five case studies:

1. Companies and governments are driving data center development narratives.
2. There is a lack of information access and transparency around data center development.
3. There is a range of community responses and resistance strategies.

[65] While we provide insight into high-level trends, case study analysis runs the risk of decontextualizing learnings.

[66] For more on the realities and tension of laborers working inside data centers see Mayer, V., & Velkova, J. (2023).

Theme 1: Companies and governments are driving data center development narratives.

Data centers are not merely infrastructure but strategic assets. They are the manifestation of immense financial and political power. Throughout our case studies, we saw companies strategically market data center development projects through:

- **Overpromising data center benefits.** Regardless of geographic location, data center marketing follows a similar story: promised potential jobs, hypothetical future economic activity, faster internet speeds for locals, and claims of technological advancement for the region. One example is the creation of jobs in rural areas (e.g., promising upward of 400 in Zeewolde and 100 in Querétaro). In reality, data centers employ at most 20 onsite jobs per center.[66] The Wall Street Journal recently debunked inflated claims of data center jobs at OpenAI. Additionally, companies often play up their sustainability metrics and increasingly promote the narrative that AI will help solve climate change.

- **Financial incentives.** Local governments are often initially excited about the prospect of new investment and future tax revenue. National and local governments alike provide tax incentives to data center companies (as seen by PILOT

programs in the US), waive environmental assessments by claiming there are no carbon emissions (as seen in the Netherlands), and amend zoning codes or apply pressure to fast track project approval processes (as seen in Cerrillos Data Center, Project Harper, and Ascenty1).

- **Geopolitical power dynamics.** Data center development narratives are also steeped in national agendas. In the context of the US, for example, the so-called 'AI race with China' has fueled a surge in data center investments. Thus, data center development is often strategically pitched as financial favors to small (often rural) communities. For instance, in Missouri, the town's resistance to Project Harper was reprimanded by local officials for damaging their "ability to attract good, positive developments in the immediate future."

  This response can be contextualized in broader nationalistic rhetoric, in which supporting the data center development is presented as a patriotic duty to further technological and economic dominance. Similar nationalist narratives can be seen in Equinix's rhetoric in South Africa, which sought to help "women and the youth" by "connecting Africa to the World." Rhetoric supporting data center construction echoes ongoing narratives of promised 'development' that routinely accompany extraction from the local community. In this vein, carbon colonialism, where Global North 'outsources' carbon emissions by moving its digital emissions to the Global Majority, is also apparent in the cases of Chile, Mexico and South Africa.[67]

Data center development moves quickly, with opaque bidding processes and no centralized rules or standards for evaluating projects' environmental impacts. Amidst a lack of visible information, the narratives around data centers are determined and maintained by large technology companies.

Theme 2: There is a lack of information access and transparency around data center development.

- **It is difficult to access information about data center resource use.** For instance, in Mexico and Chile, utility companies and government agencies often lack specific information on individual data centers. In Chile, specifically,

[67] In Mexico, the expansion of renewable energy has displaced Oaxacan communities. Specifically, Spanish companies have developed wind farms to capitalize on Mexico's green energy demand. In Chile, the community was concerned that natural resources would be depleted to sustain data centers functioning as vast repositories for the Global Minority's data. Notably, the Global Majority includes low-income communities within the Global Minority. For instance, the Institute for Local Self-Reliance found that "nine out of the top 10 counties being affected most by this AI expansion or data center expansion are low-income communities, [with] predominantly Black populations" who already bear the disproportionate weight of social and environmental harm.

Google was evasive when environmental bodies asked whether the water rights they purchased were already in use. In Mexico, companies like Microsoft: acquire water concessions without disclosing their identity in official records; procure utilities through intermediaries that do not update annual usage data; or operate within industrial parks, making it challenging to disaggregate water consumption by individual firms.

Beyond water and energy use, assessing data centers' broader environmental and health impacts remains challenging. Other key questions – about wastewater disposal, fuel sources, carbon emissions, e-waste management, noise pollution, and public health effects – lack transparency. While such data may be available in contexts with robust environmental regulations, it was largely absent in the cases we examined.

- **Negotiations about proposed developments, financial incentives, and contracts are often concealed.** It is often difficult to find out about tax incentives or the details of the quiet deals made between large companies like Google, Meta, and local governments. Even the sheer fact that a data center is in a proposed planning stage is often kept under wraps. Data center companies often require local governments to sign NDAs, as observed in the Cerrillos Data Center and Project Harper. In Operation Tulip, Meta established subsidiary companies to obscure its involvement in land acquisitions and government negotiations.

- **Media coverage of data center opposition is sparse.** Most countries have data center associations that support tech companies, acting as PR firms to improve their data center's image and release information about building progress. In general, we found mainstream media coverage tends to be uncritical – repeating government and company claims about the benefits of data centers when the deals are announced, with minimal follow up coverage. In the cases of Cerrillos Data Center in Chile and JN1 in South Africa, national media did not report on the community opposition, while in Mexico, local media coverage of resistance of Ascenty1 and Ascenty2 was often superficial. In Project Harper, there was no local media coverage and in the case of JN1 and Ascenty1, neighboring communities were not aware of the data center developments, to the best of our knowledge.

Theme 3: There is a range of community responses and resistance strategies.

Communities' resistance to data centers is contextual. Communities' perception of resisting data center developments varies depending on the sociopolitical and geographic context. In some cases, resistance efforts remained localized – focused specifically on the town taking on NIMBY undertones – while in other cases, resistance was contextualized in broader climate and human rights efforts.

- **In the absence of critical reporting and publicly available information, communities are left to independently gather data.** This task was often undertaken by advocacy organizations, investigative journalists, or a few dedicated individuals volunteering their efforts.

  - » In Chile, MOSACAT activists navigated dense technical documents to compile questions for Google, while CIPER uncovered confusion regarding the water rights Google acquired for the Cerrillos Data Center.
  - » In Mexico, Voceras de la Madre Tierra petitioned and wrote letters to the national courts, and investigative journalists used Freedom of Information laws to access utility information as government agencies and companies refused to release data.
  - » In the Netherlands, investigative journalists from Omroep Flevoland helped expose Meta's greenwashing claims of sustainable development practices.
  - » In South Africa, researcher Samantha Ndiwalana's requests for information were repeatedly ignored by water and electricity utility companies.
  - » In the US, one local resident took time off from work to organize a social media campaign, investigate the data center project, and distribute information about protests and town hall meetings.[68]

  In all cases of resistance, communities rely on social media (namely, Facebook) as a primary way to engage in collective peer-to-peer education, uncover hidden information, and convene the community.

[68] Eli Tan, interview by Hanna Barakat, Jan 17, 2025.

- **Targeted pressure on local governments.**

> In all the case studies of community resistance, local residents had to confront data center companies on their own. Focusing on local governments was a strategic proxy in making their demands heard.

For instance, the mayor of Cerrillos was initially supportive of the data center project, but after a local referendum showed the community was not in favor of it, he now regrets not having warned his community of the environmental impact of the project. Similarly, in Missouri, the community applied pressure on the local government. Eventually, the alderman expressed regret about a lack of transparency around signing the NDA. Today, the town's demands focus on removing the mayor. Similarly, in Zeewolde, the residents' distrust for their current government was an incentive for a new, anti-data center political party to gain popularity.

RECOMMENDATIONS

Below, we highlight general recommendations for strategists, organizers, academics, and foundations. While some recommendations are location-specific, we include them to provide insight and inspire future strategy.

General recommendations

Recommendation 1: Increase available information and network-based engagement for both local governments and communities to counter corporate greenwashing narratives.

- **A) Understand what information government leaders need to help them make informed choices.** From local councils and town mayors to ministers of sustainability and heads of governments, there was a lack of understanding about the harm data centers can cause and an uncritical acceptance of companies' narratives of economic and environmental advancement. In the rare cases where local government leaders grew skeptical of developments, companies redirected their efforts (eg, Meta's relocation of Operation Tulip from Zeewolde to Spain). This highlights the broader need for cross-geographical support in information sharing.[69]

- **B) Equip affected communities with credible counter arguments**. In our case studies, it was often emboldened and doggedly informed community organizers who applied pressure to local governments. It should not be so difficult for communities to gain access to key information about what is going on, or to make clear arguments about the situation. Currently, due to the localized nature of data center developments, these corporate backdoor deals, non-disclosure agreements, and a lack of disclosure requirements, gaining access to even basic information about data center development is a recurring challenge. There is an opportunity for cross-movement coordination around both advocating for proactive disclosures and debunking greenwashing and economic-benefits narratives. This is organically happening on public Facebook groups sharing

[69] In the context of the US, national policy resource centers such as Good Jobs First are building databases that track corporate tax abatements and subsidies for data center development.

information about data center development across different counties, but more systematic information sharing would reduce barriers to advocating for community needs.

Recommendation 2: Ensure community consultation is meaningful.

Climate activists, researchers, and communities have documented company greenwashing tactics promoting data center development; however, in response to the spreading information about the harmful impacts of data centers, companies and developers are now strategizing ways to pre-emptively curb community resistance (in line with broader patterns of 'greenwashing' and 'participatory-washing'). Other tactics include: "bridging conversation with local communities" to "support a more amicable response"; education in K-12 classes; providing material support via donations;[70] strategically forming community advisory boards, partnerships with local businesses, and local education initiatives; and holding community events on data center campuses.

While democratic consultation with community members is essential, public hearings and community consultation often happen after developments are secured or underway, if at all. Efforts to require community consultation should be co-created in collaboration with organizers.[71]

Recommendation 3: Provide material support to communities resisting data center development.

Community organizers are often unpaid volunteers working with their neighbors. A little bit of resourcing would go a long way to help them in their fight. Future efforts could explore financial support through microgrants to grassroots organizations to help cover legal fees, commission research, and engage in public awareness campaigns. Additionally, access to specialized expertise – whether legal, environmental, or technical – strengthens community-led resistance by equipping organizers with credible arguments to challenge data center projects.

For instance, in Chile, MOSACAT hired an environmental lawyer to represent them with Google and the various government agencies; meanwhile, in the Netherlands, the Zeewolde community relied

[70] For instance, Sabey Corporation provided youth in Douglas County, Washington, with a $15,000 grant to purchase Chrome tablet computers.

[71] For instance, in Peculiar, Diode hosted a community presentation and the city administrator hosted a 'Let's Talk' community conversation. However, when asked for further transparency, the company's responses to questions exposed inconsistencies. This ultimately furthered distrust in the local government. In the case of Chile, MOSACAT was invited to take part in a national working group; however, they ultimately withdrew from the group because they felt the resulting plan would neither sufficiently benefit the environment nor serve the interests of the Chilean people. That said, there are increased efforts to strategically negotiate conditions to proactively protect families, local businesses, and tax payers– protecting residents from subsidizing the costs across the data center's infrastructure and energy needs.

upon expertise from energy researchers, which debunked Meta's claims of a sustainable residual heat model. While the material needs of communities vary by context (and should come from them directly), we highlight two key high-level areas for further exploration.

- **A: Resource strategic litigation.** Strategic litigation is essential to ensuring data center projects comply with environmental and regulatory standards, and to advancing jurisprudence related to data center development in a way that better serves the public interest. Our research highlights opportunities for legal intervention, particularly in early approval phases when projects are fast-tracked or exempted from environmental oversight. Community-led collaborations between national investigative journalists and environmental lawyers are one key way to create a collective research base useful for strategic litigation. Funding digital rights-focused litigation hubs, such as R3D in Mexico City, can enhance legal support for affected communities and hold both corporations and governments accountable.

- **B: Invest in research and investigative journalism.** Sustained funding for independent research and investigative journalism is critical to addressing transparency gaps—not just around data centers, but across the entire supply chain.[72] Our case studies highlight how investigative journalists play a key role in uncovering hidden information and exposing 'greenwashing' narratives. Their work provides communities with publicly accessible evidence and shapes informed advocacy. Funding independent journalists[73] and researchers[74] strengthens accountability mechanisms and ensures that critical information reaches both policymakers and the public.

Recommendation 4: Demand key information is made proactively publicly available.

Comprehensive frameworks would improve transparency around the operations of data centers at both the national and international levels. For example, the EU's Energy Efficiency Directive will require stricter public reporting from data centers, in all EU countries, on energy consumption, water use, and carbon emissions. While not yet in force, this provides a promising example of how data centers can be monitored, putting the onus on the *companies* to produce the data

[72] Data Centers are just one part of a broader extractive supply chain that includes a range of toxic emissions and human rights abuses..

[73] There are a couple of existing fellowship programs that fund researchers in this space - Green Web Foundation and Mozilla Tech & Society, plus the Green Screen Coalition, which provides small catalyst grants to those working on environmental justice. Some of the larger foundations are exploring how to support communities to resist data centers, but to date there has been little philanthropic support..

[74] One outlet that stood out for their high quality coverage of data centers was Rest of World.

and on the *government* to enforce the framework, thereby establishing distinct roles for the public and private sectors.

Another opportunity is to ensure environmental impact assessments are publicly available, as they are in many countries. Environmental impact assessments occur before breaking ground on a project and are a collective, consultative process, usually involving impacted communities, local environmental organizations, and Indigenous leaders. As seen in the Netherlands, environmental impact assessments can determine moratoria or caps on energy demand and water amount availability for data centers. Environmental impact assessments are necessary as data centers are defined as part of industry, not as service providers.[75] More broadly:

- **Data center companies** should meet standards of transparency and make their information publicly accessible by communities, especially in areas with electricity and water shortages. They must also be transparent about their past interactions with local communities.

- **Publicly-owned utility companies** should provide information about baseline community water and energy use to communities, and clear projections of what a new data center project would require for the lifespan of the project. If utility companies are unwilling to provide such information, then strategic policy, litigation, media attention, and activism may create the necessary pressure for change.

- **Local government officials and data center company representatives** should be prepared to answer residents' questions honestly and fully. And over time, information shared about the projects of hyperscaler companies should be compiled to cross-check claims and support local officials and communities to ask the right questions and demand answers.

[75] Data centers should be categorized similarly to other polluting industries, like natural gas and fossil fuel companies, and assessed in the same way.

Recommendation 5: Increase multistakeholder and cross-movement convening.

Many communities resisting data centers do so with limited guidance or external support. The rural nature of data center developments is an important context when strategizing about convening– there is an opportunity for future cross-geographic

and cross-movement learnings that address the lifecycle of harm across technological development (eg., human rights activists, environmentalists, critical data and security researchers, labor movement organizers, Indigenous activists, etc.)

Facilitating convenings among stakeholders would help distribute a network of knowledge and connect local organizers with environmental lawyers, policy researchers, litigators, and Indigenous activists across the entire lifecycle of technological development.[76] This would help to craft stronger legal cases and influence regulatory frameworks.

One example is the working group of local organizations that are collectively suing AWS. This group was initiated by Ecologistas en Acción and includes Tu Nube Seca Mi Río, an activist-led organization that collaborates with other data center resistance efforts across Europe. Supporting partnerships with energy researchers, environmental scientists, and investigative journalists to critically assess corporate sustainability claims would provide communities with credible counter arguments.[77] More broadly, convenings provide a space for communities to generate visibility for movements and surface information.

CONCLUSION

Currently, the development of data centers is largely shaped by corporate and governmental narratives that overpromise economic benefits while simultaneously reinforcing geopolitical power dynamics of extraction and excessive digitization.

> Our report highlights how data center companies choose locations around the globe where they have less financial, environmental, and political restrictions.

Moreover, data center resource use, financial incentives, and contract details are often concealed, making it difficult for communities and decision-makers to assess the impact of data center development and to weigh important decisions carefully.

Because of this, the task of uncovering information often falls on

[76] For example, The Securing Indigenous Rights in the Green Economy (SIRGE) is a global coalition working against harmful rare earth mineral extraction (such as copper, coltan, nickel, and silicon) for technology products, including the renewable energy sector.

[77] For instance, in the U.S., strategic approaches to addressing data center developments are grounded in labor movements. Organizations such as Data & Society and Tech Workers Coalition alongside The Enabled Emission Campaign, Amazon Employees for Climate Action, DSA Tech Action, Responsible Mining, Media Justice are working to convene and strategize around data center development.

individuals and communities to use their own time and resources to lead investigations on data centers and mobilize support for their cause. There is a need for increased resources and support for legal, academic, journalistic, and technical expertise.

Beyond community support, national and global efforts to increase public access to information, including environmental assessments, are essential. As our list of recommendations outlines, improving outcomes for communities impacted by data center development will require restructuring corporate and government incentives. There is a need to systemically address the 'whack-a-mole'[78] approach to resisting data center development– whereby opposition leads companies to relocate (or outsource) data centers to areas with less visibility or weaker regulation.

Data centers are a physical manifestation of where "the cloud" meets cement. But these giant cement boxes house more than just data– they are symbols of intersecting harms from exorbitant use of limited local water and power, to the broader extractive global supply chain (eg., rare-earth mining) of technological development, to the growing accumulation of data used for surveillance and exploitation.

This 'physicality' is an opportunity. Data centers can serve as a unifying issue, bringing together climate activists, Big Tech accountability advocates, and human rights defenders across the Global Majority and Minority to coordinate action– starting with the communities on the front lines of data center development.

[78] Whack-a-mole is a game using a mallet to randomly hit toy moles, who disappear and reappear. The phrase is often to describe a situation where attempts to solve a problem result in temporary or minor improvement.

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APPENDIX

Additional context about data centers

Data centers are physical buildings with substantial amounts of computing infrastructure, used for tasks like training and inferring on AI models, hosting websites and services, storing information, running software, and more. They consolidate computational and assistive infrastructure[75] in one location.

[75] Services such as electricity, cooling, and security.

The vast majority (5,000+) of existing data centers are located within the US, and the majority of the data centers located in other parts of the world are owned by US companies. These data centers vary substantially across a variety of implementation characteristics, such as:

- **Customer-type:** Colocation data centers are operated by a data center company who leases out the space to technology companies using their own hardware. Hyperscale data centers are large scale data centers, often developed exclusively for one tech company. Hyperscale data centers can be incredibly large, with a few spanning up to 10 million square feet. Micro data centers are self-contained small data centers; they are not a subject of this report.
- **Type of cooling**: Data center cooling is an evolving landscape, with a variety of methods used to keep the computing equipment within operating temperatures. The two main categories are air-cooled and liquid-cooled systems.
  - » Air-cooled systems, which all rely on forms of air-conditioning systems, vary in the distribution of where coolers are and how the server racks are configured. These coolers use heavy amounts of electricity to cool ambient air, often by evaporating water into the data center. The water evaporation also results in heavy water usage, and discharges contaminants into the wastewater.
  - » Liquid-cooled systems are generally more energy and water efficient than air-cooled systems. They take multiple forms, including immersion cooling (where computing equipment is submerged in a liquid) and direct-to-chip (where the heat generating components are treated with a coolant and heatsink that is then cooled ambiently or by another liquid). In most cases, liquid-cooled systems are also in part air-cooled.

- **Location:** Data centers can exist in diverse locations, from the middle of major metropolitan areas, to the outskirts of rural towns and in industrial parks.
- **Electricity usage and sources:** Data center capacity can vary from small locations offering a few hundred kilowatts (KW) of capacity all the way up to hundreds of megawatts (MW). Their sources of energy and reliance on local grid infrastructure can vary too, with everything from isolated data centers running on their own sources of renewable energy to ones tapped directly into fossil-fuel based local grids.

[76] Power Usage Effectiveness (PUE) measures how much overhead, such as cooling and lighting systems, is required to maintain data centers. A lower number (1 being the lowest) signifies a more efficient system.

The influence of global policy

Government policies heavily influence the implementation choices made by data center companies. With the upsurge of data center demand in recent years, governments throughout the world have been implementing often conflicting policies that aim to incentivize, regulate, and oversee production of data centers.

In the US, President Trump has declared an energy emergency, allowing him to use expanded executive powers to speed up the development of power plants, including coal-fired locations, to fuel data centers, waiving environmental requirements and advancing a 10-year moratorium on state AI regulation. He recently announced a $500 billion 'Stargate' project between OpenAI, Microsoft, Oracle, and SoftBank. In the UK, the new Labour government has promised to accelerate data center development, designating data center projects as a national priority to fast-track their approval and prevent local councils from blocking new sites, including on historic 'green-belt' land. Malaysia recently streamlined its data center permitting process, adding in environmental and zoning requirements for buffer zones between data centers and residential areas.

Uniquely, Singapore has heavily regulated the data center industry, following a surge of data center developments in the 2010s, by implementing a moratorium on data center construction from 2019-2022. New data centers in Singapore, which are responsible for 7% of the country's electricity consumption, now have to meet stringent sustainability requirements set out in the country's 'Green Data Center Standard'. These requirements include high levels of energy efficiency (targeting a 1.3 Power Usage Effectiveness[76]), the use of green energy for power, and stricter requirements for water usage.

METHODOLOGY

Research question

In each case study, we discuss the factors that led to the proposal of the data center, government positions, existing policies, environmental/social/economic impacts, community opinions/resistance, and eventual outcomes. Specifically, we aim to answer the following questions:

- What corporate considerations influence data center location selection?
- How do different levels of government, and different government agencies and regulations (e.g., environmental/zoning/planning regulations) influence the development, transparency, and operations of data centers?
- What are the potential environmental/social/economic impacts of these specific data centers, and how do they influence government and community attitudes?
- Are local communities involved in discussions of data center development? If there is community resistance, what methods do people use to oppose development? What resources would be helpful in supporting those efforts?

Phase I. Landscape analysis

We began this research with a landscape analysis of data center developments. We aggregated existing and planned data center developments (~25). Through secondary research, we aggregated information about why a location site was chosen, what government planning and local consultation was undertaken, negotiations between the tech company and the government, consultations with local communities, tactics used by community groups, and so on. We also supplemented this information with a network mapping of relevant actors, individuals, and organizations involved in the resistance strategy.

Phase II. Case study selection

We selected five case studies of data center development across the globe from a survey of 25 available options.

Our criteria for the data center case study selection was:

- Diversity of locations – urban, suburban, and rural settings.
- Regional variability – centers across different climate zones and regulatory environments.
- Geographic representation – inclusion of centers in the Global North and Global South.

- Variety of data center companies – range of industry leaders and smaller-scale providers.
- Community resistance – centers which faced strong resistance and centers with minimal resistance.

In the vast majority of cases we considered for inclusion in this report, there was no evidence of resistance efforts. This narrowed our selection processes.

Phase III. Interviews

We then hosted a collaborative discussion among activists, researchers, and environmental justice activists focusing on data centers. We sought to facilitate shared learnings from others in the field and build a global network within a currently decentralized ecosystem of research and resistance.

For the specific case studies, we conducted targeted outreach to key stakeholders actively engaged in organizing efforts related to data center developments. This included community resistance leaders, local residents, journalists, academics, and environmental justice activists. That community's knowledge brought immense value to this report and we compensated our research partners for sharing their time and expertise.

Phase IV. Thematic analysis

Finally, we synthesized the case study findings into noticeable trends with recommendations to support government officials, local communities, and funders seeking to mitigate environmental harms and oppose the construction of data centers when appropriate. We sought to identify cross-cutting themes that highlight patterns in location selection, tech company practices, and methods of effective resistance.

A note on the lack of available information

In selecting case studies, we were limited by the availability (or lack thereof) of information about many data center development projects. For example, as noted earlier, this report does not contain a case study for a data center in Asia or Oceania. After our landscape analysis, two potential cases stuck out but were ultimately decided against due to a lack of available information.

First, the city of Johor, Malaysia has become a hotspot for data center development, increasing from a total data center capacity of 10 MW in 2021 to 1,500 MW in 2024. This is due to strong government support and close proximity to Singapore, which had a moratorium on data center development. Recent reporting has suggested that Johor rejected 30% of data center applications in the first half of 2024 because of concerns around resource strains. Apart from this, however, we were unable to find any substantial

information about which applications were denied, what sorts of resource strain concerns existed, other specifics about data center projects in the region, and information about any resistance efforts.

Second, in Mekaguda, India, Microsoft is building a data center on 22 acres of land. Recent reporting has shared that local residents had filed a petition against the company, claiming that during construction, it was encroaching on land and dumping industrial waste in a local lake. There is also some available information about Microsoft's complaints against the local council and the government encouraging completion in 2025. Other than this reporting, we were unable to find anything else about the data center's construction, the residents' complaints, and any success/failure they have had in resisting Microsoft.

This lack of available information is especially true for data centers in Asia and Africa, but is also the case for many data centers in the UK, Europe, and South America. For the dozens of potential cases we considered for this report, we were regularly unable to find information about the technical specifics, proposed energy and water usage, the available resources in the area, community consultations or complaints, clients and users, or government procedures.

It is worth noting, even among our selected case studies, there are substantial information-availability discrepancies, including lack of information about the technical specifics of a data center and information about local resistance efforts. These discrepancies are the product of differences in the amount of media coverage, the use of digital platforms by community groups, transparency requirements, and permitting requirements.

Subjectivity statement

In line with Design Justice principles, we believe it is imperative to address the 'experience of the knower.' This report was conducted by four researchers, located across a range of geographies (Mexico, the US, and the UK), educated within various disciplines (i.e., science and technology studies, environmental justice, biology, political science, and computer science), embody diverse identities (i.e., academics, organizers, and activists), and ethnicities (Palestinian, Indian-American, white British, and white Canadian). Our subjectivities inform our approach to the questions we ask, the cases we examine, and the analysis featured in our findings.

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