Issue 03

Data Centre Futures:
Land and space use

From asset to place: rethinking the connection between data centres and their environment

Foresight
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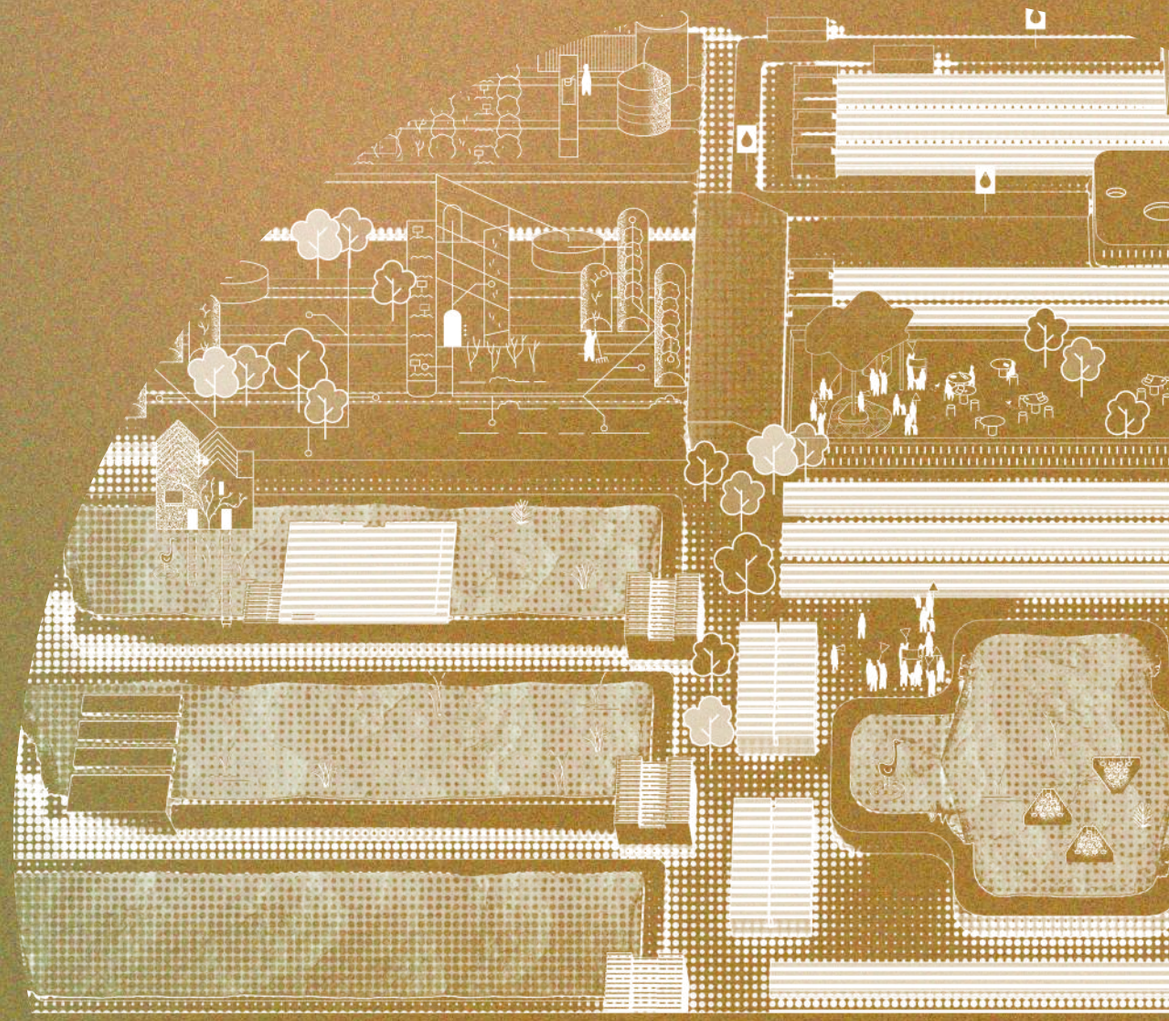

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Data Centre Futures – looking beyond the asset

Twenty-first century life — from the smallest everyday interactions to large-scale international and even extraterrestrial systems — is increasingly reliant on flows of data. While we would all feel the effects if these flows were disrupted, few of us pause to reflect on the vital digital infrastructure that transforms this data into meaningful insights, the communications, services, and operations that enhance our everyday lives.

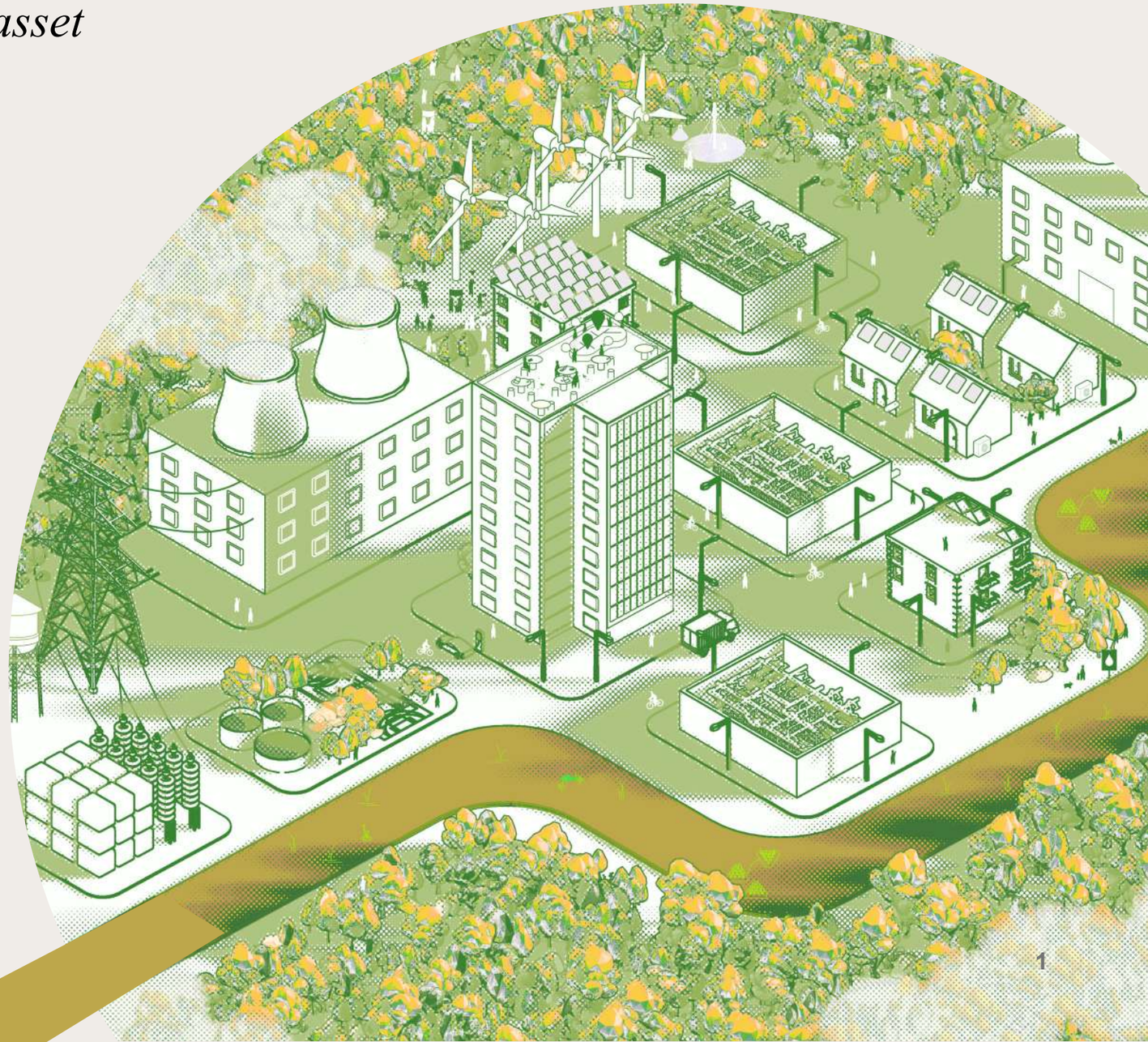
If left unchecked, data centres could destabilise the urban metabolism, crowding out resource flows that are vital for short and long term urban development.

Data centres embody a paradox. Their rapid growth is placing increasing strain on key resources, even as our dependence on them continues to intensify. Managing this tension is critical.

Within an ‘urban metabolism’, data centres are hubs through which flows of water, energy, materials, and people — as well as information — move. And as critical infrastructure, which needs to be protected, they can play a central role in shaping safe, resilient and regenerative places.

Data centres are critical nodes in one of the most prolific infrastructural periods in history. Thinking of them merely as ‘assets’ narrows our field of vision and limits the potential for wider, positive impact through their design.

So, what defines a ‘good’ data centre and how can the facility be both a ‘good neighbour’ and a ‘good ancestor’?



Data Centre Futures – looking beyond the asset

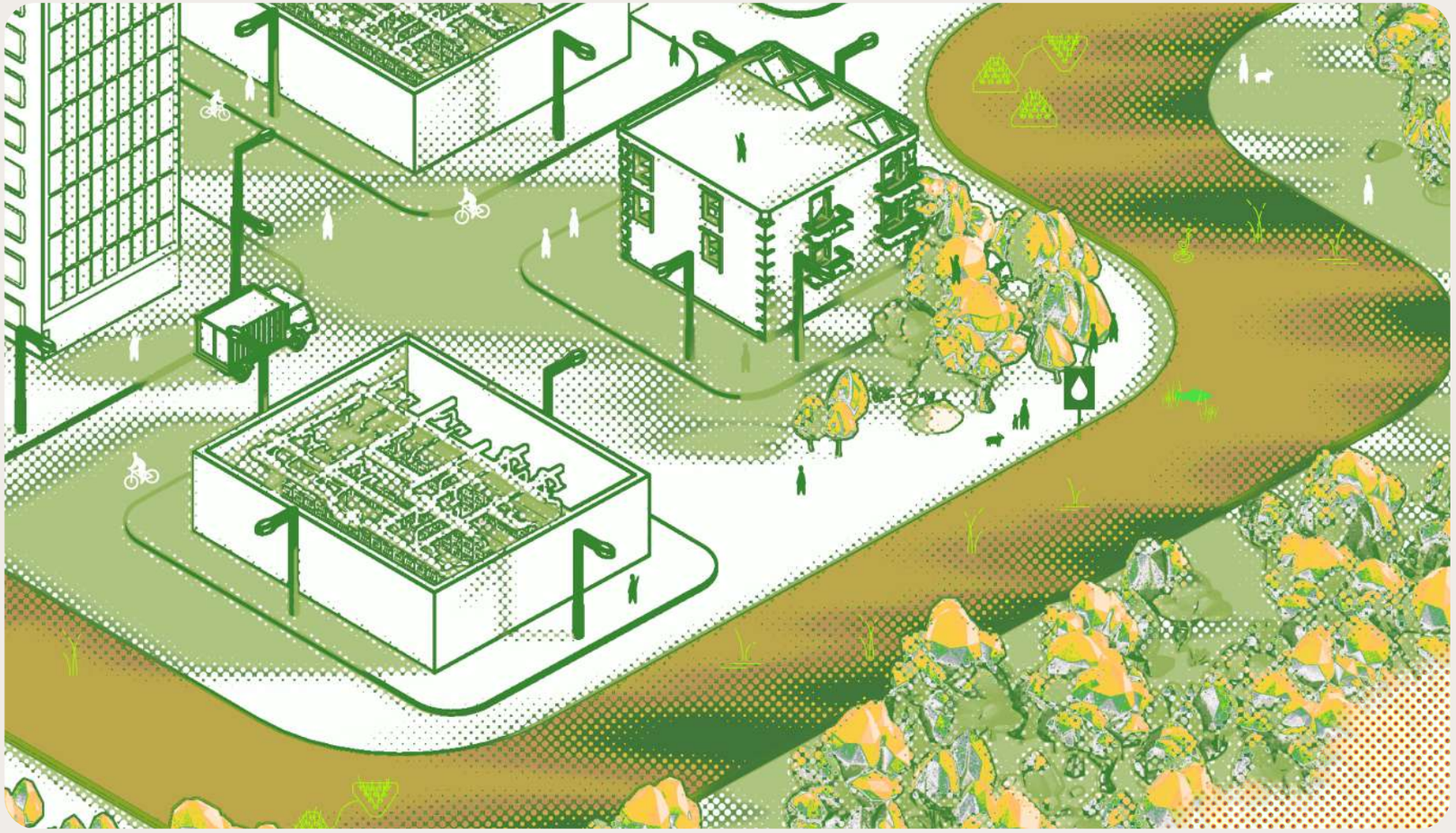
Being a good *neighbour* requires a rethink of 'performance' metrics; a reframing of 'efficiency'; a refocusing on their impact in the areas in which they are built. How can data centres improve their local place and their local ecosystem? Being a good *ancestor* requires an awareness that the infrastructure of today becomes the relics of tomorrow. It also means accounting for the impact of the decisions we make today on future generations.

Creating meaningful impact starts with long-term thinking and designing systems that can adapt to change. What happens when technological and socio-cultural evolutions make data centres, in their current form, redundant?

With this and subsequent issues, we explore the Future of Data Centres, building upon our already broad range of insights on Arup.com.

We aim not to defend a position, but rather to elevate the conversation around data centres, encouraging more of us to ask better questions about dangerous assumptions *and* possible futures in this fast-evolving landscape.

Hit pause, look up and look around.



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Data Centre Futures series

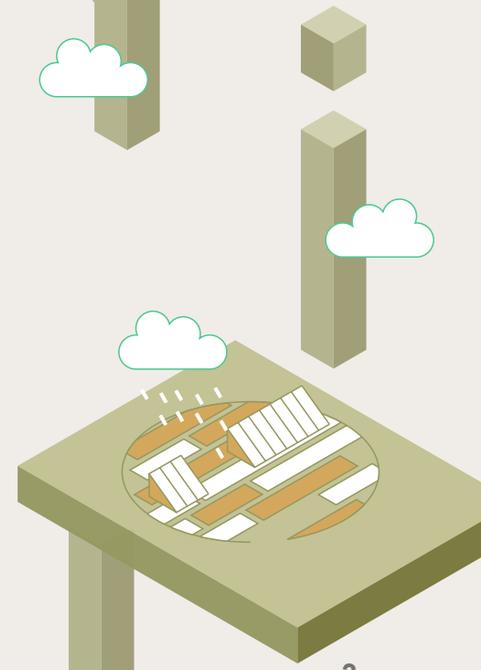
In collaboration with technical experts across Arup's global offices, the Foresight team presents the Data Centre Futures series.

Each issue explores a key theme, emerging issues, trends shaping future context, critical reflections and informed speculation on longer-term possibility.

In this, the third issue, we focus on the **land use and spatial implications of data centres**, understood as the land they occupy and the ways in which they shape, connect to and integrate with the places in which they are built.

What are the key forces influencing the sites for data centres now and in the next decade? How can data centres remain viable as compute technologies outpace the structures that house them?

What future disruption might cause data centres to lose their social licence to operate? And how might data centres play a role in cultivating safe, resilient and regenerative places?



Data centres' land and space use today

The rapid expansion of data centres is accompanied by an increased focus on their integration with local communities and environments.

Digital services, cloud computing and now AI have become fundamental to economic competitiveness and societal processes. The data centre sector is growing rapidly, with new facilities coming online at a pace that produces varied outcomes across regions.

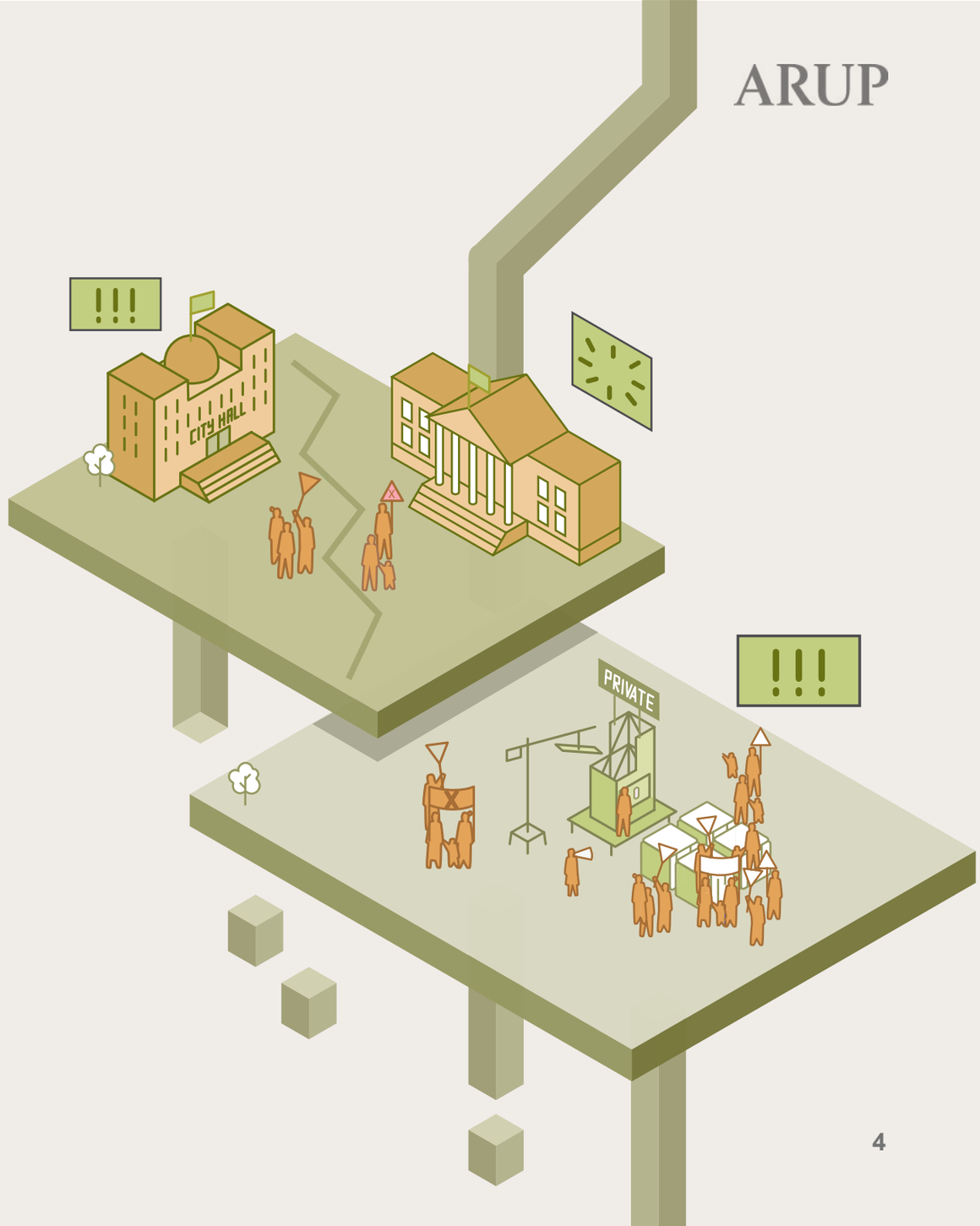
In areas with limited planning processes or those emerging as major data centre hubs, this speed often overwhelms local authorities, leading to moratoria, public backlash or missed opportunities to capture benefits.

Other regions take a proactive approach, using policy incentives and recognising data centres as critical infrastructure.

In these cases, partnerships help deliver the supporting connectivity and services needed for sustainable growth.

Regardless of the maturity of existing planning processes, local and national authorities must manage the additional demand for land alongside competing priorities such as housing, transport, industry, biodiversity protection and climate resilience.

This can result in conflict between the pursuit of economic opportunity, competition for resources, community sentiment and a functioning ecosystem. While the precise nature of the trade-offs varies across regions, they must be managed cautiously.



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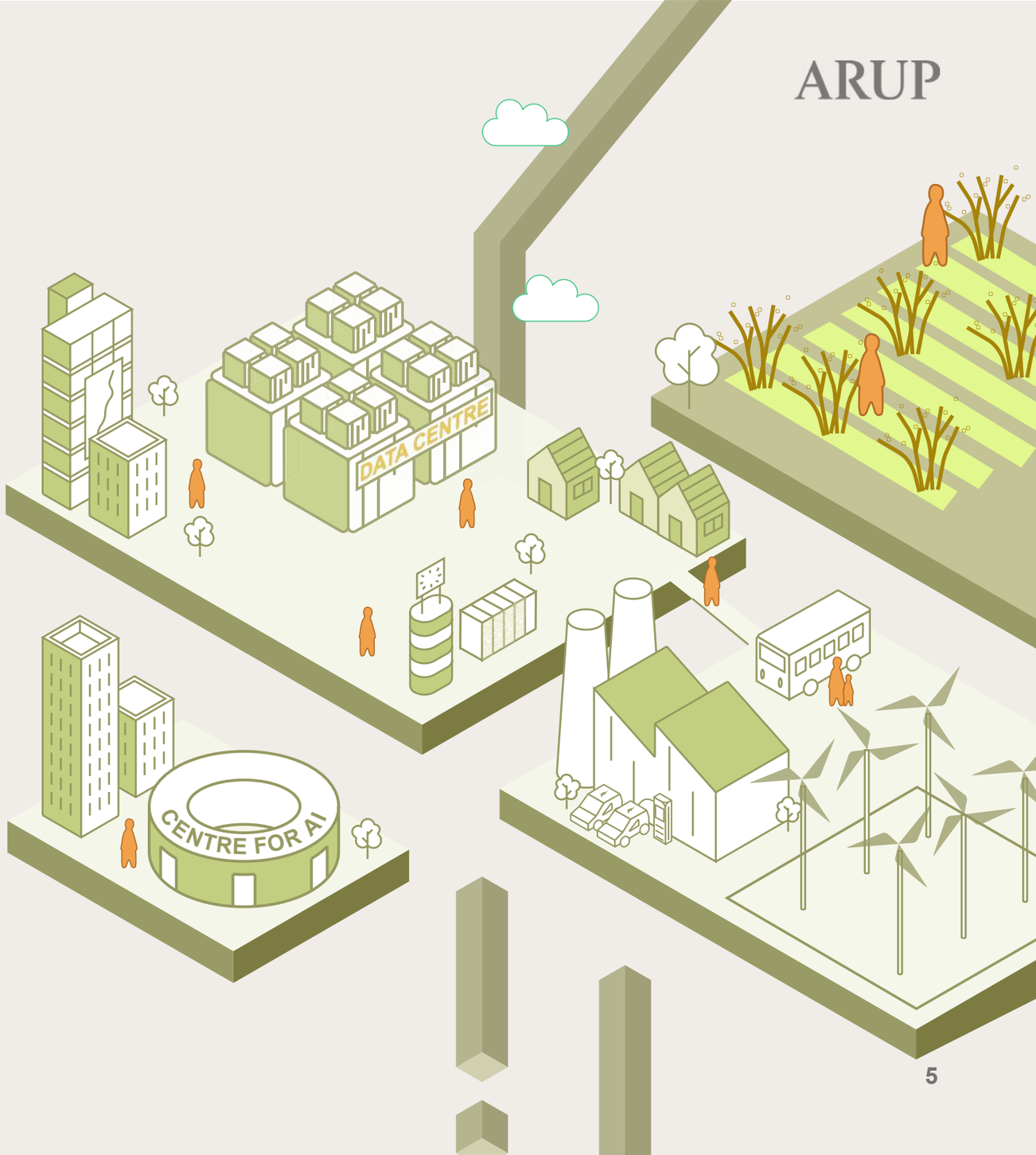
At the heart of this is the recognition that data centres are no longer invisible infrastructure. They are increasingly evident, resource-intensive neighbours whose impacts (noise, heat emissions, land competition) are experienced locally. This gap between widespread benefits and localised impacts has led some communities to feel they bear more costs than gains, particularly when facilities are developed without meaningful engagement or consideration of local priorities.

The critical question: what forces and factors are shaping the future use of land and space for data centres, and how might these dynamics evolve over time?

In exploring this question, it is essential to remember that no two areas, regions or markets are the same. The sector is a global patchwork, with different planning and regulatory environments, economic incentives, community responses, evolving climate and resource environments, and varying competing requirements for space. How might this evolve over time? What new considerations could help avoid the creation of stranded assets? What can unlock opportunities for socio-economic and environment regeneration at a local level?

While there is no standardised approach to data centre development and location, the sector has shown a tendency to cluster within established markets and regions. Such an approach sees operators and developers benefit from the network effects that manifest in dense technical ecosystems, skilled labour pools and robust utility infrastructure.



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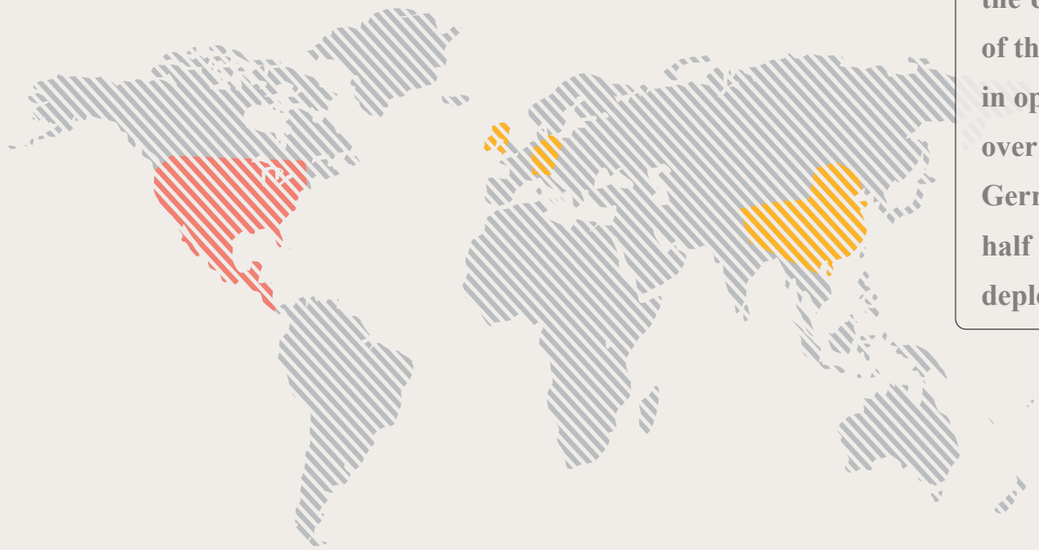
In terms of energy demand, the US and China account for almost 70% of global data centre electricity consumption, reflecting that it's not just the quantity of data centres that need to be considered, but also their wider impact on resource constraints.[1]

Urban to rural and everything in-between

In dense, urbanised environments, developers focus demand on a relatively small pool of locations that meet critical land, infrastructure and market requirements. This intensifies competition and land prices for the most suitable sites and corridors. Rising land values are often accepted as a cost that enables access to wider expertise. London, for example, which has some of the highest real estate and land prices globally, hosts around 80% of the UK's data centre stock.[2]

In such environments, data centres may compete with housing and other land uses, sometimes leading to restrictions on new development. On the other hand, data centres can act as anchors for new economic activity, creating new opportunities for local development and collaboration. For example, the adaptive reuse of brownfield sites or integration with district heating networks can generate tangible benefits for surrounding communities.

In other areas, data centres aim to fit into existing industrial or infrastructural ecosystems, or they are placed in the location perceived as optimal by their owners and operators without much consideration beyond their own requirements.



Global concentration of data centres

This dynamic has resulted in the US hosting almost *40%* of the 10,000 data centres in operation globally. Just over four nations (US, UK, Germany, China) account for half of global data centres deployment.[3]

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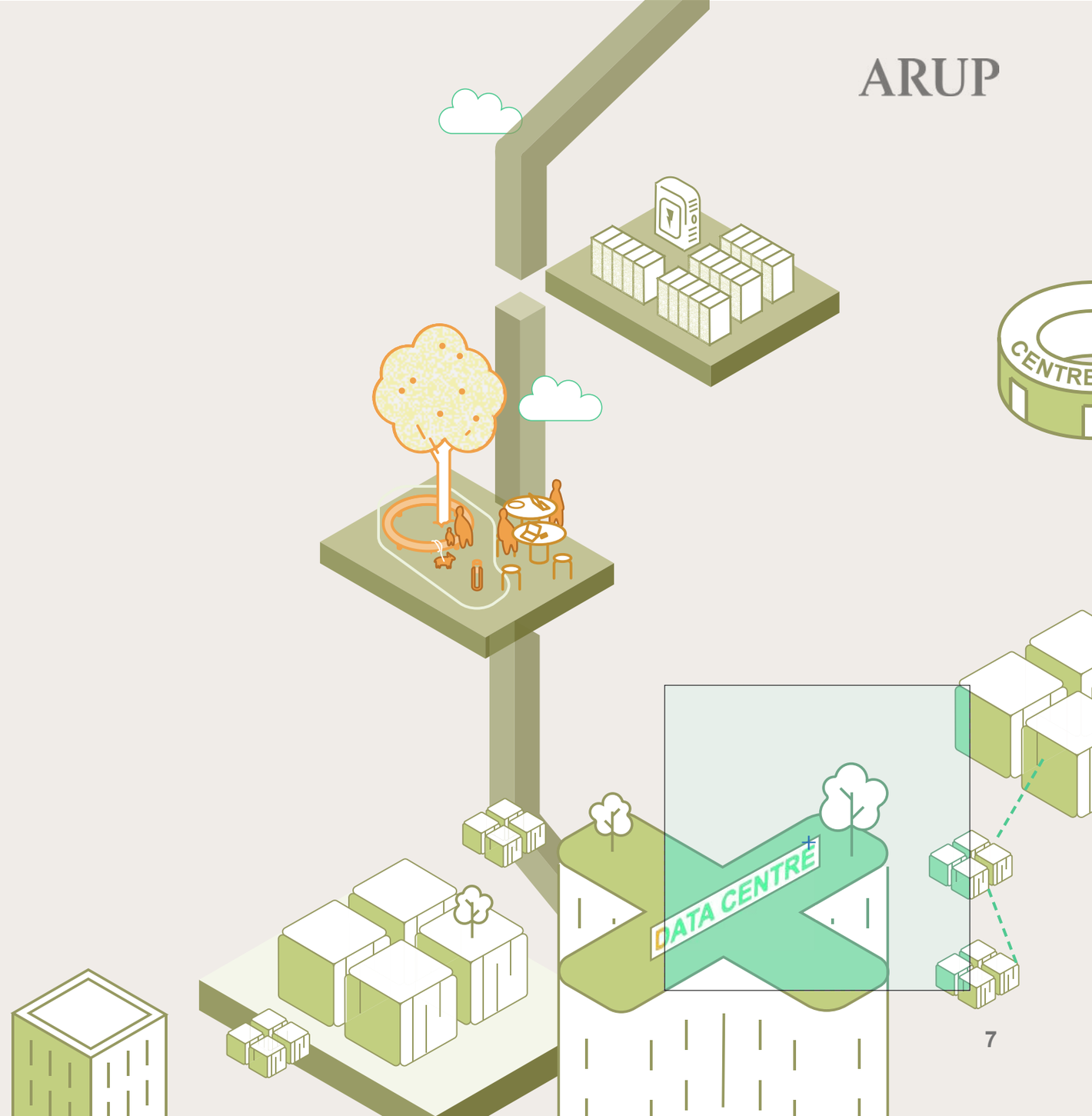
Data centres are increasingly locating in rural areas where land is cheaper and more available. These large-scale facilities can reshape local economies and resource flows.

In such settings, concerns often centre on their impact on landscapes and biodiversity raising important questions about land management and stewardship.

Welcoming a multi-stakeholder landscape

Land and spatial use of data centres is multifaceted, and nuance can be easily lost. Whether as part of a community, as a developer or as a local authority, all stakeholders will shape the sector going forward. Understanding these different roles and relationships is central to how future land and space decisions could, and will, be made.

While responses from places and authorities vary accordingly, there is clear value in actively planning for data centres, integrating them into long-term spatial and industrial strategies, aligning them with energy and water systems, and using targeted incentives to attract investment.



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Arup expert piece: the UK planning landscape

In response to a scarcity of power-ready and consented development sites, the industry is putting considerable effort into unlocking more sites for development. Data centres often have the economic muscle to ensure prioritisation ahead of other forms of development. In certain key market locations this is creating significant pressure on land resources where different typologies are competing for the same space. As data centres continue to scale up in size, these pressures intensify, requiring coordinated planning to balance economic growth with environmental and social priorities.

Because of the supply side issues that the industry faces, the UK Government for example has introduced national planning policy reforms aimed at supporting immediate development while encouraging longer-term plans that identify more sites and suitable cluster opportunities.

In urban contexts, data centre development is often sited in areas of industrial land – typically comprising of low-rise and under-utilised buildings. The ability for data centres to occupy multi-story buildings effectively allows more concentrated and, thus, economically beneficial use of the limited land resource.

For areas where data centres are emerging rapidly, the arrival of this unique typology of buildings can be met with resistance. Typically, data centres are viewed as monolithic inward-facing buildings which contribute little to the local economy or community. However, data centres are an essential part of today's digital infrastructure, the need for which is only increasing.

Through collaboration between data centre providers and local planning authorities, the full potential of the investment that these buildings bring can be harnessed. We have supported projects that deliver mixed-use outcomes to sites, including SME business spaces that provide an active frontage to the city.

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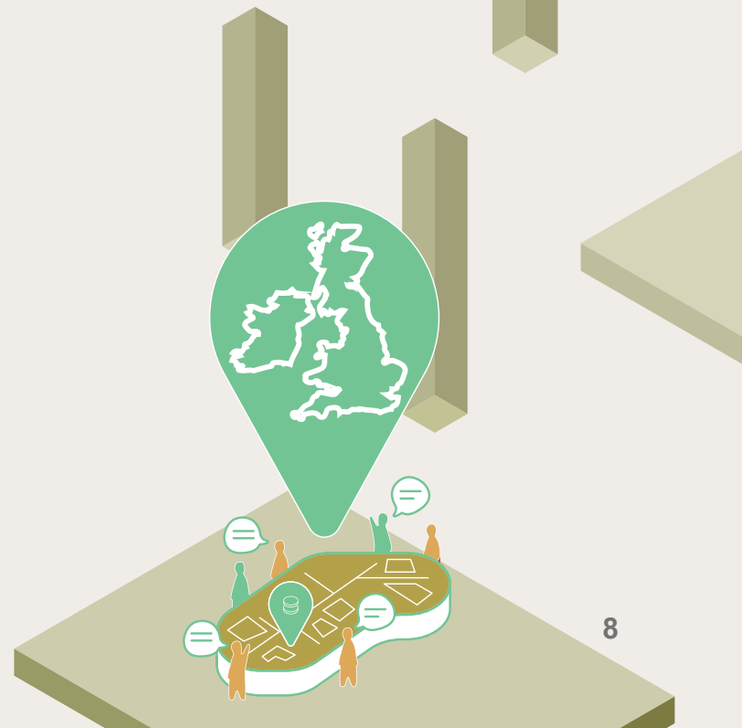

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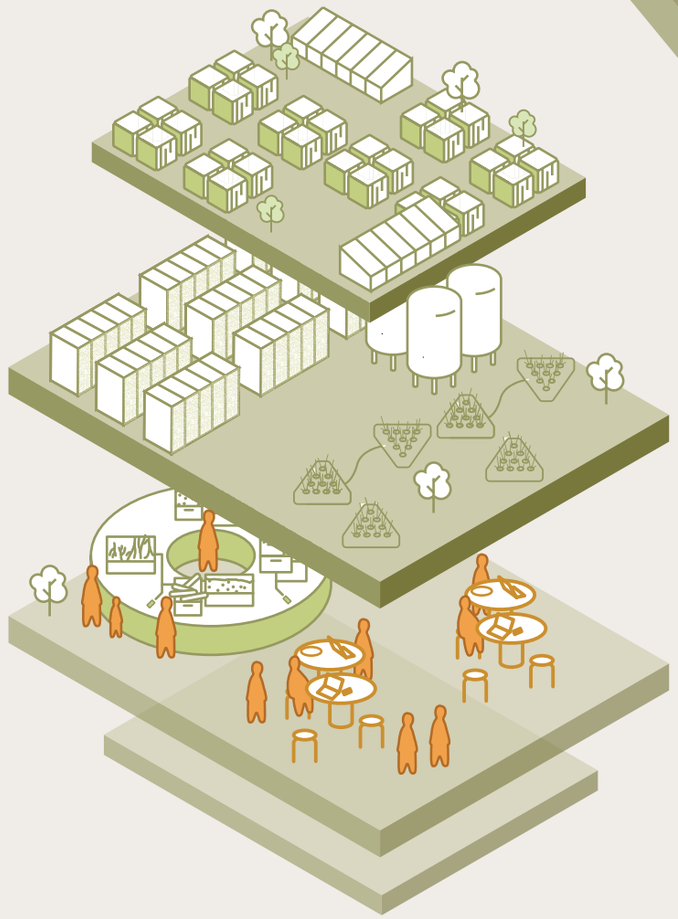
In other contexts, the planned arrival of a hyperscaler has been leveraged by authorities as an anchor investment and a signal to investors and stakeholders for development of broader adjacent innovation clusters. This requires a clear vision from local authorities, visible long-term commitment and supporting infrastructure, implemented by new zoning and planning that enabling synergetic economic activities to progressively co-locate. By planning for these synergies from the outset and proactively attracting relevant players, specific places can attract a diverse mix of economic activity, catalysed by the initial data centre project.

Another example is an urban project that featured an eye catching art façade, creating a building that does not shy away from its context. Instead, this building stands tall, proudly proclaiming its use as a data centre and inviting local residents and passers-by to interact with it. This unique piece of public art will provide benefits in an area dominated by large functional buildings offering little visual appeal.

The scale of development, particularly where greenfield sites are being converted, requires greater focus on ecological and green infrastructure credentials.

We are seeing schemes respond to this challenge with greater on-site biodiversity enhancements and opening up previously private land to public access for parks and green infrastructure to mitigate the impacts of these developments.

Data centres can be catalysts for positive change and economic prosperity in the communities they call home. By embracing this new typology of building, innovation can be given the chance to flourish, ensuring that the maximum level of benefit for local communities is secured.



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Arup expert piece: Social value and engagement

Dr Sara Candiracci
Social Value Global Leader, Arup

Susana Isabel
City Planning and Design Leader Spain, Arup

Drivers of Change: Competition and seeing community engagement as a journey

The rapid expansion of the data centre sector is reshaping urban and regional landscapes and creating pressure on communities and spaces that demand a fundamental evolution in how we plan, integrate and manage them. While regions are at different points in this journey, the changing dynamic between data centres, communities and local authorities is increasingly recognised as central to sustainable growth and long-term competitiveness.

Historically, data centre developers operated with standardised designs, making only minimal adjustments to meet local regulations.

This is changing, however, with a number of factors driving a shift toward more context-sensitive approaches.

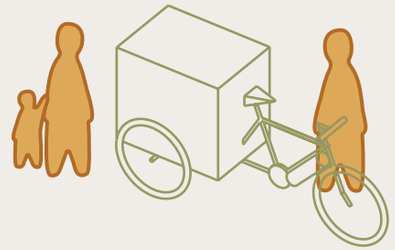
Competition

The data centre market is incredibly competitive, often with multiple developers chasing the same sites. Instead of a race to the bottom, this competition is driving a race to the top. Developers are increasingly differentiating themselves with community engagements, interventions and more socially conscientious designs. This shift moves them beyond simply meeting planning requirements to actively earning a social licence to operate.

Community engagement as a journey — from risk reduction…

In a fast-moving sector, any delay could have significant financial consequences for a project. Developers have historically approached community engagement as something they do only when they have to, opting to fly under the radar anonymously and often not disclosing who they are until the last possible moment.

In some regions, failing to engage with communities is increasingly leading to pushback and project delays from locwal authorities. As a result, developers are becoming more willing to invest in community engagement as a low-cost way to reduce these risks.



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… to ambitious partnerships

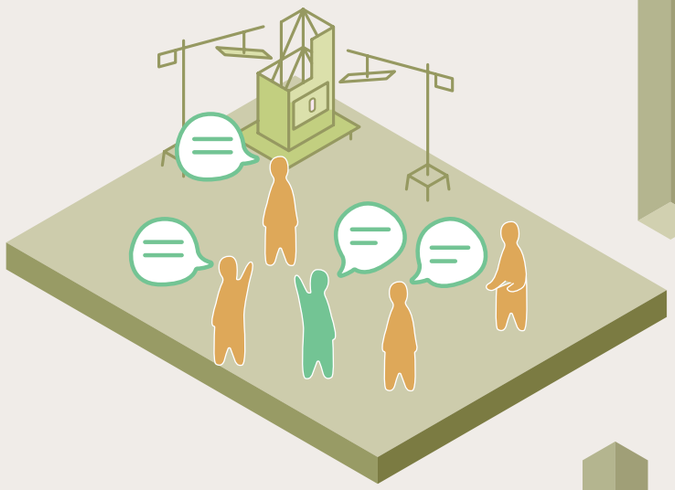
While risk mitigation remains a primary driver, there is a growing recognition that deeper engagement can unlock broader benefits. Collaborating with communities and local stakeholders — voluntarily and with transparency — is a much more positive and constructive approach to project development. It establishes trust within communities and local authorities, improving the perception of developers and, most importantly, helps create buy-in for future projects which, long term, act as a catalyst for innovation and change.

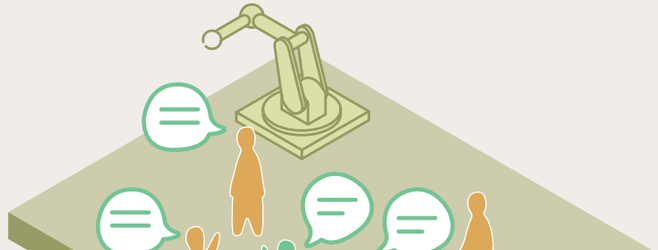
There is no single approach that should be followed in community engagement and data centre planning. It is often tailored to the local context, community and resource concerns, as well as the regulatory environment.

No one-size-fits-all approach exists

Geographically, community engagement is far more prevalent in Europe than in other regions. In Europe, engagement has become a necessity due to stricter planning regulations, higher social awareness, closer proximity to communities and longer approval timelines. Other regions often see faster permitting and less emphasis on community input, with engagement typically limited to statutory requirements.

The ownership of a data centre also affects the level of engagement with communities. Those who build and occupy their own data centres tend to invest more in long-term community relationships, while those who lease or sell facilities are less involved post-construction. Communities are often unaware of these distinctions, and can hamper efforts to drive engagement.





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The emerging interventions

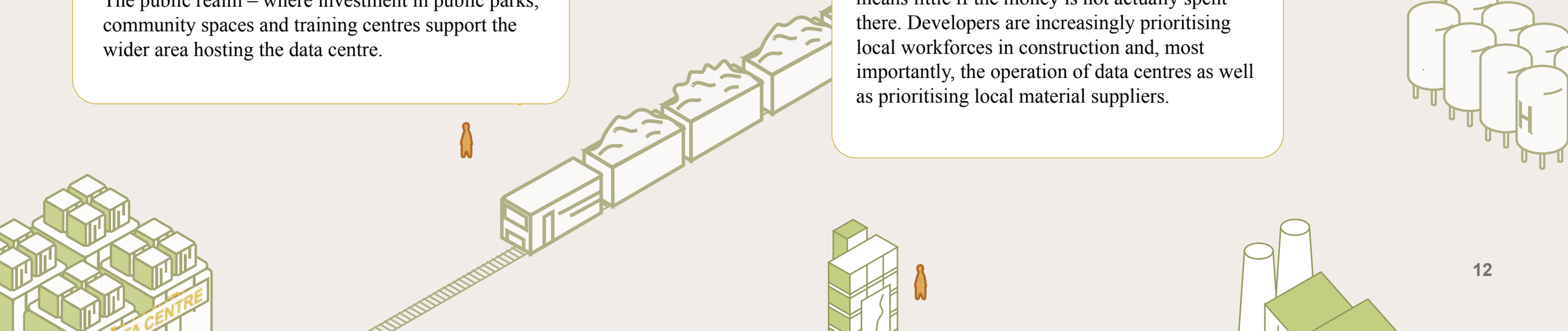
This evolving mindset is manifesting in a range of interventions that extend beyond the data centre site at a variety of different spatial levels. These reflect a growing push to maximise social and environmental value, rather than simply minimise harm. Interventions can focus on (but are not limited to):

Infrastructure resilience – communities benefit from a wide range of infrastructure upgrades that come with a data centre. For some, this may mean a new road enhancing connections to other areas, while for others it may mean reinforced power and fibre optic networks.

Positive resource contributions – environmental compensation measures, such as water-positive initiatives, are also gaining traction, particularly in regions facing resource constraints. Most importantly, many of these measures try to compensate the area hosting the data centre, rather than somewhere else completely unconnected.

The public realm – where investment in public parks, community spaces and training centres support the wider area hosting the data centre.

Local value chains – investment in an area means little if the money is not actually spent there. Developers are increasingly prioritising local workforces in construction and, most importantly, the operation of data centres as well as prioritising local material suppliers.



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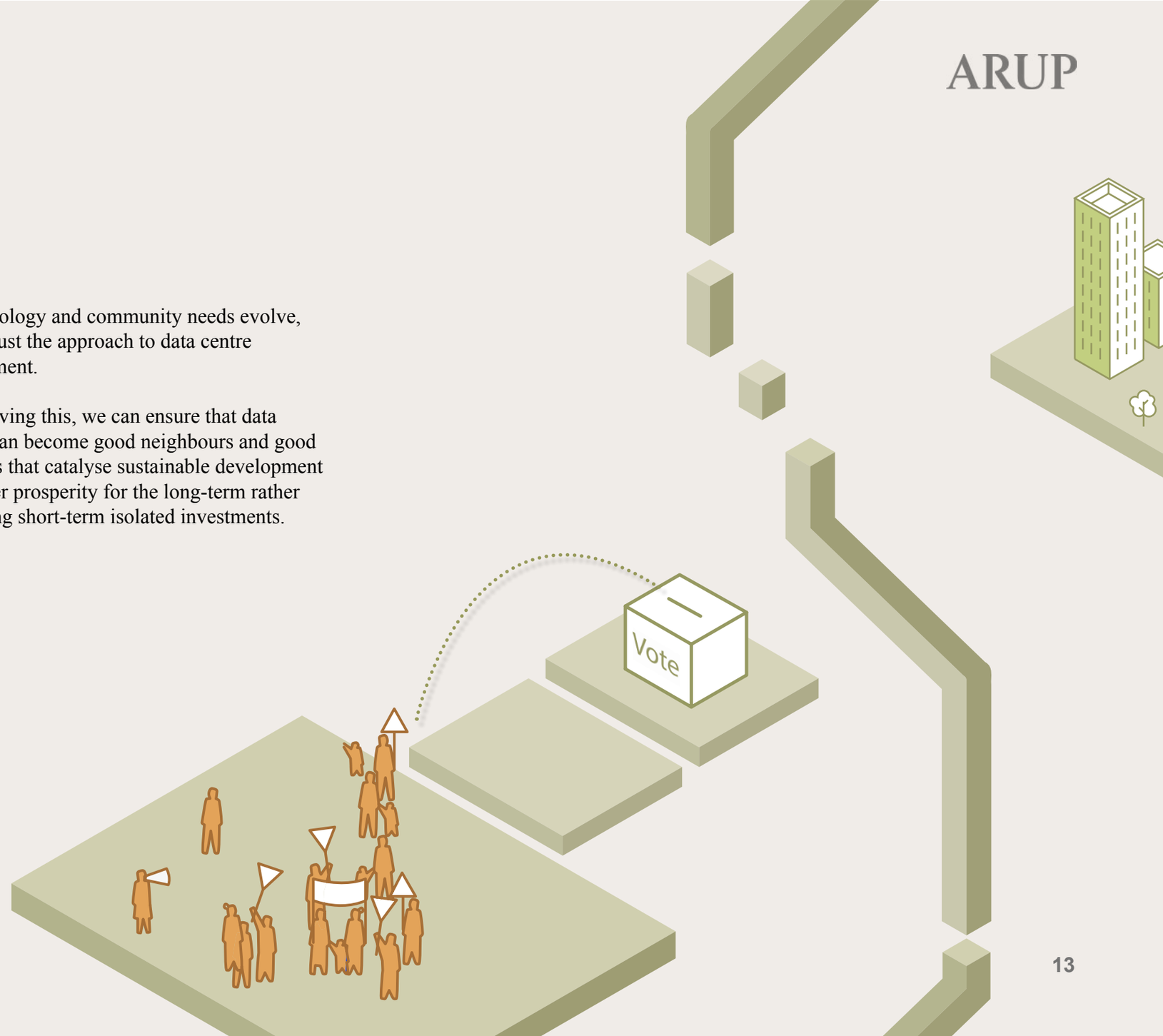
Toward a fundamental shift: Strategic planning and ongoing engagement

A lot of what we have described above is incremental, still often project specific and far too often the exception rather than the norm. Achieving a true evolution in data centre models and their engagement with communities requires more than incremental change. It requires strategic and coordinated planning that anticipates the sector's impact on local economies, infrastructure, and resource use.

This approach has to be proactive rather than reactive, with all the stakeholders actively engaging with one another across the whole lifecycle of a data centre, not just during planning and construction. Proactive engagement also includes adaptive planning to evolving needs of the data centre industry and local community over time.

As technology and community needs evolve, so too must the approach to data centre development.

By achieving this, we can ensure that data centres can become good neighbours and good ancestors that catalyse sustainable development and wider prosperity for the long-term rather than being short-term isolated investments.



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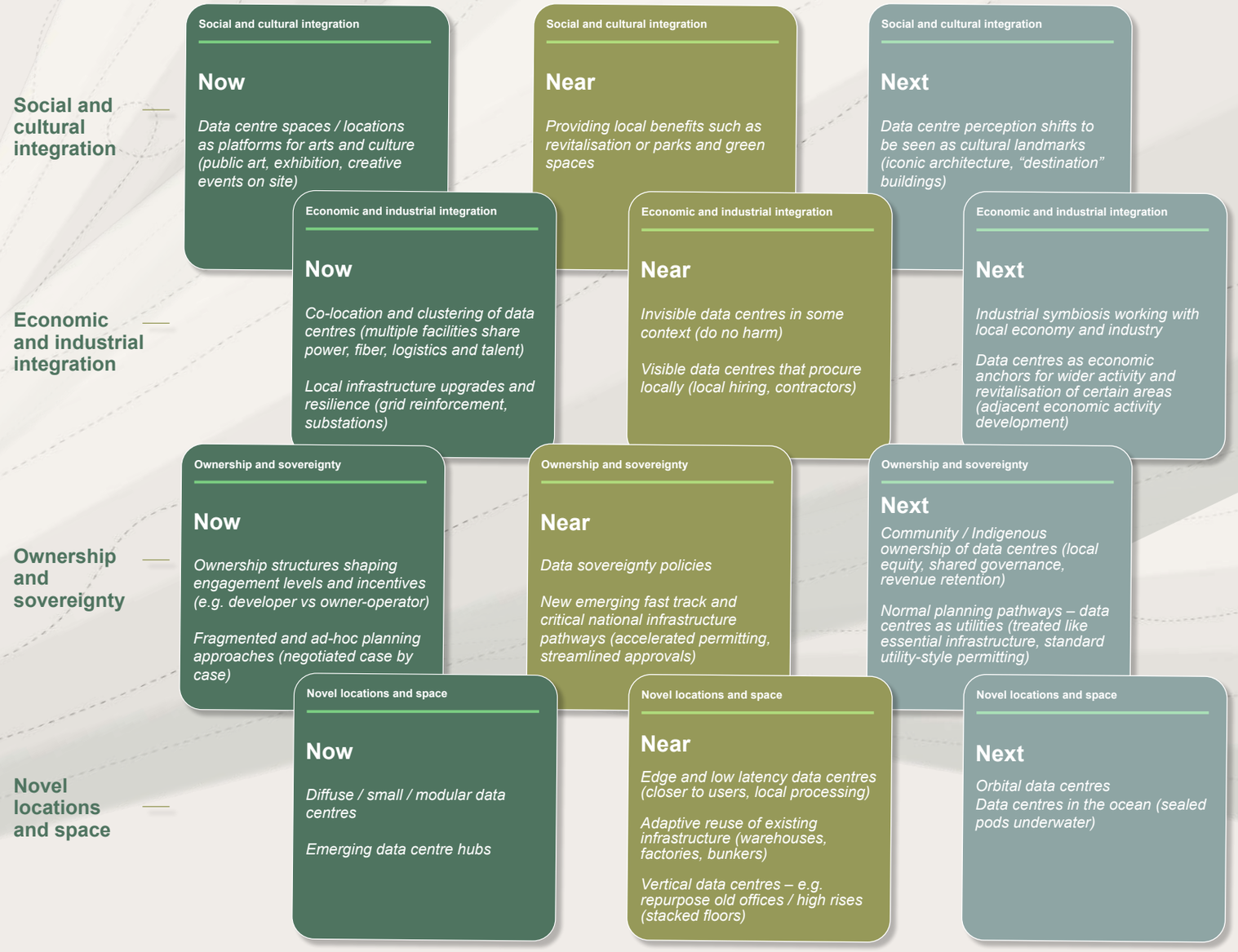
Horizon scan evidence

Trends and signals shaping the use of land for data centres

This is just a small selection of key data we are tracking relating to the social and cultural integration of data centres, economic and industrial integration, ownership and sovereignty of data centres and emerging novel and non-traditional locations and space for data centres.

They are split into current forces **(now)**, emerging trends **(near)** and informed speculation based on early signals of change **(next)**. These developments may occur at various speeds across the globe.



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Rehearsing various futures

Data centres are still an emerging asset class within many planning, policy and investment frameworks. Norms are evolving around where they belong, how they should be designed and how they can contribute to wider local goals.

Across this spectrum, authorities, communities and asset owners face similar questions about permanence, risk and opportunity: which sites will remain productive, which assets could become stranded and how new developments could support broader local benefits longer term.

As the sector continues growing, looking to the future is essential to ensure that today's investments in data centres do not become tomorrow's relics. In this context, the questions we ask today about permanence, risk and opportunity will shape not just the future of data centres, but the resilience and vitality of the places they inhabit.

Preparing for rapidly changing futures

To explore how data centres might engage effectively in different places and land use contexts, we have created theoretical examples of data centre typologies. These aim to cover a range along the urban-rural axis and various models of creation of, or integration into existing, social, economic and environmental ecosystems.

Urban

Dense, land- and resource-constrained environments with high population and diverse economic activity.

Rural

Land-abundant environments with lower population density, and a higher proportion of non-human stakeholders.

Create

Creating new infrastructure capacity and kickstarting economic activity, bringing new services and agreements that were not there before.

Integrate

Re-using and adding to existing infrastructure, recirculating flows, creating new value in existing systems.

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The case for long term thinking

Urban

Create

Integrate

Rural

Urban - Create

From high-friction, parcel-by-parcel builds on scarce land with late-negotiated benefits...

To pre-zoned, vertical energy-infrastructure districts where DCs are designed in as city assets (design, noise, logistics, resilience), delivering efficiency, flexibility and place-based upgrades.

Urban - Integrate

From technically connected but socially “invisible” facilities with limited local circularity or neighbourhood value...

To neighbourhood-grade compute with a design that adds character and resources flow that support communities.

Rural - Create

From ad hoc, land-first greenfield development with incremental utilities and uneven local value...

To resource-screened zones that set the land and community bargain upfront, building shared power, fibre, access and stewardship frameworks that scale benefits with growth.

Rural - Integrate

From one-off brownfield co-location with reactive value-sharing...

To planned regional anchors embedded in existing rural economies and infrastructure, pairing loads with nearby offtakers where feasible, using basin-fit water strategies, and delivering repeatable, monitored grid and community benefits.

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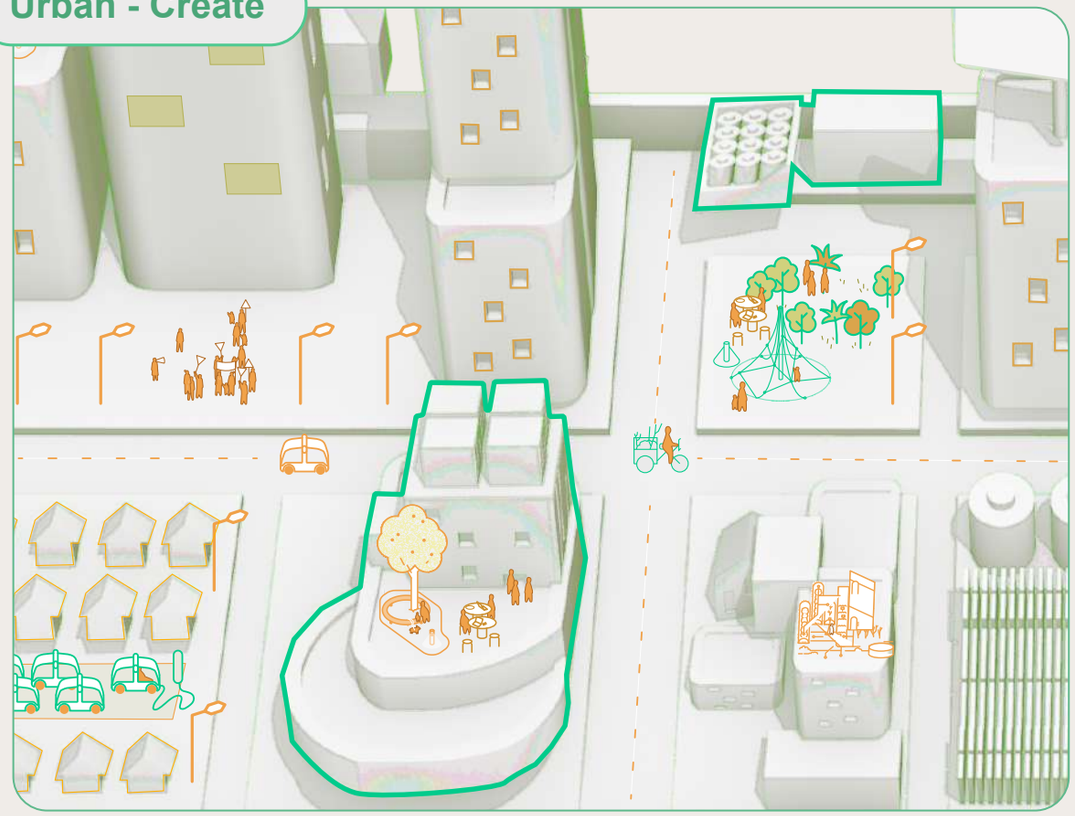
Urban - Create



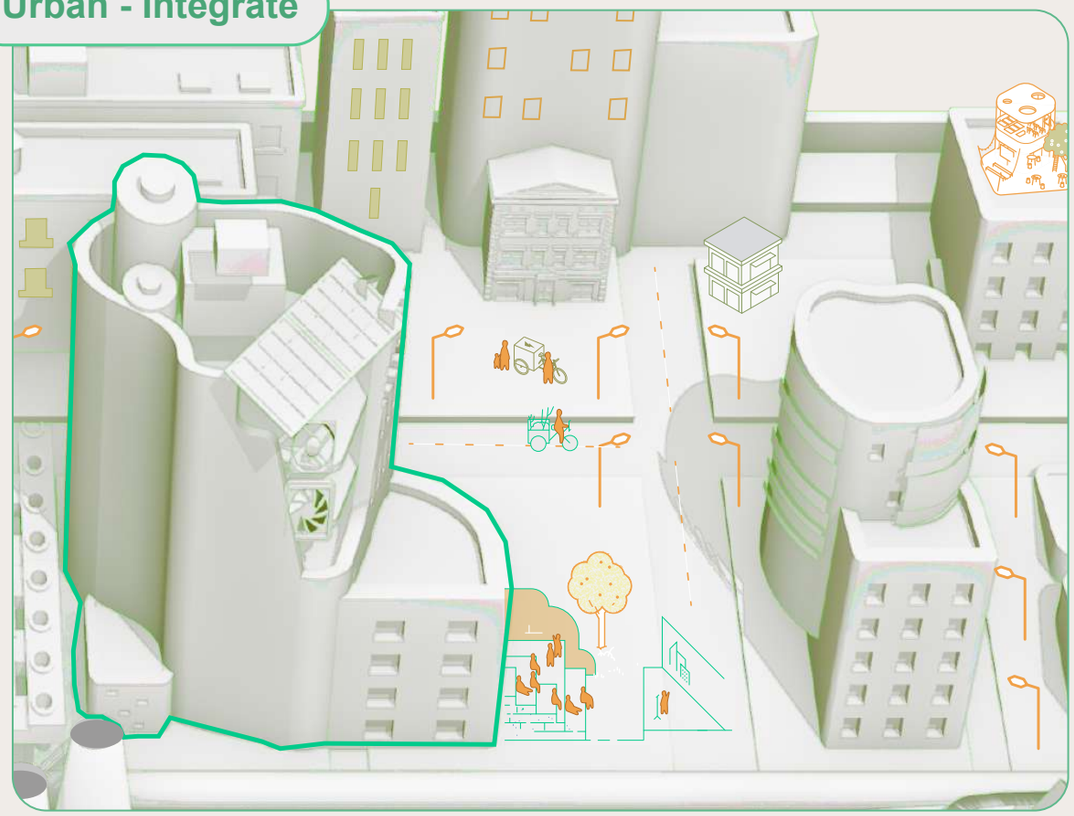
Stakeholders: *Residents, small businesses, civic-building users, emergency planners and urban species share the block.*

Data Centre Scale: *Medium-to-large*

From: *Isolated proposals that struggle for consent;* →

To: *Pre-zoned energy-infrastructure districts that trade certainty for visible civic benefit and responsible resource use.*

Urban - Integrate



Stakeholders: *Hospitals, universities, clinics, commercial tenants, street users and urban wildlife species are the immediate neighbours.*

Data Centre Scale: *Medium to small and very small, occasionally large (e.g. building retrofit)*

From: *Quiet retrofits that few notice;* →

To: *A distributed fabric of embedded nodes that strengthen districts without expanding land take and nearby settlements.*

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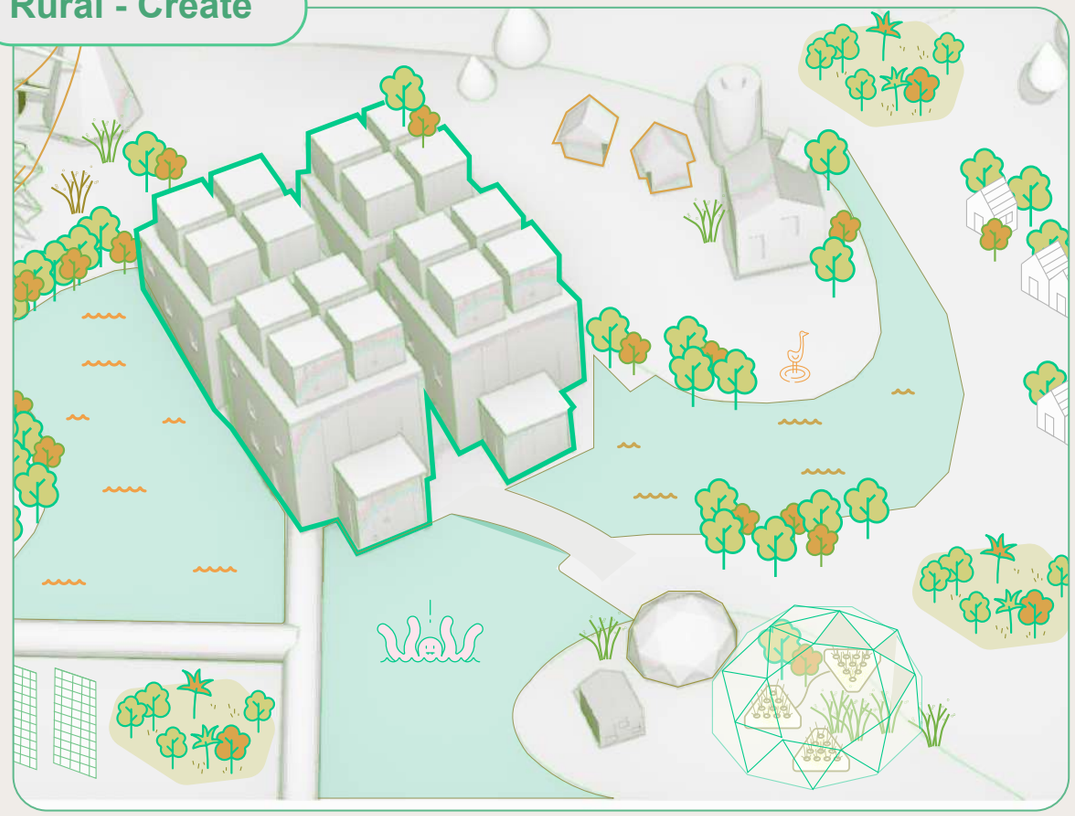
Rural - Create



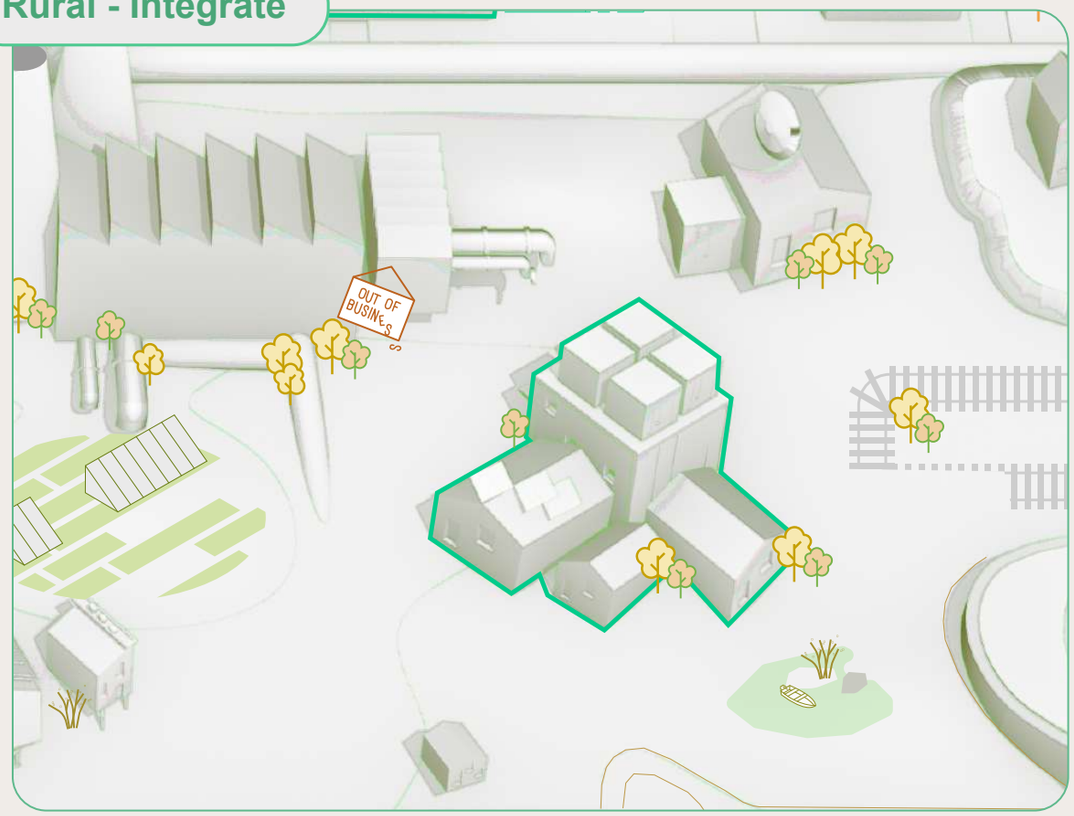
Stakeholders: *Growers, land managers, grid operators and native species sit closest to the boundary.*

Data Centre Scale: *Hyperscalers and large-scale*

From: *Varied greenfield projects selected for parcel size and time to power,* →

To: *Resource-screened parks that set the land and community agreements up front.*

Rural - Integrate



Stakeholders: *Adjacent light industry, town facilities and river or dryland species are the immediate neighbours.*

Data Centre Scale: *Large-to-medium scale*

From: *From opportunistic brownfield reuse;* →

To: *A planned regional anchor that works with legacy infrastructure and nearby settlements.*

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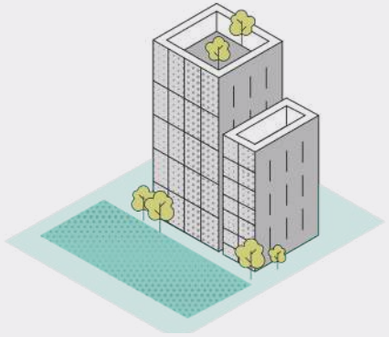
Early signs of the future in the present

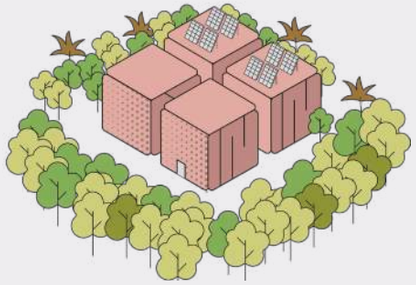
Case Studies

Conscious urban data centre design, Australia



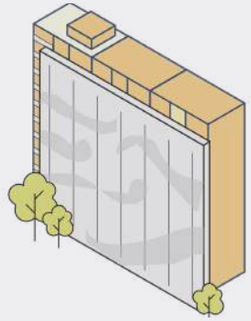
Located between industrial and residential zones in south Sydney, the Project Duke Data Centre, used thoughtful urban design to reconcile demanding technical data centre requirements with a sensitive urban context. First Nations designers and consultants were included in developing a water sensitive landscape design approach. This approach integrated protective measures without creating an unwelcoming street presence. Offices components were positioned along the street providing street activation, while generators were located away from residential neighbours, and generous setbacks helped create space for extensive landscaping, covering 20% of the site and helping embed the facility within its context.[4]

Indigenous and community data centre ownership, Canada



Woodland Cree First Nation in Alberta, Canada announced plans to acquire a partially constructed power plant on its traditional lands with plans for a large-scale Indigenous-led data centre capable of supporting AI loads. The project is part of a wider long-term strategy to build community-driven energy and data infrastructure in the area, with their approach aiming to reconcile First Nations values within existing regulatory frameworks.[5 6]

Capturing a neighbourhood's past and future in art, UK



The Vantage LHR2 data centre in London is a six-storey data centre that features one of Europe's largest permanent public art installations on its façade. The art installation, titled *11 Million Dots*, transforms ambient sounds, machinery hums, and over 100 interviews with locals into binary codes and audio waveforms that reflect the past and future of Park Royal's industrial heritage. It aims to mimic the complexity of microchips and urban landscapes and transform the data centre from an inconspicuous box structure into an immersive cultural landmark reflective of the local context.[7 8 9]

Local community business funding, UK

The Kao Social Enterprise and Environmental Development (SEED) fund provides financial support to not-for-profit community-led initiatives that drive social and environmental development. Social enterprises, local community groups, not-for-profit organisations, grassroots projects and individuals are encouraged to apply for funding of between £500 to £2,500, with the aim of empowering local projects and creating a positive impact in the surrounding community. The project aims to show how data centres can act as catalysts for local communities and make a real difference to people locally.[10]

External expert piece

Infrastructure and the local context: from fixed assets to continuous metabolism

Indy Johar
Mission Steward at
Dark Matter Labs

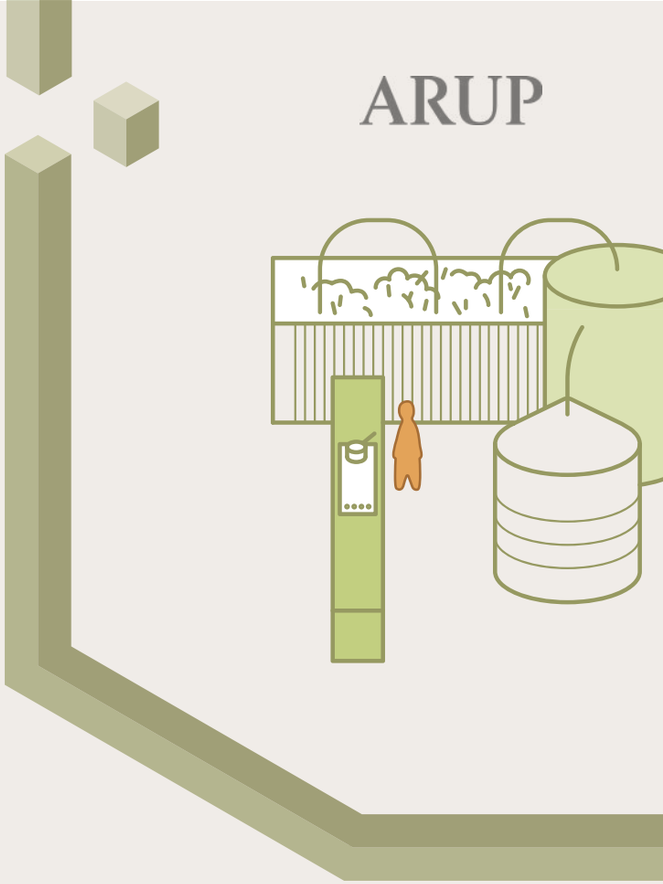
For more than two centuries, the traditional paradigm defined infrastructure as hard, fixed, spatially bound provision, often singular, monumental assets like bridges and power stations. This structure served as the physical embodiment of certainty, translating policy into permanence, underwritten by assumptions of stable geographies, cheap energy and material and assumed abundant labour, justifying the scale of the construction itself. Yet, the accelerating volatility of the biosphere, demographic contraction, the automation of production and maintenance have rendered permanence a risk rather than an assurance.

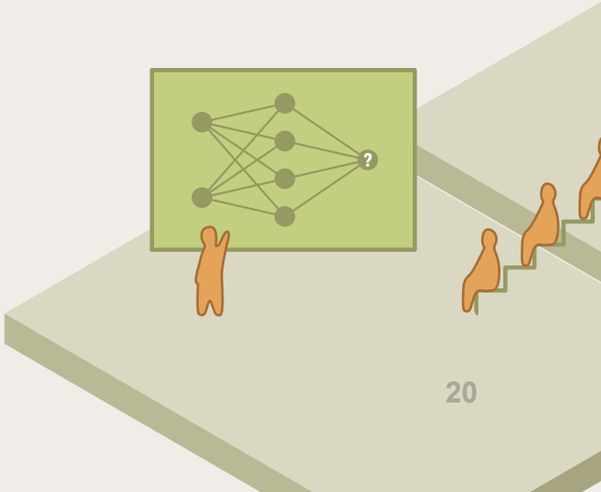
The governing question for policymakers is no longer *how to build more*, but *how to provision adaptively*. This shifts how we approach infrastructure from an object to an organism, from fixed provision to adaptive performance.

This paradigm shift profoundly affects how we conceive large infrastructure, such as data centres. Despite their digital function and dimension, they manifest as fixed assets requiring vast land allocation, challenging local resource security, especially energy and water provision and have tangible impact on local communities and population.

Throughout the 20th century, large-scale infrastructure projects anchored their social legitimacy in their capacity to serve as engines of employment. This logic is now eroding. The automation of production and maintenance, combined with the digitisation of operations, is steadily decoupling infrastructure from its traditional labour base. Data centres, highly automated and capital-intensive, underscore the premise that labour is no longer the anchor of infrastructure legitimacy. The metric of success shifts from jobs created to *functions maintained under volatility* – from labour absorption to system resilience.

In this new reality, public investment must be justified by its capacity to sustain life-supporting systems (energy, data, health) through cascading shocks.





Automated, distributed infrastructures, including intelligent data provision, are often invisible, lacking the visibility or monumentality of traditional fixed structures. Their value is expressed through continuity, not spectacle, demanding that governments rearticulate the social meaning of infrastructure.

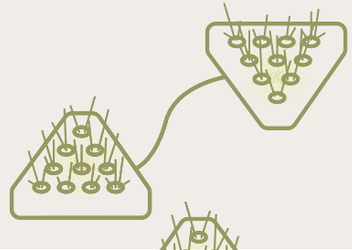
To overcome the inherent rigidity of fixed land assets, infrastructure policy must embrace the concept of continuous metabolism. Fixed data centre facilities represent static stocks, which lock societies into forms that become misaligned with their emerging futures. The future of infrastructure, however, must function as a living provisioning system– a continuous interplay between material assets, digital intelligence and ecological feedback loops. Governance must shift *from project delivery to context management.* For policy, this implies budgeting and regulation of value *flows* (resilience, adaptation, continuity) as much as *stocks* (assets, capital), requiring planning frameworks that integrate ecological and digital intelligences.

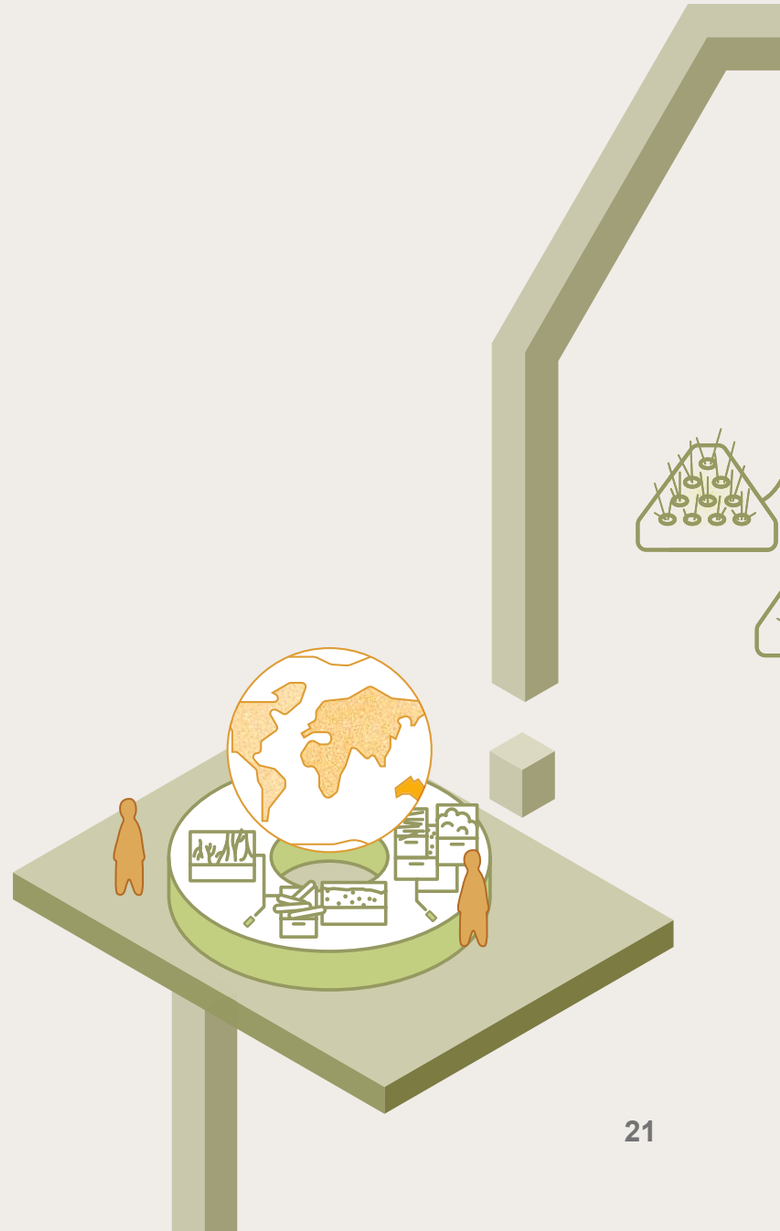
This necessary transition requires a new public contract for infrastructure, one grounded in responsiveness, shared stewardship and mutual learning. Traditional legitimacy derived from tangibility and scale; living infrastructure, despite its physical footprint on local land, must derive legitimacy from transparency and responsiveness. Citizens will not judge success by how much is built, but by how effectively the system learns and adjusts to local resource constraints and ecological feedback.

The institutional challenge is to operationalise this contract by creating hybrid institutions capable of managing real-time data ecosystems and coordinating distributed actors.

This demands a civic turn in infrastructure policy, recognising communities as *co-producers* of resilience, contributing local knowledge, data and care to the continuous maintenance of shared systems. This civic turn transforms participation from consultation to co-stewardship, ensuring that the adaptive capacity of infrastructure is secured not by central control, but by collective achievement.

Ultimately, the infrastructures of the 21st century must promise continuity through cooperation, binding citizens, markets and governments in the shared task of sustaining the conditions of life in motion. This art of sustaining coherence across transformation, which values continuity over permanence, is the new horizon of civilisation.





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Recommendations

CONSIDERATIONS **NOW**

These recommendations focus on managing the immediate pressures of rapid expansion and competition while establishing foundational relationships for future integration.

Mitigate immediate negative externalities
Actively manage and reduce visible, local externalities such as noise, heat emissions and traffic impact, as data centres are increasingly experienced as resource-intensive neighbours whose disbenefits are felt locally.

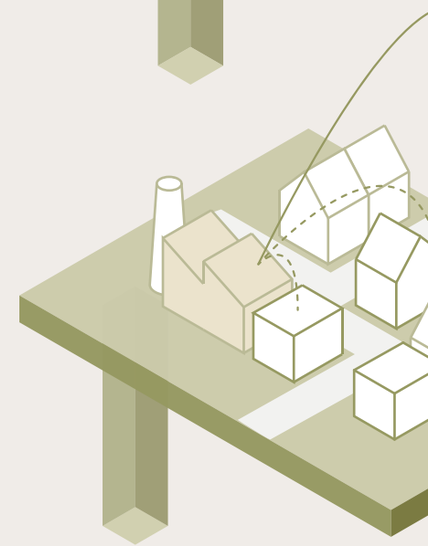
Prioritise local value and engagement
Shift away from minimal regulatory compliance and differentiate with measures such as proactive community engagement and context-sensitive designs to secure social licence to operate. This includes being transparent and working collaboratively with communities and local authorities to build trust and avoid project delays.

Maximise efficient use of urban land
Explore new data centre typologies that allow for denser and more economically beneficial use of limited land resources where they compete with housing and other uses. Data centres could occupy multi-storey buildings effectively in urban industrial areas as an example.

Utilise adaptive reuse for brownfield sites
Engage in the adaptive reuse of brownfield or legacy sites, especially in urban environments, which can generate tangible benefits for surrounding communities and help integrate data centres into existing ecosystems.

Invest in ecological and green infrastructure
Increase focus on the environmental credentials of development by implementing on-site biodiversity enhancements and opening up previously private land for public access to mitigate the impact on greenfield sites and landscapes.

Harness investment for local benefit
Ensure that the investment data centres bring is directed locally, where possible, by prioritising local workforce employment and training for construction and operation phases, as well as securing local supply chains for materials.



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Recommendations

AND FOR THE **NEXT FIVE YEARS**

These recommendations focus on structural changes, fundamental grid reform, leveraging future technologies, and shaping societal demand.

Establish strategic planning and pre-zoning

Move toward coordinated, strategic planning where authorities actively plan for data centres, integrate them into long-term spatial and industrial strategies, and align them with wider utility systems. This includes establishing pre-zoned energy-infrastructure districts where capacity is reserved in exchange for visible civic benefit.

Consider and start preparing for community co-stewardship

Shift the infrastructure paradigm from central control to co-stewardship by establishing a "new public contract" for infrastructure that values transparency and responsiveness. In practice, this means formalising value through binding Community Benefit Agreements and procurement targets, especially in rural areas where data centres reshape local economies.

Integrate data centres as grid and heat partners

Design data centres to move beyond consumption by incorporating them as proactive grid partners that deliver system services through flexible operation and storage. This also means reserving corridors and adopting infrastructure (like heat mains) to enable heat export and integration with district heating networks, supporting circularity.

Embed resilience and adaptability into design

Design facilities with the long term in mind to avoid creating stranded assets, focusing on adaptability in structures and mechanical plant and the wider area. Near-term design choices should reserve space and access provisions required by future technologies, such as higher densities and liquid cooling.

Adopt resource-screened development

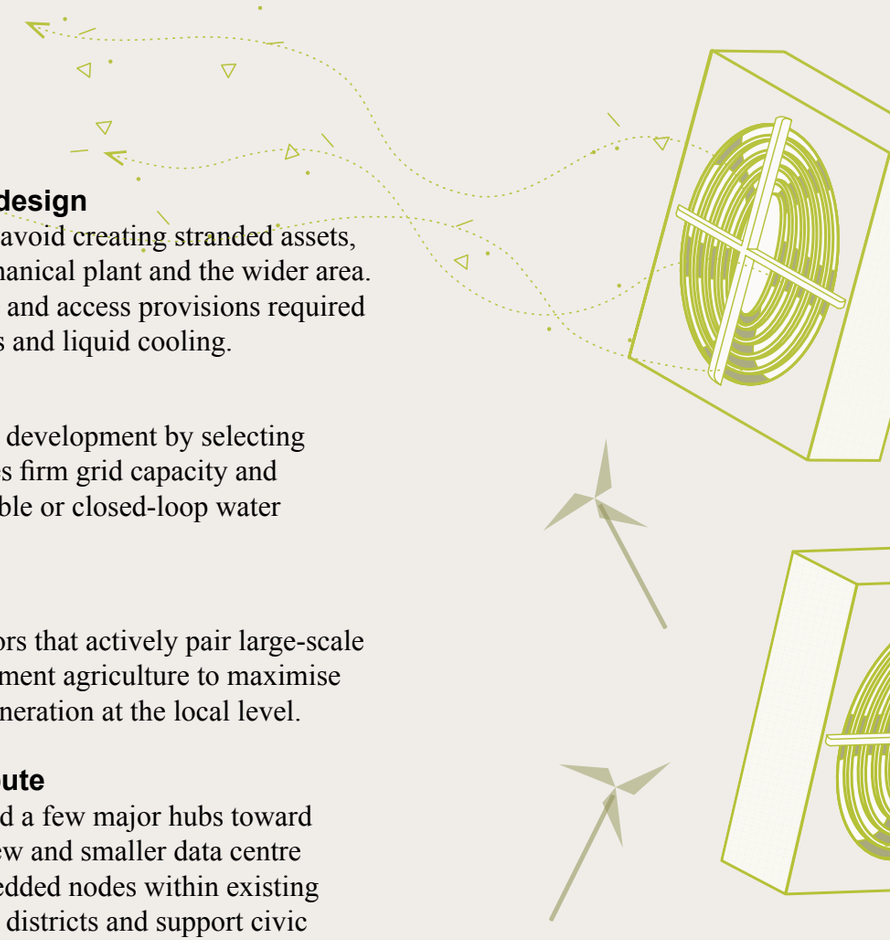
In rural landscapes, move away from land-first development by selecting resource-screened zones where siting prioritises firm grid capacity and basin-specific cooling systems, using non-potable or closed-loop water strategies in scarce areas.

Promote industrial symbiosis

Position data centres as planned regional anchors that actively pair large-scale loads with local industry or controlled-environment agriculture to maximise heat recovery and deliver socio-economic regeneration at the local level.

Foster distributed and embedded compute

Encourage a move away from clustering around a few major hubs toward greater decentralisation of capacity. Explore new and smaller data centre typologies, such as a distributed fabric of embedded nodes within existing buildings (e.g., retrofits), which can strengthen districts and support civic services without expanding land take.



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Read more perspective pieces from Arup

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The good neighbour theory: how data centres can strike a better balance between technology, community and nature - Arup

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