

# Crystal ball gazing: meeting and managing data center demand

As connectivity becomes a non-negotiable pillar of socioeconomic progress, how can data centers (DCs) not only meet demand, but manage the very processes for meeting demand in equitable, sustainable ways?

## The state of DC demand 2023

In 2023, global data center capacity reached 7.4 gigawatts (GW), **increasing from 4.9GW in 2022**, with global vacancy rates declining across all four regions, according to CBRE's 2023 trends analysis, as strong demand outstrips supply [1].

**Global DC market to grow 10% annually to 2030 [1]**

## US: record highs and lows



**3.3%**

**US vacancy rates:**

dropped from a record low in 2022 (3.8%) to lower still in 2023 (3.3%) [2]

**3X YoY**

**Occupied data center space:**

almost tripled in US markets from 2021 to 2023 [1]

**25% YoY**

**US data center construction:**

increased by 25% YoY in 2023 to a record-high capacity of 2,288 megawatts (MW) [3]

## Global: a year of demand

**< 4MW**

**Singapore:**

The world's most power constrained market has less than 4MW of available capacity and record-low vacancy of less than 2% [1]

**2% YoY**

**Asia Pacific:**

Tokyo and Hong Kong have slashed their vacancy rates by 1.5%, bringing it down to 2% on a year-to-year comparison [1]

**44%**

**Europe in Q1 2023:**

In Frankfurt vacancy virtually dropped in half, from 8.6% to 4.8%, [1] and in London, vacancy dropped from 21.6% to 15.3%

## What's driving massive data demand

Expanding, interconnected economies, industries, people and innovation are driving insatiable demand for critical data center infrastructure.



**58EB by 2028**

**Mobile data to grow from 18 exabytes (EB) per month in 2022 to 58 EB per month by 2028 [4]**



**\$3.3T by 2030**

**Global market for Industrial Internet of Things (IIoT) valued at \$544.3B in 2022, expected to grow to \$3.3T by 2030 [6]**



**\$678B in 2024**

**Public cloud spending estimated to reach \$678B in 2024 [5]**



**\$2T by 2030**

**Global AI market to grow twentyfold, from \$100B in 2021 to nearly \$2T in 2030 [7]**



## Global connectivity on the horizon

The digital divide between connected and yet-to-be-connected communities is narrowing, with previously underserved regions soon to be integrated into the global digital ecosystem.

**Emerging markets:**

Regions like India and Africa are accelerating connectivity and expanding data center footprints.

**New users:**

Economic growth is bringing hundreds of millions of people online from developing economies.

**Beyond major hubs:**

A shift towards tier-2 DC markets and edge data center locations is pivotal to the DC demand paradigm.

## Pushing the envelope at the edge of efficiency

How are data centers helping customers extend digital reach, where and when it's needed, while containing the sheer quantity of power required amid global scarcity?

**Hyperscale DCs:**

vast facilities, optimized for large-scale cloud operations, are growing outside of the US where they're now common, designed for economies of scale and efficient energy usage.

**Advanced cooling:**

Innovations like liquid immersion cooling, water to chip and other cooling techniques support high-density deployments.

**Edge computing and edge connectivity:**

For processing data near its source, decentralizing tasks, spreading demand and reducing reliance on centralized systems.

## Barriers to data center growth

Despite the justified optimism, there's no room for complacency. To fulfill the optimism and satisfy surging demand, data center providers and key partners must remain acutely aware and adaptive to a litany of sobering challenges.



**Energy challenges**

Fluctuations in global power supply availability and cost



**Skilled workforce**

Bridging the talent gap in a highly specialized arena



**Resource management**

Water availability and optimized usage



**Supply chain turbulence**

Overcoming increasingly frequent disruptions to infrastructure projects



**Flexing DC design**

With customer requirements from customers changing constantly, standardized DC design remains continually challenging



**Space and location**

Real estate challenges of finding optimal location amid global scarcity

## How are data centers preparing for future pressures on digital sustainability?

Amid skyrocketing data center demand and energy challenges, it's about doing what's possible in the 'now', while implementing forward-thinking strategies for the medium and long-term. Major innovations in Liquid Immersion Cooling (LIC) and Direct Contact Liquid Cooling (DCLC) technologies are a big part of this.



**Economy of scale**

NTT Global Data Centers is rolling out purpose-built hyperscale campuses worldwide, capable of supporting high density loads, while containing power usage and environmental impact.



**Flexing amid the flux**

Flexible design is another paramount factor for enabling rapid adaptation of evolving energy-efficient technologies and market needs.



**Robust inventory**

Robust Inventory management also plays a huge role in ensuring timely and effective project execution for staying on-track with delivering high-density availability.

## References

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