

Europe: a hot spot in the fast-moving world of data centres



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When it comes to data centres, the speed of evolution of the market might be best demonstrated by considering the incredible increase in data used in our everyday lives. Today, more data is created in an hour than was produced in an entire year two decades ago. By 2025, the sum of generated data will eclipse 175 Zettabytes (ZB), up from only 18ZB in 2015.¹ Major markets in Europe are experiencing first-hand this dramatic growth in data consumption—driven by innovative economies and high personal incomes. Latency is a real sticking point for consumers and businesses and the physical location of a data centre will determine how large a population it can efficiently serve. As a result, critical data centre hubs have emerged in the Tier 1 centres of Frankfurt, London, Amsterdam, and Paris (often referred to as the FLAP markets), forming the core of a system crucial to both European and global economies, and this phenomenon is spreading to Tier 2 cities across Europe. As enterprises, colocation groups, cloud service providers, and other tenants drive demand for these facilities, a lack of supply creates an opportunity unique to Europe.

For investors, owning properties with these difficult-to-find attributes will help ensure the data centre will retain its relevance over time. The technology underpinning the equipment and machinery in a data centre doesn't evolve nearly as quickly as the IT infrastructure. However, cooling equipment,

generators, and uninterrupted power supply (UPS) equipment are regularly updated to ensure that the data centre is operating at an optimal efficiency. Because the life cycle of this equipment is fairly dispersed—batteries can last for approximately seven years, cooling systems for 15, diesel generators for 25—there's a constant cycling of updated hardware on site, helping to ensure the property adapts to technological advances.

Core markets connect the globe

The use of data for nearly any purpose requires two critical components—connectivity and power. Linking data networks across geographic borders creates a reliance on the fibre cables that connect the globe. For data centres in Europe, the most important of these international cables links New York to London, then to a number of major European cities before connecting to Asia and Africa. The further a data centre is from these international fibre connections, the more latency (i.e., delays in data transmission) there will be, which is why the FLAP markets have become attractive for data centres.

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Each of these core markets are population centres with substantial business activity and an intensive requirement for data storage and processing. With data processing speed a top priority for both businesses and consumers, the locations of these hubs help provide

low latency for users. Core markets share similar characteristics, though each has their own strengths and weaknesses from an investment perspective:

- Frankfurt has strong environmental protections and is space constrained. In the third quarter of 2021, its vacancy rate was low, which likely will not change any time soon.² The city benefits from a strong financial services presence and serves as a gateway to the East.
- London is the largest data centre market in Europe and home to many corporate headquarters. West of the city, hyperscale cloud service providers have set up availability zones that serve as hubs for data centres to provide their services. More recently, the north and east of London have attracted data centre interest, including that of Google. London has roughly 814 megawatts of commissioned capacity, representing approximately 38% of the total capacity in the FLAP markets.
- Amsterdam struggles with a lack of power, limiting supply of new data centres. Recently, a moratorium against development of new facilities has been lifted; however, its effect was to dissuade data centre companies from setting up new facilities there due to worries around ability to expand. Now that it is lifted, interest in the market can start to grow again. The government remains positive on the data centre industry's growth, citing some 30 anticipated projects scheduled in the next few years.²
- Paris is the smallest of the FLAP markets and has high power costs but remains significant in Europe. In 2019, the government created a new tax incentive for the development of data centres that would cut in half the price of electricity for certain projects, assuming they abide by specified environmental standards.³ The market has seen growing interest from both cloud service providers and enterprise customers. Vacancy rates remain low.

Competitive barriers create opportunity

As these markets dominate Europe's data centre landscape, new entrants are faced with a number of challenges. The complexities of the space require high-level expertise. Finding ideal locations can be difficult, as data centres must be close to both an accessible power supply and a large population centre. They also require significant ongoing infrastructure investment (i.e., data protection, technology upgrades, chillers, and backup generators).

But the biggest hurdle to building a data centre in Europe is gaining access to a suitable power supply. While this may seem like an industry headwind, the reality is that restrictions and other roadblocks to entry have created an imbalance between supply and demand, essentially placing a higher value on existing data centres and making them more attractive investments. In any of Europe's core markets, a data centre with the right power contracts in place, plus access to international fibre lines, has a distinct advantage over new entrants. This supply/demand imbalance is not nearly as ubiquitous in the U.S. or other big data centre markets as it is throughout Europe.

Because FLAP markets have proven difficult to penetrate, many second-tier locations in Europe are gaining attention as users seek other options for low-latency, high-bandwidth networks. Places like Zurich and Milan that have large populations, access to relatively affordable power, and good fibre connectivity are quickly evolving and becoming more attractive. As South America becomes increasingly linked with Europe, Madrid and Barcelona have become prominent locations. Marseille is a growing hub, with its dense population of fibre lines, and much of the connectivity to Africa is routed through the city.

Additionally, many companies choose to have their data centres located in their home countries for regulatory or data security reasons. This has sparked new centres outside Frankfurt in Germany, a country with strict data privacy laws.

Obsolescence risk: not new in real estate

The risk of obsolescence exists for nearly every real estate property type, whether it's online commerce replacing in-person retail shopping or work-from-home trends impacting office space. But in many ways, data centres are on a stronger footing. The industry's unique characteristics include significant power supply requirements, a high level of technical expertise, and specific geographic location requirements—collectively creating a high barrier to entry that sets data centres apart from many other real estate sectors.

While innovation certainly makes some data centre hardware obsolete and will continue to do so for the foreseeable future, the obsolescence that arises from the rapid development of semiconductors or other IT hardware should not be considered a threat to data centres. Landlords invest in properties where there are fundamental reasons for the data centre asset to succeed. Our focus is on the factors that make good investment traits:

- Good connectivity to fibre cable networks. The further a data centre is from international fibre connections, the more latency (i.e., delays in data transmission) there will be, which is a primary reason why the Frankfurt, London, Amsterdam, and Paris (FLAP) markets have become attractive for data centres.
- Access to a power supply that can support the data centre's capabilities. In Europe, power

constraints have driven demand beyond the FLAP markets to regions with more abundant and affordable energy supply.

The impact of innovation and other trends

Alternative data storage methods are continuously under development. Among them is molecular and biological data storage—which uses algae DNA and could help minimise the amount of electricity needed to store data. While such forward-thinking innovation may seem like a threat to the current data centre model, much of this technology is focused on long-term storage as opposed to more immediate data processing needs. It doesn't change the demand for data centres located close to international fibre lines, cost-effective power supplies, and population centres. This is especially true as technologies that rely on high bandwidth, low latency data networks, such as artificial intelligence and machine learning, become more prevalent.

Another factor that mitigates obsolescence is the increasing demand for power supply access. Even if developing technologies solve for a huge capacity to generate power, it isn't feasible to get these up and running anytime soon. As potentially transformative as it may seem to use algae DNA to store data, the systems needed to build this at scale will take decades to come together, considering the volume of data that will be created over that period in the meantime. The same is true for quantum computing, which

could potentially consolidate a data centre's processing work into a much smaller physical space.

While this would create serious change in the market, we're likely decades away from making this theoretically possible—let alone commercially feasible.

One additional consideration is the potential obsolescence of locations. A big European trend at the moment is investing in new data centre developments in the Nordic countries because of their access to cheap renewable energy. This is a clear sign demand is outstripping supply. However, while energy cost and abundance of green energy are important factors in data centre development, without access to international fibre lines and population centres, the facility will have a limited reach with slower processing speeds, making it unsuitable for many types of tenants. Likewise, as ESG considerations become increasingly important, the desire to break ground for a new data centre instead of using what has already been built will likely fade, again increasing the attractiveness of existing data centres as investments.

Finally, one of the most notable developing trends: Data centres are becoming larger. This is, in part, due to the massive demand for cloud computing from companies like Google, Amazon, and Microsoft. But it's also about efficiencies of scale. Scale can be important as more servers and other infrastructure is needed to maintain these facilities. The current bias toward scale has led some to suggest that smaller data centres are becoming less relevant. However, even as the growth of cloud computing has made data centres larger, the other uses of these facilities remain equally important, such as for edge providers, retail colocation providers, managed services providers, corporations that need in-house data centres because of security concerns, and colocation providers serving small businesses. To that end, smaller data centres will continue to play an increasingly important role in the market.

Vital to the modern economy

The digitisation of our lives—accelerated by pandemic-related lifestyle changes—will be the prevailing dynamic in the global economy for the foreseeable future. As part of this shift, data demand will continue to accelerate, as will the

need for more solutions for storing and processing this data.

While technological progression continues to improve data centre operation—whether through cost or energy efficiencies—innovation won't make these facilities obsolete.

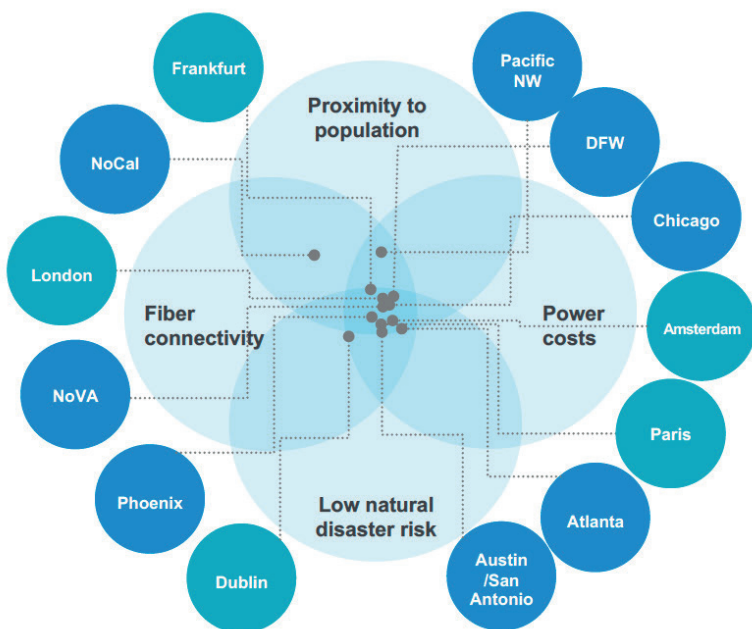
Instead, we believe data centres will continue to evolve alongside innovation and provide critical support to the entire digital economy.

Institutionalisation will improve the investment landscape

More than \$100 billion flowed into data centres over the last 10 years as institutional investors recognised the secular opportunity this sector presents.³ As data centres become more “institutionalised,” there has been more contract standardisation and an increase in leases that pass operational costs from landlord to tenant (i.e., triple net leases). These investments are now more accessible and better understood than in the past.

With more European data centre assets in the hands of institutions—and the industry consolidates with M&A activity—these properties will only become more valuable. We are committed to expanding assets in core markets where there is opportunity to benefit from the demand/supply imbalance but are also making targeted investments in second-tier European markets with growth potential.

As the world becomes increasingly interconnected, the data centre landscape will continue to evolve as fast as the technology within these facilities. The secular trends developing in European markets are presenting new and exciting opportunities for data centre investors, and we believe investments in this industry will continue to add long-term value to diversified real estate portfolios.



Source: Principal Real Estate's research and views and not a forecast or guarantee of future events, March 2022.

FOOTNOTE

- 1 IDC, Data Age 2025
- 2 European Data Centres, Q3 2021, CBRE Report
- 3 Data Center Global Market Comparison, Cushman & Wakefield's Data Center Advisory Group



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