

SPECIAL BULLETIN #6 | DATA CENTRES EVOLVING WITH INNOVATION



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The speed of technological innovation 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

As the demand for data drives innovation, technological advancements such as cloud computing and smaller hardware components are rapidly modernising data storage and processing. This evolution has led to questions about the viability of data centres, which some observers suggest will eventually become obsolete.

Innovation will indeed impact data centres, but we believe these risks are both limited and manageable. In fact, the global economy's increasing reliance on data has only made these facilities more attractive real estate investments.

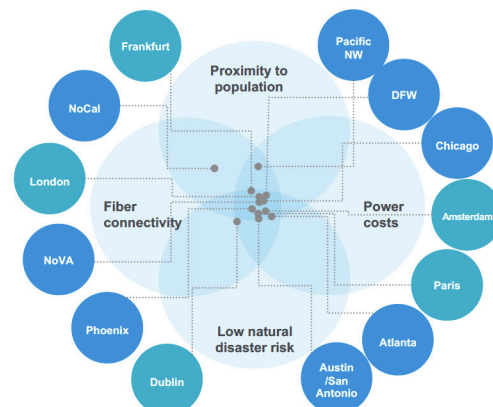
Obsolescence risk: Not new in real estate

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 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 three universal factors that make good investment traits:

At a glance—Data centres face little risk of obsolescence

- **Stable investments:** Power supply access, geographic limitations, and other barriers to entry will preserve property values over time.
- **Tenant leadership:** Many tenants are the most innovative companies in the world, betting long-term on data centres through leases of up to 30 years.
- **Vital to the modern economy:** The digital economy will remain dependent on high bandwidth, low latency data processing, and storage, regardless of innovative progression.
- **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.



Source: Principal Global Investors research and views and not a forecast or guarantee of future events, November 2020.

¹ https://www.seagate.com/files/www-content/our-story/rethink-data/files/Rethink_Data_Report_2020.pdf

- **Proximity to the population it serves.** Latency is a real sticking point for consumers and businesses. The physical location of a data centre will determine how large a population it can efficiently serve.

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, diesel 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.

Tenants at the forefront of innovation

The technology that allows for a growing volume of worldwide data to process quickly is developing rapidly. Many of the businesses driving these technological changes (i.e., Facebook, Amazon Web Services) are also the largest data centre tenants. These innovation leaders often sign 30-year data centre leases, which we view as a clear sign the data centre model won't disappear any time soon. Landlords for these users, the fastest growing segment of data centre tenants, benefit from a tenant that is regularly pushing technology boundaries to ride, or lead, the innovation wave.

Tenants also have an additional incentive to maintain the data centre's equipment—their contracts. Whether a triple-net lease (where operational costs are passed from landlord to tenant) or a fully repairing and insuring (FRI) lease, tenants have a contractual obligation to maintain all equipment under the terms of the lease. Technological advancement will require new machinery and equipment investments, which will ultimately improve the asset and help the property hold its value over time.

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 supporting the supply-demand imbalance benefiting investors in this space.

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, small data centres will continue to play an 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 skyrocket, 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.

Risk Considerations

Investment involves risk including possible loss of principal. Past performance is no guarantee of future results. Potential investors should be aware of the risks inherent to owning and investing in real estate, including value fluctuations, capital market pricing volatility, liquidity risks, leverage, credit risk, occupancy risk and legal risk.

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