IRON MOUNTAIN®
DATA CENTERS

INFRASTRUCTURE PLANNING REPORT

EMEA – FRANKFURT

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Iron Mountain Data Centers (IMDC) has compiled this Infrastructure Planner to give you a balanced overview of key colocation markets - their strengths and weaknesses, and the latest issues and opportunities.

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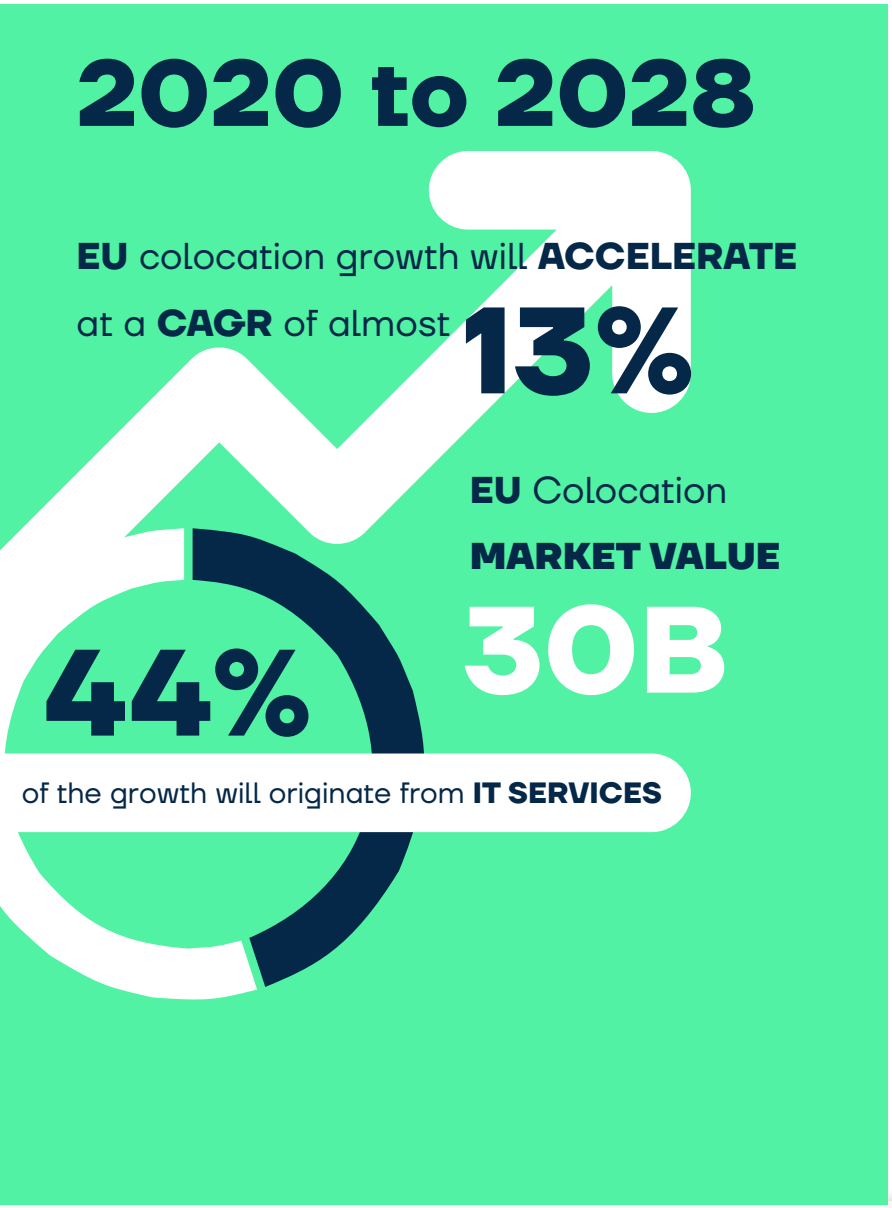
EUROPEAN **INFRASTRUCTURE**



With surging demand, colocation data center investment in Europe is reaching record highs. According to Grand View Research, the European colocation market will expand at a CAGR of over 13% percent over the next few years to reach a value of over $30 billion by 2028.

Colocation users in the region can currently be divided in half in terms of spend: Retail colocation users are enterprises and organisations who expect a fully managed and serviced facility. Wholesale users – mainly hyperscale cloud businesses like AWS, Google, Apple and Microsoft - contract core design and build and manage the fit-out and operations themselves.

GDPR, the latest set of European Union data regulations, is driving the dissemination of data into a larger number of facilities in different countries, by stipulating that data is stored in the country in which it is generated. Edge growth – the movement of data closer to the 'edge' of the Internet to support high-speed high-bandwidth applications such as IoT and AR/VR running on 5G networks – is also driving a new disseminated build pattern.

However, the vast majority of colocation space in Europe – around 70% of capacity - is still concentrated in four cities - Frankfurt, London, Amsterdam and Paris. These top data center markets are known as the FLAP region. Between them they now offer more than 2,000 MW of capacity.

European facilities are all located close to key transport hubs. They are also renowned for their industry-leading efficiency levels, use of renewable power, and ease/diversity of interconnection.

THE **GERMAN** MARKET

Situated right in the center of Europe, but with easy access to Central and Eastern European markets, Germany has many advantages as a data centre location. As well as being Europe's largest single economy, the country has earned a reputation for reliable power supply and robust design. Because Germany's data protection laws require the data of German citizens to be stored within Germany, there is consistent demand for space from international as well as national service providers.

According to some studies, Germany provides the most energy-efficient data centres in Europe. However (and this may also be a contributory factor) the price of electricity has been high for a long time, and there are lengthy approval processes when building new facilities.

Perhaps due to these factors, Germany's overall growth as a data centre location is average in international terms.

FRANKFURT – EUROPE'S FASTEST-GROWING LOCATION

The Frankfurt area, with its dynamic growth, is a clear exception to the general German situation. In fact, of all the FLAP cities, Frankfurt is currently Europe's number one growth market.

Why is it so popular? As the home of the European Central Bank, the German central bank, and the German stock exchange, Frankfurt is one of Europe's leading financial centers. The availability of capital has accelerated technology start-ups and fuelled broader growth. Frankfurt quickly became Germany's ICT infrastructure hub, creating a virtuous circle of growth and capacity. Today, there is significant demand from hyperscale data center consumers such as large cloud providers and internet businesses who need to service the German market, but enterprises are also seeking more space.

Partly because of these factors, and also because of the city's strategic location, Frankfurt is home to one of the largest internet exchange points in the world.

ISSUES & **OPPORTUNITIES**

THE RACE FOR SPACE

Scarcity of supply is Frankfurt's biggest challenge. In a recent report, CBRE Research estimated that by end 2022, unleased data center space in Frankfurt will reach a new all-time low of 6%, compared to around 15% across the FLAP regions as a whole. Hyperscale demand is one of the factors driving this, as cloud providers seek to expand their availability zones. At the same time some providers have suffered from delays in delivering new capacity due to Mechanical & Electrical (M&E) supply bottlenecks, many of them dating back to the Covid lockdowns.

Economic uncertainty and rising inflation are also putting pressure on prices. Due to these factors, and the high overall levels of demand a great deal of Frankfurt's data center capacity is now being pre-sold.

REGULATORY PRESSURE

Adding to this complex picture, Frankfurt City Council has announced plans to regulate data center building. While these plans have not yet been finalised, proposals have been made that new data centres should be restricted to specific parts of the city, should be multi-storey and should share excess heat where possible. The German Data Center Association (GDA), while keen to cooperate on sustainability measures, has pointed out that the allocated areas may be either inappropriate or incapable of meeting demand. The GDA also pointed out that, while data centers use 5% of the commercial space in Frankfurt, they provide 70% of Germany's digital services.

SUSTAINABILITY TARGETS

At the EMEA level, The European Commission's 2020 paper "Shaping Europe's Digital Future" states that data centers must be carbon-neutral by 2030. Many of Europe's major data center operators, including Iron Mountain Data Centers, are already in step with this, having signed the Climate Neutral Data Centre Pact, initiated by EUDCA.

Like Iron Mountain Data Centers, most data center providers in Europe already use sustainable energy sources. Wind and solar are the top renewable energy sources at present, and there is work being done with hydropower and other forms of renewable energy. However, there is always more that can be done, such as sharing carbon credits with customers to encourage a greener grid, reducing embodied impact through Asset Lifecycle Management, and achieving 24x7 renewable power usage.

POWER & **INTERCONNECTIONS**

The German grid has a reputation for reliability which, combined with design excellence, makes it an extremely attractive infrastructure destination. Germany is also known as the continent's most central connectivity hub.

POWER FLUCTUATIONS

Although the basic prices for electricity are quite similar across Europe, the ancillary costs from levies, taxes and grid charges are set by politicians. The biggest price factor in Germany has traditionally been the renewable electricity surcharge, introduced under the German Renewable Energy Sources Act (EEG). Unlike other energy-intensive sectors in Germany, data centers were not exempt from this, making power prices higher than in other EU countries. However, following the energy price rises caused by the Ukraine War, the EEG levy was cancelled in 2022. While this creates a much more positive outlook for large power users, it may have a mixed effect on renewable power pricing, as it is set against a backdrop of rising prices, plus there is a risk that it will affect the funding currently available to suppliers of renewables.

LATENCY

Due to Frankfurt's central location, traffic enjoys excellent working latencies to every corner of Europe, with 14ms to London; 11ms to Paris; 28ms to Madrid; 9ms to Milan.

DENSITY

The Deutscher Commercial Internet Exchange (DE-CIX) is one of the world's busiest traffic hubs, similar in size to the Amsterdam Internet Exchange (AMS-IX). 1,084 international networks converge at the DE-CIX exchange and traffic levels consistently peak at just under 14 Terabits per second. In addition to access to all of these major networks, DE-CIX offers interconnection services at five more Internet Exchanges in Germany - in Hamburg, Munich, Dusseldorf, Leipzig, and in Berlin where they cooperate with the Berlin Commercial Internet Exchange (BCIX). Traffic levels continue to rise fast. Data traffic at the Frankfurt Internet Exchange has increased by 50% since 2020, and 14% during 2022.

DE-CIX

IRON MOUNTAIN DATA CENTERS **IN FRANKFURT**

IMDC operates two large facilities in Frankfurt, a key strategic location in our global footprint.

FRA-1

FRA-1 is a 36,000 square metre 27 MW colocation facility located on Borsigallee, just a few kilometers from the heart of Frankfurt. In one of the largest wholesale deals in the history of European colocation the entire facility was leased to a Fortune 100 wholesale customer.

FRA-2

FRA-2 is a 20,000 square meter facility located on Heinrich-Lanz-Allee, in the Am Martinszehnten Industrial Park, 18 minutes from both the airport and the city center.

It offers over 10.6 MW of power in a wide range of densities running up to 20 kW per rack, and can be expanded to add much-needed Edge computing capabilities.The facility runs on 100% renewable power and provides the highest levels of redundancy, security, efficiency, and connectivity, in line with IMDC's industry-leading global compliance standards.

As well as full migration and Smart Hands remote capabilities, it offers easy access to hundreds of leading networks, multiple cloud on-ramps (direct connects) and has on-site access to many major networks including Lumen, EU networks, Colt Telecom, Verizon Business and BT, as well as the DE-CIX internet exchange.

ABOUT IRON MOUNTAIN DATA CENTERS

Iron Mountain Data Centers operates a global colocation platform that enables customers to build tailored, sustainable, carrier and cloud-neutral data solutions. As a proud part of Iron Mountain Inc., a world leader in the secure management of data and assets trusted by 95% of the Fortune 1000, we are uniquely positioned to protect, connect and activate high-value customer data. We lead the data center industry in highly regulated compliance, environmental sustainability, physical security and business continuity. We collaborate with our 1,300+ customers in order to build and support their long-term digital transformations across our global footprint, which spans three continents.

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