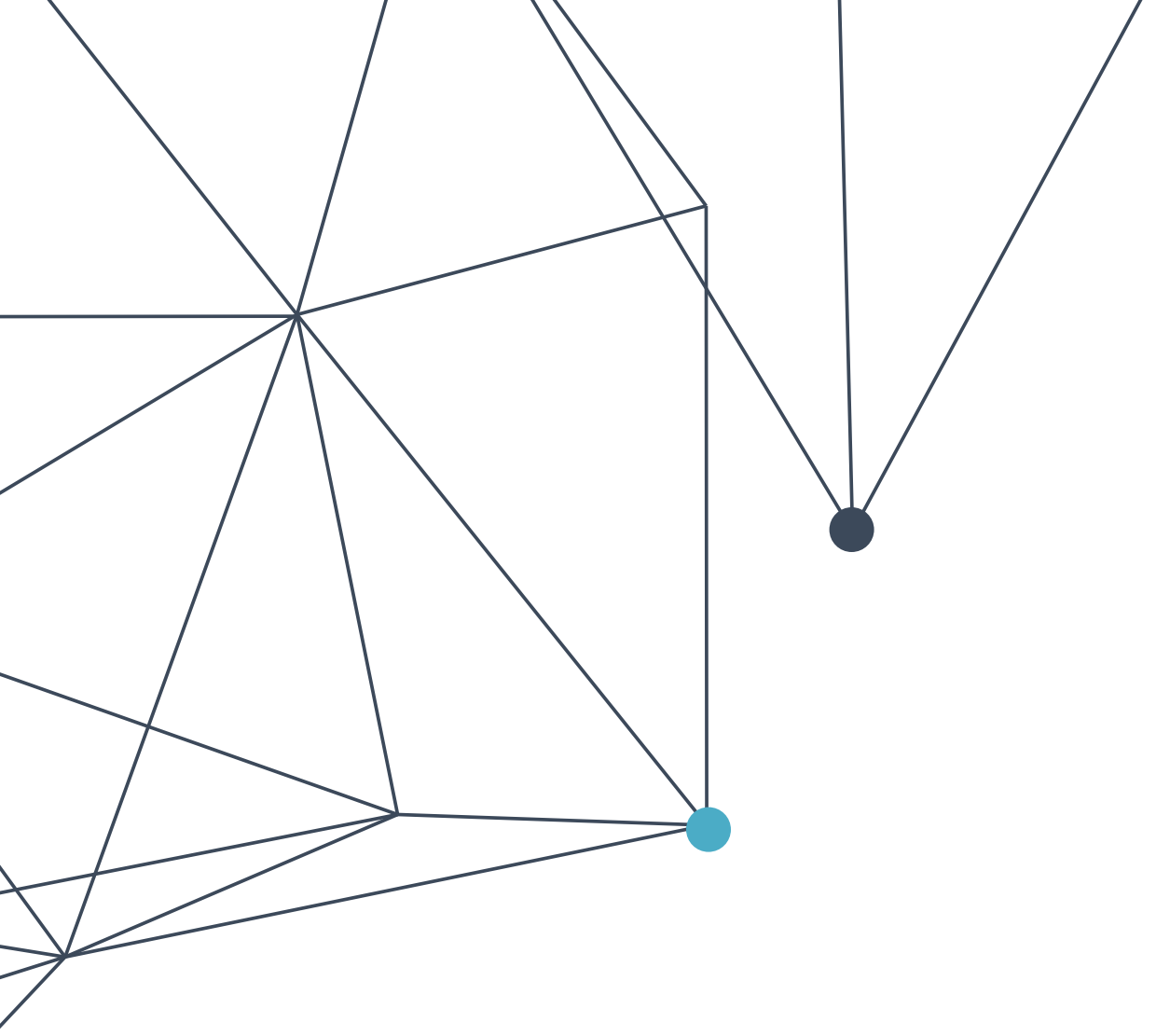
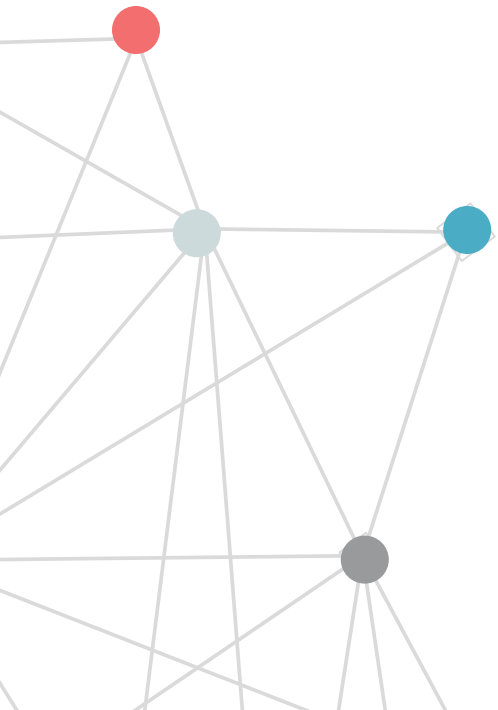


ITALY DATA CENTER REPORT

Spring 2022

CUSHMAN & WAKEFIELD





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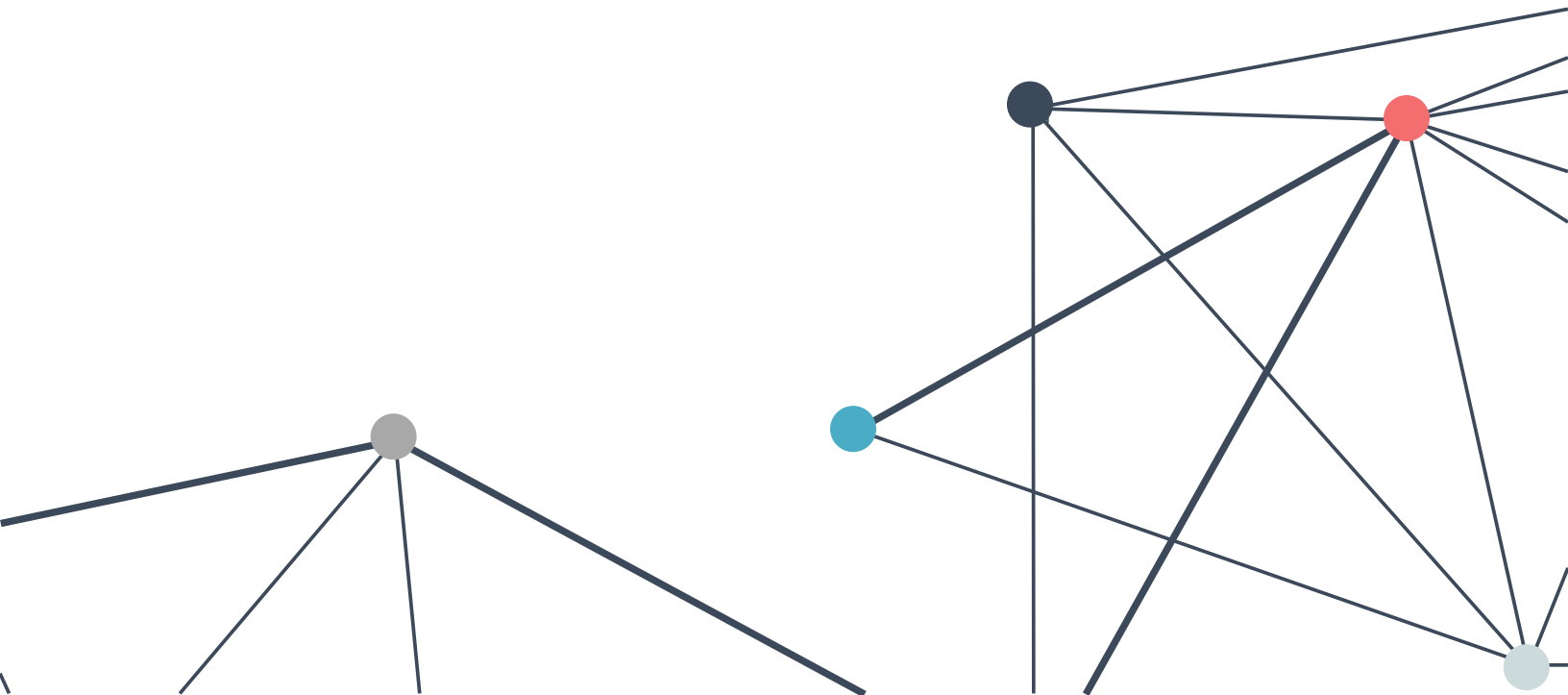
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OVERVIEW: DATA CENTER MARKET



WHAT IS A DATA CENTER?

A **data center** is a facility that centralizes an organization's shared IT operations and equipment for the purposes of **storing, processing, and disseminating data and applications**. Because they house an organization's most critical and proprietary assets, data centers **are vital to the continuity of daily operations**. Consequently, the **security** and **reliability** of data centers and their information are among any organization's **top priorities**



A GROWING MARKET

In recent years there has been a dramatic growth in the use of data, accelerated by the pandemic that has impacted the business continuity of entire economies. No matter the business, the importance of data continues to grow. The sheer volume, accessibility and requirements for its storage and transport, are ballooning. The digital universe is expanding and the need to support and deliver time critical information to end users, places huge pressure on infrastructure and resources.

PRIMARY ELEMENTS OF A DATA CENTER:

Facility – the usable space available for IT equipment. Providing round-the-clock access to information makes data centers some of the world's most energy-consuming facilities. Designed to optimize space and environmental control to keep equipment within specific temperature/humidity ranges are both emphasized.

Core components – equipment and software for IT operations and storage of data and applications.

Support infrastructure – equipment contributing to securely sustain the highest availability possible. The Uptime Institute has defined four tiers of data centers, with availability ranging from 99.671% to 99.995%. Some components for supporting infrastructure include:

- **Uninterruptible Power Sources (UPS)** – battery banks, generators and redundant power sources.
- **Environmental control** – computer room air conditioners (CRAC); heating, ventilation and air conditioning (HVAC) systems; and exhaust systems.
- **Physical security systems** – biometrics and video surveillance systems.

Operations staff – personnel available to monitor operations and maintain IT and infrastructure equipment around the clock

Source: https://www.paloaltonetworks.com/cyberpedia/what-is-a-data-center

LOCATION DECISION

In today's market, due to the complexity and the detailed technical knowledge required to complete the development process, it is the occupiers' IT teams which are the driving force behind Data Center developments or acquisitions rather than the traditional real estate decision makers.

There are four main parameters that should be considered in choosing a location for a data center:
Power, Connectivity, Natural Hazards and Cooling Systems

THREE BIG CHALLENGES

- Within the European Green Deal, major European cloud and data center operators have signed up to the **Climate Neutral Data Center Pact**, an agreement to become **climate neutral by 2030;**
- In Italy, the importance of the Data Center is also reflected within the **NRRP**: the plan for relaunching the economy focuses on the country's technological transition.
- Blue & Raman Submarine Cable Systems: Italy will be a new strategic point as a digital gateway between Africa, Middle East, Asia and Europe

GROWTH DRIVERS

The Data Center environment has become the heart of every organization as the central IT resource and is set to continue to be unquestionably important.

Main sectors behind the growth in demand are :
Gaming online, online business transactions (banking, financial, insurance transactions) , eCommerce, Iot, Video Streaming online, Big Data, Cloud Computing, Smart working, eLearning and Telehealth.

ITALY MARKET

Italy is a focal point for connectivity between Europe, the Middle East and Africa.

Lombardy is the most developed Italian region in the data center sub-sector and the location with the highest concentration is **Milan**, sustained by strong financial and engineering sectors. Rome follows, with an increasing interest to investors.

The market ranges from hyperscale Data Centers (over 50,000 sqm), intermediate sized spaces, to 'Edge Data Centers', smaller centres that provide cloud computing services to local users.

INVESTMENT MARKET

Although there is strong interest from investors, the market is not yet mature.

In the Italian market transactions recorded and negotiations in progress refer only to land acquisitions, both greenfield and brownfield.

The Hyperscale/ Cloud operator presence in Milan is growing and is based on small connectivity points of presence. We anticipate these to develop into larger wholesale deployments.

OCCUPATIONAL MARKET

In today's market, due to the complexity and the detailed technical knowledge required to complete the development process, it is the occupiers' IT teams which are the driving force behind Data Center developments or acquisitions rather than the traditional real estate decision makers. This is also due to the real estate cost being relatively small in comparison to the total expenditure of a Data Center project (to include fit out and IT expenditure).

In real estate terms, there are 3 products provided by the market:

LAND SITE: Power remains the attraction for a Data Center occupier, developer or investor. Demand from this segment of the market is strong especially for larger developments where critical mass, economies of scale and future expansion can be secured. Increasingly specialist Data Center occupiers are undertaking their own development removing real estate players in the process.

SHELL & CORE: building with appropriate power supply and planning consent. This product allows the landlord to achieve an elevated rental level to that otherwise achievable for that property's alternative use but not incur any development risk or further capital expenditure involved in developing a fully fitted facility.

FULLY FITTED DATA CENTER: Data Center investment landlords take on responsibility for the fit-out of the facility up to and including the Power Supply. Knowledgeable Data Center landlords often provide the Fully-Fitted facility with a service agreement and/or an operational entity in order to maintain the Data Center and secure addition income for management of the facility.

ITALIAN MARKET:

The Italian market, still quite young but in strong expansion, is at present characterized mainly by land sales to large operators. In addition, an increasing number of specialist Data Center occupiers are undertaking their own developments, removing traditional real estate players in the process.

These end users are using Data Centers to store their own data or to act as "co-location operators", offering a data storage service to customers with a wide range of requirements.

Within the broader co-location model, there are a diverse range of operational types varying between network dense connectivity led 'retail' sites to wholesale facilities, housing a small number of very large, usually hyperscale led customers, with a wide spectrum of pricing and contract terms.



LOCATION DECISION - CRITICAL FACTORS

MAIN DRIVERS

The fundamental drivers in considering a Data Centers location, size and operational feasibility are Energy and Fiber.

Energy: The availability and deliverability of a continuous supply of electrical power from the Grid is crucial to a Data Center's operation. The cost and lead in time for delivery of power to a property directly influences the feasibility of a particular location for a Data Center use. The primary source of power is taken from the national utility Grid, ideally from multiple diverse supplies. In the event of a power outage, Data Centers cater for back-up power with the installation of onsite generators and Uninterruptable Power Supplies (UPS) systems, in order to retain constant power to the IT hardware.

Fiber: The ability to provide truly resilient, high-bandwidth connectivity is vital for co-location and enterprise Data Centers. A fiber connection from an independent infrastructure provider can give greater customer choice and the potential for completely diverse routing.

ENVIRONMENTAL RISK & SECURITY

Environmental threats are a common contributor to equipment failure and data center down time. The aim is to minimise the risk of accidental and environmental phenomena.

Common Environmental Threats:

- Electromagnetic fields
- Industries with hazardous work
- Railways
- Airports
- Hydrogeological hazards
- River Basin/Watercourses

ENVIRONMENTAL SKILLS

Climate Control, guaranteed by cooling machines, is a fundamental component of the critical infrastructure within a data center. Cooling is provided to maintain an ideal temperature of the machines, humidity levels are managed, filters are installed to ensure clean dust-free air and sensors monitor potential water penetration or fire occurrences. The increasing power density of Data Centers, and therefore the heat generated, have made it necessary to develop increasingly efficient cooling solutions, given the resulting energy consumption and environmental impact.

The selection of a location that is conducive to an efficient cooling system is a factor that could sway the decision between sites. The cooling requirements are a constant, regardless of the season and have a significant cost impact over the life of the facility. A site that has a temperate, non-variable environment will require less mechanical cooling in lieu of economizers.

THREE BIG CHALLENGES

1. ENVIRONMENTAL AWARENESS AND DATA CENTERS: CLIMATE NEUTRAL DATA CENTER PACT

The digital sector is one of the most energy-intensive and is among the world's largest emitters of CO2. Hence the rapid development of projects to reduce energy consumption: today, **the Green data center,** which is designed for minimum environmental impact through the use of low-emission building materials, catalytic converters and alternative energy technologies, is growing in popularity.

Moreover, Data Center operators and trade associations are committed to the **European Green Deal**, achieving the ambitious greenhouse gas reductions of the climate law, and leveraging technology and digitalization to achieve the goal of making Europe **climate neutral by 2050**.

One year after the adoption of the European Green Deal, leading cloud infrastructure providers and Data Center operators have created the **Climate Neutral Data Center Pact**. Twenty-five companies and 17 associations have agreed to a Self Regulatory Initiative to make Data Centers in Europe **climate neutral by 2030**.

The Self Regulatory Initiative sets ambitious goals that will facilitate Europe's essential transition to a greener economy. It commits signatories to ensuring their Data Centers are climate neutral by setting ambitious measurable targets for 2025 and 2030 in the following areas:

- Prove energy efficiency with measurable targets
- Purchase 100% carbon-free energy
- Prioritise water conservation
- Reuse and repair servers
- Look for ways to recycle heat

Progress towards achieving climate neutral Data Centers will be monitored by the European Commission twice a year.

Signatories:

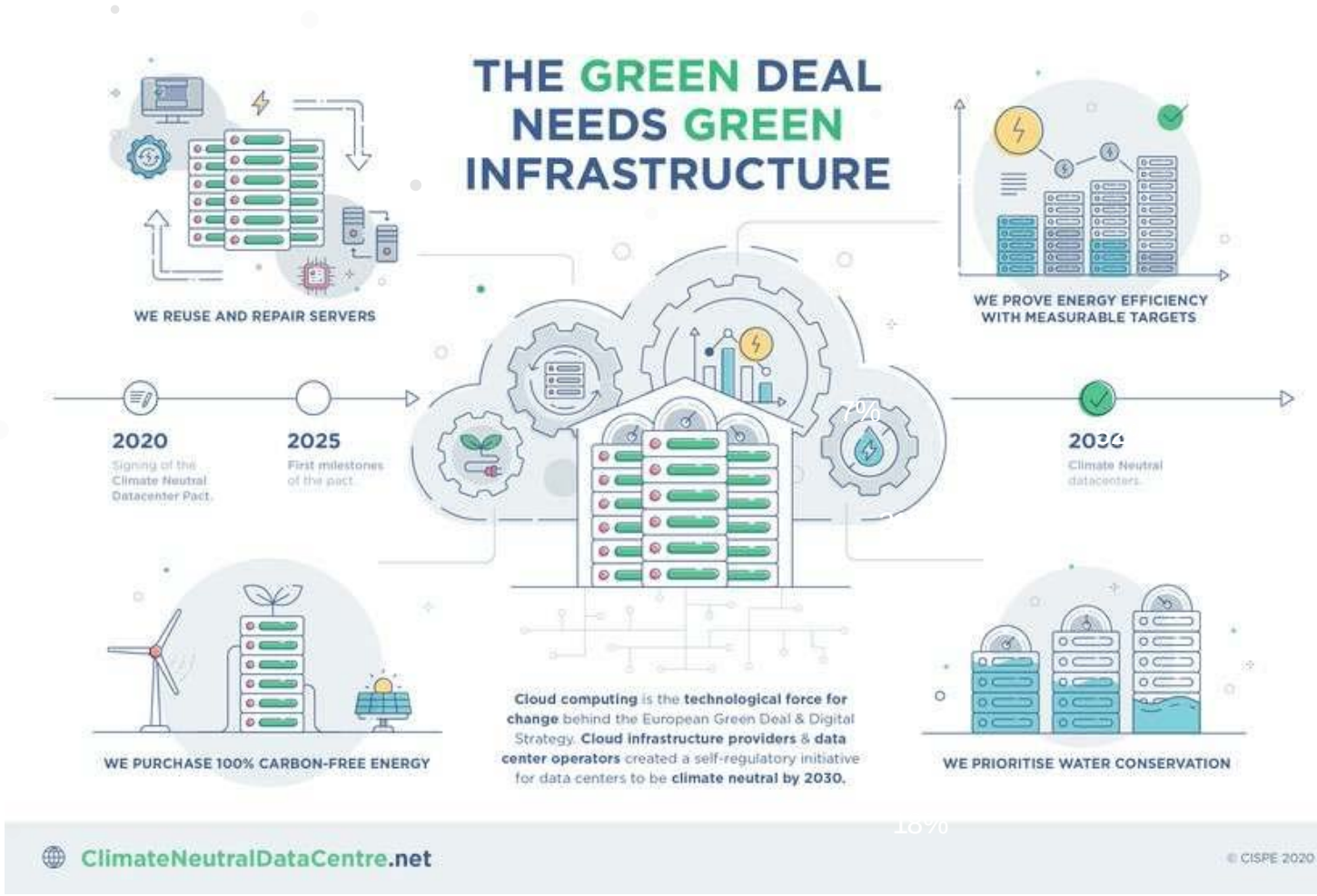
***Cloud providers and operators of Data Centers**: 3DS Outscale, Altuhost, Aruba, Atos, Aws (Amazon web services), CyrusOne, Data4, Digiplex, Digital realty/interxion, equinix, FlameNetworks, Gigas, Google, Ikoula, Ilger.com, Infoclip, Irideos, Itnet, Lcl, Leaseweb, Ntt, OvHcloud, Register, Scaleway, Seeweb.*

***Trade associations:** Cispe (Cloud infrastructure services providers in Europe), Eudca (European Data Center association), Cloud28+, Cloud community Poland, Danish cloud community, Datacenter industrien, Data Center Alliance, Dutch datacenter association, Dutch hosting providers association, Eco – Alliance for the strengthening of digital infrastructures in Germany, EuroCloud Croatia, EuroCloud France, France datacenter, Host in Scotland, Ikn Norge, IspConnect, TechUk.*

INNOVATION

SUSTAINABILITY

GREEN



Source: ClimateNeutralDataCentre.net



2. DATA CENTER AND DIGITALIZATION WITHIN THE NRRP

In Italy, the importance of the Data Center is also reflected within the **NRRP**: the plan for relaunching the economy focuses on the country's technological transition, which transversally affects all six missions of the plan, the first of which concerns 'Digitalization, innovation, competitiveness, culture and tourism', to which 21% of the resources are allocated - with about **€40.32 billion** out of a **total of €191.5 billion.**

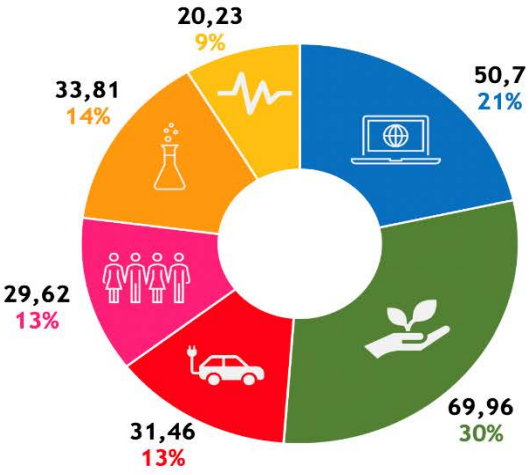
In particular, the aim is to promote innovation and competitiveness in the production system; accelerate the digital transformation of the Public Administration and bring 75% of Italian administrations to use cloud services by 2026 as well as the digitalization of tourism and culture.

This digital transformation will also address energy transition and sustainable mobility (necessary to create a suitable terrain for the development of the so-called 'internet of things'), as well as education and research.

But above all, digitalization is seen as crucial to promote a new concept of healthcare, which is set to grow in the coming decades due to an ageing population and the increasing number of patients suffering from chronic diseases. The most important innovation could come from so-called 'mobile-health' or 'm-health', a branch of e-health that uses ICT technologies to remotely manage care, monitoring and data acquisition processes.

In the face of a National Recovery and Resilience Plan that focuses on digitalization and sustainability, it seems essential to have infrastructures that can support the acceleration needed for the renewal of the public and private sectors.

SIX MISSIONS OF NRRP





Note: amounts in millions of euro

3. SUBMARINE CABLE: GENOA, THE NEW DIGITAL GATEWAY TO EUROPE

The cabling system is the spine of the worldwide internet, essential for trade and communications. It is managed by different organizations such as governments, academic or trade entities which allow data to move across the different countries through Internet Exchange Points. Cables are mainly placed underwater, and the major system is on the bottom of the Atlantic Ocean and connects North America with Europe, but other networks are being developed in different parts of the world.

In Italy, in 2019 Telecom Italia Sparkle announced its investment in BlueMed, a multi-fibre submarine cable that will connect Palermo with Genoa. Genoa, known for the central role it played in maritime trade for many centuries, will now be a strategic point on the global submarine cable map. The new cable will cross the Tyrrhenian Sea connecting Sparkle's Sicily Hub in Palermo - connected by 18 international cables - with the new landing station in Genoa, directly connected to Milan's rich digital ecosystem. BlueMed will also include several branches in the Tyrrhenian Sea and is designed to support further extensions south of Sicily.

With a capacity of up to 240 Tbps and approximately 1,000 km in length, BlueMed will provide advanced connectivity between the Middle East, Africa, Asia and Europe's continental hubs with a latency reduced by 50 per cent compared to the terrestrial cables connecting Sicily with Milan. BlueMed will strengthen Italy's role as the main digital gateway between Africa, the Middle East, Asia and Europe by providing an alternative access on the western European coast.

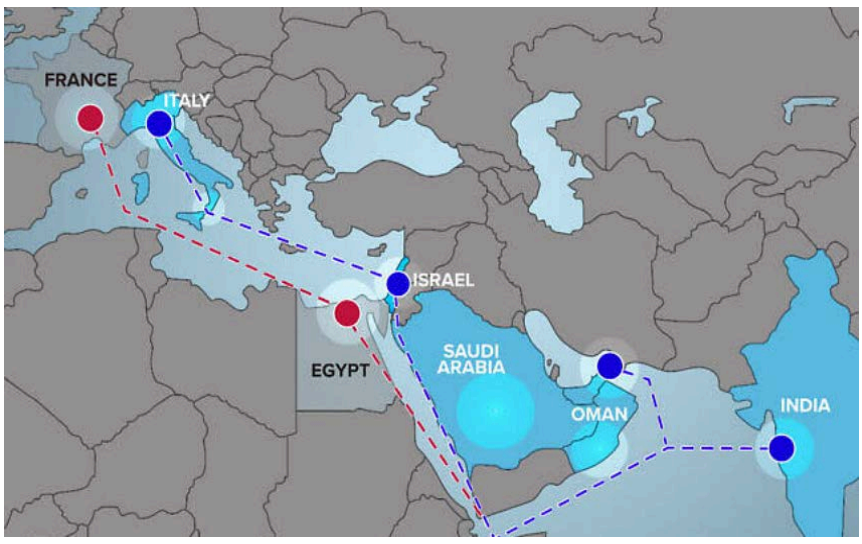
In addition to this, there has been the announced collaboration between Sparkle, Google and other big operators, for the realization of the **Blue & Raman Submarine Cable Systems**: *Blue System* will connect Italy, France, Greece and Israel and the *Raman System* Jordan, Saudi Arabia, Djibouti, Oman and India. **The two systems set a new reference in terms of diversification, scalability and latency throughout these geographies.** BlueMed is extended up to Jordan (Aqaba) with additional private branches into France (Corsica), Greece (Chania – Crete), Italy (Golfo Aranci – Sardinia and Rome), Algeria, Tunisia, Libya, Turkey, Cyprus and more in the future. The Blue-Raman cable is a creative route connecting Asia and Eruope via Israel and Jordan, bypassing the crowded Egypt route.

Blue and Raman are expected to be ready for service in 2024, with the Tyrrhenian part of BlueMed planned to be operational already in 2022.

BlueMed (connection Palermo-Genova)



Blue & Raman Submarine Cable Systems



New Fibre Optic Cable Route

Estabilished Fibre Optic Cable Route

GROWTH DRIVERS

The Data Center environment has become the heart of every organization as the central IT resource and is set to continue to be unquestionably important.

Major drivers for the Data Center sector are:



Gaming: online is a rapidly growing segment. With millions of players and fans around the world, online gaming is more than just a booming industry. Infrastructure is an integral part and that's why leading gaming brands are collaborating with data centers to offer the best online gaming experience to gamers: aspects like Low latency or Lag define an overall gaming experience and are critical in multiplayer games. A minute delay in the delivery of packets can completely ruin the experience;



Online business transactions (banking, financial, insurance transactions) and eCommerce: the digital revolution is transforming the way customers access financial products and services. the sector has experienced a degree of change in recent years and the constant penetration of technology-driven applications in nearly every segment of financial services is growing. The acceleration of e-commerce has also made digital payment by credit cards or other online payment methods not only necessary, but extremely convenient, both for the buyer and the seller;



Internet of Things (IoT): is the network of physical devices, vehicles, home appliances, and other items embedded with electronics, software, sensors, actuators, and connectivity which enables them to connect, collect and exchange data. The huge number of connected devices and sensors generating and exchanging large amounts of data all the time, coupled with the volume, speed and variability of the data structure related to IoT, is creating new challenges not only related to Data Management and data security but also to the technology layer underlying data, workloads, processes, i.e. servers, storage and network infrastructure (connection and communication);



Video Streaming: plays a substantial role in modern society. During their everyday lives, people watch streaming clips on social media, tune into shows on demand using their tablets and laptops, and share video content with their friends, thereby increasing its viral potential;



Big Data: The most important infrastructure aspect of Big Data analytics is storage. Data over the size of a petabyte is considered Big Data. The amount of data increases rapidly, thus the storage must be highly scalable as well as flexible;



Cloud computing: Cloud has gone from niche to conventional in just a matter of years. Enterprises are continuing to shift their IT from on-premise Data Centers to off-premise co-locations, hosted private cloud and public cloud environments. With the surge of cloud computing, there's been an increase in demand for extra Data Centers;



Smart working and eLearning: The last two years have been remarkable in many ways; the way we work, study and live have deeply changed. Today there is greater certainty about the new way of working which sees a hybrid model where WFH and office work will be integrated and this means a growing need for greater cloud technology to connect a dispersed workforce and enable people to do their jobs in a work-from-home environment;



Telehealth: Perhaps no technology accelerated as quickly during the past year and a half as that of telehealth. Although telehealth is not new, advances in video meeting apps, smartphone availability and broadband access are enabling more use cases. Not only is adoption among consumers growing exponentially when it comes to telehealth, but the level of investment is also on the rise.

The Data Center is a strategic asset in the digital revolution

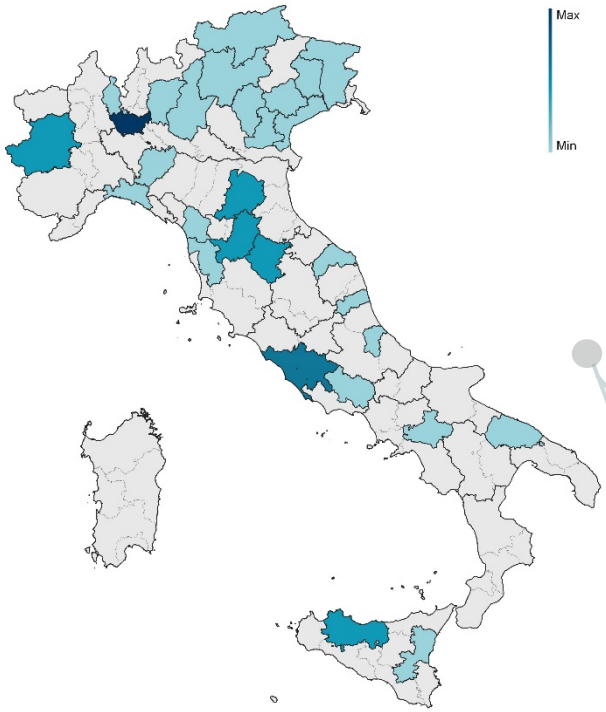


ITALY MARKET

- **Italy is a focal point for connectivity between Europe, the Middle East and Africa.** There are significant subsea cables that land in the south of the country although there are challenges delivering that fiber connectivity through the mainland.

- As shown by the map, today **Italy** hosts 80 co-location Data Centers (*). **Lombardy** is the most developed Italian region in the data center sub-sector and the location with the highest concentration is **Milan**, sustained by strong financial and engineering sectors. **Milan** is also **the smartest city in Italy** thanks to the **Digital Transformation Plan** which, launched in 2016, has been focused primarily on streamlining government processes and simplifying citizens' lives - paving the way for the development of fully digital services and guaranteeing the sustainability of municipal projects. As Italian enterprises, as well as the public sector, begin their progression to cloud technology, Milan has drawn interest from the **largest cloud services** organizations as a new growth market, like Amazon Web Services (AWS), Microsoft Azure, Alibaba, Google Cloud Platform (GCP), IBM.
  Rome is further behind the Milan market but of increasing interest to investors, especially due to the needs of inhabitants and companies in central and southern Italy.

Co-location Data Center concentration in Italy



Note: (*) Source www.datacentermap.com

- Hyperscale and Cloud operators, which did not have significant representation, have entered the market in recent years by building their own facilities and we expect this to increase in the coming years as new international player approach the market. Moreover, the need for servers at local level is increasingly high due to the increased demand for bandwidth and the disproportionate growth of data and in particular for a latency problem.

- The first operator to invest in Italy with its own Data Center was the national firm Aruba, with four facilities, including the largest Data Center campus in Italy located in the province of Bergamo (with 200,000sqm) and today the expansion in the city of Rome, with the development of 52,000 sqm of data center space. Among the main players in strong expansion today are Microsoft, Google and Oracle, which have announced to create their own Cloud Regions.

International and National Operators who have entered the Italian market



Expansion Plans - Who is Moving?

MICROSOFT:
had their own major Azure announcement in May 2020, with a $1.5 billion investment plan over the next five years to bring Azure to Italy and a major IT and skills partnership with Poste Italiane.

AMAZON WEB SERVICES (AWS):
launched a full region with three availability zones in May 2020, their first region in-country and across Southern Europe.

GOOGLE CLOUD AND TELECOM ITALIA:
announced last November a partnership that will develop many Data Centers across the country in coming years and diversify the telecom giant's offerings.

ORACLE CLOUD REGION:
On 15th December, a new Oracle Cloud Region was inaugurated in Italy, in Milan. The Italian Cloud Region also marks an important step in Oracle's Cloud Roadmap: 44 active Cloud Regions by the end of 2022. The logic of the Cloud Regions, in which Oracle is investing heavily, aims to make cloud services available locally, to support a demand that is growing enormously, improving overall performance, thanks to lower latency conditions compared to a Data Center located in a much more remote location.

STACK EMEA / SUPERNAP:
At the beginning of 2022, Stack EMEA takes over Supernap Italia following the acquisition in March 2021 by IPI Partners of Acdc Holdings, the majority shareholder of Supernap Italia.

In May 2021 Supernap purchased two plots of land adjacent to the current campus, for 170,000sqm, on which to build 3 additional Data Centers for a total of 35 MW of additional capacity, bringing the total area to 270,000 sqm and the company's total capacity in the Milan area to 75 MW. In March 2022 Stack Emea and Natixis announced the construction of the first of three Data Centers in the pipeline, which will be powered by 100% renewable energy and will bring STACK EMEA's Siziano campus to a total of 50 MW of capacity.

MILAN MARKET

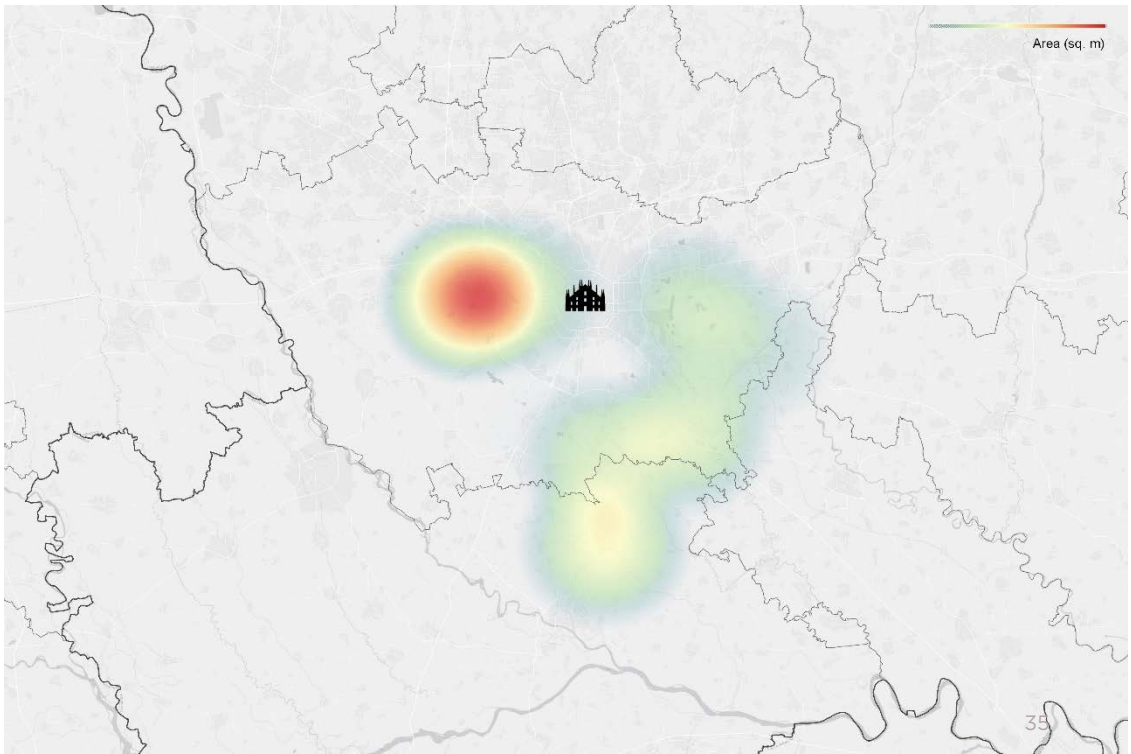
The Data Center market is developing significantly around Milan and the main areas of interest and development are:

- The **West Area** (in particular Settimo Milanese and Cornaredo) which can now be consider a consolidated cluster for this sector with a total of circa **400,000 sqm** Data Center space.
  - ✓ With its 110,000 sqm *MIX (Milan Internet Exchange)* in Via Caldera provides access to all major national telecommunication networks.
  - ✓ In 2013, *DATA4* was the first operator to enter the Italian market with the acquisition of a land plot in Settimo Milanese for the opening of a Data Center of 80,000sqm; further 40,000sqm were built at the end of 2021.
  - ✓ In 2015, DATA4 has also developed for *IBM* a Cloud Data Center in Cornaredo, the first of this type in Italy.
  - ✓ The upgrade of power capacity and optical fiber cabling in this area has attracted other operators, such as *Equinix,* a global interconnection and data center company which acquired TelecityGroup with their site in Basiglio (circa 6,000sqm) and in 2018/2019 bought a land plot in Settimo Milanese and built two Data Centers for a total of 65,000sqm.
- Significant transactions have also been closed in the **Eastern metropolitan Area** of Milan where a total of 130,000 sqm of new Data Center have been developed in the last couple of years.
- The **South Area** initially registered a limited interested; *Supernap (today Stack EMEA)* has been the first company to settle in this area, in 2015 in Siziano, with a 42,000 sqm site which was expanded in 2021 for a total of 100,000 sqm and 40 MW of power capacity. There is a plan to further extend the campus with the construction of three Data Centers, which will take the power capacity to 75MW. Moreover, this area is gaining more and more interest from operators with important projects underway, with completion expected in 2022/23.
- The **North Area** is a more residential area and therefore not suitable for the development of Data Centers which generates a certain acoustic disturbance.





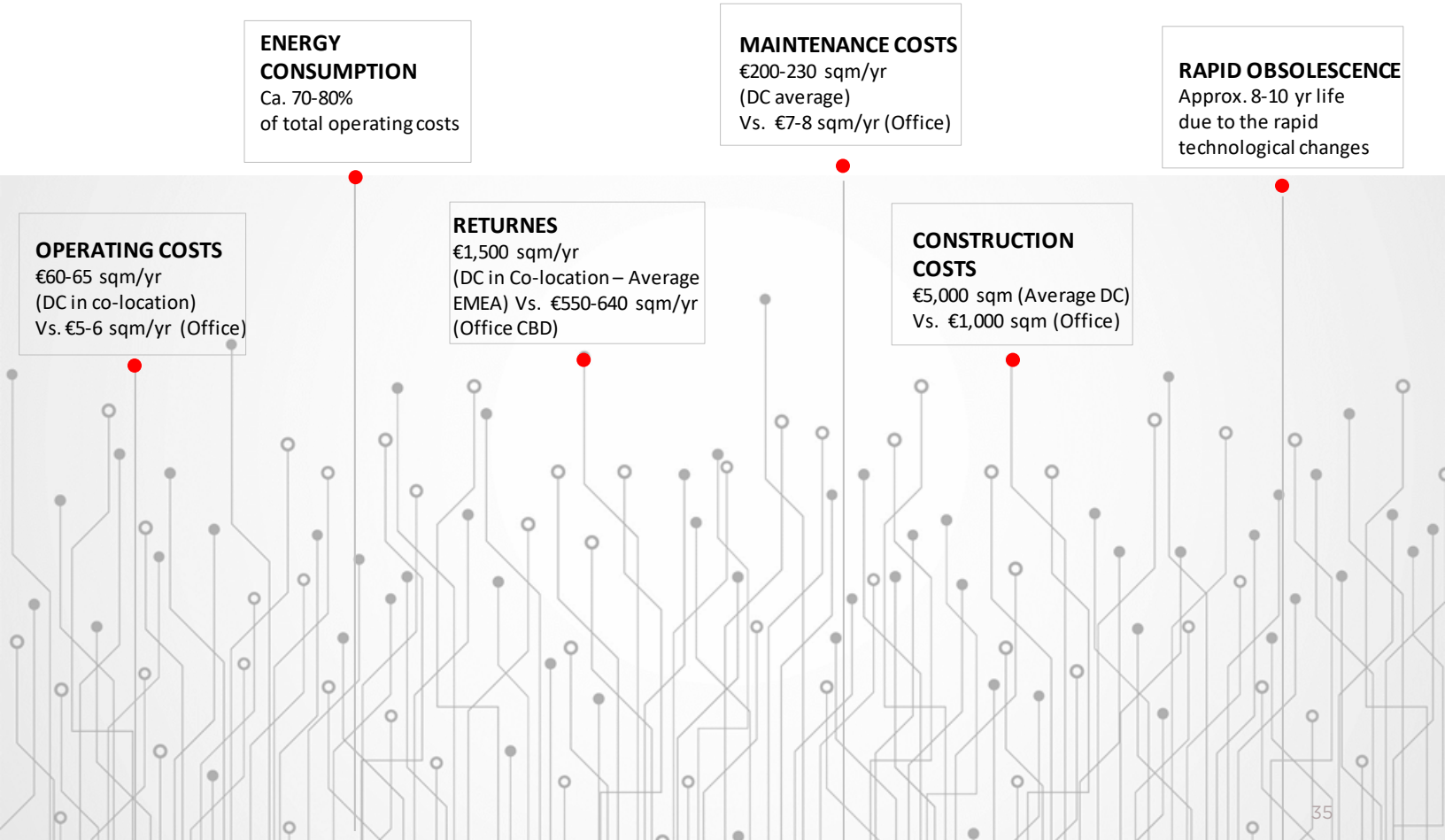




INVESTMENT MARKET

- The Data Center sector is an asset class which globally attracts investment not only from Real Estate companies but also from Private Equity funds and infrastructure providers. In Italy, from 2013 to 2021, the market has registered transactions for 750,000 sqm and a value of 650 Mn Euro. Completed transactions and ongoing negotiations refer only to land acquisitions, both greenfield and brownfield, and mainly by sector operators. Investors on the operator front include: Aruba and Telecom Italia joined by pan-European operator DATA4, global firms Colt and Equinix, and the Switch-backed SUPERNAP Italia campus (today Stack).
- Although there is strong interest from investors, the market is not yet mature. The traditional property investment market currently views the Data Center market as an attractive alternative asset class in which to invest, but which presents atypical characteristics from a real estate point of view, with operating, construction and maintenance costs equal to several multiples of the costs expected for other asset classes.
- By way of example, if we consider construction costs, the price for a new Data Center is between 5,000 sqm and 8/10,000 sqm, net of real estate costs, which are 10 times higher than those for a logistics property and 8 times that of an office building. On the other hand, there is a return in terms of rent of around 1,500 €/sqm/yr, well above the 50-68 €/sqm/yr for Logistics or the 550-640 €/sqm/yr for Offices CBD. Another risk factor to be taken into account is the fact that a Data Center is a property that cannot easily be converted into an asset with another use, and therefore its owner must consider this important limitation.
- Nevertheless, Investors understand the expediential growth of IT and information storage therefore the future use requirement for Data Centers. We believe there to be strong potential for future evolution, with many new opportunities arising.
- Below are some considerations on the values related to Data Center asset class:

CONSIDERATIONS



CONTACTS

For further information, please reach out to:

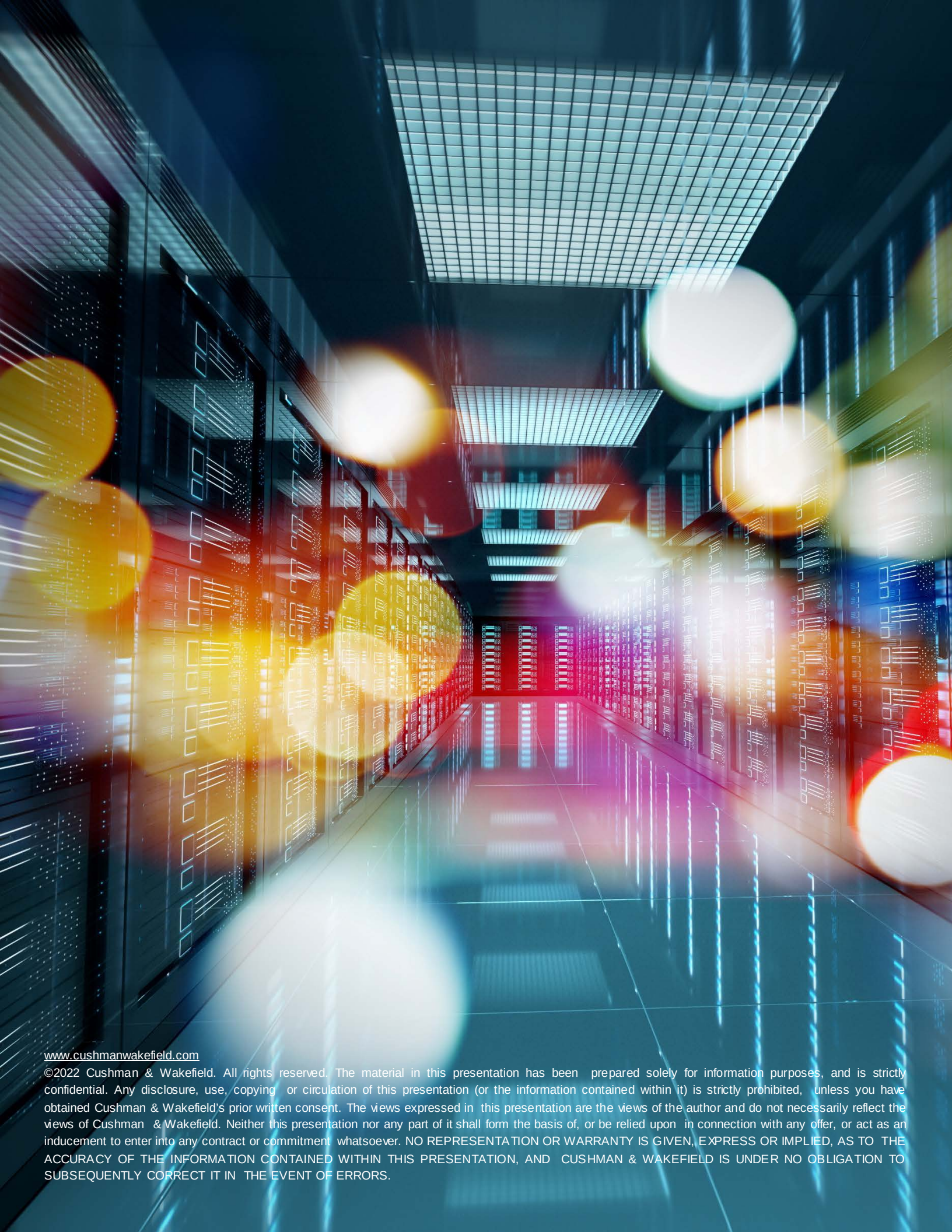
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