



GERMAN
DATACENTER
CONFERENCE

23

2022

DATACENTER
OUTLOOK
GERMANY

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EDITORIAL

WELCOME TO THE GERMAN DATACENTER CONFERENCE 2022!

FOR THE FIRST TIME IN 2022, WE INVITE YOU TO THE GERMAN DATACENTER CONFERENCE TO DISCUSS PRESSING TOPICS AND MARKET ISSUES IN THE UNIQUE ATMOSPHERE OF THE DATA CENTER HOTSPOT FRANKFURT.

It is essential data centers achieve sustainability goals for the future, by driving forward digital processes and investments in sustainable technologies. More than ever this year, our industry was made aware that the opportunities of digitization for Germany can only be capitalized if we work together with political stakeholders, authorities and institutions towards this common goal. At the same time, we need to sharpen the image of our industry and demonstrate the urgency of digital infrastructure concerns and progress further.

Together, we are committed to driving forward the international competitiveness and digital power of Germany in a more sustainable and efficient manner and taking charge of the shaping and progress of our country. Finally, we must also work for the right framework conditions in Germany for climate protection and the energy transition. We are certain that with the hard work of our powerful members and partners, we can be part of the solution. With all these



challenges and opportunities, the German Datacenter Association has created a platform that provides expert insights into technological trends, investment opportunities and offers the opportunity to share business ideas and space to make valuable contacts with other industry representatives.

We are so excited, to organize an event of this magnitude to promote new opportunities and encourage cooperation. We cordially invite you to take advantage from the synergy with our interdisciplinary speakers, members and partners and welcome you to the GERMAN DATACENTER CONFERENCE 2022!

KIND REGARDS
ANNA KLAFT

EVENT PARTNERS

MAIN PARTNERS



SILVER PARTNERS



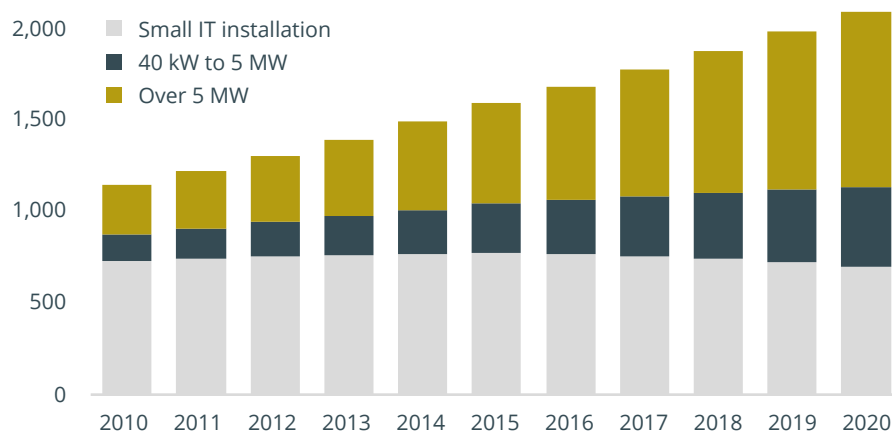
GERMAN DATA CENTER MARKET

OUTLOOK 22 / 23

Despite all concerns about power supply over the coming months, Germany remains in a strong position for data centers in Europe. There are no signs for the demand for new sites to develop data centers slowing down. It is more likely that new buyers are entering the market and driving up prices even further for the few sites with power still available.

While most of the attention is, for good reason, still on Frankfurt and Berlin, there is little doubt that new data center clusters will emerge in other regions as well.

INSTALLED DATA CENTERS – CAPACITY (IN MW)



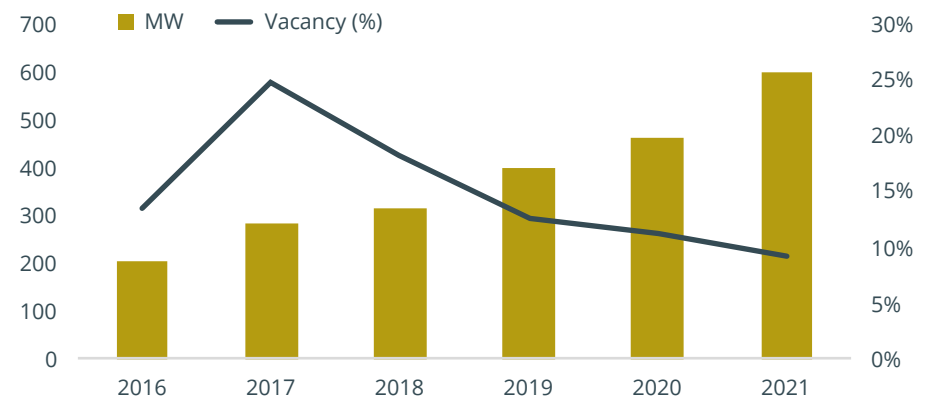
FRANKFURT

The Frankfurt market is still by far the leading location in Germany for data center investment despite raising constraints for new developments: Securing power is becoming more and more difficult, a new masterplan for data center developments limits new land options in the city. Nevertheless, Frankfurt remains a desirable market for organisations.

OUTLOOK

Hyperscalers want to expand their availability zones and enterprises have digitization efforts underway. New regions like the District of Darmstadt or locations west of the River Rhein in and around of the city Mainz might become of interest for new developments. Pre-let's play a big role too as organisations strive to source precious capacity. This and the overall dominance of hyperscale developments brings the market vacancy further down.

COLOCATION AND WHOLESALE CAPACITY IN FRANKFURT (IN MW)





BERLIN

The success story for Berlin continues. Coming from 35 MW in 2020, the combined capacity in Berlin is now beyond 120 MW. Berlin has established itself as the second leading market in Germany with strong focus on DC campus developments in and south of the city.



DUSSELDORF

While Dusseldorf used to be a strong cornerstone in the early 2000s in the DC industry, new developments have been comparable slow in recent years. Besides the opening and expansion of the DC1 data center south of Dusseldorf and an expansion of Digital Realty into the data center campus "Connecta park", we have seen little growth of new DC capacity in this market.



MUNICH

Munich has a strong standing in the colocation landscape. Recent expansion came from NTT with an additional 9 MW supply coming online in 2021. Due to a strong economy with many corporate headquarters located in the area, there is huge potential for more data center capacity ahead.



NUREMBERG + STUTTGART

Although about 150 km apart from each other, Stuttgart and Nuremberg share a lot of similarity in their market structure. Both cities are mostly served through local retail colocation operator satisfying a demand from many German large and mid-cap occupier with HQs in these areas.

OUTLOOK

Multiple sites in the market are in different stages of development, promising further growth of the market capacity. A strong demand for new sites indicates that we are far from slowing down this development, although first locations struggle to secure power in a reasonable timeframe. This could lead, like in the Frankfurt area, to new availability zones in different directions.

Dusseldorf might see a first hyperscale campus development soon. The regional government (Landesregierung NRW) supports a redevelopment of former coal power plant in the Lower Rhine region sites into data center campuses. The 3 MW data center for the Ministry of Finance in Kaarst might bring more fibre connections to the right side of the river Rhein. The potential of the wider Dusseldorf area is in the availability of land, a dense power grid and access to a consumer base of 18 million people in North Rhine-Westphalia.

Munich could see a similar growth in new capacities like Berlin, unless planning restrictions and overall high land prices hold back interest from investors.

Both markets remain to be strong in their segment. While a hyperscale development has yet not been discussed in these markets, there is a market appetite from colocation operators to expand their footprint in the regions.



MICHAEL DADA is director of the Advisory & Transaction Data Centre Solutions team at CBRE. Michael sees the challenge in the market as not only making data centers more sustainable in terms of energy consumption, but also making them more positive connected to the urban landscape they sit in.



EXPERT INSIGHTS

WHAT NEW DEVELOPMENTS/ INITIATIVES WILL BE RELEVANT TO YOUR COMPANY IN 2023?



Focus on security. Resilience, redundancy, continuity, sustainability. All these trigger strong and valuable missions like the GAIA-X European data sovereignty initiative. Rosenberger OSI is mirroring this rebalancing by driving – and thriving with – several ‘focus topics’ just to name two out of this we appreciate: the KritisV regulation catalogue launched by the German government and the digitization act “Schulen ans Netz” which creates tremendous workloads.

MATTHIAS REIDANS | Senior Project Manager Services
Rosenberger-OSI GmbH & Co. OHG



There are two things that particularly excite us: 1) We see an increased focus on design and build sustainable data centers; basically, we see a shift from primarily focusing on PUE to also use less or almost no water and reuse of energy. 2) We are also excited about some of the developments in liquid cooling, and the increased possibilities this provides for reusing heat. It may not be fully visible in 2023, but we are excited about the developments and are ready to support.

JAKOB JUL JENSEN | Director, Business Development, Data Centers
Danfoss

As a designer of data centers, the ongoing demand for new facilities creates a positive business outlook for 2023. Also, with the DC industry taking sustainability finally serious, new opportunities arise to deploy innovative and sustainable solutions and really move forward to net carbon zero.

ALEXANDER HAUSER | Managing Director / Owner
TTSP HWP Planungsgesellschaft



At Huawei we are striving to build a smart low carbon society! With the effects of climate change becoming more and more visible each year, our focus is to help our customer to refine their sustainability roadmaps and to make a contribution to the transition to a zero-carbon society. Until 2025, Huawei has therefore committed to increasing the energy efficiency of its products by at least 270 percent!

SANJAY KUMAR SAINANI | Senior Vice-President & CTO
Huawei Technologies



Further progress of waste heat utilization from data centers for residential and industrial areas comes into focus. Respective IT heat capturing and distribution solutions will be further developed.

MANFRED ENGELHARD | Director of Technology
Exyte



The continuing expansion of the German Data Center market and the growth of the second tier data center regions outside Frankfurt e.g. Leipzig, Berlin, Hamburg. An increase in attention on sustainability and a demand for sustainability reporting throughout the value chain, drive towards carbon reduction goals in Scopes 1, 2 & 3. A trend of hardware life extension – organizations are adding additional years in their depreciation calculations as hardware infrastructure is used for longer, making use of redeployed parts and components for servicing and upgrades. Demand for spare parts and re-manufactured parts is increasing as a result of this.

JELLE SLENTERS | Commercial Director, EMEA
Sims Lifecycle Services



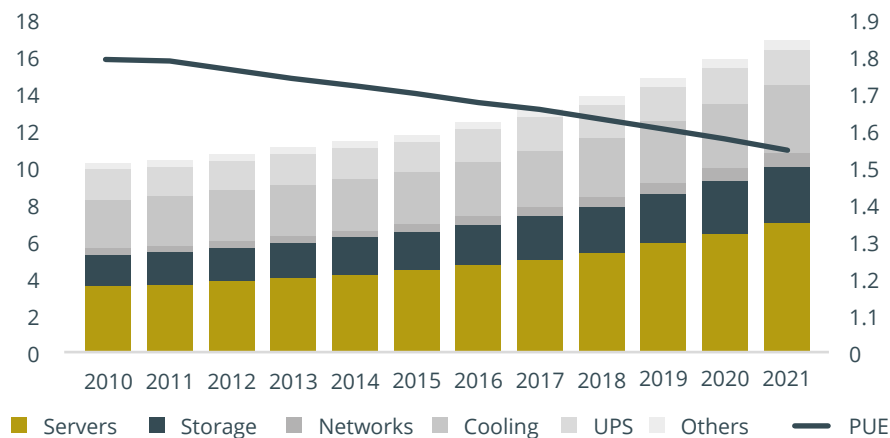
STILL A LONG WAY TO AN ABSOLUTE CLIMATE NEUTRALITY OF DATA CENTERS

THE CURRENT SITUATION IN GERMANY

The data center market is booming – especially in Germany. As a result, the energy consumption of data centers is also growing. A recent study by the Borderstep Institute shows that in Germany, the energy consumption of data centers continues to increase. In 2021, data centers consumed 17 billion kWh, which is 6.5 % more electric-

ity than in 2020. Among others, the strong growth of cloud data centers can be seen as one of the main reasons for this trend. However, traditional data centers continue a high share of data center capacity; in 2020, their share of the IT capacity of all data centers in Germany was still over 60%.

ENERGY CONSUMPTION OF DATA CENTERS IN GERMANY FROM 2010 TO 2021
AND AVERAGE PUE (BILLIONS OF KWH/A)



In the big picture, the increased demand for digital services from data centers leads to the overall growth. Even though servers, storage and network devices are becoming more powerful in terms of performance-per-Watt and the utilization of these systems has been increased, those efficiency gains couldn't compensate the overall growth. Also, the popular indicator for infrastructure efficiency, the average Power-Usage-Effectiveness (PUE) of data centers in Germany has been improved in the long-term trend between 2010 and 2021 from 1.82 to 1.56. This is because, despite the sharp rise in energy consumption by ICT components, which almost doubled during the period, infrastructure consump-

tion increased relatively little from 4.6 to 6.1 billion kWh.

Large IT companies and data center operators known to be large customers of renewable power generation, helping to finance new large-scale wind and photovoltaic projects. Nevertheless, a lot of CO₂ is generated in Germany in the production of electricity. According to the German Federal Environment Agency, in 2021 domestic electricity use generated 435 gCO₂/kWh. If we calculate with this value, data centers in Germany will cause emissions of 7.4 million t CO₂ in 2021, taking into account only the energy-related CO₂ emissions.

CLIMATE NEUTRAL OPERATION OF NEW DATA CENTERS FROM 2027 ON

In recent years, the sustainability of digitization and data centers in particular has become increasingly important to the public and politicians. The European Commission has set a target for data centers in Europe to operate in a climate-neutral manner by 2030. In response, a self-regulatory industry initiative, the Climate Neutrality Pact for Data Centers, was formed. In Germany, the current government has not only stated in the coalition agreement that public data centers must introduce an environmental management system by 2025, but that all new data centers in Germany must be operated climate-neutral from 2027. A precise definition of what climate neutrality means in this context is still pending. However, it is clear that the possibility of climate-neutral operation depends strongly on the permis-

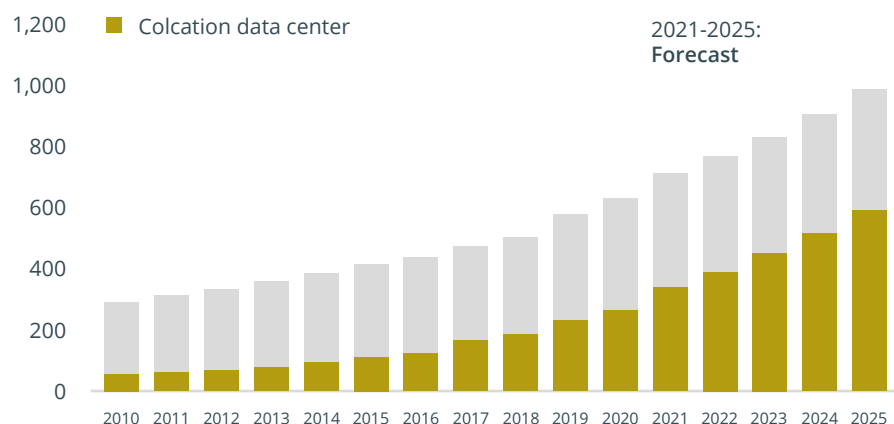
sion of certificates or accounting method of the emissions:

- First, whether the electricity must be generated carbon-neutral at the same time.
- Second, whether distant producer certificates (e.g., Norway) are allowed as a source of electricity.
- Third, whether further emissions such as refrigerant losses or the extended life cycle (production, transport, etc.) are taken into account.
- Fourth: Can positive effects, for example, through the substitution of fossil heat generation by data center waste heat, be offset as compensation?

If one chooses a stricter definition with respect to electricity supply, climate neutrality cannot be achieved by data center operators alone, but the entire electricity supply of Germany must be transformed. Regardless of the ultimate interpretation of the term climate neutrality and the resulting political framework, there are various technical options, to reduce greenhouse gas emissions. A particular hotspot for data centers in Germany is the state of Hesse

and, in particular, the Frankfurt Rhine/Main region. About one-third of all German data center capacity is located in Hesse. And the growth of this location continues unabated. The market for colocation data centers in particular is growing very dynamically (Figure 2). No wonder that discussions about the environmentally friendly and sustainable operation of data centers are most intense in this region.

CAPACITIES OF DATA CENTERS IN THE STATE OF HESSE WITH SHARE OF COLOCATION (IN MEGAWATT)



TECHNICAL OPTIONS TO REDUCE THE ENERGY DEMAND – A WIDE RANGE OF OPPORTUNITIES

As described above, the ICT systems have enabled enormous efficiency gains in terms of “performance per Watt” in recent years, but in total terms, these effects have largely been absorbed by increased software requirements and growing demand. According to the Borderstep data on data center energy consumption, on top of the ICT energy consumption, the data center infrastructure still causes an overhead of ~56% in 2021. Within the infrastructure sections, cooling had with roughly 3,7 billion kWh/a by far the biggest energy consumption which is why high savings potentials still exist there.

The physical objective of cooling is to protect the IT components from overheating and to dissipate the waste heat with as little energy as possible. A widely used cooling method in air-cooled IT rooms and data centers is indirect free cooling, which uses heat exchangers to isolate the IT environment from external influences. This method can be used to provide efficient cooling at low outside temperatures. However, when outside temperatures exceed a certain temperature, the temperature of the cooling circuit must be actively cooled down. This is usually done by a compression chiller, in bigger data centers often evaporation cooling is used to reduce the energy demand of the compression chiller. The refrigerants used in the chillers often have a high Global Warming Potential, which causes additional greenhouse gas emissions. With evapo-

rative cooling, on the other hand, the consumption of water is increasingly criticized in water-scarce regions.

By allowing higher temperatures in the data center, the usage of active cooling can be reduced drastically and, in some cases, active cooling can be avoided. Also, direct air-to-air heat exchangers or the so-called Kyoto wheel can be used to maximise the effect of indirect free cooling.

The use of fluids directly at IT for heat dissipation instead of air represents a radically different approach to data center cooling. The higher heat capacity compared to air, in some cases by a factor of 1000, not only enables significantly lower volume flows, but also higher operating temperatures. Within fluid cooling, a distinction can be made between on-chip cooling with liquid-flow heat sinks and immersion cooling, in which the IT is immersed directly in a non-conducting fluid. Immersion cooling has recently attracted a lot of attention and some experts expect a market breakthrough in the near future. HotFIAd (Hot Fluid Adsorption Cooling) - a current research project in Germany has even demonstrated that hot fluid cooling can achieve significantly higher cooling efficiency while effectively utilizing waste heat from data centers. In particular, the waste heat from such a hot fluid system can be used to drive an adsorption chiller, which in turn can be used to generate cooling.



Data centers represent an important backbone of digitization, which in turn plays a very significant role in decarbonization. There is no question that they must be operated sustainably as quickly as possible. There are various technical options for this, but from the perspective of Germany, energy conservation and renewable power supply still represent the greatest leverage. In order to reduce energy-related emissions in the big picture, the high potential of waste heat must also no longer be left untapped.



DR. RER. POL. RALPH HINTEMANN is a senior researcher and partner at the Borderstep Institute for Innovation and Sustainability. His research focuses on innovation strategies, the development of sustainable markets of the future, and the diffusion of new products and technologies, in particular environmental innovations and information and communication technologies. He has been researching data centers and sustainability for more than 20 years.



SIMON HINTERHOLZER is a researcher at the Borderstep Institute for Innovation and Sustainability. He studied the bachelor's and master's degree program Renewable Energies at HTW Berlin. At the Borderstep Institute, he has been researching the climate and environmental impacts of digital technologies, especially data centers, for several years. He is Co-author of a recent study on "Energy-efficient Cloud Computing Technologies and Policies for an Eco-friendly Cloud Market"

GDA EVENTS IN 2022

OCTOBER

GDA NET[T]WORK LUNCH @ Stulz GmbH | Hamburg

NOVEMBER

GDA NET[T]WORK LUNCH @ Eaton Electric GmbH | Bonn

GDA EVENTS IN 2023

FEBRUARY

20./21.02.2023 GDA goes KICKSTART EUROPE | Amsterdam

MARCH

21./23.03.2022 GDA goes CLOUDFEST | Rust

APRIL

25. - 27.04.2023 GDA goes DATA CLOUD GLOBAL CONGRESS | Monaco

MAY

10./11.05.2023 GDA goes DATA CENTRE WORLD FRANKFURT | Frankfurt

AUGUST

APPLICATION DEADLINE: GDA YOUNG TALENT SPONSORSHIP AWARD

SEPTEMBER

GDA GENERAL ASSEMBLY | Frankfurt

GERMAN DATACENTER CONFERENCE | Frankfurt

GDA YOUNG TALENT SPONSORSHIP AWARD CEREMONY | Frankfurt



EXPERT INSIGHTS

ARE THERE ANY DEVELOPMENTS WHICH ARE INHIBITING GROWTH TODAY? WHICH INNOVATIONS OR SOLUTIONS ADAPT TO SOLVE THAT PROBLEM?



The availability of skilled people is probably the most critical issue we are currently facing. It is crucial that we as an industry are becoming more visible and that we work with schools and universities to attract young people to the sector. We also need to become an integral part of the digital agenda that is so high on politician's priority list. A digital society without a digital backbone can not exist. Therefore the role of associations like GDA is absolutely vital.

PETER LAMBRECHT | VP Sales EMEA
Vertiv



The data center market in Germany is currently characterised by high demand for large and professionally operated data centers. On the other hand, unfavourable factors, such as long and complicated administrative processes and high electricity prices, make the situation particularly challenging compared to the rest of Europe. There are also still major administrative hurdles that delay required changes, for example regarding building permits.

GÜNTER EGGERT | Director Public
NTT Global Data Centers EMEA

Talent is a continuous challenge. Significant investment in talent management team globally, continual investment in training organizations to ensure unique employee offering and grass roots partnerships with education bodies to attract talent during secondary and higher education. Working with candidates from parallel industries e.g. Oil & Gas, Aviation and the armed forces.

NEIL JOHNSON | Vice President
CBRE Data Center Solutions



Supply chain issues and lack in skills and resources are concerning obstacles for moving ahead. OSI supports to cover shortages e.g., by implementing optimised stock management techniques nurtured by elements from our internal digitization workgroup. To tackle down issues and fight disadvantages our European sourcing is intensified, relying on long term partnerships is key. In addition, a joint forecasting is established. The clients are integrated! To enable appropriate upgrades in fibre-based connectivity towards 400G/800G roadmaps are followed with carefully levelled efforts and insisting directives.

MATTHIAS REIDANS | Senior Project Manager Services
Rosenberger-OSI GmbH & Co. OHG



Mainly the provision of the necessary power contingent on high voltage / mid voltage level is limiting Data Center project developments. There is enough power at the Transmission System Operating firms, but the expansion of the power grids and sub stations for the Distribution System Operators need to be accelerated.

MANFRED ENGELHARD | Director of Technology
Exyte



The master plan to build truly climate-neutral data centers is still missing. We need to think out-of-the-box and have the courage to implement ground-breaking new concepts for data centers - on the one hand in energy supply, but also in establishing closed-loop systems for materials.

SIMON HINTERHOLZER | Researcher
Borderstep Institute



TO UNDERSTAND THE DATA CENTER MARKET, LOOK AT THE APPS!



The decisions we take now will impact the environmental performance of the digital economy for decades to come. Efficient use of resources on-site and standardization of data center design are some of our priorities.

HERBERT RADLINGER
VP Projects & Solutions, NDC-GARBE

Germany has been a primary market for cloud and hyperscale deployments in past decades. Its centralized geographical location, coupled with vast communication networks and secure land and power connections, played a pivotal role in attracting data center investments. Germany has also demonstrated its ability to deliver the required solutions consistently while maintaining the highest availability and quality.

Thus, the relationship and trust have grown within the hyperscales. The challenge for data center developers is to evolve with technologies and work with their customers on their technology and business goals. Currently, there is growth from hyperscalers, which are deploying services within key regions in Europe, especially in Germany, to keep up with the current and future demands of their end customers.

THE 2ND WAVE OF DIGITAL TRANSFORMATION

While other countries are moving to more interconnected, decentralized, and autonomous systems, in Germany, the next wave of digitization is only at the starting point. The digitization process within enterprises has not yet fully matured, as companies run only a limited amount of applications on the cloud. Soon, organizations will experience and discover the full potential of hyperscale offerings, which will enable them to scale their business further in a short time. We will witness advancements and

adoptions of new technologies and solutions, such as IoT, AI, and Machine Learning. Those applications require reliable power sources to process, distribute and store a large amount of data. Furthermore, the generated data must be constant, instant, reliable, and accessible anywhere. To distribute relevant content and reach the end customer much faster, hyperscale and enterprises will drive Edge deployments as "satellite" data centers within each region in Germany.

Data centers are embedded in a complex ecosystem. Creating value for all stakeholders and communicating it clearly is our responsibility. Only then will we be able to boost expansion, improve public relations, gain trust and facilitate funding.

PETER POHLSCHRÖDER
Managing Director, NDC-GARBE



As already mentioned, Germany's central location has not only played an essential role in the past but will continue to play it in further boosting the growth of each region. The excellent ecosystem of highly connected telecommunications networks will

allow hyperscalers to reach any European location with full redundancies. In addition, some hyperscalers are expected to integrate services and applications amongst themselves, opening new Availability Zones depending on current configurations.

INHIBITORS

In addition to the problem of a shortage of suitable land throughout Germany and particularly in Frankfurt we are witnessing a reduction in electricity due to the current geopolitical situation. Hence, the collaboration with energy partners with renewables and alternative solutions will be paramount to maintain the growth within Germany.

Here, the challenge for data center developers is to provide alternative energy solutions. For example, fuel cell technology can act as a primary or secondary power source and provide required resilience and redundancy in the short to medium term and until the current power grid is upgraded in 2026.

WHAT HAPPENS NEXT?

To support the current and future growth of each hyperscale, it is important for data center developers to identify individual re-

quirements and flexibly adapt to their business models and technical solutions. For 2023, three aspects should be considered:



DANIEL ROZAIRO has more than 12 years of experience in the data center industry as well as in the telecoms, technology industry. He serves as Vice President of Hyperscale Sales at NDC-GARBE. Previously, he served in senior management roles, implementing strategies in connectivity and strategic accounts while working at leading global data center and telecom providers.

1

Alternative power solutions and resourcing

New and innovative ways to provide alternative and more environmentally sustainable energy sources need to be explored. One example is fuel cell technology, which can be used as a primary or secondary power supply and combined with cooling solutions that enable high production efficiency. These solutions will offer full redundancies and resilience, providing SLAs similar to the grid power. That will allow operators the flexibility and the speed to deploy services within certain availability zones currently under power constraints.

2

Better understanding of customers' technologies

To provide the right solution at the right time. As each customer seeks to improve and enhance the efficiency and latencies of their applications to reach the end customer faster, understanding the applications and solutions used in data centers is indispensable. In this way, data center developers are able to become a trusted partner and can provide a tailored solution to support their customers' core nodes of computing, production, storage, and edge/connectivity deployments.

3

Consistencies on sustainability

Sustainability in digitization is imperative. It is not only about designing and deploying data centers that are as energy efficient as possible, but improving every aspect of the solutions to meet set industry and government standards. For example, it is important to ensure that raw materials used for implementation can be recycled and reused within the data center industry to have the lowest impact on the environment. Also, it is essential to focus on community sustainability by engaging in dialogue with initiatives, the community and surrounding communities as early as the design stage of data center projects. By distributing waste heat, for example, local authorities will be able to reduce their dependence and consumption on the local grid.



EXPERT INSIGHTS WHICH TRENDS DO YOU EXPECT TO SEE HAPPENING IN 2023 AND ARE RELEVANT FOR YOUR ORGANIZATION?



We expect further investments in data centers in the Frankfurt area albeit at a lower rate. We also expect DC investments to be spreading further into other areas of Germany. Generally, with macroeconomic uncertainty increasing, we expect a generally lower pace of expansion of the DC industry despite the continued trend towards digitization.

ALEXANDER HAUSER | Managing Director / Owner
TTSP HWP Planungsgesellschaft



Across the industry we expect an acceleration of efforts towards 2025 goals, including those set in the Carbon Neutral Data Center Pact. This includes assessing 100% of used server equipment for reuse, repair or recycling and increasing the quantity of server materials repaired or reused with a target percentage created.

JELLE SLENTERS | Commercial Director, EMEA
Sims Lifecycle Services

We experience a willingness for buyers to collaborate with suppliers, which is extremely important to overcome current challenges. This is highly relevant, as closer collaboration can help accelerate developments and secure the data center industry is meeting the ambitious growth predictions.

JAKOB JUL JENSEN | Director, Business Development, Data Centers
Danfoss



We expect the energy transition to gain pace! These requires smart and intelligent solutions in order to manage huge data streams from a large number of decentral renewable energy sources and consumers in real time. High efficient system for power generation, provisioning and consumption combined with real-time data collection and processing allow us to optimize the system and the use of resources. Digitization is becoming a real game changer.

SANJAY KUMAR SAINANI | Senior Vice-President & CTO
Huawei Technologies



The public will increasingly demand sustainability measures for Data Centers, a meaningful sustainability indicator beyond PUE/WUE need to be developed. GDA and the European partnering associations need to support this.

MANFRED ENGELHARD | Director of Technology
Exyte



The global supply chain continues to be extremely stressed: lead times and prices continue to be way beyond what we have been used to 24 months back. This calls for much more forward thinking and planning. The 'old' way of working is no longer viable. We need to work on a close coupled integrated supply chain with both suppliers and customers.

PETER LAMBRECHT | VP Sales EMEA
Vertiv





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ABB

Electrifying the world in a safe, smart and sustainable way, ABB Electrification is a global technology leader in electrical distribution and management from source to socket. As the world's demand for electricity grows, ABB's 50,000+ employees across 100 countries collaborate with customers and partners to transform how people connect, live and work. ABB develops innovative

products, solutions and digital technologies that enable energy efficiency and a low carbon society across all sectors. By applying global scale with local expertise, the company shapes and supports global trends, delivers excellence for customers and powers a sustainable future for society.

WWW.GLOBAL.ABB

BORDERSTEP INSTITUTE FOR INNOVATION AND SUSTAINABILITY

The Borderstep Institute for Innovation and Sustainability is active in the field of applied innovation and entrepreneurship research and committed to the vision of sustainable development. Borderstep is an independent research institute focused on entrepreneurial solutions for global challenges.

Borderstep's research focuses on green innovation, sustainable entrepreneurship, climate change and smart energy systems in the building and the IT sector.

WWW.BORDERSTEP.ORG

NDC-GARBE DATA CENTERS EUROPE

NDC-GARBE is a German data center developer. The international team is focusing on projects in the most sought-after locations in Germany and its neighboring countries. As a joint venture between NDC Data Centers and GARBE Industrial Real Estate, the company gathers decades of experience in the European real estate markets and profound knowledge of the data center industry to sustainably increase the level of digitization in Europe.

Whether it is a modular, standardized solution (NDC Cube) or a data center designed for customer specific requirements, NDC-GARBE supports every phase of the project and guarantees smooth development and punctual delivery.

WWW.NDC-GARBE.COM

CBRE DATA CENTER SOLUTIONS

As the world's largest data center real estate practice, CBRE Data Center Solutions is able to provide the strategies, insights and end-to-end services needed to optimize data center solutions from inception through disposition.

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SPACE FOR NOTES

ABOUT GDA / GDC

GERMAN DATACENTER CONFERENCE

The German Datacenter Conference is an initiative of the German Datacenter Association. With the conference, we offer all stakeholders of the digital infrastructure

ecosystem a platform to make contacts and exchange professional ideas at the data center hotspot Frankfurt am Main.

GERMAN DATACENTER ASSOCIATION

The German Datacenter Association e.V. (GDA) unites operators and owners of data centers in all dimensions. The GDA is supported by leading research institutes, municipalities and a network of partners.

Founded in Frankfurt am Main in 2018, the association offers data center operators in Germany a platform to jointly promote the industry's growth. Its declared goal is to sustainably improve framework conditions for data center operations in Germany, the public's perception of the data center industry, and to enhance the appeal

of German locations in the eyes of investors. Members concentrate their know-how in six competence groups with a view to working together on the Association's key issues. The development of a strategy for sustainable digitization and intensive dialog with representatives from politics, local authorities and the real estate industry are just as much a focus of the working groups as the promotion of young IT talent and transparent communication of, for example, sustainability goals already achieved and aspired to by the data center industry.

INTERESTED IN BECOMING A MEMBER OF GDA OR PARTNER OF THE GERMAN DATACENTER CONFERENCE 2023? CONTACT US VIA OFFICE@GERMANDATACENTERS.COM

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DESIGN, GRAPHICS, LAYOUT

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