PERSPECTIVES FOR A SUSTAINABLE[1] DATA CENTRE INDUSTRY BY 2030

DATA CENTRES FOR GERMANY AS A BUSINESS LOCATION

bitkom

eco

GERMAN DATACENTER ASSOCIATION

[1] Dimensions: Economic, social and ecological

DATA CENTRES
ARE THE FOUNDATION AND CORNERSTONE OF DIGITALISATION

Without data centres, no societal or economic sector could today guarantee the provision of essential services. In the past few years, data centres have come under greater political and public scrutiny due to their unquestionably high energy consumption and growth. Nonetheless, compared to the strong worldwide rise in computing power (increase by a factor of 10) and the volume of transmitted data (increase by a factor of 20), the increase in energy demand (only by a factor of 1.55) is disproportionately low. This underlines the continuously improved energy efficiency of data centres. In addition to the strengthening of positive effects in various economic and societal sectors, which can already be seen today, the industry supports the German federal government's goal to operate new data centres in a climate-neutral manner from 2027. Data centres thereby play a significant role in achieving German sustainability goals.

11.5 BILLION EURO
2025 REVENUE IN THE COLOCATION AND HOUSING SECTOR

The Frankfurt/Rhine-Main area is the most important data centre location in Europe with one of the largest Internet Exchanges in the world (DE-CIX). Due to Brexit, its position is continuously expanding. With a projected average annual growth rate of 15.7 per cent, the colocation and housing market is a key driver of growth in the networks, infrastructure and operating sector. In providing access to the Internet (stationary and mobile), this is the baseline for every Internet service. In 2025, the colocation and housing market is expected to generate a revenue of 11.5 billion Euro; in 2022, the revenue already amounts to 7.9 billion Euro. In addition to video streaming and entertainment services, new, future-oriented digital business and action fields such as connected cars, Smart Building, Industrial IoT and 5G are key to the growth of the colocation and housing market. The Internet industry in Germany, which relies on functioning data centres, is expected to generate 195 billion Euro in 2022. By 2025, the market volume of the entire Internet industry will increase to approximately 245 billion Euro and account for 7 per cent of Germany's GDP. Apart from the data centre industry's revenue, boosts in demand should also be taken into account as indirect economic indicators. In this context, one example relates to temporary boosts in demand from the supplier and construction industry during the construction of a data centre. Between 2016 and 2021, data centre capacities in Germany grew by 30 per cent, in particular due to the increased demand for cloud services which is driving Germany's innovative strength. In 2021, 68.5 billion Euro was created in value alone through the use of cloud services in the overall economy.[2] Investments in IT hardware and infrastructure in German data centres also currently amount to approximately 7 billion Euro. Top location factors for data centres in Germany are data protection, legal security and reliable power supply, as well as connections to Internet Exchanges.

COLOCATION – DATA CENTRES

Colocation refers to the supply of data centre capacity to multiple third-party companies. In 2020, colocation data centres, which are often used by multiple companies, accounted for 40 per cent of data centre capacity in Germany.

CLOUD CAPACITIES

In Germany, the importance of cloud deployment models is on the rise. In total, approximately 1.25 million companies in Germany use cloud solutions.

EDGE DATA CENTRES

Edge data centres are small data centres located at the edge of the Internet, closer to end users and devices. Latency is significantly lower, and services can be delivered faster. The market is still relatively young, but is gaining in importance.

130,000
WORKERS

FORTIFY THE
DATA CENTRE INDUSTRY

Approximately 130,000 full-time workers are currently employed in the data centre industry, while an additional 80,000 jobs are indirectly dependent on data centres. The predicted growth of the data centre industry is accompanied by an even higher demand for skilled workers in the future. The Internet industry as a whole is expected to employ half a million workers by 2025. From 2020 to 2025, this would equate to an annual increase of 3.8 per cent. Around 35 per cent will be employed in the networks, infrastructure and operations sector. **IN GERMANY, HOWEVER, THERE IS ALREADY A NOTICEABLE SHORTAGE OF SKILLED WORKERS.** Particularly in the fields of **ELECTRICITY AND CLIMATE SUPPLY**, relevant **UPSKILLING** is urgently needed for the data centre sector. Many operators are investing in internal training for professionals

on the market to meet the industry's specific requirements. In addition to skilled workers in the programming area, a need for workers who can professionally perform the physical work on site also needs to be taken into account.

A COMPREHENSIVE POLITICAL STRATEGY IS URGENTLY NEEDED IN THIS CONTEXT. The shortage of skilled workers in the digital industry can only be counteracted in the long term through a stronger focus on STEM[3] subjects. Such a strategy should also include a focus on the transformation of skilled workers from industries that will be less relevant in the future, not to mention the qualitative improvement of schooling, education and studies. These must be attractive to all, and the drop-out rate must be reduced. The data centre industry in

Germany provides future-proof technical and administrative jobs for people from all societal fields with a wide range of educational backgrounds.

A strong and reliable data centre landscape is a foundation for **DIGITAL SOVEREIGNTY** and maintaining the **COMPETITIVENESS** of the digital and the general industry in Germany as a business location. In addition, legal security and data protection are particularly significant location factors which afford Germany a significant advantage over other countries.

However, competitiveness is impaired by Germany's high electricity costs. These constitute a major disadvantage for Germany as a business location in light of European and international competitive-

ness. In this field, there is an imperative need for action by federal policymakers. Germany can only become the top data centre location if energy costs are competitively advantageous from a European and international perspective.

Targeted support for data centres also exerts a positive impetus on investment and location projects in downstream fields ("gravity concept") and promotes digital ecosystems. A digital ecosystem is a socio-technical system in which a large number of participants come together to pursue a common goal for mutual benefit with the help of a digital platform.

[3] STEM: Science, technology, engineering and mathematics.

DATA CENTRES AS SYSTEM-RELEVANT INFRASTRUCTURES

WHAT IS REQUIRED

– Prioritisation of data centres in the event of supply shortages
– Redefinition and enhanced recognition of data centres as system-relevant IT infrastructures
– Exemption for emergency power systems from immission standards according to the 44th Ordinance of the German Federal Immission Control Act (BImSchV)

DEFINITION OF DATA CENTRES AS SYSTEM-RELEVANT

There needs to be a redefinition of which data centres are considered to be system-relevant. At present, the only indicator is the size of the data centres measured by the contracted IT electrical power. However, essential municipal IT infrastructure such as municipal utilities are often located at smaller data centres. The electrical connected power must therefore not be the only indicator and, based on the criticality of the IT systems, smaller data centres must be included in crisis management as **SYSTEM-RELEVANT INFRASTRUCTURE**.

PRIORITISATION IN THE EVENT OF A CRISIS

Against the backdrop of the looming energy crisis, greater consideration must be given to system-relevant IT infrastructures, which are essential for the functioning of our modern society, economy and state. Data centres must be equally prioritised when drawing up an energy distribution plan (regarding electricity and fuel) in the event of persistent shortages.

ADAPTATION OF THE GERMAN IMMISSION CONTROL ACT

The demand for high availability of data centres often stands in conflict with the requirements of the "44th Ordinance of the German Federal Immission Control Act" (abbreviated in German as the "BImSchV"). In the event of an energy supply crisis, emergency power systems run the risk of exceeding the immission values permitted under the Immission Control Act due to excessively long operating times. Emergency power systems should therefore be exempted from strict immissions regulations by means of an emergency act so that they can continue to operate in a legally compliant manner in the event of a crisis. This also corresponds to the intention of the Directive (EU) 2015/2193.

BUREAUCRACY AND REGULATORY HURDLES

DIGITALISE, ACCELERATE, STANDARDISE AND SIMPLIFY APPROVAL PROCESSES

For this purpose, the "German Investment Acceleration Act" should be extended to data centres in order to roll out essential data centre capacities in Germany in a needs-oriented manner. In particular, municipal planning and approval procedures must be digitalised, accelerated and standardised. Approval processes in Germany sometimes take more than a year, while, in other EU countries, such processes are regularly concluded in a few weeks. This leads to a considerable competitive disadvantage for data centres in Germany and slows down the growth of the digital economy. A complete digital application process including standardisation of documents would be an important first step towards improving the approval processes.

EU-WIDE STANDARDS NECESSARY TO ACHIEVE THE CLIMATE GOALS

This approach is indispensable to enable fair European competition based on comparable standards. The data centre industry is aware of its responsibility and is already making its contribution to achieving the climate goals on the basis of self-regulatory initiatives. These include the "Climate Neutral Data Centre Pact" (CNDCP), which has been signed by all three associations and most of the major providers in the industry, and the "European Code of Conduct for Energy Efficiency in Data Centres". In addition, the KPIs of the European EN50600-X standards address the measurement of key performance indicators for energy and resource efficiency in data centres, or the Maturity Model of CLC/TS 50600-5-14.[4]

WHAT IS REQUIRED

– Complete digitalisation, standardisation and acceleration of approval processes
– EU-wide standards for fair and transparent competition

[4] This list is not conclusive.

ENERGY AND
CLIMATE NEUTRALITY

WASTE HEAT UTILISATION

To date, the potential for supplying CO_2-free waste heat from data centres to the local and district heat network has been left largely untapped. However, it must be noted that the necessary municipal heat network infrastructure has not been developed, meaning that, with a few exceptions, data centres are currently not in a position to locate customers. Heat network operators must be called upon to take on more responsibility, given that most data centre companies are already willing to sell their waste heat free-of-charge or at a low cost. In particular, a potential legal obligation for data centres to sell waste heat poses a challenge. As such, a corresponding obligation to purchase data centre waste heat from municipal energy supply companies would be a minimum requirement, as would non-discriminatory access to heat networks and to supply. Older generation heat networks must be upgraded by the heat network operators in order to ensure the most efficient possible supply at the relevant supply points. To this end, the potential for feeding data centre waste heat into the network should be transparently recorded. Especially in new residential and commercial areas, local or district heating should be provided as the preferred heat supply – only then can waste heat be used effectively. Waste heat utilisation must be economically attractive for data centre operators as well as for the municipal heat network infrastructure. In regions with high data centre capacity, these centres could contribute significantly to the municipal heat transition. CO_2-free data centre waste heat should be defined as an innovative green energy source in the context of the "German Combined Heat and Power Act" and should be supplied as a priority.

CONSISTENT ENERGY TRANSITION AND CLIMATE PROTECTION

The industry supports the goal set out in the coalition agreement of the 20th legislative term to operate new data centres in a climate-neutral manner from 2027. Most data centre operators are already looking for suitable ways (e.g., PPAs) to significantly reduce the carbon footprint of data centres and are trying to make the best possible use of all options available to them for sourcing green power. In practice, however, the German federal government's declared goal is currently only possible if the carbon footprint of the power supply is compensated by the purchase of CO_2 certificates. Especially for highly operational data centres, the continuous availability of electricity is of immense importance.

It is therefore crucial that the energy transition is implemented consistently and successfully, accelerating the roll-out and, in particular, the **AVAILABILITY OF ELECTRICITY FROM RENEWABLE ENERGIES** in Germany. Such circumstances are the only way to achieve genuine climate neutrality for data centres. This is where politics must immediately take action.

A further essential step towards climate neutrality is the reduction of Scope 1 to 3 immissions. The data centre industry is observing and reviewing the use of low-CO_2 building materials or the reuse of cement with great interest. In particular, a look at Scope 2 or 3 immissions[5] is necessary for data centres, since a large part of the technology used in data centres is equipped by supplier companies. In this context, the topics of refurbished IT, remanufacturing and re-use also hold great potential for reducing immissions from data centres.

WHAT IS REQUIRED

– Strengthening municipal heat network infrastructure and waste heat efficiency
– Defining waste heat as a sustainable energy source
– Consistent energy transition for de facto climate-neutral data centres in 2027
– Reduction of Scope 1 to 3 immissions for data centres

CONCLUSION

In summary, it can be noted that the data centre industry is making a substantial contribution to the fulfilment of our economic goals and will make an even greater contribution in the future. The industry is also already making a significant input to meeting the challenges of climate policy, and this can be decidedly strengthened. However, this progressive route forward will only occur with targeted support from industry and energy policy framework conditions.

IMPRINT

FURTHER INFORMATION
(FACT SHEET)

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BITKOM STUDY: Data Centres in Germany – Current Market Developments, Status 2022 (2022): https://www.bitkom.org/Bitkom/Publikationen/Rechenzentren-in-Deutschland-2022 (German-language)

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BUREAUCRACY AND REGULATORY HURDLES

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BITKOM POSITION PAPER: Refrigerants in data centres (2020): https://www.bitkom.org/sites/main/files/2020-09/20200909_bitkom_positionspapier_kaltemittel_in_rechenzentren.pdf (German-language)

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This publication is a joint position paper prepared by bitkom, eco and the German Datacenter Association regarding the creation of a sustainable data centre industry by 2030.