DATA CENTRES

THE BASIS OF THE MODERN WORLD
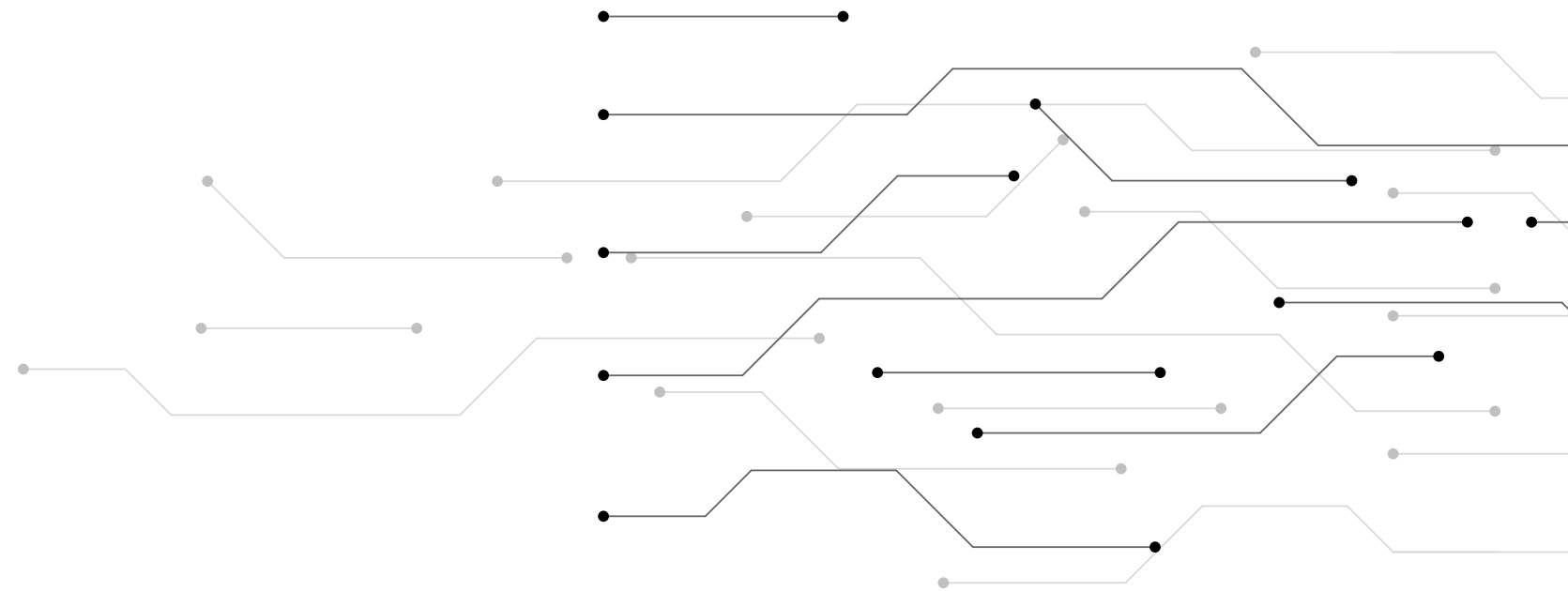
„Data centres are to many industries like the banking system for finance”

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WHAT KIND OF NEEDS ARE APPROPRIATE FOR DATA CENTRES?

Data centres are rooms or even entire buildings, which are designed with the sole purpose of housing data processing equipment. Data centres are often home to a very large number of devices.


A growing number of devices bring new challenges – an ever-increasing complexity in relation to interconnections, an icreasing demand on power needed, more heat generated by servers, as well as storage and the sheer number of network devices. The hardware is not the only thing responsible for energy consumption. Auxiliary systems which need electricity in order to ensure optimal conditions for operating IT equipment with air conditioning systems providing the main cooling, also emit the heat output of all the other devices.
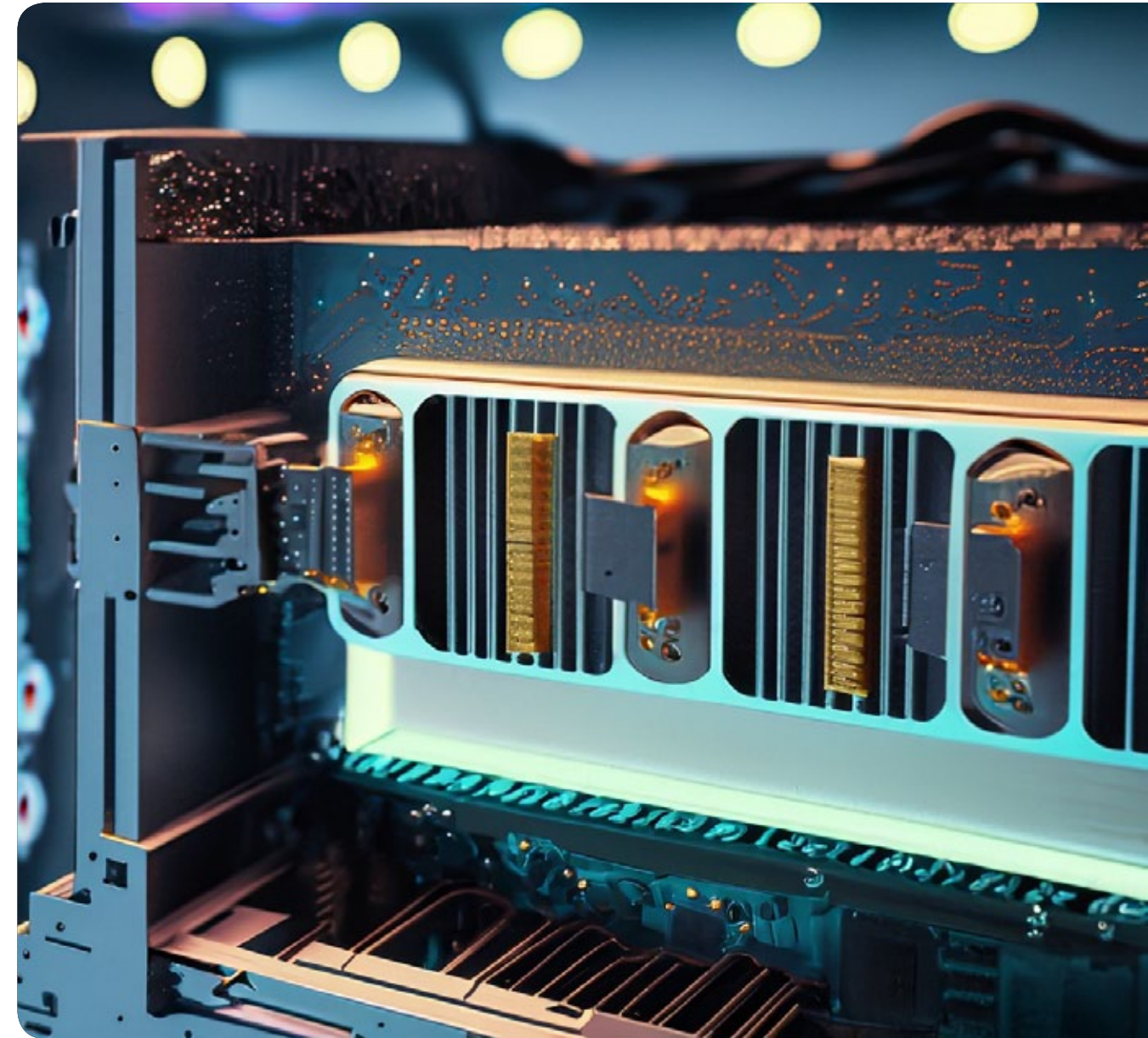
WHAT KIND OF NEEDS ARE APPROPRIATE FOR DATA CENTRES?
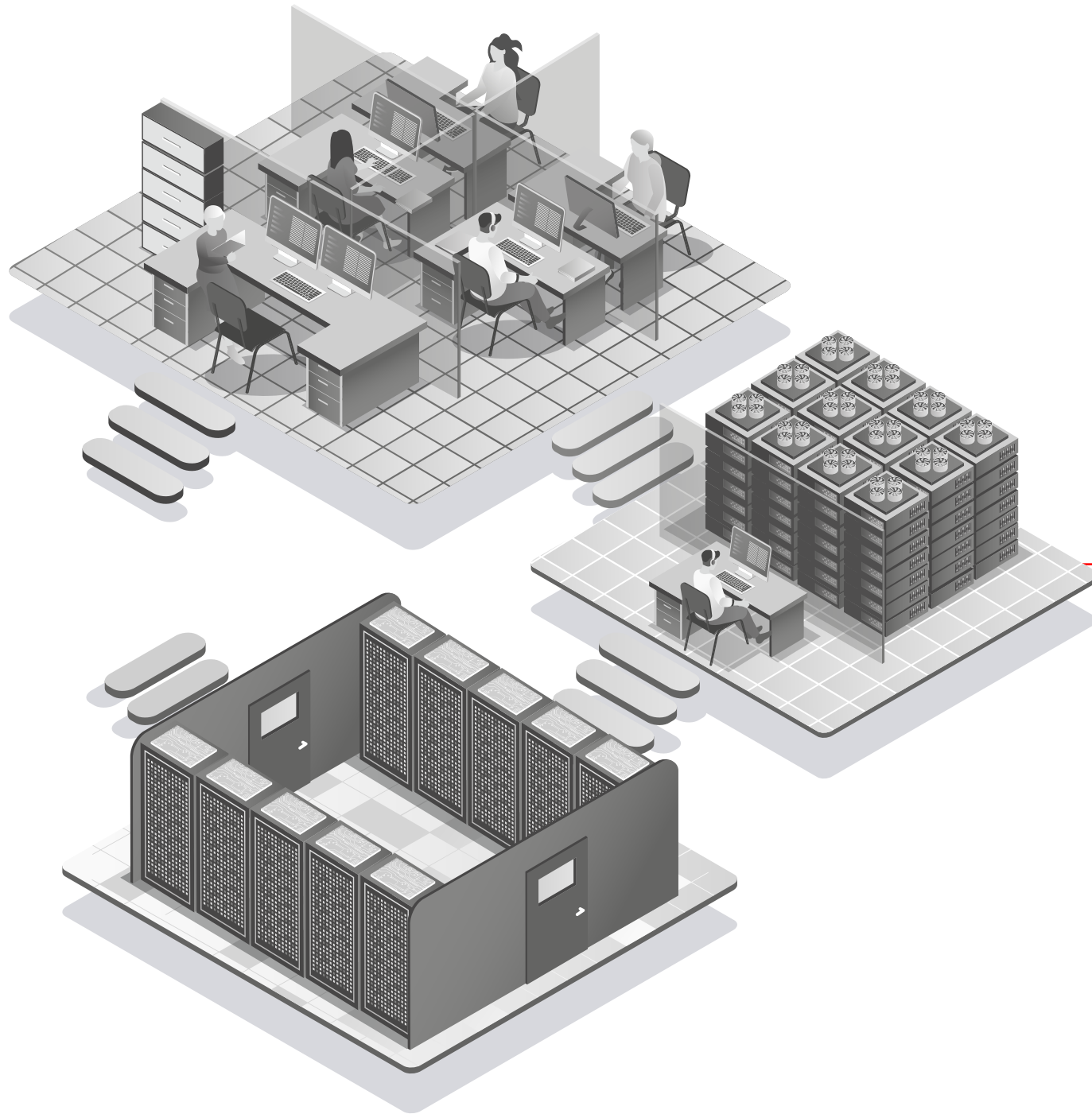
A data centre needs to ensure security on all levels, starting with the physical aspect – access control, as well as protection against the effects of natural disasters, weather events, earthquakes and fires. Many of these systems are sophisticated – flooding all the devices with foam or fire extinguishing powders is not the answer. Therefore, data centre fire suppression systems can mostly extinguish fires by displacing oxygen from the air.

These complex systems has special requirements on data centre equipment vendors and management software.

Do you want to learn more about data centres? Watch our podcast:
Data Centre: Where data lives?

Automating the World

WHAT KIND OF NEEDS ARE APPROPRIATE FOR DATA CENTRES?

There are several priorities when it comes to the operation of a data centre – optimising energy consumption, increasing reliability and reducing downtime, as well as sourcing energy from renewable sources – partially or completely.
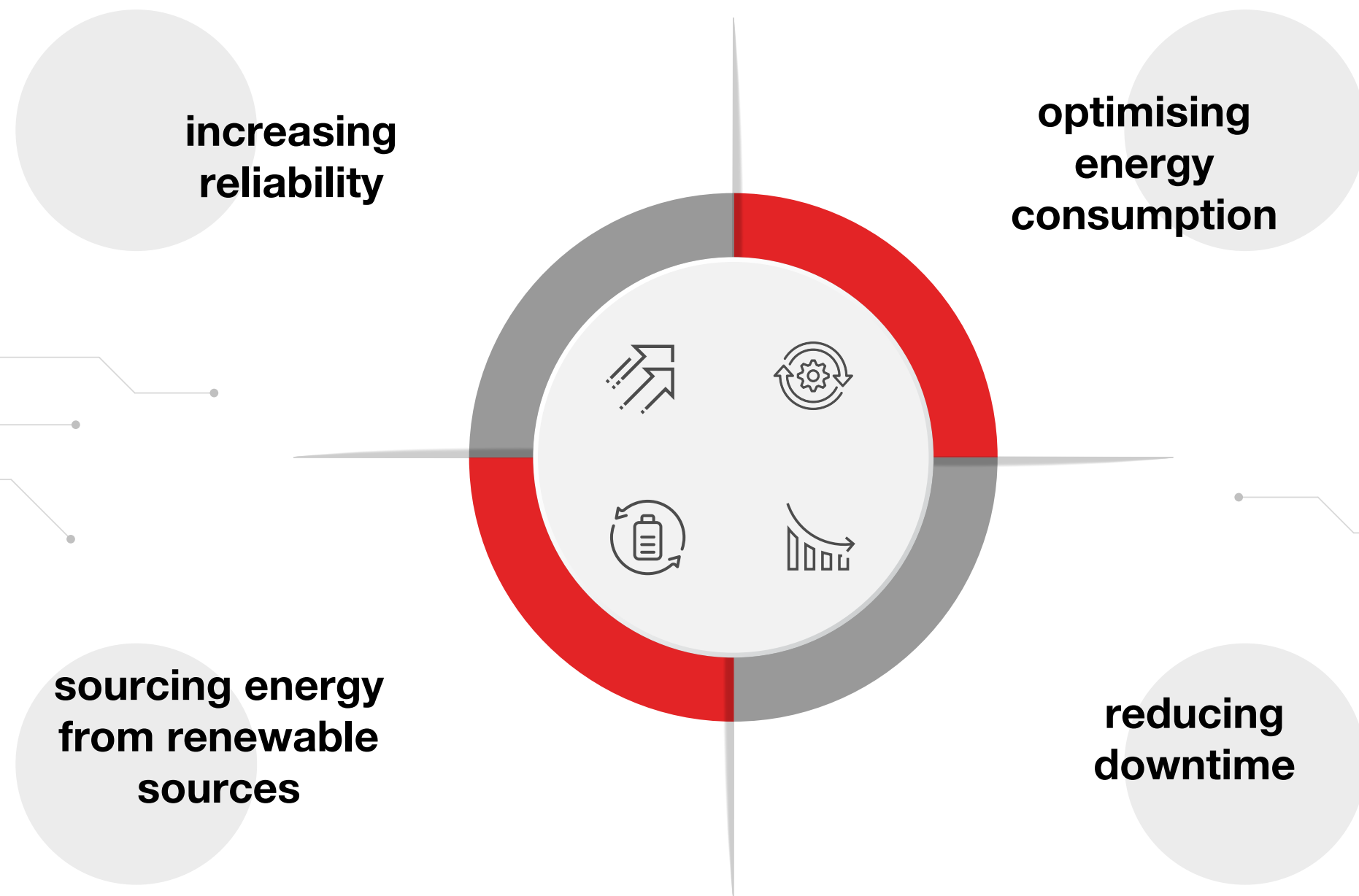
The Mitsubishi Electric Group has extensive experience in the majority of areas relevant to data centre operators, including monitoring and optimising energy consumption, data analysis and building large-scale screens to facilitate situational awareness and disaster management. The company also offers solutions for industrial automation systems, including building automation and low- and medium-voltage power systems.

Mitsubishi Electric also specialises in building DCIM (Data Centre Infrastructure Management) systems. Mitshubishi Electric has the competence, products and expertise to help you build and maintain even the largest data centres, ensuring their ongoing operation.

WHAT KIND OF NEEDS ARE APPROPRIATE FOR DATA CENTRE?

SEVERAL PRIORITIES OF A DATA CENTRE

increasing reliability

optimising energy consumption

sourcing energy from renewable sources

reducing downtime

Automating the World

WHERE ARE THE DATA CENTRES LOCATED AND BUILT?

Data centres appear in major cities and outlying areas alike. In Europe, there are several hubs including cities such as: Frankfurt, London, Amsterdam, Paris, Dublin (FLAPD) and Berlin, Helsinki, Zurich as well.

DATA CENTRES OF SELECTED LARGE COMPANIES

Amazon Web Services
(125 data centres
in 20 countries)

Google
(35 data centres
in 10 countries)

IBM
(36 data centres
in 13 countries)

Many modern facilities have been built in the Netherlands, Scotland (Inverness), Sweden, Finland and Norway, with the Nordic countries being a particularly attractive region for data centre investors, thanks to the region's relatively lower average temperatures.

WHAT FACTORS INFLUENCE THE CHOICE OF LOCATION?

Selecting a location for a new data centre is a process that requires taking a number of factors into consideration, including available power sources and grid capacity, network infrastructure (fibre optics) with sufficient bandwidth, as well as climate conditions.

WHERE ARE THESE DATA CENTRES LOCATED AND BUILT?

Solar and wind power are increasingly seen as net positives in the process of picking the right location, with the possibility of building such installations for the data centre's own use being touted as a major boon.

Geography also matters, data centres should not be built in regions prone to floods, earthquakes, hurricanes or tsunamis.

Political considerations also count – the possibility of acquiring land ownership rights, relevant regulations concerning storing and processing sensitive information (personal data, medical records etc.), a stable political situation, a low risk of armed conflict, the absence of active terrorist groups all matter in the selection process.

Mitsubishi Electric offers solutions that can make the construction of a modern data centre less costly and time-consuming, while lowering its environmental footprint.

TYPES OF DATA CENTRES

There are many types of data centres.

DATA CENTRES ON A HYPER SCALE

Large organisations such as IBM, Google, Amazon, Microsoft, among others use this kind of data centre for processing and storing data for themselves. They are enormous in size, consume huge amounts of energy, power countless numbers of servers.

Concentrating almost all computing power in a single location has many benefits – it reduces operating costs and makes securing the facility against unauthorised access very easy. What is more, it also enables easier management during normal operation and in emergency situations.

hyperscale data centres

edge data centres

DATA CENTRES THAT HOLD EDGE DATA

To process data within relatively small data centres is a concept that has been extended to edge computing. What makes them stand out? In terms of accessing data very quickly, this can be done almost instantly. They can act as a kind of buffer between the user and a remote, larger data centre, storing data that is frequently accessed or modified.


colocation data centres

privately owned data centres

TYPES OF DATA CENTRES

COLOCATION DATA CENTRES

Facilities built with rack space to lease and the idea to provide services in mind. Clients are provided with rack space by the operators, where they can use their own devices. Power, access to networks and proper operating conditions – air conditioning, ventilation, fire suppression, emergency power supply and all the other needs are ensured. Depending on the requirements and business model, it can also provide additional services, such as hardware leasing or sales, in-house service personnel, private space, restricted access only for authorised personnel.
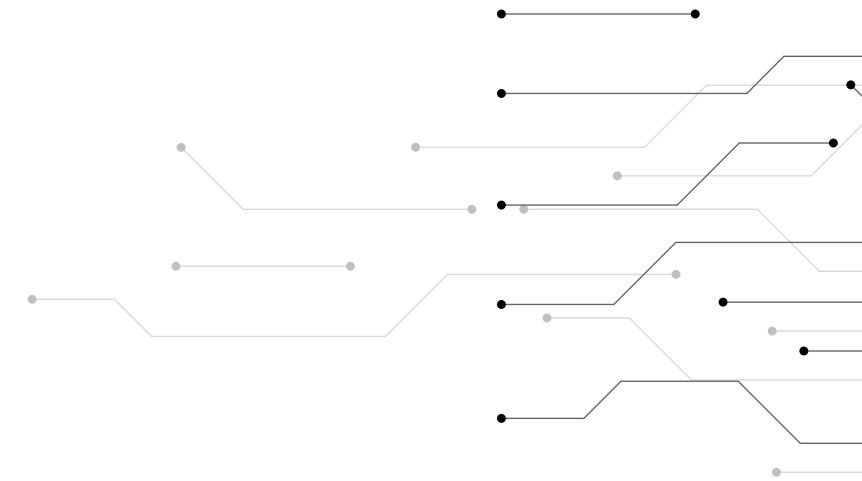
Do you want to learn more about data centres? Watch our podcast: **Data Centre: Where data lives?**

PRIVATELY OWNED DATA CENTRES

These data centres are built for a specific company or institution – small businesses, international organisations and government agencies including hospitals and more. In some cases, they can employ unusual solutions, such as shipping container modules and reinforced buildings resembling military bases.

HOW ARE DATA CENTRES PERCEIVED?

The collective imagination considers data centres as a symbol of the modern age. They are also seen to consume a huge amount of data, as well as being a tool that is used for spreading culture – without data centres, reaching audiences around the world could prove impossible.

Many societies have their own stereotypes concerning a variety of things and data centres are not an exception. People are aware that these facilities house enormous amounts of equipment that consume huge amounts of energy – this is seen as a negative aspect mainly because people know so little about data centres.

At the same time, they play a crucial role in today's world – a role that is often underestimated and underappreciated.

These days, data centres are indispensable as gateways to streaming services or applications which provide power in our everyday lives.

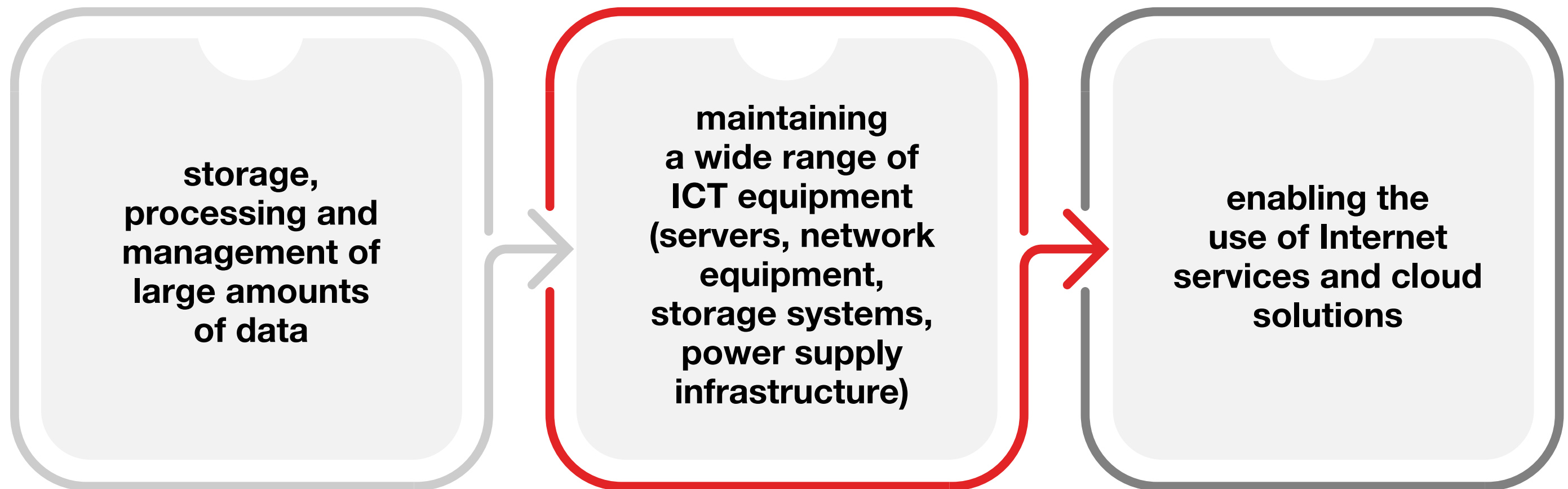**They make it possible to develop new technologies for various industries.**

Without data centres, watching films and listening to music via streaming platforms would be impossible, not to mention scouring the web for information or using social networking platforms. Without data centres, aviation would not be safe, mobile telephones or research which is carried out for modern medicine. Banks, financial institutions and insurance companies, research centres and television stations would cease to function.

HOW ARE DATA CENTRES PERCEIVED?

MAIN TASKS OF DATA CENTRES

storage, processing and management of large amounts of data

maintaining a wide range of ICT equipment (servers, network equipment, storage systems, power supply infrastructure)

enabling the use of Internet services and cloud solutions

HOW ARE DATA CENTRES PERCEIVED?

Data centres are often seen as major energy consumers. What is more, a large part of the energy consumed from the grid is not used by the IT infrastructure, but auxiliary systems and equipment.

Mitsubishi Electric is involved in research into methods of reducing energy consumption. We manufacture devices that enable precise measurement and develop software for analysing usage data.

Our DCIM (Data Centre Infrastructure Management) tools enable you to create an efficient, secure system based on the GENESIS64 SCADA server. It can interface with PLCs, energy meters and other industrial automation components.

Do you want to learn more about data centres? Watch our podcast:
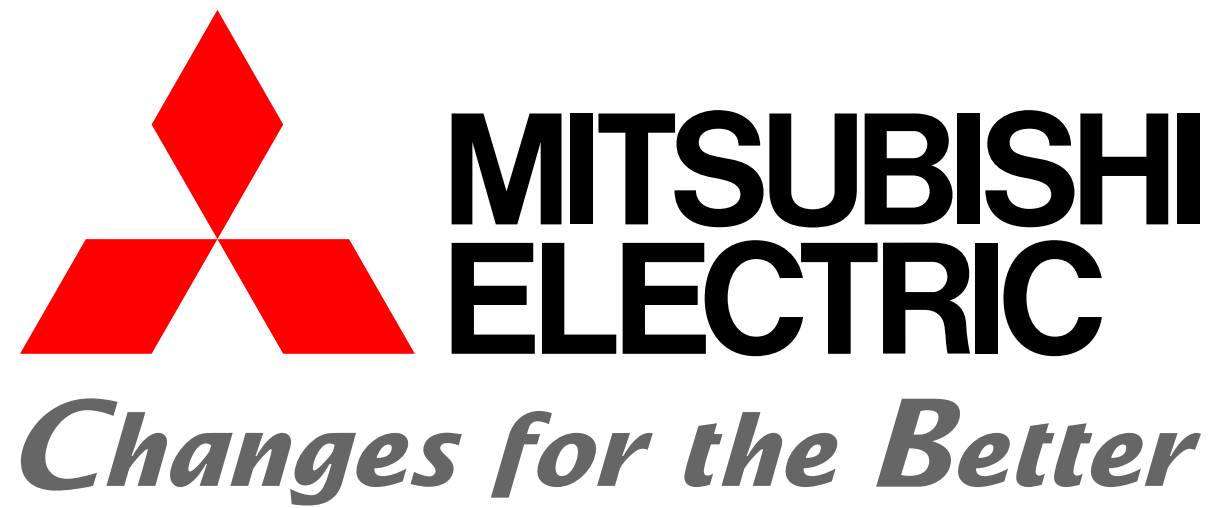**Data Centre: Where data lives?**
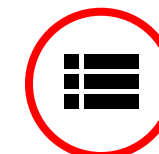
HOW ARE DATA CENTRES PERCEIVED?

It prompted the creation of the so--called Power Usage Effectiveness (PUE) coefficient, which is a ratio of the total energy consumed by the data centre to the energy supplied to the actual IT infrastructure. Many data centres were characterised by the ratio of 1.7. However, efforts are continued to accomplish ambitious goals to achieve the value of PUE close to value 1.0. There are data centres where this ratio is below 1.4.

The energy supplied to servers, network devices and storage needs to be used optimally – this is ensured by a number of different systems. The most of electricity is converted into heat and discharged through HVAC systems into the atmosphere, but this solution has a number of drawbacks – chief among them being financial losses and increased greenhouse gas emissions. The tool developed Mitsubishi Electric which support saving energy is ICONICS Genesis64.

https://emea.mitsubishielectric.com/en/