Hogan Lovells

The World of Data Centers

Greenfield development and brownfield investments: Success factors, pitfalls and lessons learned

2023

Connected

Introduction

Data centers are fundamental to today's digital society - successful development and roll out of new facilities and/or the acquisition or financing of existing facilities require advisors with deep industry knowledge who are fully aware of the legal and commercial risks inherent in these projects, all around the globe.

Our integrated dedicated data center team comprises lawyers with an in-depth understanding of the data center industry and its characteristics. When providing you with closely coordinated one-stop advice, we bring together our knowledge carriers from various legal disciplines including Real Estate, Infrastructure, Permitting, Energy Regulatory, Resources & Projects, Intellectual Property, Project M&A, Data Security, Dispute Resolution, Corporate, Commercial, Project Finance, Employment Law and Sustainability as well as Tax Law. This approach adopted by our integrated team ensures that you receive consistent, industry specific and solution-oriented advice which focuses on what you really need.

This brochure summarizes key legal aspects to be considered when buying, selling, financing and/or constructing a data center, including data protection, digitalization and cybersecurity.

What we offer

Many years of experience, a deep understanding of your industry, and a solution-oriented focus.

Welcome to the World of Data Centers

Data centers of the future: Between Edge and Hyperscale

Hyperscale data center – the future is happening now

In the last four years the data center workload has grown on average by more than 20% worldwide. This development will continue in the coming years (Source: CISCO).

Companies are moving more and more data into the cloud. There are over 2.5 quintillion bytes of data generated every day. Computing power (IaaS), entire applications (SaaS) and platforms (PaaS) are run from within the cloud. As a result, the desire for reliable, low latency data centers is rising constantly. Cloud providers, big data applications, and IoT-providers however do not constantly need the same amount of IT-resources. Depending on the business model, the required resources can fluctuate considerably during any given day, week or month. From Friday evening to the end of the weekend, for example, food delivery services or taxi companies require significantly more resources than on Mondays. The companies therefore face a dilemma: either they maintain IT-infrastructure which absorbs the high peaks, but other than that essentially remains unused while incurring additional costs, or – alternatively – they rely on a lower capacity, but have to accept and absorb higher latencies or even a failure of services due to server overload. Against this background, companies are asking themselves why they should pay for unused IT infrastructure and if there are any other – scalable – options.

Hyperscale data centers provide a possible answer and consequently, are experiencing a significant boom. There is no official definition of what hyperscale data centers are. Looking at it from the outset: Hyperscale data centers tend to have a minimum of 5,000 servers and 10,000 square feet. Studies by the Synergy Research Group indicate that currently 504 hyperscale data centers are in operation, of which the majority are run by the four leading cloud providers. With a further 151 hyperscale data centers being planned or currently under construction, this number is set to increase significantly.

The main driver for companies to move data and applications to hyperscale data centers is the ability of these data centers to scale their resources within a short time. The server architecture of hyperscale data centers is designed for scalability and high-level performance in order to provide their customers with a flexible and scalable on-demand IT-infrastructure, computing power, data storage space or networking capabilities. It enables its customers to expand or reduce the amount of server capacity based on the respective demand based on two options:

- Horizontal scaling (scaling out) which means that the number of server and computing units are increased; and
- Vertical scaling (scaling up) which means that the power of the already used server and computing units is increased.

This flexibility enables the customers to react quickly to peak loads or low demand. As the risk to utilize the IT-infrastructure is shifted to the data center operator, the user can benefit from the flexibility afforded by the IT-infrastructure to save costs when the IT-infrastructure is not used.

To take full advantage of the technical scalability of hyperscale data centers the parties should ensure that this scalability is reflected within their service agreements. The standard approach for "classical" data centers was to define precise service levels and combine the (non)achievement of these service levels with bonus-malus regulations or (liquidated) damages.

This approach cannot be fully transferred to hyperscale data centers. The fluctuant services might lead to a shortfall of service level due to downscaling of the actual services. Hence, the service agreements should provide for the sufficient flexibility of the parties to increase and decrease the used data center capacity. To secure a successful implementation of hyperscale projects, experience shows that the parties should focus on the following considerations:

- Clearly defined KPIs as an indispensable factor for a successful contractual relationship.
- Determining the available capacity and its pricing via:
  - Models where the baseload provided is priced differently as the offered and used peak load whereby additional load thresholds could be implemented in order to be able to cater to the customer's needs;
  - Option or package models in which the customer can call up certain option rights (for example limited to a fixed number of days in the year or certain days of the week/hours) for additional capacity; or
  - The pricing of a single computing unit or a fixed amount of computing capacity and multiplying the pricing with the used units/amounts.
- The service agreement could include safeguards for the customer that ensure the customer always has access to sufficient capacity (such as liquidated damages or a sophisticated bonus-malus scheme).
- The hyperscale data center operator should not fail to mirror the flexibility granted to its customers in its own energy supply agreements. If customers scale up, the data center operator's energy consumption will also go up. In order to avoid costly surprises, the energy supply agreement should include adequate safeguards or provide for sufficient flexibility to be able to offer such services.

Alternatively, onsite generation (in the near future potentially provided by hydrogen units) may allow the operator to produce the peak energy themselves rather than relying on the energy utility.

A CAGR (compound annual growth rate) of over 9% during the period 2018 – 2024 for hyperscale data centers has led the world of data centers to a new paradigm. A clear contractual framework can assist in turning a hyperscale project into a successful one.

There are over **2.5 quintillion bytes** of data generated every day

5G and Edge data centers
In a nutshell: Edge data centers serve to bring the network resources and computing power closer to the end user and its (mobile) devices. Edge computing moves the computing power from the center of the network – the data centers – to the edge of the network, where the data is produced. Data which does not require low-latency processing, or which would still be stored, is expected to be transferred to the "core" data centers.

With the development of IoT-Business models and autonomous driving on the horizon, the requirements for data centers are shifting. Machine-to-machine communication ("M2M") – as a foundation for today's IoT applications – requires fast and reliable internet connections with low latencies. With the increasing requirements on computing power, network capacity and latency, cloud computing is fast reaching its limits as latency becomes too great. 5G Technology, combined with edge data centers, can help to unlock the full potential of M2M and are fast becoming a key aspect of digitalization and the IoT.

Reducing the distance between the data center and the device enables low-resource devices to run heavy-resource applications in real time as the data does not need to be sent to data centers located far away and which costs additional time. This is especially critical when life-death decisions are to be taken, for example by an autonomous car when it urgently must make the decision as to whether the breaks are to be applied or not. The round-trip time to the cloud, the time used in processing the data and then sending it back may just lose the crucial millisecond which is necessary for the autonomous car to effectively execute the emergency break. Virtual Reality applications also require low-latencies to avoid the so-called "virtual reality sickness". 5G and edge will provide great benefits for the healthcare sector (instant diagnosis, remote operations and autonomous operations), for the use of robots and related to smart city and IoT business models.

A report from Allied Market Research predicts a CAGR of 32.8% for edge computing in the period 2018-2025. Edge data centers have to fit into an urban landscape. While hyperscale data centers are becoming increasingly large, edge data centers lead to smaller deployments. As they require less space, the edge servers and edge infrastructure could be fitted into warehouses, distribution centers and empty factory buildings. It is possible that edge data centers are getting even closer to the 5G-infrastructure by establishing container solutions at the 5G transmission masts. This development illustrates the convergence of IT and telecoms infrastructure as data centers and the grid move closer together.

Many of the technical aspects are still under development and corresponding business models have yet to be created. In any event, only a large scale rollout of the edge computing and 5G infrastructure should be cost and time efficient. Nevertheless it is expected that the 5G rollout will cost even more than the 4G LTE deployment. Such rollout requires considerable investments by the telecom operators and/or the data center operators, which are likely to be financed. In this case, the bankability of the business model and constant cash flows are crucial for the success of the rollout. In addition, it is essential that the underlying project agreements are drafted carefully and efficiently. The good news is: The first to successfully set up a large scale edge network will be the one to define the market standard.

Lease or own your Data Center?

Lease or build a data center?

When a company is growing and wants to outsource servers and IT equipment, it must decide on the best way to do this.

Such a decision can be crucial if the business is expanding rapidly and therefore urgently requires additional space for servers and IT equipment. The choice it faces is whether to lease data center space (by a co-location or warehouse solution, which we will refer to as "leasing" or a "leasing solution") or whether to build its own data center.

The obvious advantages of building over leasing are that

- the company has maximum control over the IT equipment and anything related to it;
- there is no risk of "losing the lease"; and
- any unused space can be leased out to other companies, thus reducing electricity, cooling and security infrastructure costs.

On the other hand, the main disadvantages of building are upfront costs which can add up quickly if not calculated thoroughly. The costs of building and maintaining a data center should not be underestimated and may be a crucial factor in the decision making process. When evaluating the costs involved, the focus is mainly on power, staffing and IT infrastructure. Real estate related costs are however often not taken into account sufficiently or at all. These include architect, planning and design costs, building costs including costs for permits, such as building permits, costs for fire suppression and detection systems, notary costs, costs of registrations, etc. Nor should companies underestimate the various risks related to power and cooling infrastructure, hardware and software, technological development, uncertainty surrounding future business strategy and potential space problems, i.e. if the space later proves to be too small or too big. Moreover, companies should be aware of the large number of building regulations to be met, for example in the area of fire safety which may be very strict in some jurisdictions. On balance, leasing is likely to be a better solution for many companies because it allows risks to be confined and gives companies the flexibility to adapt their space needs to their business needs.

Data center leasing strategies – the various types of contract structures

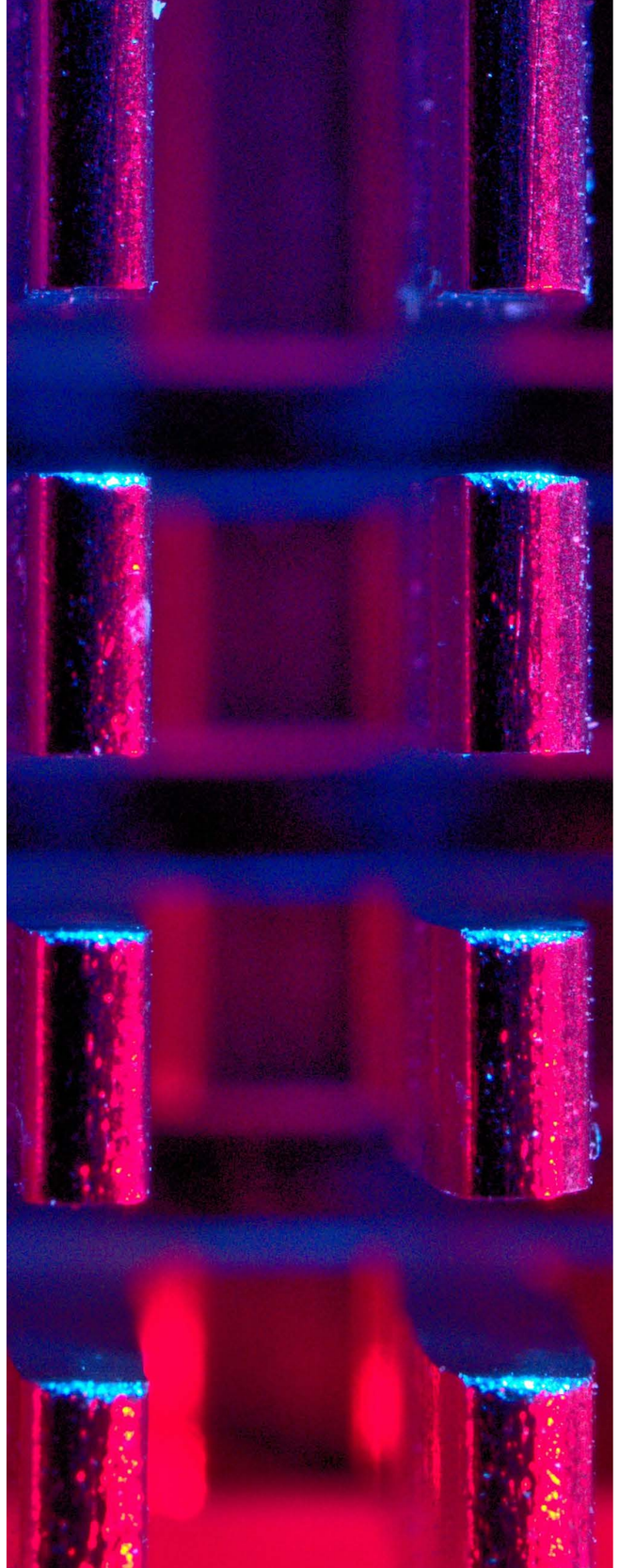
The most common types of leasing structures for data centers are:

- Wholesale data center;
- Powered shell;
- Colocation solutions;
- Server hosting – managed hosting;
- Cloud computing.

Balancing the need for control with the desire to cut costs

Ultimately, the decision between a wholesale/colocation structure and a purely managed hosting structure is one of balancing the need to control the servers and IT equipment with the desire to achieve the best possible cost savings by entering into a data center lease. Important topics which need to be addressed before taking such a decision include:

- how much control is necessary with respect to operation of IT equipment and the premises in which the IT equipment is stored;



- whether the tenant is prepared and willing to accept (high) capital expenditures for repairing and updating IT equipment; and
- whether the tenant is prepared to employ and pay for the necessary personnel to operate and maintain the IT equipment.

When taking this decision, the tenant should not only consider its present situation and its needs as a business, but also bear in mind its future strategies and plans in order to find the best solution. Overall, the wholesale/colocation solution or a hybrid solution might be the right choice for many bigger companies, whereas the managed hosting solution could be the ideal solution for smaller firms.

What a data center lease should cover

First and foremost, it is vital to clarify the legal relationship between the data center provider/landlord and the occupier/customer. Depending on the actual use and allocation of rights and obligations, a lease agreement (triple net or double net), a service agreement or an agreement with lease and service elements are possible options. In most cases, the parties will sign a lease agreement which also includes elements of a service agreement.

As the lease agreement is the main legal document which governs the relationship between the parties, particular care should be taken when negotiating "Provider Must-Haves" on the one hand, and "Customer Must-Haves" on the other. Key topics to be considered in lease agreements include:

Lease term and renewals

Would the company prefer a long-term or short-term lease taking into consideration that the initial term is often 15 to 20 years? In addition, the number of renewal periods and any preemptive rights of the tenant should be considered.

Rent payment
Another important point is how the rent will be paid. The basic rent is usually based either on square meters or on power availability.

Space, permitted uses and equipment
The leased space might not be enough for all the equipment and infrastructure that the tenant requires. It is therefore advisable to stipulate in the lease agreement whether the tenant is allowed to use additional space, e.g. on the roof for antennas, shaft space within the building or special support areas for the placement of generators.

Setup, alterations, maintenance, repair and replacement
Depending on who owns and who will be obliged to maintain the facility infrastructure, specific provisions must be incorporated into the lease agreement regarding alterations, maintenance, repair and replacement. The tenant and/or landlord might be required to comply with certain standards and/or maintenance schedules. Provisions on services relating to data center equipment, heating, ventilation and infrastructure should also be included.

Power supply, cooling, humidity, connectivity and data capacity
Power supply, cooling, humidity, connectivity and data capacity are the core topics of a data center lease. Provisions covering these areas must therefore be included in the agreement. Specifically, the following topics should be discussed and agreed: power requirements, cost of power and uninterrupted power supply as well as redundant fiber access, multiple carriers and sufficient data capacity.

Service level agreements
The parties should also consider including service levels and reasonable support provisions. Moreover, the agreement should describe what happens if service levels are not met. For the customer, it might be desirable to include a termination right for continued breach of guaranteed service levels.

Liability, indemnification, data protection and security
A limitation of liability might be beneficial for both parties. The agreement should also include provisions regarding data protection, security (e.g. access to the building) and compliance with laws.

In addition to the key topics mentioned above, it might be advisable to incorporate other provisions, depending on individual circumstances.

Avoiding pitfalls in construction contracts

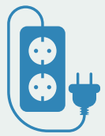
Unlike brownfield projects/transactions, developing greenfield data center (as well as expansion) projects are challenging and come with various risks with respect to delivering the project on time and within the preagreed cost frame. The developer needs to decide on the right approach for such a development: Delivering the project with various (multilot) contractors and a potential designer/or engineer or choosing a turnkey approach whereby an EPC-Contractor delivers the whole project and agrees to engineer, procure and construct the data center. While the first option may deliver a more cost-efficient solution, a turnkey EPC Contractor undertakes the full completion, turnkey and interface risk of such a highly complex project. One of the most obvious benefits of entering into such a contract is having one single point of contact and responsibility for the project, thereby avoiding having to manage various roleplayers that would otherwise have to be involved in the construction and setting up of such a project.

While it is, of course, commonplace for an EPC Contractor to engage various subcontractors to provide certain services or works, the EPC Contractor remains the single point that is directly responsible for ultimately delivering a project ready for operation. This means for the Employer in an EPC project that the added risk of liaising with various parties and allocating various risks is avoided.

Parties need to face reality in terms of construction of a data center. According to a survey of the Queen Mary University of London, published in 2019, “the two main causes of disputes, in the respondents’ experience, were late performance (68%) and poor contract management (63%), reflecting the difficulty of completing sometimes very technically complex engineering projects on tight schedules.”

Having this in mind, a clear contractual framework including a fully functional and efficient claims and risk management can assist in avoiding pitfalls as well as significant delays and cost overruns.

Under a powered shell lease agreement, the construction risk is partly shifted to the tenant of the data center. While the landlord remains responsible for the construction (and the permitting) of the main structure, the tenant is responsible for the internal fitout. This includes sinking the cooling, piping and cables which are necessary for the operation of the data center. Even though the landlord may benefit from such transfer of risk, this business model includes several interfaces between landlord and tenant which must be managed.



Power supply, cooling, humidity, connectivity, and data capacity are the core topics of a data center lease.

Getting Your Contracts Right

Service level agreements with respect to data center leases

A service level agreement is the main contract that defines the parties' rights and obligations under a data center lease.

Before signing such contracts, the parties should assess the scope of services that the data center landlord will perform under a service level agreement. These services could range from entire business processes or merely IT processes, through to the exclusive provision of IT infrastructure within the data center.

More elaborate service level agreements may also stipulate the provision of certain types of software (applications) by the potential financiers (application service providing, "ASP").

Such an assessment is a key consideration for the validity of any service level agreement. The scope of the data center lease and the rights and obligations of each party may vary according to what was agreed upon between the parties. In any case, it sets the standard for the evaluation of the agreement with regard to the law on General Terms and Conditions.

However, both IT and data center services are prone to faults, require maintenance or updates and may be subject to cyberattacks. All these and other adverse effects may lead to downtimes and impact on the availability of the data center. With regard to the strict applicability of the law on General Terms and Conditions, the parties are advised to ensure that the availability of the data center is laid down in the agreement. Conversely, the landlord faces the risk of having to guarantee the permanent availability of the data center.

The parties should not include a disclaimer regarding warranty claims. The statutory warranty obligations of the landlord or the contractor cannot be excluded within the General Terms and Conditions in many jurisdictions for instance.

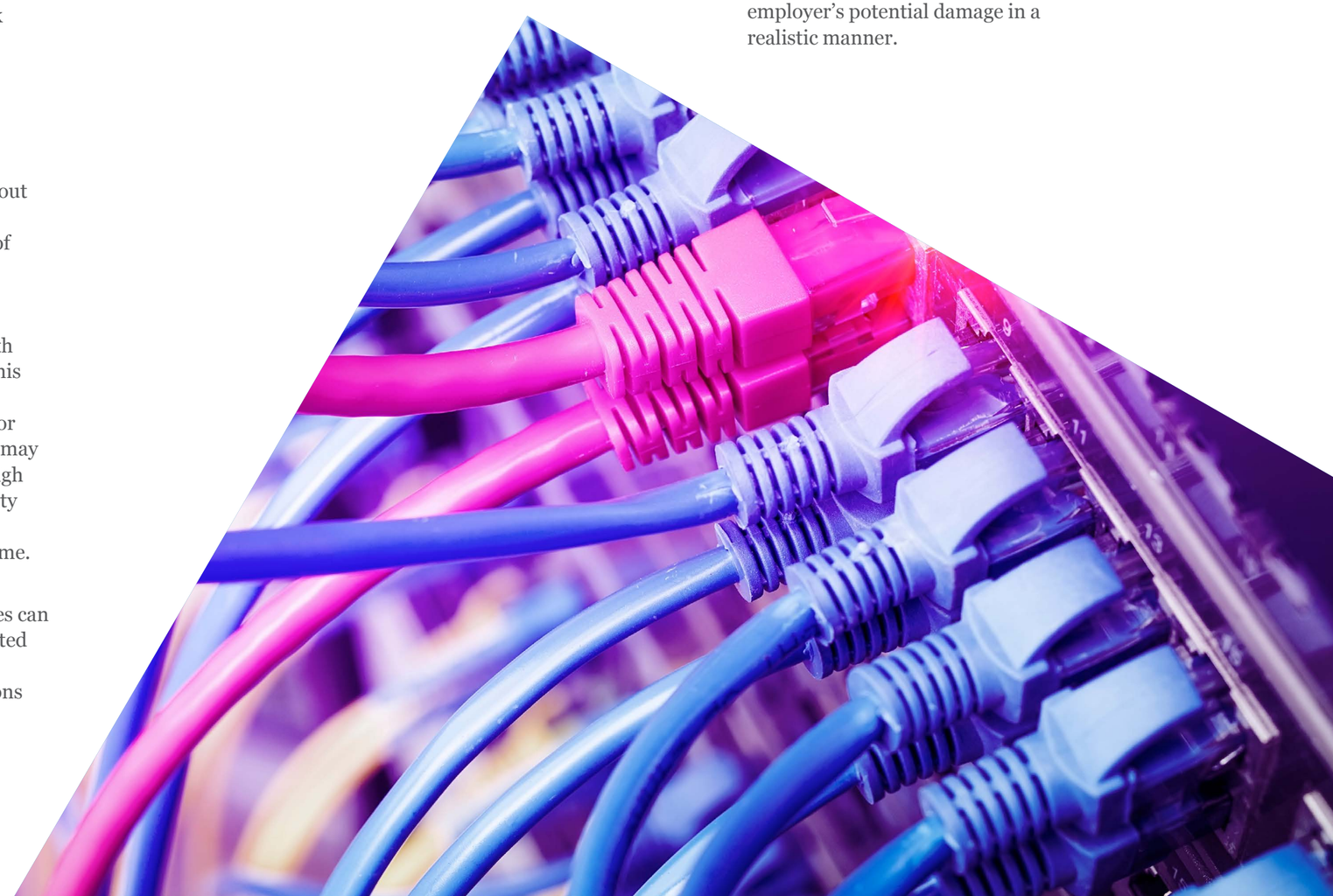
Finally, the parties should assess the validity of any limitation of liability clause regarding strict liability on a case-by-case basis. However, the limitation of the landlord's liability should always consider the risk of cyberattacks and appropriate preventive measures.

Getting the operation structure right

When it comes to the operation and maintenance of data centers, it is all about availability, reliability and stability of the services. Just recently, some parts of the World Wide Web were interrupted for several hours due to a downtime of an internet hub as a result of an energy breakdown in a data center coupled with a crash of the energy redundancies in this data center. Even short outages of the energy supply, the cooling of the racks or the humidity control in the data center may cause enormous downtime costs and high damage. Thus, uninterrupted availability and fast troubleshooting services are required and should be secured at all time.

A key instrument for securing such availability and avoiding potential losses can be seen in liquidated damages. Liquidated damages are designed to meet the legal requirements in the relevant jurisdictions and may help to keep the pressure on the operator in order to secure quick troubleshooting and sufficient redundancies of the contractor. In some jurisdictions a well thought-through drafting of contractual predefined liquidated damages is essential to avoid unenforceable provisions.

In order to achieve this, the party engaging an operator should extensively investigate and consider in detail all possible scenarios which may lead to interruptions in the services. Especially the core services (e.g. power supply, cooling, humidity control, security) should then be discussed with a view to defining contractual service levels, percentages of guaranteed availability and preagreed reaction and troubleshooting times. In particular, the contractual service levels should ensure that the required times for (successful) troubleshooting and the points of measurement of the availability are exactly defined. The better the parties describe such obligations and service levels in the contracts, the better they may be able to link these times and percentages to an escalating mechanism of liquidated damages covering the employer's potential damage in a realistic manner.



Data Center M&A and Financing

Share vs. asset deal

In an acquisition scenario it should be decided as early as possible whether the transaction will take the form of a "share deal" or an "asset deal".

Under a share deal, all or part of the shares in a business are transferred to the purchaser. If, for instance, a project company or holding company has been set up as a limited liability company, the purchaser – upon completion of the purchase – becomes a shareholder of that company.

In contrast, under an asset deal, the seller only disposes of and transfers individual assets (and liabilities) under an asset purchase agreement ("APA"). Based on the principle of legal certainty in some jurisdictions, the transferred assets and liabilities must be clearly defined in the APA together with any required particular kind of transfer method to the purchaser. Therefore, an asset deal initially also involves increased costs and effort on the part of the seller and the purchaser to establish and agree on the "object of the purchase" and the contractual documentation (i.e. the "APA"). However, the advantage of an asset deal lies in the possibility to select individual assets and liabilities for transfer. Any ancillary contracts (including rights and obligations e.g. power purchase agreements, commercial agreements such as lease agreements for the provision of data center services) will have to be transferred to the purchaser separately by way of novation. It should be noted here that – in contrast to a share deal – both the sale and transfer of the contractual relationship require the consent of the counterparty.

In the course of a share deal, the purchaser will acquire a certain percentage of the shares in a target company from the shareholders of that company, including any and all of the target company's contractual relationships, receivables and liabilities on the basis of a share purchase agreement ("SPA"). Unless dedicated "change-of-control" provisions apply, no consent from the other contractual parties is required, as it is only the shareholder of the counterparty (the target company) that changes, not the counterparty itself. Potential risks, in particular on the investor/purchaser side, arise not only from the acquired assets themselves, but also potentially from the underlying entity that owns the assets and whose shares have now been acquired by an investor/purchaser. Consequently, since under a share deal the transaction does not affect any existing contracts – claims by employees, third parties as well as long-term contractual relationships potentially unknown to the purchaser will be assumed – this risk should be mitigated by way of indepth due diligence as well as by imposing an appropriate guarantee and liability regime on the seller in the SPA.

Nonetheless, transactions involving data centers are typically implemented as share deals, because they allow a clean exit for the seller and a comprehensive acquisition of rights and assets for the purchaser. However, asset deals may be preferable if the target company bears major liability risks (e.g. from other operations or from pending disputes with customers), or if the transaction takes place in the context of a crisis or insolvency proceedings of the target company (distressed M&A). In summary, the question of whether a share deal or an asset deal is preferable cannot be answered in general – the decision must be taken following an assessment of the interests of the respective party (seller or purchaser) and the specific transaction.

Due diligence – the best of both worlds

Our practical experience repeatedly confirms that due diligence in data center M&A transactions significantly differs from due diligence in traditional M&A transactions. This aspect is frequently underestimated and often leads to risks not being identified and therefore not reflected in the underlying share (or asset) purchase agreement.

By nature, data center acquisitions require a different approach to due diligence. While it may be sufficient in "traditional" M&A to summarize the key provisions of the commercial agreements (such as termination and change of control) and to examine whether the agreements are legally binding, this is not enough when dealing with data center projects. The traditional approach tacitly assumes many commercial agreements and that these agreements are implemented according to their provisions, without any "problems" arising.

This approach is too simple for the data center world. It tends to be the rule rather than the exception that for instance only a limited number of (long-term) and commercially highly relevant lease agreements are in place – and the loss of just one of those agreements may jeopardize the buyer's assumptions in its financial model and accordingly the success of the entire transaction.

Therefore: heads up! We mitigate such transaction risks by conducting risk-based and tailored data center due diligence that analyses the commercial agreements as part of a stress test and takes into account the specific characteristics of the respective data center: We review in detail any lease agreements, power purchase agreements with a view to ensuring uninterrupted power supply and cooling of the facilities, as well as any other operation and maintenance agreements that are critical for the operation of the data center. Ultimately, this means that our clients can be sure of correctly identifying the risks inherent in the often complex contractual documentation and of avoiding any unpleasant surprises later – this is a significant success factor for any data center transaction.

In this regard, we believe that a careful examination of the data center specific agreements yields the best results if it is carried out by lawyers with appropriate drafting and negotiating experience. Only they are able to rapidly and reliably understand which scenarios will have which effect on the project agreements. Our experience of providing legal advice for data center project developments means that we know what can go wrong and are thus able to identify typical risks.

As a result, our clients are aware not only of the current status of the agreements, but also of precisely what may lie ahead – and what does not.

Our experience of providing legal advice for data center project developments means that we know what can go wrong and are thus able to identify typical risk

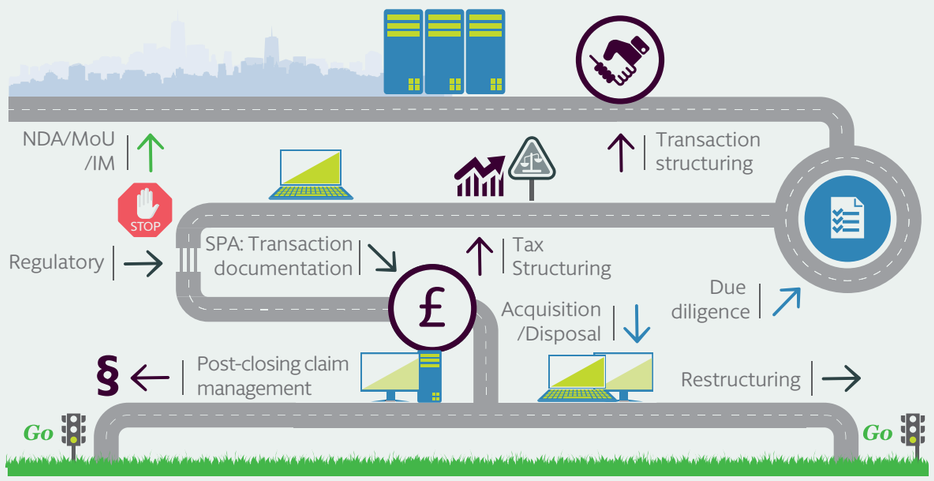
Focus on cash flows – not on warranties

The approach to share (or asset) purchase agreements in a data center transaction differs significantly from "traditional" M&A.

In contrast to traditional M&A transactions cash flow and profit are often not generated via the sale of goods and services to a market, but via a small number of key contracts – and sometimes only one. This makes investment attractive for long-term strategic and financial investors, but also shows that the return is dependent on these contracts.

In addition, data center deals often have a simpler asset structure than "normal" transactions. A lot of representations and warranties which are market standard in traditional M&A are not required in data center M&A or, even worse, give a false sense of security. It would be fatal if a buyer of a data center that generates profits under one or two long-term lease agreements only relied on an extensive set of representations and warranties and did not take into account that such representations and warranties are usually time barred for 12 to 18 months after closing, often leaving the major part of the contract term unprotected.

As a consequence, we have adopted our approach to the "data center SPA". Instead of having lengthy and costly discussions on partially meaningless representations and warranties, we focus our efforts to ensure that the cash flow from the relevant data center is protected in the SPA, as this is the real asset which is bought in a data center M&A transaction. This approach only requires a limited set of representations and warranties but needs to ensure that if those turn out to be wrong, the entire loss in cash flow is compensated. By focusing the SPA discussions on the relevant issues, we are usually able to significantly reduce negotiation time and to ensure that the SPA is structured and easy to understand. This approach also frequently helps our buy side clients to strengthen their position in auction processes in the highly competitive and seller-friendly data center market.



Project finance vs. corporate finance

Data centers involve significant capital investment. A data center's operator may wish to finance either the development and construction or the acquisition of a data center with debt. Whilst it is possible to source funds with all the usual instruments of corporate finance, the revenue stream generated by operating a data center can also be suitable for project finance. Project finance is typically described as the long-term financing of infrastructure and energy projects held in a special purpose vehicle ("SPV") with a non-recourse or limited recourse financing structure. The key characteristic is that the project debt is exclusively repaid by the cash flow generated by the project. No other income is typically available and the providers of both types of debt must rely on the success of the project to generate sufficient and stable cash flows. The project's assets, rights and interests serve as collateral. Compared to project finance in other sectors, the financing of a data center also includes elements of real estate finance:

Given that the owner of a data center is normally also the owner of the land, one of the main security rights provided to the debt providers is a land charge in many jurisdictions.

It is also not uncommon to work with an Op-Co/PropCo which is also an element known from real estate finance. One of the core elements for successful financing is a well-structured and realistic business case. The data center operator must therefore have a clear picture of the investment costs, an appropriate contractual set up for the reliable and secure performance of the development and construction as well as of the long-term operation of the data center and the expected return. Securing a long-term lease agreement with at least once anchor tenant which accounts for a substantial part of the business case is therefore key.

PropCo – OpCo structures with respect to data center leases

Tax optimization helps: A PropCo-OpCo lease structure can be used e.g. to reduce exposure to German trade tax, a tax levied by German municipalities (around 15-16% in larger cities).

Real estate companies, i.e. companies engaged exclusively in the mere leasing and letting of their own real estate, are able to reduce their trade tax exposure to zero. A company owning and operating the data center cannot apply this exemption because it also provides a number of services that go beyond the leasing of real estate to its customers.

Thus, the data center building and the underlying real estate, excluding all fixtures and fittings, needs to be allocated to a different entity ("PropCo") than the entity operating the data center ("OpCo"), which in turn leases the data center building from PropCo. As the business activities of PropCo are limited to mere leasing, the PropCo can make use of the specific exemption for real estate companies.

Any rents payable by OpCo to PropCo will consequently be exempt from German trade tax at the level of PropCo. Although OpCo will have to consider an add back of a certain portion of the rent to its trade tax base, overall the trade tax exposure is reduced by such a structure. In other jurisdictions thoughtful structuring helps to reduce taxes as well.

Green Data or how to supply your Data Center with sustainable Energy

Energy: optimizing cost efficiency and minimizing risk

Every data center operator has to address one considerable cost driver: energy costs. Fortunately, operating a data center offers numerous opportunities for energy cost optimization on both the operator and tenant side.

One of the goals for operators may be to maximize their data center's power usage efficiency ("PUE"). The PUE is the ratio of a center's overall energy consumption versus the energy used by the IT installation. Ideally, the PUE equals 1. In this case, all energy consumed in the data center is used to power the IT infrastructure and no additional energy is required for auxiliary equipment, i.e. for cooling or lighting. In such a case the data center would be highly efficient and the operator could use the entire electrical capacity available at the site for its core business.

Although a PUE of 1 is a theoretical value, there are several ways to get as close as possible to this figure. One of the most promising methods is to use a combined heat and power plant ("CHP"), which converts heat from the IT hardware into electrical energy and simultaneously provides cooling through absorption refrigeration. On the tenant side, an increase in energy efficiency can be achieved particularly by maximizing the efficiency of the hardware in use. This includes efforts such as virtualization. Other, physical measures comprise the use of state-of-the-art energy-saving computing platforms. It should be noted, however, that in order to incentivize tenants to take such measures, it is essential to meter their individual power consumption. Additional incentives for tenants to reduce energy consumption may be contractually agreed.

Finally, it may be possible to obtain long-term loans at favorable interest rates for measures to increase energy efficiency.

Electricity Grid Connection

Onsite power generation remains an exception for the core energy supply of data centers at present and probably for the foreseeable future. Hence, it is important for a data center operator to secure a grid connection which provides for the required external electricity power import capacity. When securing the network connection and capacity, it should be determined whether a connection at a specific voltage level impacts the network fees, since a connection on a higher level can often result in lower network fees.

In addition, a data center operator may scrutinize whether there are specific regulatory requirements to comply with as a result of the operation of electricity infrastructure (e.g. transformer stations) onsite and within the data center premises.

Energy supply of data centers – Exploring your options

Studies show that data centers can spend up to 50% of their operational expenditure on electricity. Therefore, it is essential for data center operators (or in case of powered shell solutions for the tenant) to understand the various options in meeting their energy needs. In this regard, data center operators have the following main options:

- A full supply contract with an energy supplier;
- Power Purchase Agreements ("PPAs") meaning agreements between the energy customer and the energy producer without any intermediary; whereas especially PPAs with operators of renewable energy installations can be taken into account;
- Procurement on the trading market under OTC contracts or at the energy exchange;

  or

- Own onsite energy production.

"Green data"

The highpower consumption of data centers is not only a cost factor. The discussion about "sustainability" of data is only beginning to gain more and more public attention. In the future, data centers will likely have to deal with the questions about the sustainability of individual data consumption and what the carbon footprint is. Customers start questioning how much energy their internet consumption requires and whether this is inline with their overall sustainability goals. Corporate customers are predicted to also start asking these questions: With society's rising awareness of climate change, ESG issues, and the significant increase of power consumption in data centers, sustainable and renewable energy resources need to be considered in any business decision and can be a decisive criteria for the selection of a data center.

In this context, green data describes the operation of digital infrastructures with energy generated solely from renewable energy resources. By adding green/renewable sources to their power supply chain, data center operators are in a position to show and promote their efforts to contribute to a digitalized world that conserves its resources. Big players like Google, Facebook and others have already started to transform and are meeting their energy requirements by purchasing renewable energy. We further see an upcoming trend to develop onsite hydrogen solutions for onsite generation, both for backup electricity as well as for baseload and peak load energy demand. Hydrogen will also be considered as a renewable energy source and whether additional capacity is required to future proof growth or expansion of the business.

Data center operators are already in a position to offer green products using the electricity mix purchase from local energy suppliers via the "standard" energy supply agreements. In 2018, 35% of the electricity generated in Germany was already procured from renewable energies - and this is only set to increase. A data center could use this energy mix to offer around 30% of its capacity as "green data capacity".

To offer products which exceed this threshold, the data center would need to secure that more or all the energy it consumes was produced by renewable energy sources. PPAs directly agreed with e.g. wind farms or solar parks are the best

Studies show that data centers can spend up to **50%** of their operational expenditure on electricity

way to secure a "green" origin of the energy, in addition to potential onsite hydrogen applications.

PPAs – worth a closer look
Against this background, green corporate PPAs are gaining market share and will become even more popular in the future. There are two main models for PPAs: the "direct" PPA and the "virtual" PPA.

Under a direct PPA the renewable energy producer sells its energy directly to the customer. This electricity is delivered to the customer using the electricity grid. The price the customer pays consists of the PPA contract price plus its transmission-related expenses. A big advantage of this model is that the corporate customer can demonstrate that the power is procured from a specific renewable source which can provide reputational benefits.

Virtual PPAs work differently: The energy producer feeds the electricity into the grid and receives the applicable market price. The customer draws the energy from the grid but pays the fixed price agreed in the virtual PPA. This PPA provides price certainty for both contracting parties during a long-term contractual relationship (approximately ten to twenty years). It can be boiled down to a financial hedge for fluctuating energy prices. It is important to note, that using virtual PPAs the data center operator cannot label its energy consumption as particularly "green" as – from a balance sheet perspective – it receives "only" the standard electricity mix.

On-site energy generation
Operators should carefully assess options for on-site power generation. Due to the high energy consumption and large amounts of roof space, data centers are in an excellent position to integrate on-site energy generation facilities such as hydrogen applications, solar panels or CHPs into their overall energy strategy. By using energy that has been generated on-site, operators may thus avoid paying grid usage fees or system costs, electricity tax and, in certain cases, even further levies. On-site energy production is also a safeguard against rising energy prices. Furthermore, operators should consider opportunities to benefit from government subsidy programs for investments in on-site renewable energy facilities or CHPs.

Flexibility or how to deal with peak loads

The data center operator needs to ensure that a sufficient energy supply is secured at all times while keeping its costs predictable. When offering flexible capacity models, two key elements must be kept in mind: baseload and peak load.

- Baseload refers to the basic and constant energy consumption of the data center which is needed to maintain the day-to-day operation.
- Peak-load describes higher power demands a data center experiences on short notice due to higher utilization of its capacities which cannot always be anticipated.

To be able to provide customers in peak-load times with the data center capacity they require, the data center operator needs to take precautions that its flexibility provided towards the customer is mirrored in its own energy supply agreements. Otherwise it will not be able to meet the customers' demands for capacity.

To sufficiently adapt the power supply, data center operators can:

- purchase energy on the energy exchange spot market;
- agree with their energy supplier on baseload belt/peak-load belt energy models; or
- negotiate energy options or package models in which data center operators can call up certain energy option rights.

Energy regulatory

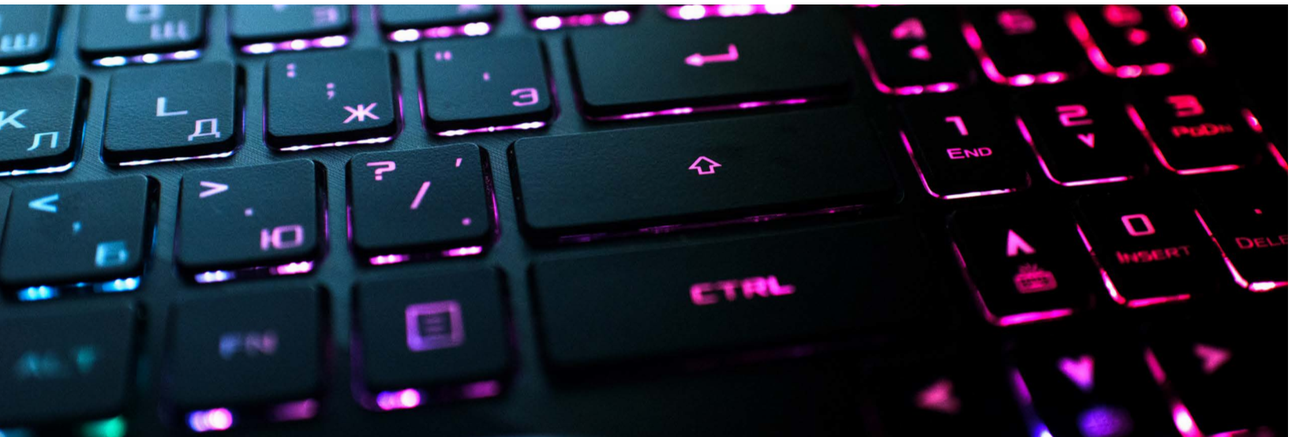
Operators should carefully assess options for onsite power generation because, if structured appropriately, this could generate an additional income stream. Energy produced by solar panels and/or a CHP on-site and fed into the public power grid is very often subsidized and operators profit from comparably high feeding tariffs. Additionally, tax reductions may apply.

From a regulatory perspective, operators should ensure an adequately scaled grid connection for the data center. In this regard, the relevant agreements with the grid operator – and if applicable with the landlord – need to be in place. As a stable and uninterrupted energy supply is paramount for the operation of a data center, contractual regulations on down times of the grid connection for maintenance reasons should be reviewed carefully. Therefore, it is important to be familiar with applicable regulatory and market standards.

Due to the importance of energy supply and cooling systems, data center projects are in an excellent position to integrate onsite energy generation facilities such as solar panels or CHPs. If structured in compliance with the regulatory framework, the advantage of such onsite generation is that it allows operators to avoid some of the taxes and levies that typically increase energy costs. By using energy that has been generated onsite, operators may thus avoid paying grid usage fees, electricity tax and in certain cases even further levies. Furthermore, operators should assess opportunities to benefit from government subsidy programs for investments in onsite renewable energy facilities or CHPs.

In order to assess the options for on-site energy generation, operators may consider entering into a so-called energy contracting agreement with specialized service providers. The scope of such agreements varies from a mere assessment and planning exercise for a project to the complete financing, planning and operation of on-site energy generation facilities. When negotiating contracting agreements, it is vital to understand the applicable regulatory framework in order to identify potential pitfalls.

For greenfield projects, there may be specific energy regulatory requirements resulting from European regulations. For example, landlords are obliged to use renewable energy sources up to a certain percentage for heating and/or cooling of new builds. There are attractive ways to meet these obligations, for example by using a CHP.



Data Protection – Beware and protect your data

From a data protection perspective, running a data center is essentially about storing, maintaining and processing digital information. In practice, however, there are many more things to consider, such as knowing your customer ("KYC"), understanding their needs, providing tailored physical and digital infrastructure as well as suitable software architecture, server capacity and staff. We understand the need to combine both the legal and practical approaches.

After all, adequate data protection and security require a certain infrastructure and highly trained staff. Managing a data center therefore inevitably involves and rests on a prudent and forward-looking privacy concept. To-the-point internal guidelines as comprehensive contractual agreements with suppliers, subcontractors and customers are key in this context. This is what we focus on in our day-to-day advice.

The correct and legally compliant treatment of personal data is only one aspect to be addressed but is probably the most obvious one. Confidentiality requirements are not merely confined to personal data. There is plenty of digital information stored in data centers that may not be classified as data relating to an identified or identifiable individual but may still be of crucial economic value to the customer. Prime examples of these are trade secrets and confidential technical information.

Moreover, machine-generated data has become increasingly important. The "Internet of Things" ("IoT") is an almost unlimited source of digital information which requires storage and maintenance. Handling such big amounts of data and offering services such as text and data mining algorithms are both a technical challenge and a business opportunity. The increasing volume of machine generated data raises a whole new set of questions. Who owns the data (e.g. data collected from cars on the road or home power systems)? What security level should be applied? Is there a public interest in allowing authorities to demand disclosure (possibly through the data center)? The answers to these questions are still being debated. We advise our clients on exactly these issues.

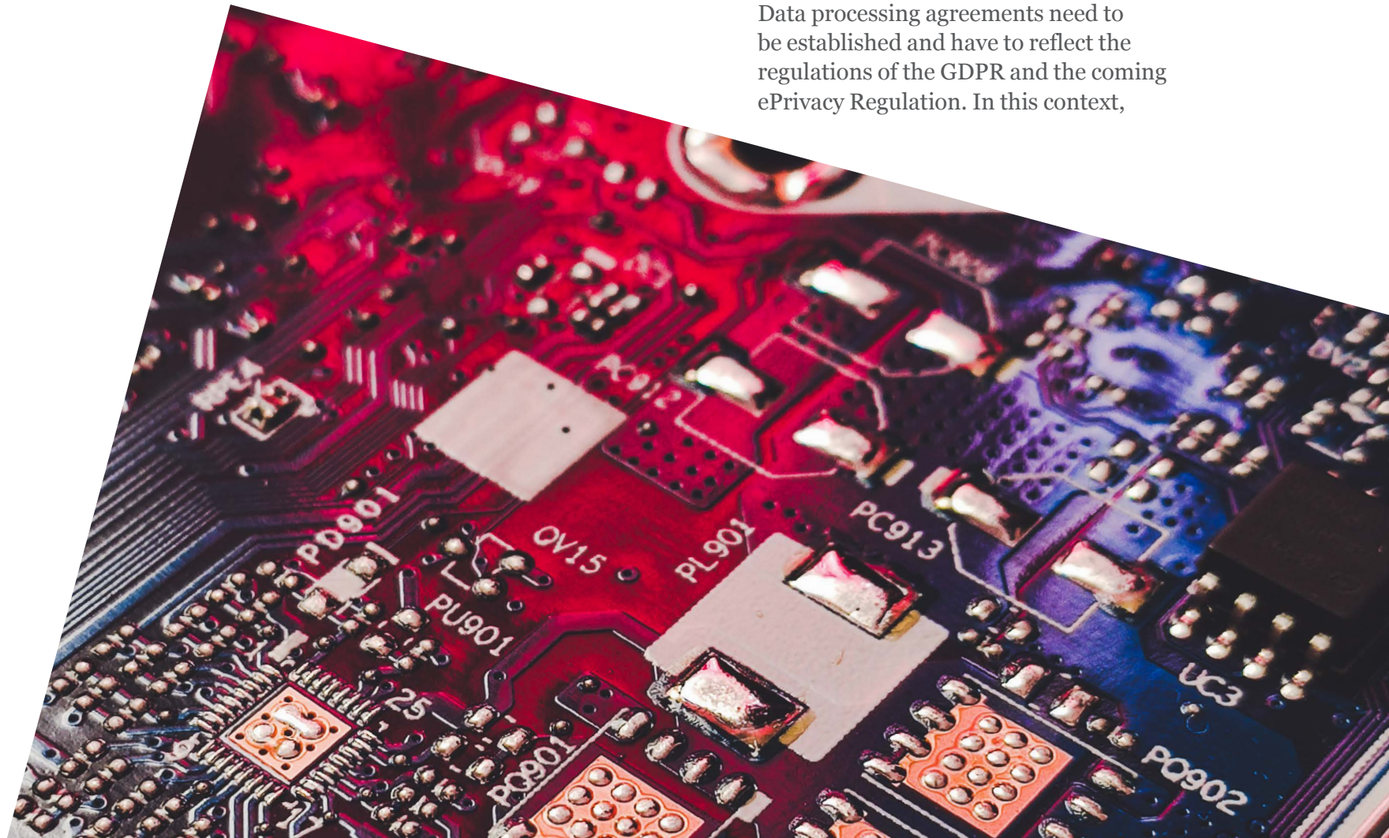
The GDPR

The General Data Protection Regulation (GDPR) has been effective since 25 May 2018. It has replaced 28 domestic privacy laws throughout the European Union. National laws only continued to apply in areas not fully harmonized by the GDPR. The supervision of privacy compliance differs from what we have been used to in the past.

Notably, the territorial scope of the GDPR not only covers the activities of a processor or controller located in the EU. It also applies as soon as the processing activities are related to the offering of goods or services to data subjects in the EU or the monitoring of behavior to the extent that it takes place within the EU. This means that processing personal data in data centers may not only allude to EU data privacy law, but also raise a wide array of complex challenges and questions in this field.

In view of the significant sanctions' regime – with fines of up to 4% of worldwide annual turnover – compliance with data privacy requirements has become even more important to any entity handling personal data.

However, it should be noted that the GDPR is not the only new piece of legislation governing the storage and processing of data. In January 2017, the European Commission published a proposal for an ePrivacy Regulation. Its core focus is to ensure an adequately high level of confidentiality of electronic communications throughout Europe. In pursuing this aim, the draft Regulation goes beyond purely personal data and covers all kinds of private information. Until now, no further progress has been achieved. For more details, see our international blog at http://www.hlmediacomms.com.



Data privacy

It is worth highlighting a few regulatory requirements.

The obligations that deserve particular mention include compulsory cooperation requirements with the competent supervisory authorities, notification obligations as regards to infringements, data privacy by design and by default, the right to be forgotten and various new documentation requirements.

It should also be noted that under the GDPR both the controller and the processor are responsible for privacy compliance. Fines for non-compliance are substantial, not to mention the damage that would be caused to a company's image if it were accused of failing to meet data protection requirements.

Accordingly, it is crucial to have adequate and up-to-date privacy concepts in place governing staff, services and infrastructure. Data processing agreements need to be established and have to reflect the regulations of the GDPR and the coming ePrivacy Regulation. In this context,

multiple layers of subcontractors in cloud infrastructures are a particularly common source of difficulty and ambiguity. Clear contractual structures and transparent technical architectures are recommended safeguards in this respect.

Different business scenarios

Privacy law generally differentiates between "controllers" and "processors". A different set of obligations applies depending on which of these two roles a company has. A data center operator has various options to choose from. The business model chosen by a firm will determine which legal regulations it must meet. Conversely, the respective legal obligations can make certain business models more or less attractive. Therefore, taking an informed decision as to how the data center service will be structured is essential for business success.

Generally, a distinction can be made between two common business scenarios:
Firstly, controllers deploying a hosting provider. Here, processing and infrastructure are part of the service rendered. Whereas the original controller is still regarded as a controller, the hosting provider might either be a processor or a (secondary) controller, depending on the extent of autonomy involved in the service rendered. The service contracts need to be drafted accordingly to ensure adequate justification for the agreed handling of data.

Secondly, controllers deploying a mere housing provider providing only the data center infrastructure. Under a "pure" version of this scenario, i.e. where no (emergency) services that potentially allow access to the processed data are offered by the housing provider, the latter may be deemed neither a processor nor a controller of the data. However, such scenarios rarely exist in practice.

As we have seen, there are various ways to "design" a data center service and each design brings with it a slightly different set of legal requirements.

Cyber security

Data centers are data hubs and therefore susceptible to cyberattacks. Such attacks could result not only in data theft, but also in the disruption of internet services of multiple customers and businesses. Consequently, a data center operator faces high liability risks.

There have been many instances of high-profile cyberattacks such as:

- (Distributed) Denial of Service ("DDoS") attacks where servers shut down due to being overloaded by a flood of incoming messages.
- Ransomware attacks, such as WannaCry and NotPetya, where malicious software blocks access to a computer's data, asking for a ransom to release the data or otherwise threatening to destroy it.
- Attacks against the data center infrastructure to screen, control or eventually destroy the facility such as the Stuxnet virus.

Recently, there has been a noticeable trend toward more sophisticated attacks. Such unprecedented techniques render the data center infrastructure even more vulnerable and are likely to result in liability claims by the data center's customers.

Unpredictable and unforeseen incidents – also known as black swan events – may not necessarily trigger fault-based liability of the data center operator. However, it can be very challenging and practically impossible for the operator to prove the existence of

such a black swan event. The WannaCry and NotPetya incidents illustrate that threat actors exploit malware families and reuse efficient attack strategies. Considering the nature of cyberattacks, it is notable that, e.g. in Q1 and Q2 2017, 75% of all ransomware attacks were based on the same six known malware variants. This means that, had the proper security mechanisms been in place, these threats could have been prevented. In such cases, data center operators may not be able to be released from non-fault liability; as such events could have been prevented and are not to be considered as black swan events. The data center operators may thus be held liable. Therefore, it is strongly recommended that data center operators stay informed about current threats and cybersecurity trends. Otherwise, the data center's board faces personal liability or regulatory fines. Hence, more efficient security packages or change of outdated IT infrastructure may be advantageous to such operators. They might result in higher costs, but augmented liability and negative publicity can lead to more severe problems.

Certain data center operators might also be subject to stricter regulation. Data centers with an annual performance of more than 5 MW, IT hosting with more than 25,000 annual average instances, content delivery networks with an annual data volume of 75,000 TB, trust services with more than 500,000 issued qualified certificates or 10,000 certificates for authentication of publicly available servers are subject to the German Federal Agency for Security in Information Technology Act (BSIG). As a result, sector-specific security standards (Branchen-spezifische Sicherheitsstandards – B3S) apply. The B3S for data centers, however, are based on ISO family 270xx. Especially the ISO 27001 and ISO 22301 – in addition to the other data center specific security standards – are referenced and need to be respected and implemented by the data center operator.

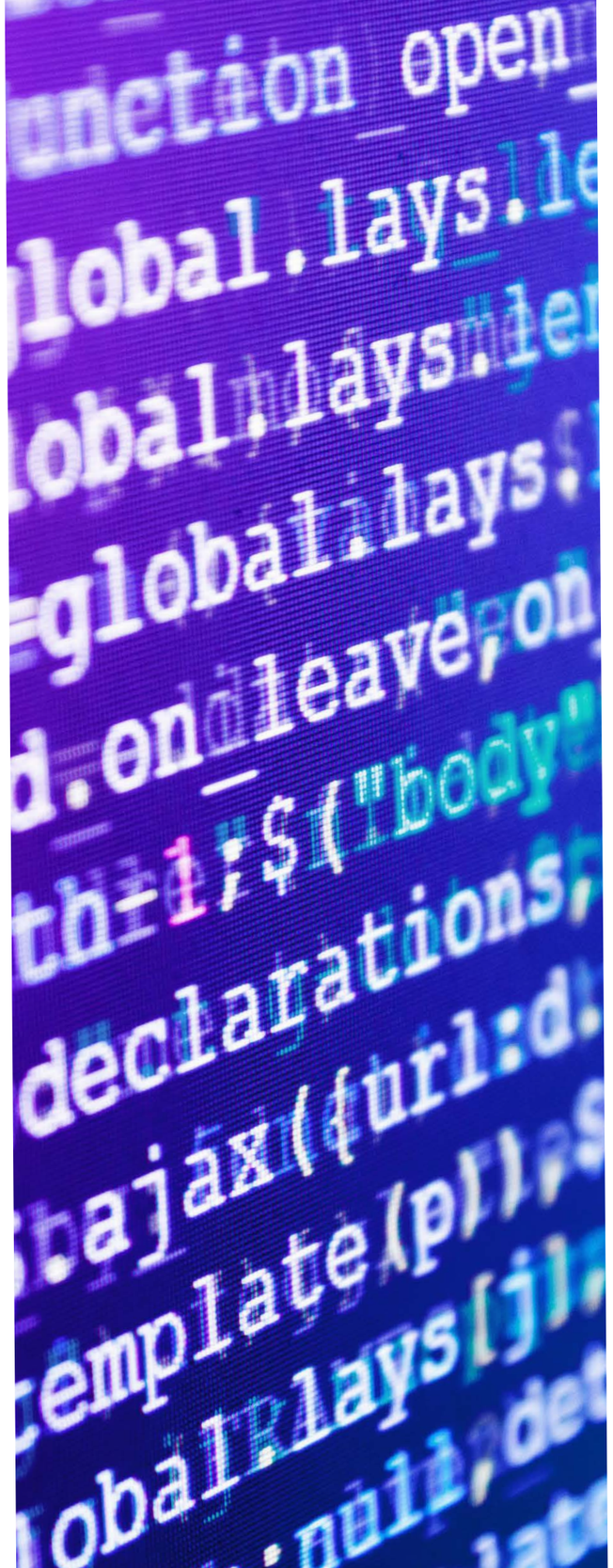
Brexit and data protection: Boom for data center operators in Continental Europe?

The United Kingdom ("UK") finally left the EU on 31 January 2020. The withdrawal agreement provided for the UK to continue to be treated largely as an EU member state until the end of the transition period on 31 December 2020, while both sides worked out the future rules for cooperation. For the period after this, current prime Minister Boris Johnson announced on 3 February 2020 in a written statement:

"The UK will in future develop separate and independent policies in areas such as [...] and data protection, maintaining high standards as we do so."

Brexit also affects the subject of data protection. To date, the GDPR has applied in the UK. As of 31 December 2020, the UK has become a third country within the meaning of the GDPR. Based on existing agreements, data exchange with the UK would then only be possible if the latter raises its data protection standards to a level that corresponds to that of the EU and the Commission issues an adequacy decision.

The UK government announced in no uncertain terms that the GDPR – just like all other EU regulations – will be replaced by a national legislation. There is therefore a real danger that the standards of the GDPR will not be met. In this case, companies that process personal data in the UK will have to act. For data center operators domiciled in Continental Europe, on the other hand, this creates opportunities.



Migrating Data to Europe?
Data center operators in Europe could benefit from this situation and have already been preparing for years for precisely this scenario, including by expanding such data center capacities in continental Europe. Personal data that is at present physically stored in data centers in the UK will possibly have to be migrated back to the European Union. In view of the already limited available capacities in the existing data centers at present, this could entail further investments in new data centers and corresponding (energy) infrastructure. In addition, it can be expected that the number of data center transactions will increase further in the future.

At the same time, however, this could also mean that data of UK service providers that has been hosted up to now in Continental Europe will be migrated back to the UK.

Adapt existing agreements
If a transfer of personal data back to Continental Europe is not an option, companies should critically examine their existing data processing agreements and prepare for the completion of Brexit.

Companies should ensure that, if the UK leaves the EU without a corresponding adequacy decision, they continue to be GDPR compliant. Specifically, they should ensure that the EU standard contractual clause is agreed with British processors.

Brexit presents possibilities and opportunities for data center operators in Continental Europe. However, much depends now on how the reform of data protection in the UK will turn out. Companies should in any case check which of their agreements require action from the point of view of data protection.

Data Center Projects and Transactions – Our Expertise

Our credentials

At Hogan Lovells we have a great depth of experience in advising clients on the establishment and acquisition of data centers.

The value we bring to clients is both in the depth of expertise in critical subject areas, such as telecommunications regulation, real estate and land use law and regulation, tax, employment, and environmental regulation, and in our ability to coordinate this advice across jurisdictions, exercising sound judgment in supporting clients with location selection decisions and strategies for execution. We have strong relationships with local regulators, and we understand the markets in which our clients operate.

vMore than just data storage

We have experienced projects, real estate, corporate, and commercial teams who can assist

- with all aspects of the acquisition and construction of data center sites or
- fully operating data center businesses if required
- with establishing title and ownership;

  and
- with all aspects of data center transactions and ongoing operation, including site suitability and risk factors, planning and environmental issues, ownership of key infrastructure (e.g. backup power, cooling, and fire suppression, customer contracts)

Setting up a data center also has various tax implications for the provider as well as for potential customers which should be taken into account (e.g. permanent establishment aspects, VAT aspects). Our Tax team is highly experienced in setting up tax efficient structures and dealing with all relevant tax aspects in the respective agreements.

Our services

Industry specific due diligence
Real estate and regulation
Service and O&M contracts
Energy-related advice and cost-efficiency
Coordination of global deals
Finance
Commercial and tax

Our Distinctive Expertise

Keppel Telecommunications & Transport and Alpha Investment Partners

On the acquisition of a €76m data center from Citigroup and on the sale and lease back agreement to Citigroup who remains the tenant.

Keppel DC REIT

On its acquisition of a data center in the Celtic Gateway Business Park. The data center is fully let to one of largest global cloud service providers on a 15-year full repairing and insuring lease that commenced in June 2016.

A borrower

The borrower in a (re)financing of a data center in Frankfurt.

Telehouse Holdings Ltd. and KDDI

Corporation on its acquisition of Databurg GmbH.

TelecityGroup

- In relation to its acquisition of the Manchester based carrier neutral data center.
- On its £87.6m acquisition of Data Electronics Group.
- On its acquisition of leading Finland data center operator Tenue Oy.
- On the acquisition of Academica, a leading data center and IT services operator in Finland.
- On the acquisition of the data center business of MedioSystems, an affiliate of the IBM Group.
- On its acquisition of the entire issued share capital of SadeceHosting.
- On its acquisition of the entire issued share capital of 3DC by TelecityGroup International Limited. Hogan Lovells advised On English law and oversaw local advisors.
- On its acquisition of Plix.

A leading UK based operator of data centers

On various project developments (EPC, O&M) as well as the acquisition of such data center in Germany.

A UK clearing bank

On the development of a dedicated data center and a number of consequent upgrade projects.

A major European colocation space provider

On the development of a new data center and consequent extension project and on projects to upgrade equipment on existing operational sites.

Du Pont Fabros Technology

On its proposed purchase and redevelopment as a data center of a heavily contaminated former chemical and pharmaceutical manufacturing site.

A leading global bank

On establishing a data processing subsidiary in China.

A leading data center operator

On the acquisition of the reversion to their facility in Harbour Exchange Canary Wharf, regearing followed by sale and leaseback.

A leading data center operator

On the lease review of 46 leases across six countries for a leading data center operator.

One of Europe's leading data centers

On all employment matters across Europe.

A number of financial institutions

On fit out of new UK headquarters premises, with related internal data centers.

A Fortune 100 company

In a global data center re-location and consolidation project.

A leading global provider of managed IT solutions

With the negotiation of software licenses, data center leases, equipment, and services procurements in connection with various program digitization engagements, including in the health care and financial services industries.

Estee Lauder

In a US$400m global IT infrastructure transformation, to transform Estee Lauder's data center, collaboration, voice and data networking and IT support functions.

A global manufacturing conglomerate

In connection with a US$180m outsourcing of its global IT operations, including data center, help desk, field support and voice and data networking functions.

A data center client

On its branding strategy in Hong Kong, China and the U.S.

A U.S. hardware and data center client

On trade mark registrations and anticounterfeiting matters in Mexico.

A leading U.S. e-commerce and web services company

On its global patent portfolio, including data center related technologies.

A large U.S. semiconductor company

On its global patent portfolio, including data center related technologies.

Funds managed by DWS

On the acquisitions of Dutch data center operators The Datacenter Group and NLDC

Equinix

On its joint venture with Omantel to create a cloud and carrier neutral data center in Oman.

Mapletree Investments

On several transactions, including its US$750m acquisition of 14 data centers located across the United States from Carter Validus Mission REIT and its US$1.4bn acquisition of a data center portfolio in North America from Digital Realty Trust.

Royal Mail

In connection with the transfer of its two data centers to CSC and the outsourcing of its entire IT and telecommunications requirements in a 10- year deal worth in excess of £1.5bn.

QTS Realty Trust

A data center REIT, on the formation of a US$240m joint venture with Alinda Capital Partners to finance the development of a hyperscale data center under development in Manassas, Virginia.

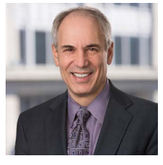
Tencent

On the commercial and regulatory aspects of the international launch of its Qcloud service, which involves over a dozen data centers across China, Hong Kong, Singapore, Canada, Germany, India, Korea, Russia, and the United States.

A syndicate of lenders

On facilities for Global Switch, a leading owner, operator and developer of large scale, carrier and cloud neutral multi-customer data centers across Europe and Asia-Pacific.

Contacts



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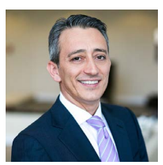

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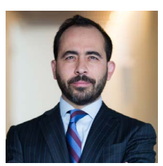

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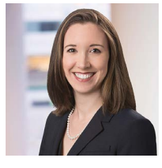

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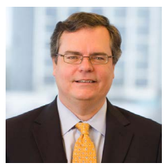

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