Power Struggle: Meeting the challenge of financing data centres and the energy transition

Summary

The energy transition and the global digital revolution have now become inextricably linked. This is in large part due to the ongoing proliferation of data centres – forecasts regarding the data centre industry's pace of growth vary widely, but the International Energy Agency has predicted that sector's total electricity consumption could reach more than 1,000 TWh as early as next year. Data centres currently account for roughly 2% of global electricity demand (and 3-4% of demand in the EU) and that share is expected to grow dramatically. Projections indicate data centres' power consumption could easily double or even triple between now and the end of the decade.

Consequently, there is an increasing belief that the energy transition and the expansion of the data centre industry need to be considered in conjunction. This is not least because global capital has to be utilised as effectively as possible to ensure that it meets society's needs for not only energy and data centre projects, but also other types of vital infrastructure. According to a recent McKinsey report, by 2030, data centres alone will require $6.7 trillion globally[1] to keep pace with the demand for 'compute power', which is the term for the hardware, processors, memory, storage, and energy needed to operate them. This is in addition to the $35 trillion needed for transition technology by 2030 to meet the key Paris accord target of limiting temperature increases to 1.5 degrees Celsius (2.7 Fahrenheit).[2]

In an effort to broaden understanding of the financial challenges facing the data centre industry and the renewable energy sector, NORD/LB convened a panel of experts to look at the challenges and opportunities that exist. This report summarises the key conclusions of the panel. Specifically, the report explores:

- Whether the establishment of a capital markets union would mean Europe would be better able to meet all its infrastructure needs, including data centre and energy transition requirements

[1] The cost of compute power: A $7 trillion race | McKinsey

[2] https://www.weforum.org/stories/2023/04/investments-in-renewable-energies-must-quadruple-to-meet-climate-target-irena/

- The challenges presented by the unpredictability of forecasts of data centre industry growth
- Why the data centre industry and the renewables and energy storage sectors should foster greater collaboration
- Why the availability of capital is a challenge facing both the data centre and energy industries, particularly when seeking to refinance existing debt
- The risk of the data centre industry consuming capital at the expense of other areas of the economy, including energy
- The case for developing local data centre capacity in Europe
- The data centre industry's attitude to energy efficiency

Doubling up: Considering the data centre industry & energy sector's capital needs in tandem

Given data centres massive energy needs, it is imperative that meeting the capital needs of the data centre industry is considered in tandem with plans for financing the energy transition, the panel heard. In a similar vein, strategies for financing data centres and energy projects, in turn, needed to be developed within the wider context of more general infrastructure needs and the need for spending on defence, for example. "The digital revolution and the energy transition need to be thought of as being "entangled"," said NORD/LB global head structured finance and general manager London branch Heiko Ludwig. "They are extremely interlinked and the sooner you bind those two things together, the better." Ludwig added that, in addition, a significant issue that needs to be considered is that – given the trillions of dollars that will need to be invested in digital, defence, general infrastructure and the energy transition in Europe by 2040 – Europe does not have an integrated capital market similar to that in the US. He said: "If we take the future investments required for all these individual topics, like defence, digital, infrastructure and the energy transition, how can Europe cope with that acceleration without developing a more integrated capital market? From a long term perspective efficiency and the recycle rate of structured bank debt clearly would need to accelerate." While the capital exists, Europe's fragmented and bank-centric system is "structurally inadequate at allocating funds at the necessary speed, volume, and efficiency to the desired areas".[3]

Another challenge that needs to be dealt with is that forecasting data centre energy demand is very difficult, according to Niels Jakeman, NORD/LB head of energy origination, structured finance Europe. He added: "Can we get sufficient supply and in the right locations to meet the demand on a 24/7 basis? Also how can we coordinate better on grid connections? This is one of the main challenges." Jakeman also there was anecdotal evidence of developers unknowingly

[3] Futures of the European Capital Market: Defense, digital, infrastructure, and energy - *Themis Foresight, NORD/LB*

building solar projects in close proximity to data centre developments, which emphasised that there are opportunities for the data centre industry and the renewables sector to collaborate more closely.

Brian Potskowski, head of advisory at Aurora, said determining exactly how much data centre capacity is on the grid is not easy. He added that, in addition, the "range of uncertainty" about projected data centre capacity further expands in the coming years. "Just after 2030, we're looking at a range of 1,400 terawatt hours between the high forecasts and the low forecasts by a range of consultants" Potskowski said. Other intangibles include changes in the regulatory landscape in future, as well as supply chain uncertainty, whether that relates to grid access, land or water, for example.

Capital availability is major challenge for data centres and energy sector

Taking into account all projected funding requirements over the medium term, the availability of capital is a major obstacle facing the data centre infrastructure and energy industries, according to Vincent Pena, director at real estate investment bank Estadil Secured. He added: "Asset-backed securities [ABS] are part of the solution, and Europe urgently needs a more liquid ABS market. However even in the US where the ABS market is much larger than in Europe, the ABS market size pales in comparison to the gigantic capital required [to build out energy and infrastructure]." Pena added that, historically, institutional investors have allocated a specific share of their portfolios to infrastructure and real estate asset classes, but now digital infrastructure is threatening to consume an ever growing share of these allocations, thereby potentially taking it away from the "rest of the economy".

Sergio Arbeláez, managing director, Europe & Latam at Matrix Renewables, said that, in the US, investing in energy projects is now much less attractive than investing in data centres, partly due to 'local content' requirements for energy projects, "increasing barriers for the latter". He added: "This is actually creating distortion in the US because we are seeing deals being priced higher for data centres, even when there is a lower risk profile than for energy initiatives due to its contracting strategy." As a result, Arbeláez said this is making it difficult for energy companies when going to the capital markets to refinance existing debt. Consequently, energy project developers are increasingly considering ways of partnering with data centre operators or hyperscalers [providers of large-scale cloud computing infrastructure] to do co-located projects because "it's the best way to get cheap funding", he added. More generally, with regard to capital availability, Arbeláez added that it was not a case of there being a lack of funds, but rather that filtering needed to be done to find the good projects that were attractive to sponsors.

The case for establishing a European capital markets union

While the US places a heavy emphasis on keeping and growing their "tech leadership" position, Europe is "just waking up to the need for data independence and, as such, for a European data infrastructure landscape", according to Ludwig. He added that a better and more integrated

European capital market would support this move: “Envisage the capital market transfer of infrastructure financings for a range of 3-7 years instead of over 10 years as we do for many infrastructure assets in Europe”. Ludwig highlighted the multiple challenges Europe will face in the next five to ten years, including investment in digital, energy, defence, as well as the maintenance of general infrastructure, and said that, in order to address these issues, the bank and capital markets “need to get closer together”. He added: “We need to better explain why the interplay between bank and capital markets will play an important role for the future of infrastructure financings. It’s about the way we need to employ capital and how fast we turn it and what kind of investment opportunities it represents for society. In Europe we need to move closer to a capital market union, the money is there, it’s about the way it is deployed and invested.”

However, Potskowski argued that, while the US is placing a strong emphasis on becoming the world leader in the technology sphere, Europe has a decision as to whether it wants to “compete or ‘free ride’ off US datacentre capacity”. Yet Matthew Harris, CFO at data centre developer Kao Data, expressed concern that Europe is falling further behind the US with regard to data centre development. Meanwhile, Pena said it was important that Europe invests heavily in data centres to “ensure sovereignty on its data” and maintain its position at the forefront of “technology leadership”.

Obtaining permits for energy projects easier in the US than in Europe

Another challenge faced in Europe is that, in comparison to the US, it can sometimes be more difficult to obtain permits for energy projects, according to Manjari Govada, a managing director at DigitalBridge Investment Management. She added that simplifying permitting “has been a recent government focus area”, but in Europe the process tends to be more complicated with various stakeholders. However, Govada said that European governments are now “waking up to the importance of being a leader in AI”, and are engaging in discussions to support the buildout of critical infrastructure.

Emma Tinker, chief investment officer at investment management firm Asper, said that the challenge for Europe is that energy prices have remained stable or gone up in much of the continent in real terms in the last two decades, whereas they have gone down in real terms in China and the US. “If you can locate a data centre globally, flexibly and your only goal is cheap power, you would not do it in many parts of Europe,” she added. However, Waldemar Maurer, partner at Digital Transformation Capital Partners, said it was important to develop local data centre capacity in Europe, for reasons of sovereignty and defence, but also because, in the context of cloud computing, cloud regions are local. Meanwhile, Govada said that, in the context of data centres, “latency matters” in the sense that siting data centres as locally as possible is impactful “if you want your local enterprises to have access to the fastest information, and retailers want to make sure that people don't click away from the website because it takes too long to load”. She added another consideration concerned data sovereignty and the impact on governments of having their citizens’ information being monitored and analysed in a remote data centre. Yet there are concerns that governments in Europe are not doing enough to support the data centre industry – Arbeláez pointed out that the Spanish data centre association has warned that there is a danger of €60 billion of potential data centre investment not being deployed because the sector is not being sufficiently backed by the government.

Financing long-term data centre projects in Europe and UK is challenging

Securing financing for long-term data centre projects is more challenging in the UK and Europe than in the US, Harris said. He explained: “In the US, there’s relatively conservative capital funding mega [data centre] campuses, but if in the UK you said ‘I'm going to build a GW campus and I can't tell you when the customers come in because I've got years of infrastructure work first’, I’m not sure who finances that.” However, Maurer argued that the biggest obstacle when developing data centres is the supply chain: “We don’t get the equipment fast enough, we don’t get the permits fast enough – to order transformers, for example, can take 24 to 36 months.” Approaches to the construction of data centres in Europe could also potentially be an obstacle, according to Harris. He proposed potential solutions being “building in a more flexible, more modular fashion”. However, Harris added that there is a “yield challenge” in Europe. “In the US you can be comfortably developing capacity at around a 10 per cent yield on cost, whereas even though it’s more difficult to deploy in Europe, projects can struggle to consistently hit those yields, I suspect the specific challenges of constructing in Europe mean we’re building more expensively and not fast enough” he said. Panellists also heard from participants that other challenges hampering the construction of data centres included national building regulations as well as rules on fire safety.

Data centres are extremely energy inefficient, Tinker argued. “Normally 50 per cent of the electrical energy they take in is wasted, that’s really inefficient,” she said. Tinker added that data centres, in her view, in the past have shown little inclination to “materially address” the issue of energy efficiency. However, Harris said his organisation was “obsessed with energy efficiency”. He added that data centre PUE – a measure of data centre energy efficiency – was a key metric. “PUE may not be the best measure, but it’s obsessively tracked and every data centre we work on is weighing increased capex costs versus the energy reduction you can deliver for your customers,” Harris said.

Could we see a data centre boom and bust scenario?

Regarding, potential future risks, Ludwig highlighted a valuable lesson that could be learned from another tech-based industry. He warned: “A boom and bust scenario should be avoided, which we have seen, on a more regional level in the fibre world – it just hasn’t been designed the right way in some markets and that gives the investment and financing community headaches and can sometimes scare away appetite to provide financing for a long time particularly if something goes really wrong and business cases do not materialise.”

Despite this uncertainty, there are a lot of private wire opportunities in the data centre industry that renewable energy developers may be overlooking, according to Mike Forber, regional lead - PPA & BESS transactions at Pexapark. He added that if energy project developers and data centre providers communicated better, there was a strong likelihood that they would discover mutually beneficial ways of working together. This could include “grid connection, export capacity and maybe also where the data centre could be struggling on the import side", Forber explained. One of the biggest challenges in GB market energy transactions at present is price, he said. "Maybe 50 per cent of that cost is non-commodity cost, so there's a considerable saving that could be made there by looking at these behind-the-meter, private wire networks," Forber commented. He also argued that there was considerable cost benefits associated with private wire networks: "A private network might have increased upfront costs but over a 20-year period, there's huge potential savings to be made on grid costs and levies." Forber also said that there may now be a better way to structure power purchase agreements that "bring in batteries and solar" and enable colocation.

Is short-term overbuild of data centres a risk?

The future of the data centre industry may be "more unpredictable than we think", according to Tinker. She added that it was important to bear different scenarios in mind, even if the probability of them occurring was low: "There is one scenario where the US is building all this [data centre] capacity and everywhere else is left behind," she said. "But maybe there's another scenario where there's short term overbuild of the sector that runs ahead of demand and it follows a capital-goods cycle seen in other industries before." Tinker added that the latter scenario could be a relief to those countries that "took a more realistic approach to the build-out of data centres".

From an equity perspective, there needed to be more recycling of capital, Maurer argued. "There are many investments, but there are not enough exits to see recycling," he explained. Jakeman commented that there was, in his view, strong support for the idea that data centre operators could be provided with grid connections much more quickly in return for the operators making investments in grid enhancements. He added that there may be benefits for the data centre industry in working more closely with players in the BESS [battery energy storage system] market, for example.

Calls for more transparency between data centres and energy providers?

Robust PPAs between energy providers and the data centre industry were essential, Forber said. He added that the respective parties should be "more open and should not be trapped in the current ways of working – they should be more transparent and more flexible in negotiations". Meanwhile, Potskowski said the market would see "more innovations around debottlenecking grid constraints and delivering tailored power solutions to datacentres".

Investors, data centre operators and banks needed to come up with viable solutions for meeting the future energy and capital needs of data centres, according to Govada. "It is our responsibility to innovate and deepen the capital pool and come up with new structures for financing significant development projects," she added. With regard to the grid, Harris said that many of the solutions to future energy challenges may come from the "digitization of the grid, rather than just constantly building out infrastructure". On the subject of capital, Harris added that providers of energy capital were now seeking out data centre developers as they are interested in funding projects at scale where the data centre is the "anchor off-taker for investment in the energy infrastructure".

Sean Cook, head of infrastructure origination at NORD/LB, said many US hyperscalers deliver their own energy sources behind the meter “to accelerate deployment in advance of a grid connection”. He added that the priorities for hyperscalers were, firstly, speed of connection, which was the prime consideration particularly in the US, then secondly, reliability, and thirdly, cost. Cook said that, in contrast, green energy was “only fourth on the list” and that this needed to change to “drive it forward” as an agenda.

Conclusion

Europe’s fragmented capital markets and under-developed asset-backed securities (ABS) markets mean that there is a risk that the continent will find it challenging to deploy the trillions needed to finance the rapid anticipated growth of the data centre industry, as well as the energy transition. Failing to properly address this issue could mean that digital infrastructure absorbs disproportionate capital at the expense of energy and general infrastructure investment. Consequently, serious consideration should be given to forging a capital markets union (CMU) in Europe, as well as developing ABS markets. This has the effect of restricting capital recycling and limiting the investor pool.

In order to ensure the data centre and renewable energy sectors secure the capital necessary to fulfil their objectives, steps could be taken to foster greater collaboration between the two industries, especially with regard to the issue of grid connections. Similarly, there is evidence that there is support for the idea that data centre operators would be prioritised for grid connections if they made investments in grid enhancements. In this vein, data centre operators should consider developing closer relationships with players in the BESS [battery energy storage system] market. However, there is still uncertainty about the extent to which the digital transition can be enabled without putting climate targets and the energy transition at risk.

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