

# The meteoric rise of the data centre Global Data Centre Investment Outlook

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# Methodology

In the first quarter of 2022, Acuris Studios (under their Inframation brand), on behalf of DLA Piper, surveyed 100 senior executives located in different regions globally on the outlook for the data centre investment market over the next 24 months. Of those, 40 respondents had invested debt into at least one data centre project in the previous 12 months (and included banks and financial institutions), 40 respondents had invested equity into at least one data centre in the previous 12 months (and included private equity, pension funds, specialist funds and sovereign wealth funds) and 20 respondents had developed at least one data centre project in the previous 12 months (and included telecommunications businesses, data centre operators and hyperscalers).

The respondents interviewed represented organisations with headquarters across 24 different countries and data centre investments across 64 countries worldwide.

The survey included a combination of qualitative and quantitative questions, and a series of interviews conducted with participants. Results were analysed and collated by Acuris Studios, and all responses are anonymised and presented in aggregate.

We would like to thank all of our respondents for their participation in this survey, as well as Tor Kristian Gyland, Green Mountain; Michael Hochanadel, Harrison Street; Andre Karihaloo, Triple Point/Digital 9 Infrastructure plc; Mark Pestridge, Telehouse Europe; Matthew Pullen, Cyrus One and John Wilson, SMBC.



# Introduction

Data centre dealmaking shot to new heights in 2021. The global boom has continued so far in 2022 and looks set to continue this year and onwards, despite economic and geopolitical headwinds.

The data centre sector stands out as a beacon of growth in these current uncertain times. Dealmaking broke new records in 2021 and this trend is continuing in 2022. Our global survey suggests that 2022 is likely to be another exceptional year.

Why is this and what is driving this data centre growth? At a macro level, underpinning this is the exponential growth of data. This shows no signs of slowing – indeed, all the evidence points to a vast increase in the need to store, manage and process data.

Our survey results this year demonstrate that the momentum we witnessed in our 2019 survey of the European data centre industry has only continued to build. Back then, while an overwhelming majority of both debt providers and equity investors (92%) said they expected the overall level of investment in data centre infrastructure in Europe would increase over the next 24 months, only 4% said they expected it to rise by more than 50%. This time around, about a third of those surveyed said they expected global investment in the asset class to increase by over 50% – a clear sign that the industry has not only expanded rapidly in the past two years but we can expect the same pace of growth to continue in the coming 24 months.

The factors driving this are well known, among them content distribution (streaming in particular), social media and ecommerce – along with significant drivers of growth such as increasing demand for cloud services. These flourished during the COVID-19 pandemic and continue to do so. Looking ahead, the rise of the Internet of Things, greater use of Artificial Intelligence, 5G rollout, even greater cloud usage and the dawn of the metaverse promise to spur data growth – and the need for data centres to provide the backbone infrastructure to support this – to ever higher levels.

As the industry has boomed, so have concerns around ESG (environmental, social and governance) issues – a major theme in the industry according to our poll. Our survey has made clear how seriously industry leaders take the topic, with the overwhelming majority agreeing that scrutiny around ESG has grown in the past two years and will increase further in the coming two years.

Overall, the investment fundamentals for data centres are strong and the future looks bright. In particular, many new players, investors and funds (specifically private equity and digital infrastructure focused funds) are focusing on data centres as an asset class, which is leading to increased competition/demand and fuelling current high valuations.



Whilst the results of the survey seem to show that the data centre boom is not slowing down anytime soon, there are risks that need to be navigated. At a high level, these include energy security and increased energy costs, rising inflation, higher borrowing costs, ESG concerns and supply chain disruption. Geopolitical risks – including the threat of cybersecurity attacks – are also on the rise, heightened by the Russia/Ukraine conflict.

In addition, there are risks to be managed at the level of data centres themselves. Respondents point to technological obsolescence, power availability and security, market liquidity and regulation as their top concerns.

Despite these challenges, respondents are forging ahead with aplomb. This study shows that equity investors, debt providers and data centre developers are all expecting to increase the value of their investments as they look to capitalise on the opportunities that lie ahead across a range of countries.

Over the following pages we explore these themes and more, looking at key drivers, concerns and regional differences.

## USD2.9 billion

Equity investors expected to invest an average of USD2.9 billion in data centres in the next two years.

# Key findings

- Deal activity in global data centre infrastructure surged last year. The total value of investment in global data centre infrastructure more than doubled year-on-year to USD59.5 billion while the number of transactions reached 117 in 2021, a 64% annual increase. This extraordinary growth is expected to continue – in the first half of 2022 we have already seen 41 transactions worth USD21.3 billion. This is double the USD10.6 billion total over the same period in 2021.
- The boom is expected to continue – 45% of developers, 56% of debt providers and 67% of equity investors say they plan to invest in or finance four or more data centre projects in the next 24 months, highlighting the confidence in the sector. Not only are respondents expecting to take part in more transactions, they're expecting to put more money to work: equity investors say they expect to invest an average of USD2.9 billion in data centres in the next two years – a 26% increase on the average of USD2.3 billion they say they invested over the previous two years.
- ESG (ie environmental, social and governance) is rapidly rising up the agenda. Almost all respondents say that scrutiny and due diligence surrounding ESG issues increased when considering data centre investment and/or development in the past 24 months (94%) and expect it to increase over the next 24 months (99%). Strong ESG credentials are an increasingly important part of the investment thesis of many players involved in the sector.
- Not only is investment in the industry booming, respondents are expecting the return they make to grow as well. According to our survey, the average internal rate of return (IRR) for equity investors of data centres is expected to be higher in 2022 (on average 17.0–17.6%) than what they think it was in 2021 (on average 13.1–13.5%).
- The importance of ESG can also be seen when respondents were asked about the overriding trends in data centre infrastructure in the coming 24 months. An increased focus on carbon footprint minimisation was cited as a top concern by 25% of equity investor respondents, and 35% of both debt providers and developers.
- Despite this, there are still regional differences when it comes to ESG: 64% of respondents in the United States track ESG-related metrics on all the data centre projects in which their organisation invests, finances and/or develops. By contrast, just 24% of Asia-Pacific respondents say the same. We anticipate that ESG considerations will become increasingly important over the next 24 months. And while there remain concerns about “greenwashing” in the data centre space, a consensus has begun to form around reporting standards – especially in Europe.
- There is a clear gap between the highest quality assets and those with below average ratings on technology, interconnectivity and ESG. A majority of investors of all types said that they would not consider investing in a data centre with poor ratings on those three criteria, even if offered at a discount. As energy costs rise and customers' expectations for uptime increase, the pricing gap between higher quality assets and the rest of the market could widen further.



## Q&amp;A

## Trends in colocation

Mark Pestrige, senior customer experience director at Telehouse Europe, discusses the trends shaping demand for colocation.



**What are the main growth drivers in the colocation space?**

There are several factors in play. The pandemic has enabled customers to look at how to work without people being in the office and this has accelerated their move towards a cloud or hybrid strategy. Over-the-top (OTT) providers, media service companies and hyperscalers have expanded. Financial services organisations and enterprise companies are increasing efficiencies and driving incremental revenue streams by moving to the cloud. So there has been a huge uptick and the demand that we're seeing at Telehouse is just incredible.

**Which policies and regulations have the greatest impact on your business?**

GDPR is one. We think long and hard about the data we have, where we store it, how long we store it for and how we transfer it. We have a large legal risk and compliance team who look at that on a regular basis. On a tactical level, Brexit has had an impact on our supply chain. There are now more regulations around getting hold of materials for building out data centres. That has had an impact in terms of lead times.

**We have seen a huge rise in awareness around ESG issues. What ESG measures are you taking?**

ESG is huge for us. We have policies to make sure that we buy all of our energy from renewable sources, and we have a commitment to be carbon neutral by the end of 2030. We are also working on strategies around water usage efficiency (WUE) and carbon usage efficiency (CUE), and we track power usage efficiency (PUE) on a monthly basis. In parallel with this, we are working with our supply chain to reduce Scope 3 emissions, as well as making sure that all materials and packaging are recycled. We are also looking at ways that heat generated by our infrastructure could be used in the community.



**Do you see rents rising?**

They will definitely go up. Costs linked to the elements we provide – real estate, people and energy – tend to rise every year. We use CPIH to track inflation and pass on increased costs to our customers. Until this year, increases were in low single digits. Obviously, there has been a material rise. Most of our customers are expecting increases, they understand the elements of the service we provide and we have had very little pushback. We'll see how that plays out.

**Do you think we are seeing a price bubble?**

EBITDA multiples are high, but it's a case of supply and demand. A lot of people want to get into this business, because it's secure and you have long-term customers, so you get a good return over ten to 12 years. I think you might see a slight softening of multiples, but I can't see the bubble bursting.

**What trends are you seeing in the colo market?**

More and more enterprise-type customers are using multi-tenant data centres and leveraging access to either cloud providers or some of the internet exchanges. The financial services sector is embracing the multi-tenant data centre concept – particularly as people move away from being in the office five days a week. There is also an ESG element for our customers: when you know your data centre company is focused on ESG, it takes off some of the pressure. Looking ahead, the things driving growth are AI, 5G and IoT – all of them rely on interconnection. So we are really enthusiastic about the way forward.

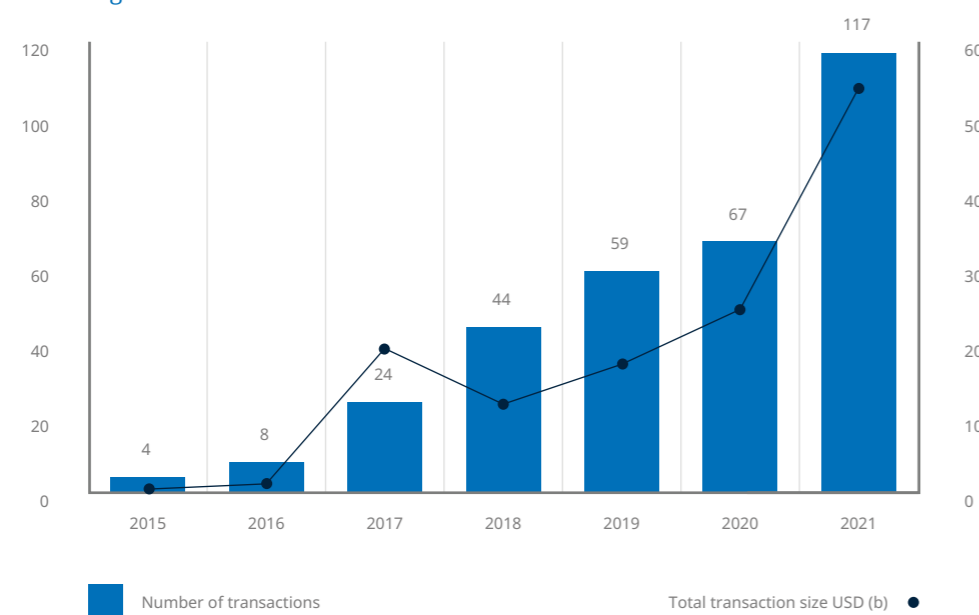
# Market activity

## Record levels of data centre dealmaking are underpinned by rock solid fundamentals.

Data from Inframation shows that investment in data centres broke new records in 2021, with total transaction value doubling year-on-year to USD59.5 billion. It was a similarly stellar picture in terms of volume, with 113 transactions reaching the stages of preferred proponent or financial close compared with 69 in the previous year – an increase of 64%.

## Global data centre project transactions\*

Fig 1.



Source: InframationGroup (correct as of 07/06/2022)

\* Data shown includes transactions that have either reached the stages of financial close or preferred proponent. Data shown includes brownfield, greenfield and refinancing transactions.

### Hyperscalers continue to drive the market

Soaring demand for data centre space is primarily driven by the hyperscalers – tech giants which require vast resources to store data. These businesses, in turn, are capitalising on the insatiable demand for cloud services, which include everything from video streaming to software-as-a-service. Demand for cloud services of all types was already growing, but has escalated significantly since the onset of COVID-19. Video communications provider Zoom, for example, saw global enterprise customer numbers leap more than threefold during the pandemic.

Another driver of data centre growth is the increased demand for colocation. This is the provision of serviced data centre space that businesses can rent and in which they can deploy their own IT equipment. Colocation – colo – facilities normally offer a complete package of both building and technology services, from connectivity and cooling to power and security.

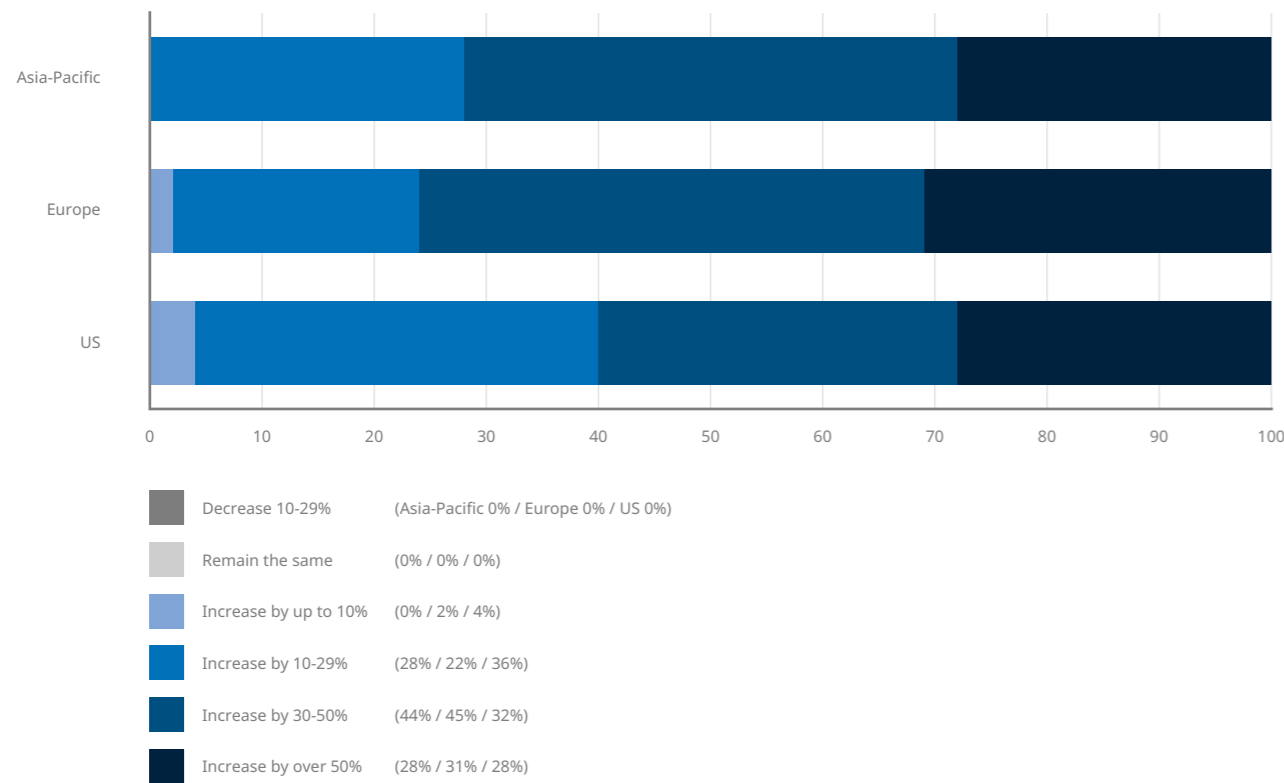
The rise of data centres as an attractive investment asset class is luring new backers and funders – among them real estate investors who have not traditionally invested in data centres, as well as a variety of infrastructure funds, particularly those with a focus on digital infrastructure, investing in adjacent popular areas such as fibre and telecoms towers. “With uncertainty surrounding traditional assets such as offices and retail, a lot of real estate investors are looking at what they can invest in successfully in a post-COVID world, including data centres,” says Alanna Hasek, partner, DLA Piper. “We are also seeing new capital players looking at data centres as an exciting asset class.”

Given the attractions, it is not surprising that respondents are bullish. All expect the overall value of investment (including debt investment) for data centre projects to increase in the next 24 months versus the previous 24 months. More than two-thirds believe that the value of investment will increase by a staggering 30%.

Although respondents across all regions are optimistic about the overall value of investment in the coming 24 months, those based in Europe are particularly enthusiastic. More than three-quarters (76%) of Europe-based respondents predict an increase of at least 30% – a significantly higher proportion than those based in the US (60%) and slightly ahead of Asia-Pacific (72%).

“How do you expect the overall value of investment (including debt investment) for data centre projects over the next 24 months will compare to that of the previous 24 months?”

Fig 2.



**Turn up the volume**

Respondents anticipate not only a rise in the overall value of investment, but also an increase in the volume of projects. Delving into the detail, 45% of developers, 56% of debt providers and 67% of equity investors plan to invest in or finance four or more data centre projects in the next 24 months.

This is considerably higher than the 10%, 27% and 37% respectively who say they invested in or financed four or more data centres in the previous 24 months. It is also notably higher than the number of respondents who said they would be investing in four or more data centres in our survey of European data centre investors, conducted in 2019. In that poll, 36% of debt providers said they would be investing in four or more European data centres in the coming 24 months, while only 8% of equity investors said the same.

While equity investors look set to be more active than debt providers in the coming two years, the debt/equity split across the market as a whole is not expected to alter substantially. “The majority is equity investment,” says Anthony Day, partner, DLA Piper. “But within every data centre business there will be a variety of debt as well, such as debt on the buildings and securitisation structures where they are packaging up revenue streams from key customer agreements.”

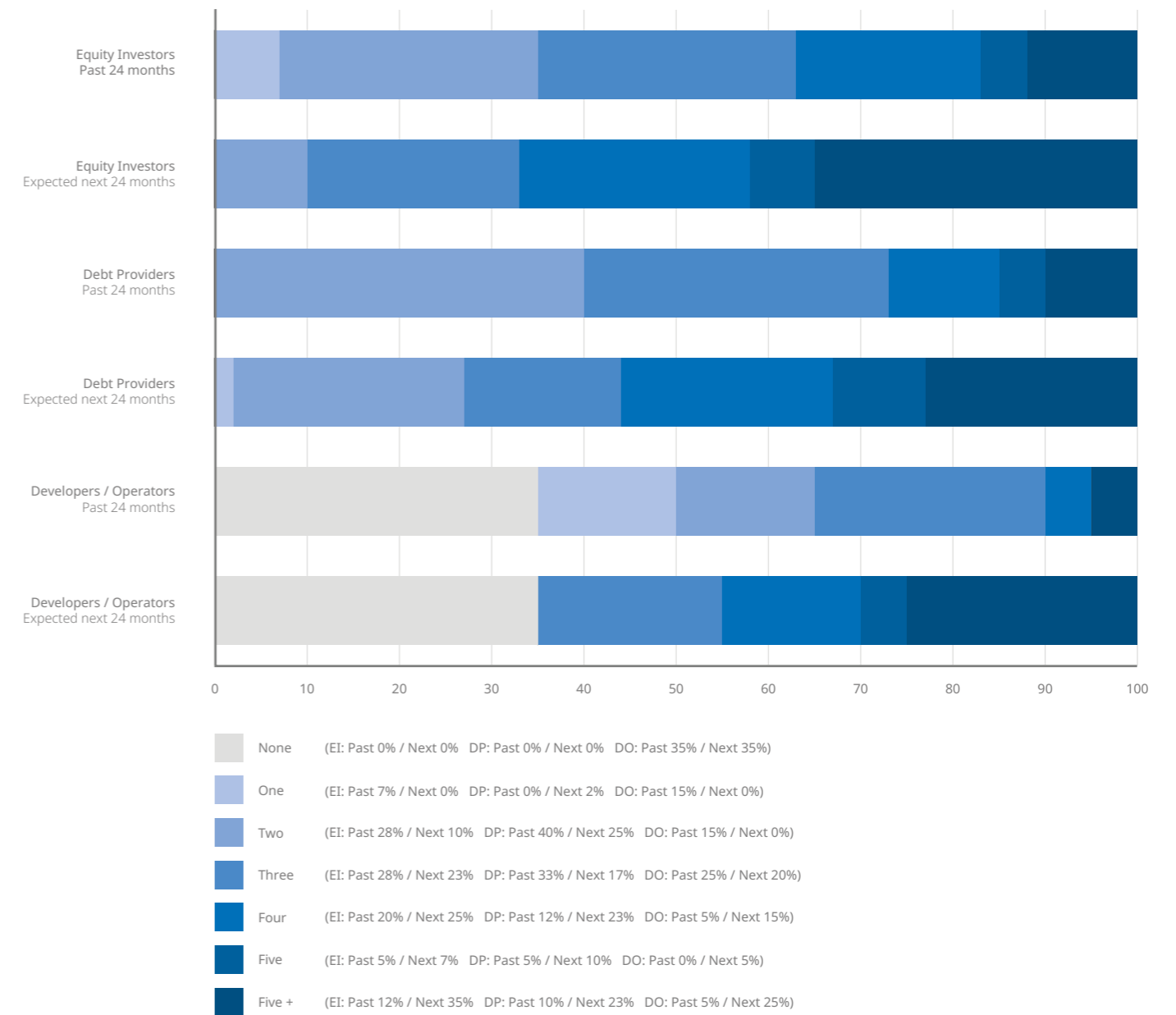
“The majority is equity investment. But within every data centre business there will be a variety of debt as well, such as debt on the buildings and securitisation structures where they are packaging up revenue streams from key customer agreements.”

**Anthony Day,**  
global co-chair,  
technology  
and sourcing,  
DLA Piper

(a) “How many data centre projects has your organisation (invested in / financed) over the past 24 months?”

(b) “And how many data centre projects do you expect your organisation to (invest in / finance) over the next 24 months?”

Fig 3.

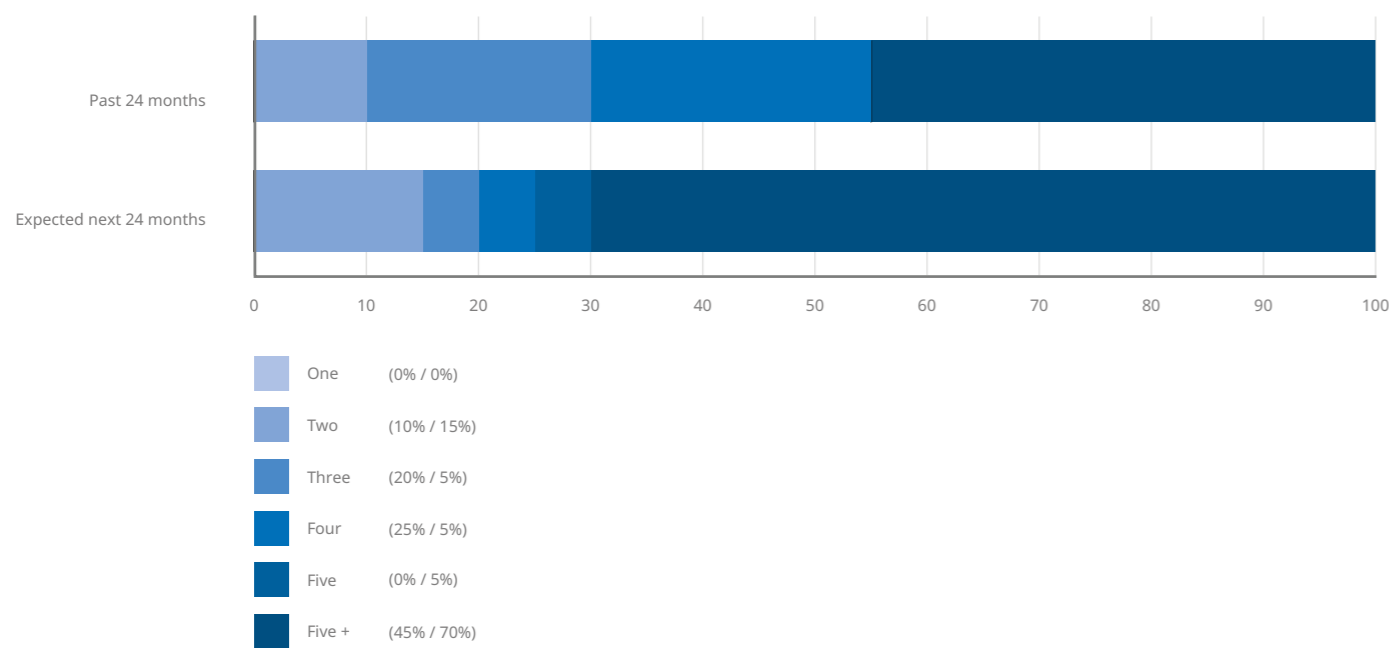


Focusing specifically on the sentiment of data centre developers/operators, the prospects look even more enticing – 70% of developers/operators say they expect to develop more than five data centre projects over the next two years, compared to 45% that say they achieved such numbers in the previous two years.

(a) (Developers / operators only) “How many data centre projects has your organisation developed over the past 24 months?”

(b) “And how many data centre projects do you expect your organisation to develop over the next 24 months?”

Fig 4.



**Active sellers**

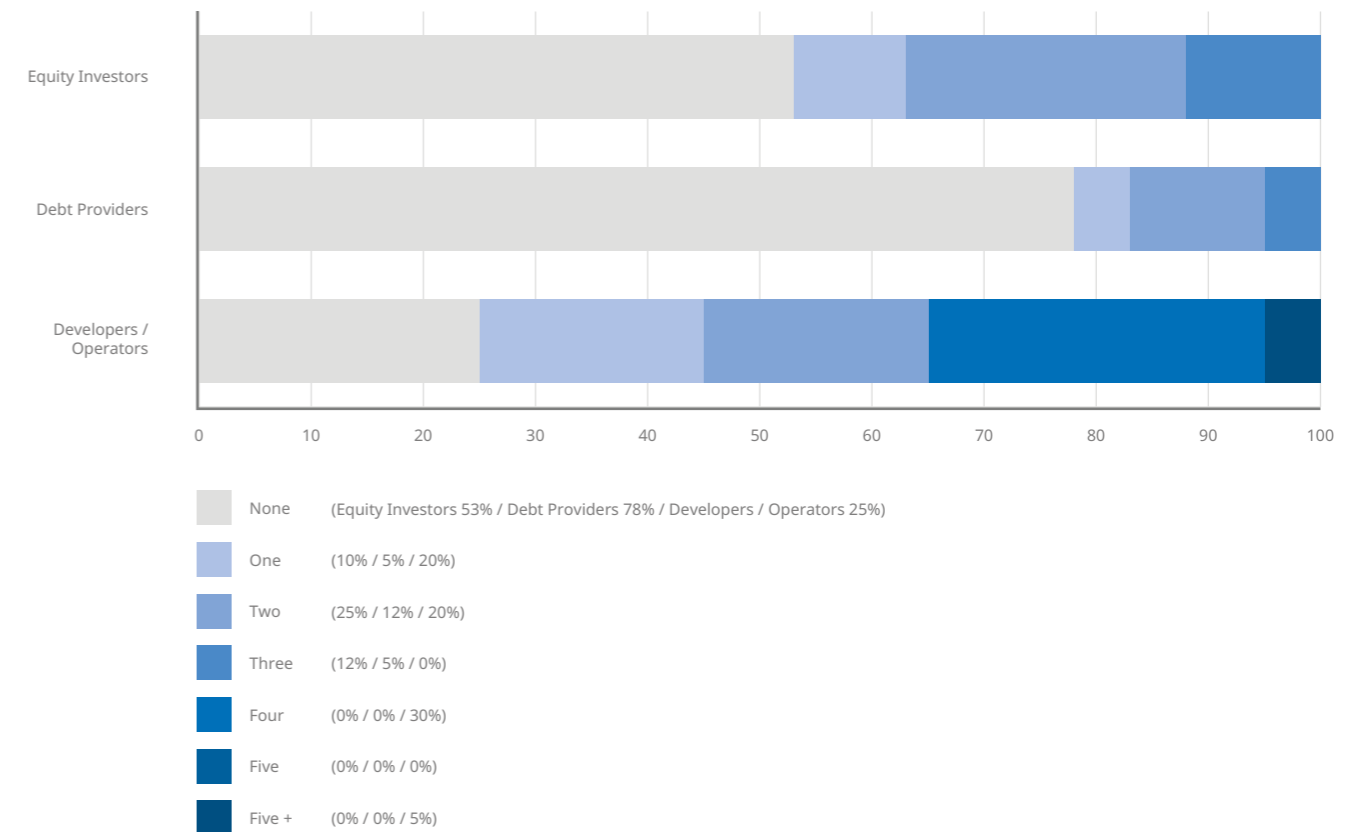
Not surprisingly, developers/operators stand out as the most prolific sellers of data centres. Asked about Corporate/M&A sales activity over the past 24 months, 35% of developers/operators report having sold four or more data centres or portfolios. Equity investors were the second most active group of sellers, although trailing a long way behind developers/operators with only 12% having directed at least three data centres/businesses over the past 24 months as they may be looking to hold data centre access as prices and demand continue to increase. Debt providers were the least active group. Only 5% had closed at least three sales over the past two years, with 78% having sold none at all.

**USD3.9 billion**

Developers/operators expect to invest an average USD3.9 billion in data centres over the next two years

“How many data centre projects has your organisation sold over the past 24 months?”

Fig 5.



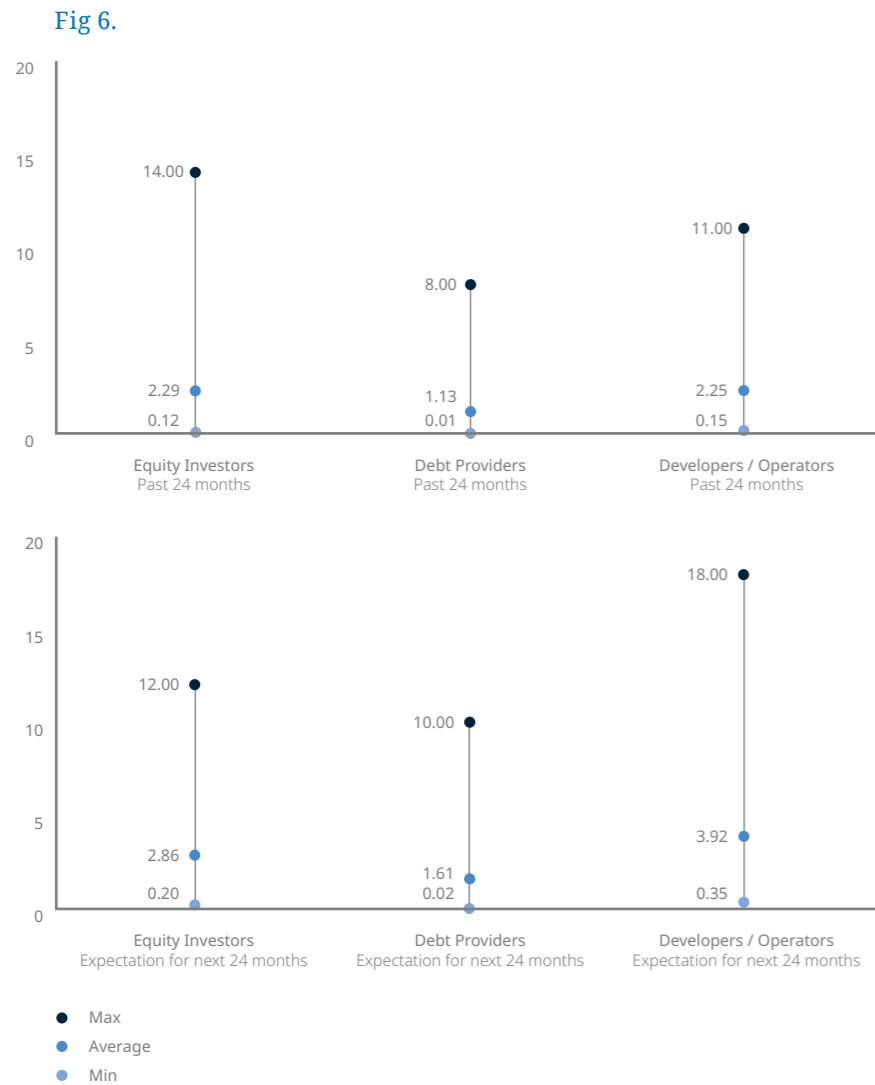
**Developer/operator ambitions**

Respondents across the board expect to increase how much they allocate to data centres. Developers/operators stand out as the group that expects to invest the most. Indeed, our survey suggests that developers/operators will overtake equity investors in the next 24 months.

Looking at the findings in more detail, the average amount developers/operators expect to invest in data centres over the next two years is USD3.9 billion –74% more than the average of USD2.3 billion they say they invested over the past two years. Meanwhile, the maximum amount cited for investment over the next two years by a developer/operator is USD18 billion, up 64% versus the USD11 billion maximum they cited over the past 24 months. This is reflective of the increased hyper-scaler and customer demand driving the need for more data centre space.

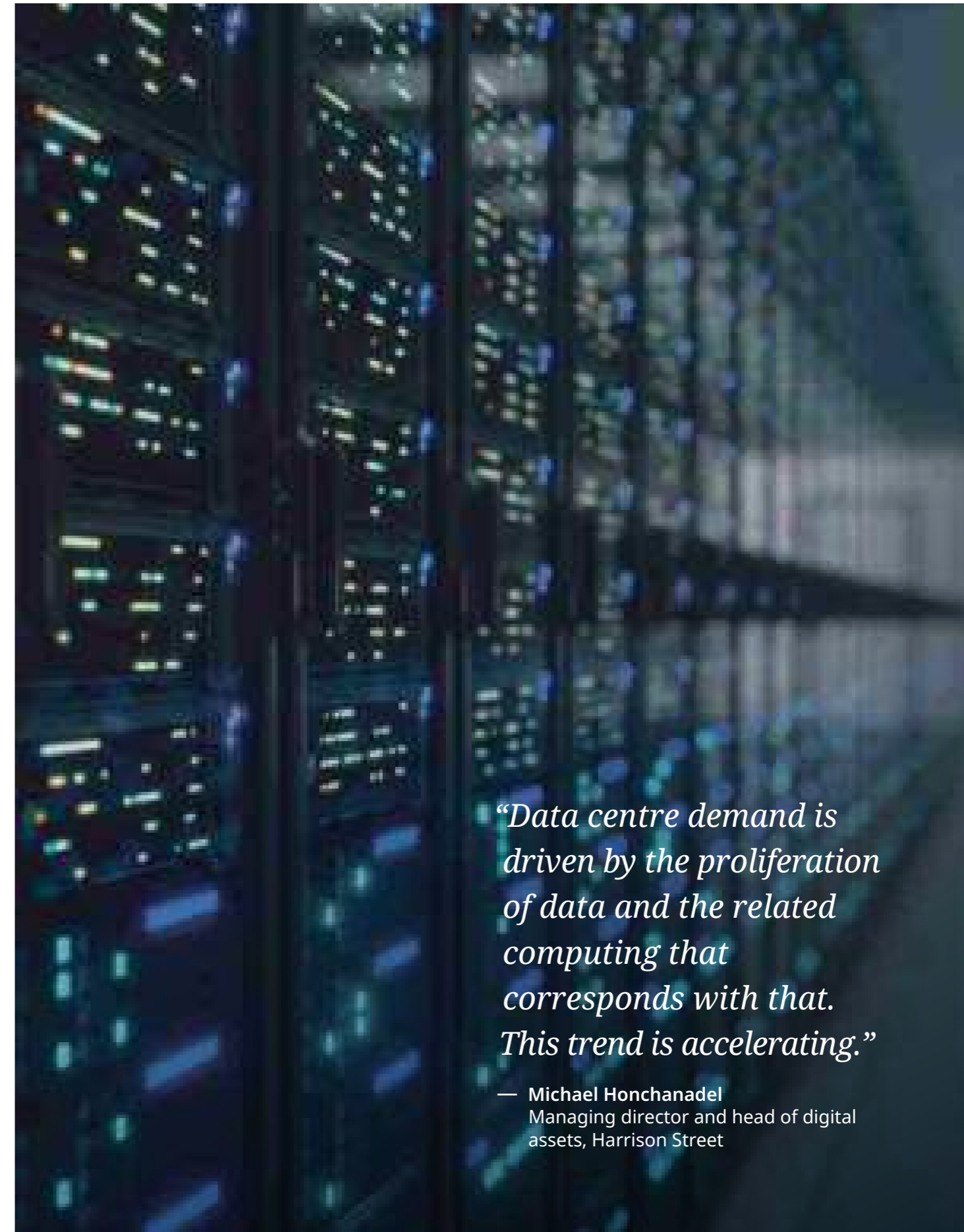
Equity investors and debt providers also expect to allocate more to data centre investment over the next two years, although to a lesser extent than developers. Equity investors say they expect to invest an average of USD2.9 billion in data centres in the next two years – a 25% increase on the average of USD2.3 billion they say they invested over the previous two years. Meanwhile, debt providers expect to invest an average of USD1.6 billion in the next 24 months, up 42% on the previous two years.

- (a) “What approximate value of investment (including debt investment) did your organisation allocate to data centres over the past 24 months?”
- (b) “And what approximate value of investment (including debt investment) do you expect your organisation will allocate to data centres over the next 24 months?”



According to the International Energy Agency (IEA), the global data centre industry used 200-250 TWh (Terawatt-hours) of electricity in 2020 (excluding cryptocurrency mining which used approximately 100TWh).

Interestingly, data transmission was responsible for 1% of global electricity usage – a proportion that has held steady from 2010. This is despite the exponential rise in data usage – global internet traffic has increased 15-fold over the same period, according to the IEA.



*“Data centre demand is driven by the proliferation of data and the related computing that corresponds with that. This trend is accelerating.”*

— Michael Honchanadel  
 Managing director and head of digital assets, Harrison Street

## Q&amp;A

# Booming demand is driving data centre investment

Michael Hochanadel, managing director and head of digital assets at Harrison Street, reveals the drivers shaping the global data centre market.



*Last year saw a huge amount of data centre dealmaking. Respondents were also optimistic about 2022, until Russia invaded Ukraine. What sentiment do you see?*

I don't see anything slowing. Data centre demand is driven by the proliferation of data and the related computing that corresponds with that. This trend is accelerating – the average compound annual growth rate (CAGR) has been more than 30% in recent years. The only way to address this continued growth is through the creation of additional facilities. Underlying drivers include video distribution and data generated by cell/mobile phones. These create an extraordinary amount of data. And pretty much anything that you buy for your home now is connected. So I don't see anything slowing on the demand side.

*Are data centres more resilient than other asset classes?*

Very much so. Data centre occupancies are incredibly sticky and fairly insulated from the typical market cycles that impact other real estate asset classes. Once a facility becomes part of an end user's compute infrastructure, it's not easy to relocate those occupancies. Where you have concern is toward the end of a lease related to older generation data centre space. In certain circumstances, those lease expirations are an opportunity for users to relocate and upgrade their infrastructure.

*Respondents point to market liquidity risk as an obstacle. Why do you think this is?*

If anything, there's so much liquidity that it can be a challenge to find the right opportunities to align with your capital. There's maybe a slightly smaller universe of lenders for data centres, but we haven't seen that impact pricing and spreads. Debt structures are still very attractive for the sector. For the right assets and the right products, the market for equity on the exit seems to be very robust. Trading is comparable to the most attractively priced core real estate. But there's probably not so much liquidity for older assets and secondary markets.

*What does ESG scrutiny mean in practical terms?*

Energy efficiency is a big factor. This is typically characterised through the PUE (power usage effectiveness) designation – the relationship between the total amount of power a facility uses compared to the amount used by the compute environment. We're now down to a PUE of 1.2, maybe lower. Access to renewable energy is also a consideration. The other factor is water usage effectiveness, or WUE. Designs which leverage evaporative cooling are energy-efficient, but use an enormous amount of water. In regions where water resources are scrutinised, there's a lot of focus on this.

*Respondents expect China and India to see the greatest growth. Do you agree?*

It's an enormous opportunity given the magnitude of the populations. Asia is a key area of growth and we will look to deploy capital there. But we need to recognise the risks. There are two factors in play. One is conventional real estate considerations: data centres are based on contract law and contract enforceability. As a foreign investor in China, there are key considerations regarding the legal dynamics around contracts. One way you can get around this is through finding the right local partners. The other dimension is data security. That's more of a consideration at the application layer – but it is foundational to demand. You can't completely ignore those types of critical considerations closer to home. We're already seeing that in the US, where some mobile operators are looking at 5G as a delivery mechanism for content.



# Choosing the investment

*Selecting and evaluating investment criteria is a complex task. Our survey reveals the factors that different groups of investors consider to be the most – and least – important.*

### Drivers and obstacles

Nearly all equity investors (95%) and more than three-quarters of debt investors (78%) believe that return on investment is one of the top two most important factors when considering investing in, financing or developing a data centre. However, only 30% of developers/operators agree with this – far more of them see energy security as one of their top priorities (70%). This clearly highlights the different outlook that particular investment groups look for when accessing potential future data centre investment deals.

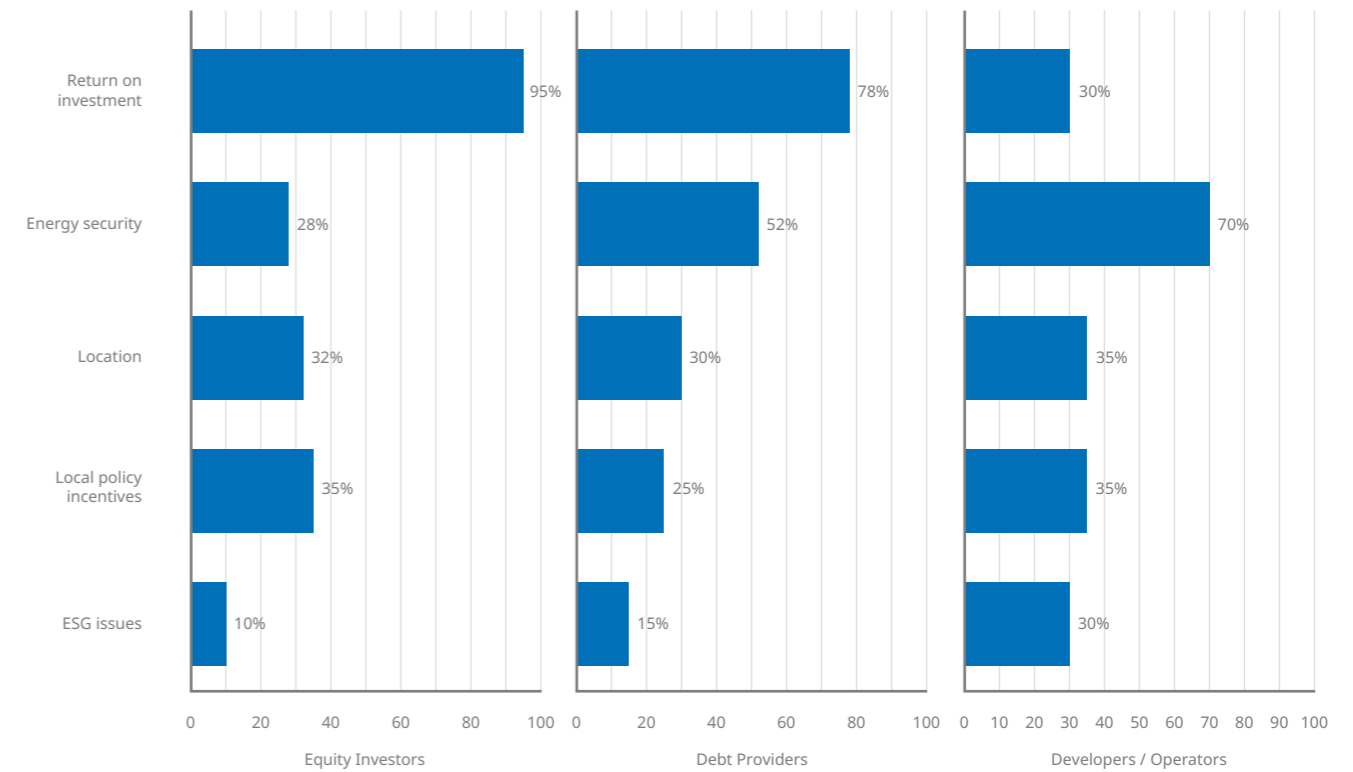
Energy security is also highlighted by debt providers as one of the top two most important factors when evaluating data centre financing (cited by 52%). Energy security, access to power, security of supply and power costs are all rising to greater prominence following the start of the Russia/Ukraine conflict and the seismic impact this is having on global energy markets and prices. Security of supply has long been a factor in data centre investments. But it has become even more crucial over the past 12 months in the wake of electricity supply disruption in some geographies and soaring gas prices (which have a direct impact on the price of electricity).

95%  
78%

95% of equity investors and 78% of debt investors believe return on investment is a top two most important factor when considering investing in, financing or developing a data centre

*“What do you believe to be the most important factor when considering investing in / financing / developing a data centre?” (Select top two)*

Fig 7.



## Drivers and obstacles

### Investment drivers

Turning to specific investment drivers, 48% of equity investors point to expectations for relatively high IRR – a greater proportion than any other respondent group. However, data centre saturation in some countries and cities, among them London and Frankfurt, is becoming a blocker. “Lack of site availability could play through into returns,” warns Hasek. “We are seeing investors looking at new locations for data centres, including Spain, Poland, China, India and Malaysia.”

The second most-mentioned driver for equity investors is the relatively future-proof nature of data centre technology, cited by 43%. This is followed by industry knowledge, particularly knowledge of policies and regulation in the sector (37%) and relatively low market liquidity risk (also 37%).

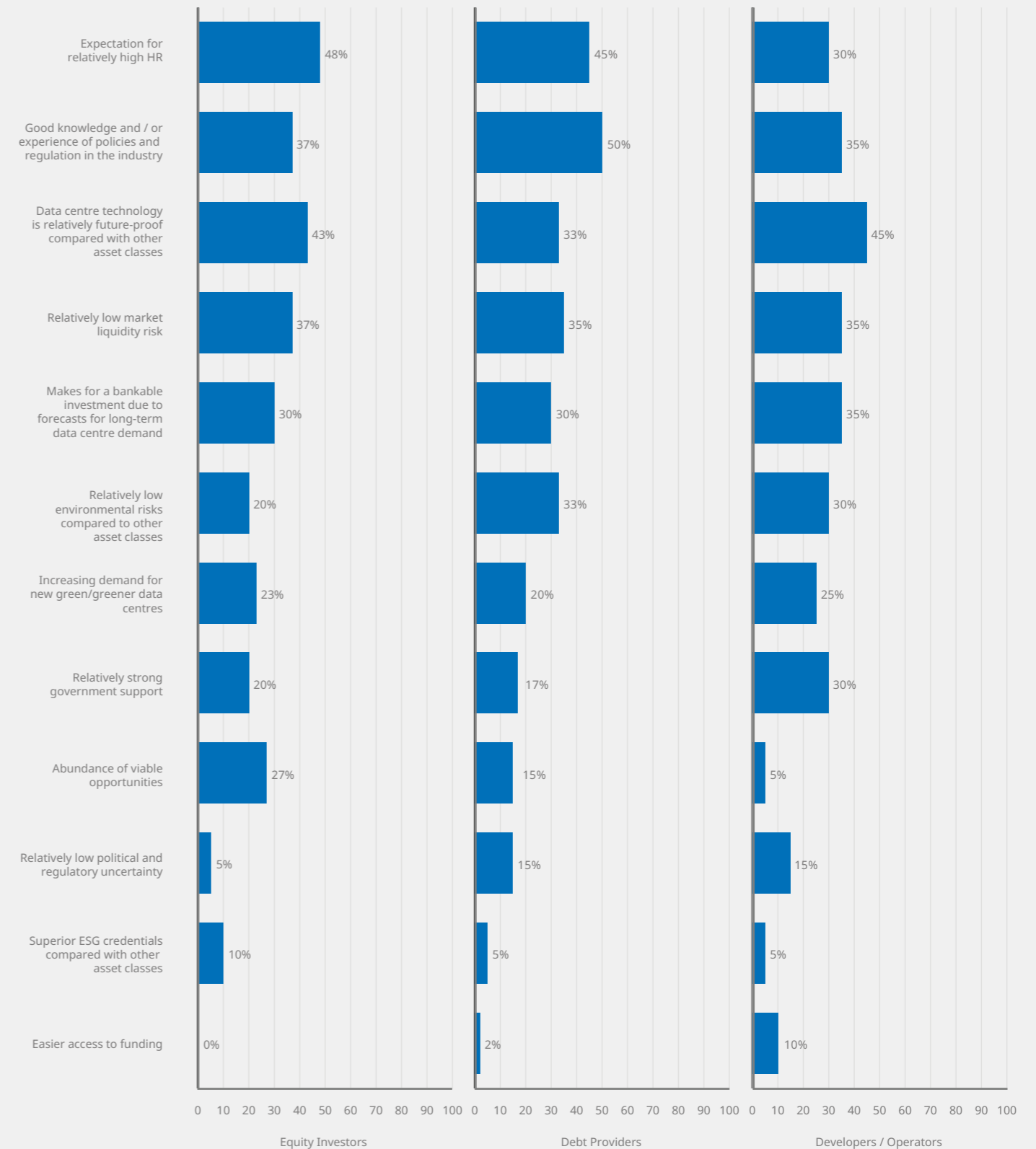
For debt providers, industry knowledge (including policy and regulation) is the top-ranked driver. This is cited by 50% of debt providers – the highest share for any group, and for any driver. Expectations for high IRR is ranked second with 45%, followed by relatively low market liquidity risk, mentioned as a top-three driver by 35% of debt providers/operators.

For developers, the picture in terms of motivations is much more nuanced. Future-proof technology (cited by 45%) is the most frequently cited driver. However, three separate factors – industry knowledge (including policy and regulation), relatively low market liquidity risk, and bankability thanks to forecasts for long-term data demand – all achieve equal shares of 35%. Meanwhile, three drivers achieve equal ranking in third place. These are expectations for high IRR, relatively strong government support and relatively low environmental risks (each mentioned by 30%).

Turning to respondents' perceptions of what motivates investors in general, the most common factors highlighted are future-proof data centre technology, expectations for relatively high IRR, and industry expertise (including policy and regulation). This latter point in relation to understanding the importance of the regulatory market is becoming critical to commercial success in many markets, and regulators and governments are starting to regulate the sector further, as Day comments, “regulatory change in the data centre space is happening at an accelerated pace, impacting those unaware, whether it may be protectionist government measures to control foreign ownership of critical digital infrastructure, or the rapidly evolving ESG regulatory landscape – you need to stay on top of this”.

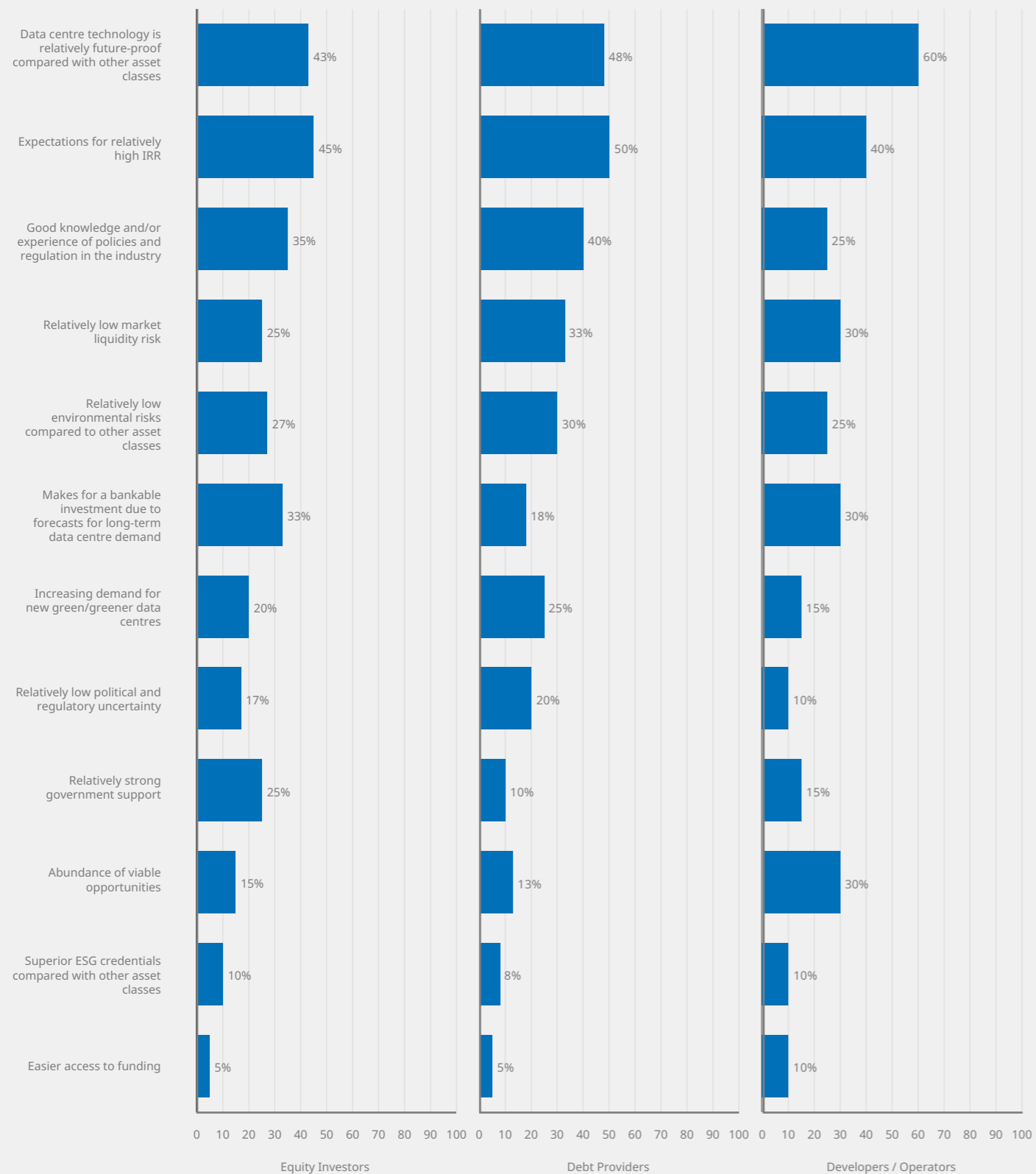
(a) “What do you consider to be the biggest drivers to investing in data centres for your organisation?” (Please select top three)

Fig 8.



**(b) “What do you consider to be the biggest drivers to investing in data centres for investors in general?” (Please select top three)**

Fig 9.



**Obstacles uncovered**

Whilst the different respondent groups are somewhat divided when it comes to drivers, there is greater consensus about potential obstacles. Given the vast amount of capital tied up in relatively illiquid data centre real estate, it is not surprising that more than half of respondents agree that market liquidity risk is one of the top three hurdles. Respondents also cited increased regulation as being a factor influencing market liquidity risk which may be influenced by Russia's invasion of Ukraine. Foreign direct investment reviews by governments have tightened during the pandemic period. A key trend is the expansion of reviews to include investments in critical national infrastructure, including IT and internet services – putting data centres within scope in some countries. “This is an area where we are going to see increased change and scrutiny going forward, such as the recent introduction of the UK National Security and Investment Act in the UK which allows the UK government to investigate transactions in the data infrastructure sector which could give rise to national security concerns”, says Hasek.

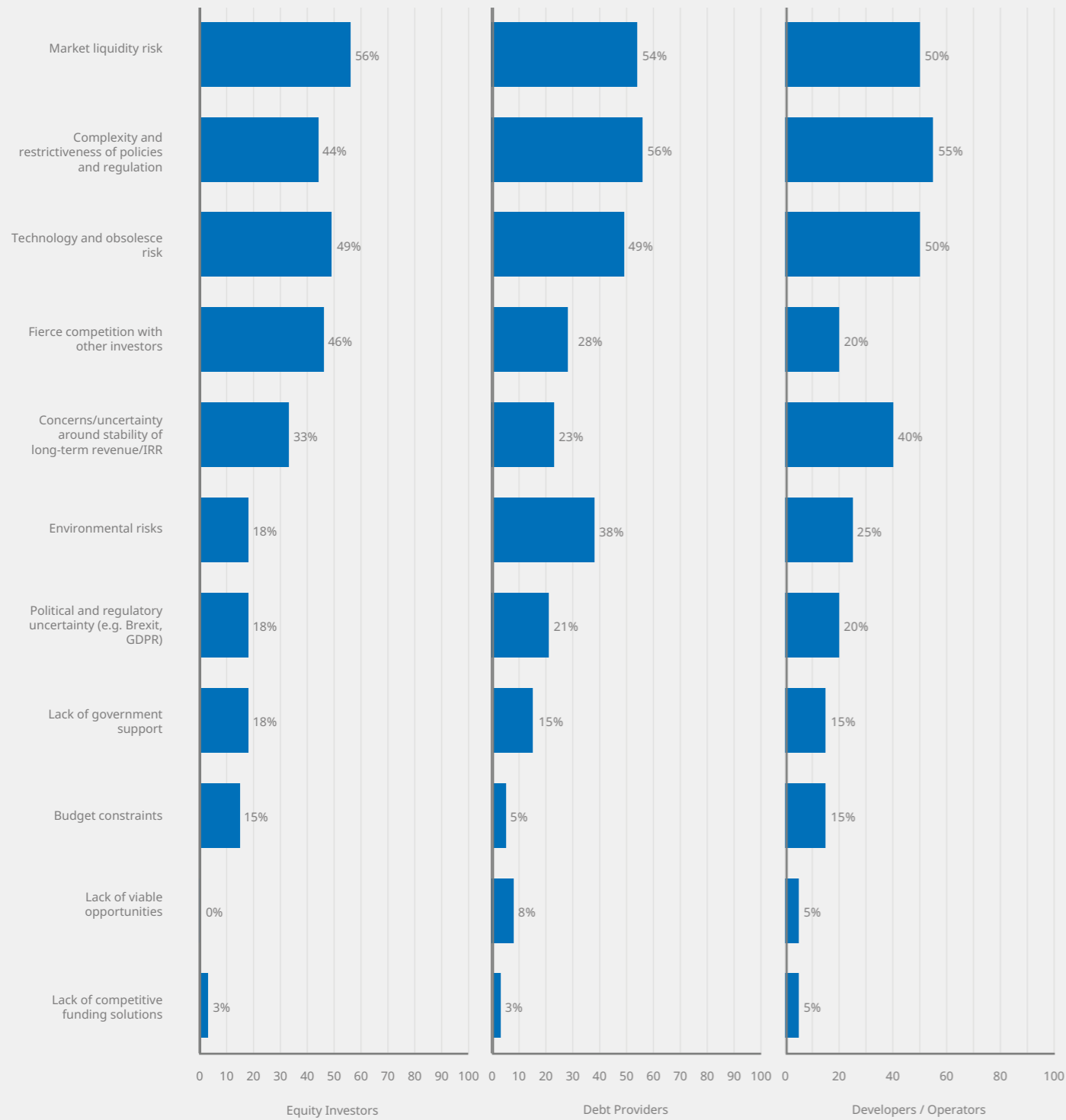
As well as liquidity risks, respondents point to the relative complexity and restrictive nature of policies and regulation surrounding data centres. A notable proportion of respondents also say that potential technology and obsolescence risks (49-50%) are key barriers to investment in some data centres. Respondents also see technology and obsolescence risks as one of the biggest obstacles to investing in data centres for investors in general, given the significant cost outlay that this can create for investors having to upgrade mechanical and engineering equipment, including cooling systems, power infrastructure and generators within data centres.

Although respondents ranked political and regulatory uncertainty relatively low on the list of obstacles – with only between 18%-21% of all respondents saying they see this as among the top three obstacles for their organisations – the outbreak of war in Ukraine, which began shortly after our respondents were surveyed, has highlighted geopolitical risks across all industries, including the threat of state-sponsored cybersecurity attacks. As critical components of the digital infrastructure underpinning modern economies, the data centre industry has always treated cybersecurity as paramount, but scrutiny is only set to increase as long as the conflict continues.



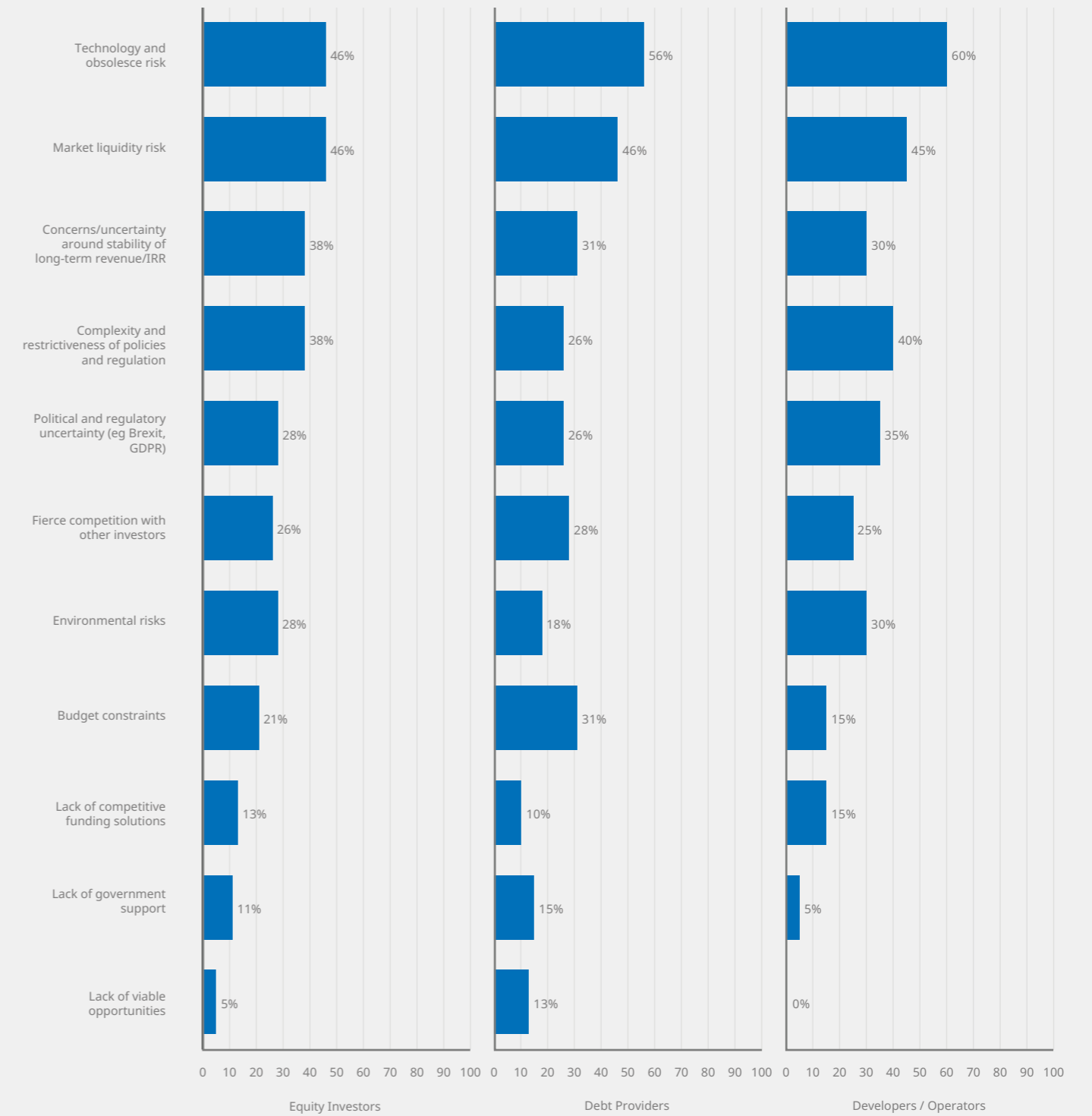
(a) “What do you consider to be the biggest obstacles to investing in data centres for your organisation?” (Please select top three)

Fig 10.



(b) “What do you consider to be the biggest obstacles to investing in data centres for investors in general?” (Please select top three)

Fig 11.



## Q&amp;A

## Digital infra fund perspective

Andre Karihaloo, investment director at Triple Point/Digital 9 Infrastructure plc (D9), highlights the trends shaping the data centre market.



**What makes data centres attractive from an equity investor's point of view?**

There's a lot to like – particularly with the economic backdrop right now. Many data centres (such as ours) have long-term contracts with creditworthy counterparties. There are elements of inflation protection within contracts, either through fixed annual uplifts or CPI/RPI links. And the scale of the opportunity – growth is exponential.

**Market liquidity risk was seen by many respondents as an obstacle to investing in data centres. What's your view?**

Exit risk is not a major factor for us, as our investment trust is a permanent capital vehicle. There may be some investors who say they're put off by the potential for liquidity risk. We were recently in a competitive process in Finland and have not seen a reduction in appetite. Right now, competition is intense.

**What are the main constraints facing the data centre industry?**

Securing power is the biggest complexity. We're seeing this right across continental Europe. But in Iceland, we don't have that issue. The country has abundant renewable energy – from geothermal and hydroelectric – and is moving away from aluminium smelting to position itself at the forefront of the fourth industrial revolution: that means energy-efficient enterprise data centres with international, creditworthy counterparties.

**Is the geography of data centres changing?**

Yes. It is more sustainable and less expensive to export data than renewable power. Traditionally, all datasets were processed in cities like London and Amsterdam - not energy efficient in hydrocarbon-dominant countries. We're educating customers on splitting datasets and migrating energy-intensive, latency-insensitive data (e.g. natural language translation, protein sequencing, aerodynamic simulations) to renewables-surplus countries. This is driving fast growth up in the Nordics.

**How fast is demand growing?**

We're seeing dramatic growth, particularly in our Nordic data centres. Verne Global has done this for longer than almost any high-performance compute data centre. A decade ago, they'd build capacity then fill it in two years. Today, we start building 20MW and we're full during construction.

**Do you see any evidence of a price bubble?**

It depends on how you define bubble. When we bought Verne Global, it was for around 20x EBITDA. Now, within 9 months, it's 15x, because capacity is full and we are investing in building more. It's about the quality of the growth platform.

**How important is ESG?**

It's central to what we do. We have a detailed scorecard for all our investments – data centres, subsea and terrestrial fibre, and wireless. Would we reject on ESG grounds? Yes – and we have. In terms of metrics, we're looking not just at PUE, but also at carbon utilisation effectiveness (CUE) and water usage effectiveness (WUE), as well as Scope 1, 2 and 3 emissions.

**Looking ahead, which geographies do you see as most promising?**

Subsea networks are one of D9's competitive advantages. 98% of international internet traffic flows through them. Because of the time they take to build and our partnerships with the global tech industry (the major procurers of digital infrastructure capacity in the world), we have visibility through to the early 2030s of where capacity will be built. We will be looking to buy or build data centres in India, Africa, southeast Asia and Latin America on the back of our subsea expansion. The opportunities are huge.



# ESG considerations

Almost all respondents say that scrutiny and due diligence surrounding ESG issues increased when making data centre investment and/or development decisions in the past 24 months (94%). An overwhelming majority (99%) anticipate a further increase in the next 24 months.

“Increased regulatory scrutiny and intervention in ESG have been driving, and will continue to drive, emphasis on ESG factors in due diligence and investment decisions over the next 24 months,” says Rhys Davies, partner and International Sustainability & ESG Lead at DLA Piper. “The uptick that we have seen over the past 24 months and expectation that it will continue is at least reflective of and possibly caused by increased interest from regulators and types of intervention,” he adds.

Lack of widely agreed-upon ESG standards remains a challenge, says Hasek: “Initiatives such as the Climate Neutral Data Centre Pact and metrics like PUE are helpful, but there is still a lot more to be done in terms of articulating what the agreed targets are and how they will be diligenced and monitored.”

Given the tightening focus on ESG, it is not surprising that some players are accelerating efforts to clean up their portfolios – and to free up capital that can be redeployed into more ESG-compliant assets. More than a third (35%) of developers/operators say that they divested at least one data centre in the past two years due to concerns relating to ESG. A smaller proportion of debt providers (17%) and equity investors (25%) say the same. In terms of geographies, the US saw the highest proportion of ESG-driven divestments (44%) and Asia-Pacific the least, with just 4%. This is an interesting insight in terms of the regional variations that we are seeing and reflective of the importance that the US market is placing on ESG.

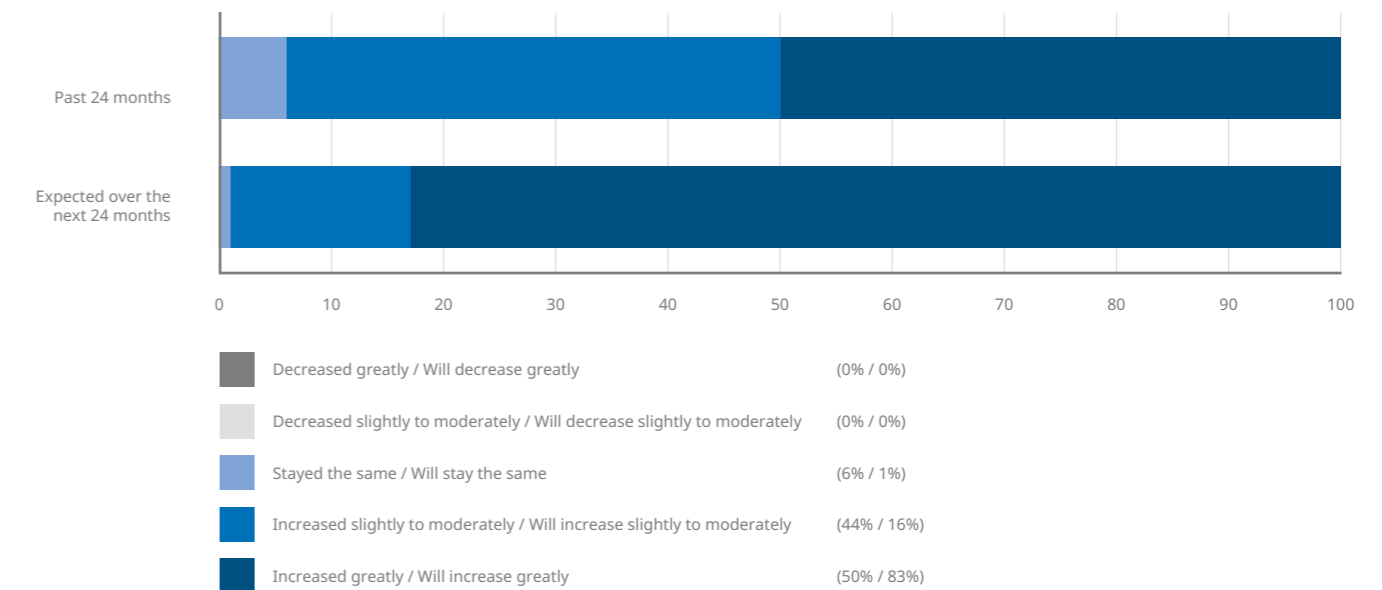
Respondents also say they are disposing of assets for strategic reasons (cited by 80% of developers/operators), for monetary reasons (the main driver for 75% of debt providers) and because assets are non-core, (cited by less than a third of all respondents). “ESG may be a driver, but the market is hot and sellers are taking advantage of this by divesting some of their less attractive sites for decent valuations,” notes Day.



(a) “Did scrutiny and due diligence surrounding ESG issues increase or decrease when making data centre investment / development decisions at your organisation over the past 24 months?”

(b) “And do you expect it to increase or decrease over the next 24 months?”

Fig 12.

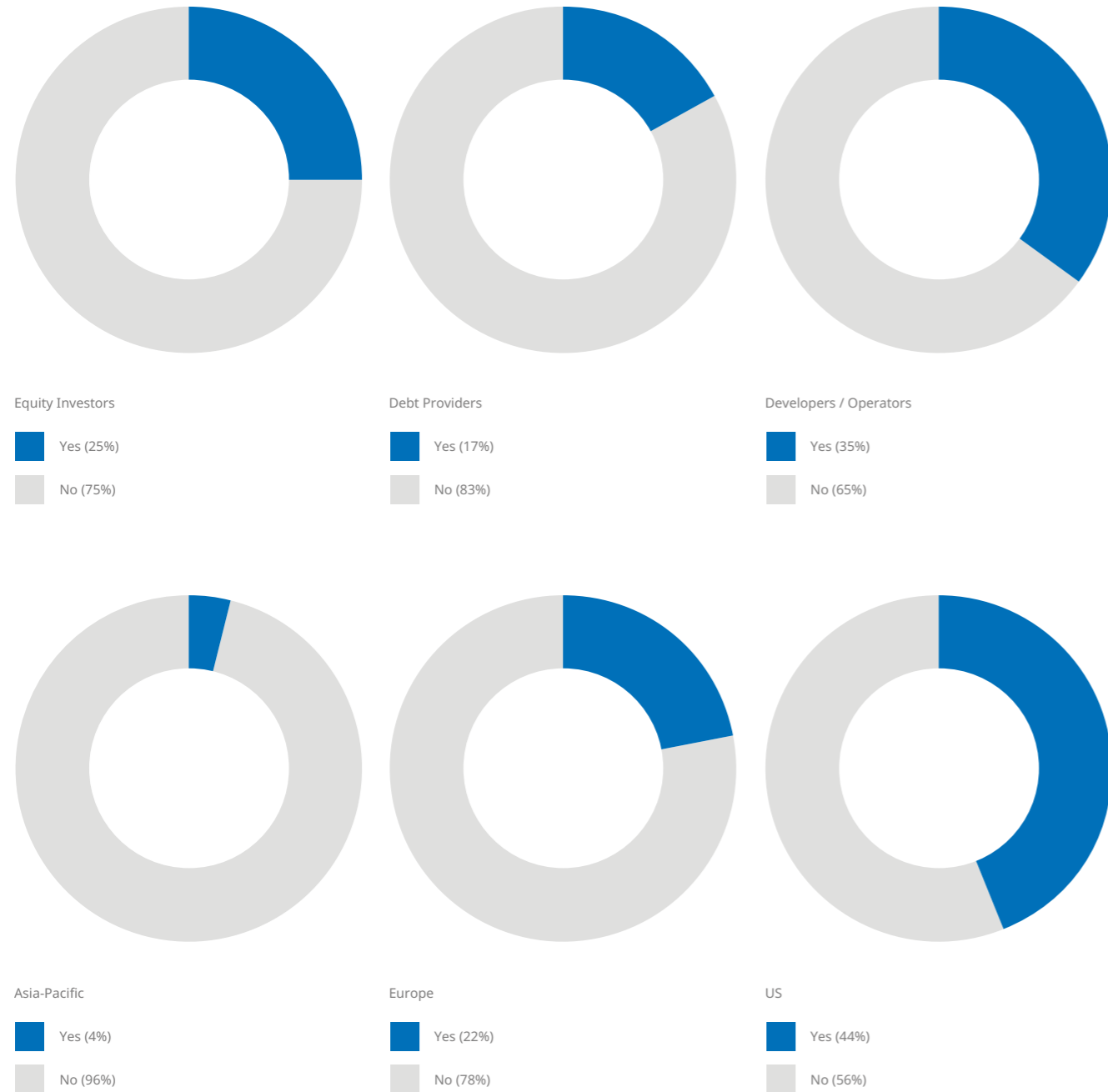


*“Increased regulatory scrutiny and intervention in ESG...will continue to drive emphasis on ESG factors in due diligence and investment decisions over the next 24 months.”*

— Rhys Davies  
Partner and international sustainability & ESG lead, DLA Piper

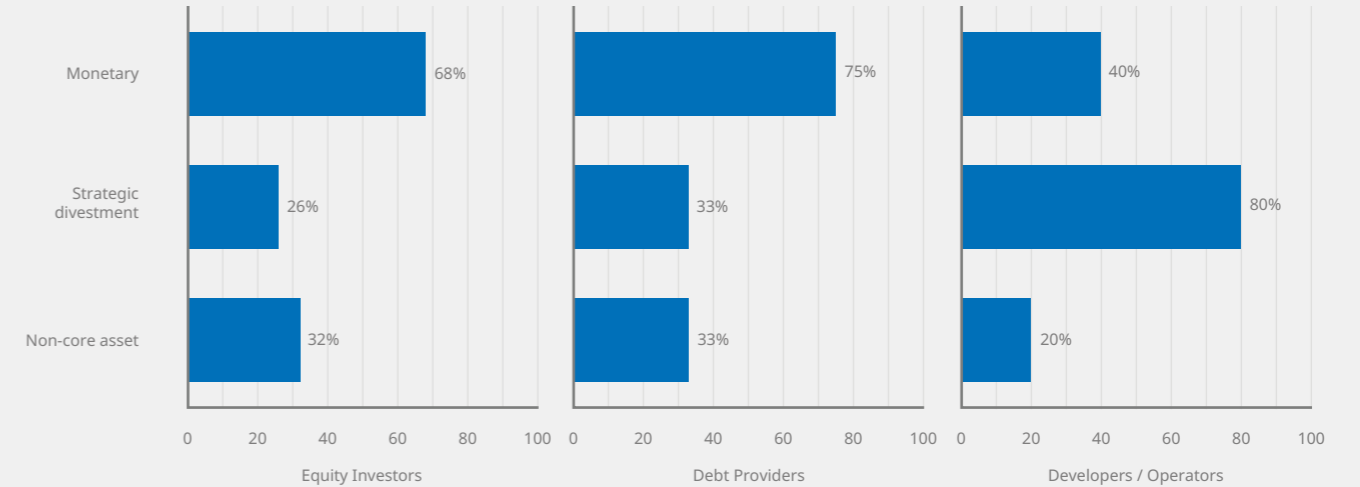
(a) “Over the past two years, have you made any data centre divestments due to concerns relating to ESG?”

Fig 13.



(b) “Did you make a data centre divestment for any other reason?”

Fig 14.



**Track record**

While most respondents actively track ESG-related metrics on the data centre projects in which their organisation invests, finances and/or develops, only a slim majority of equity investors (58%) and less than half of debt providers (43%) and developers/operators (45%) say they do this for all of them.

Focusing on geographies, US investors stand out as the most assiduous with 64% saying that they track ESG metrics for all of their data centre investments, along with 53% of European respondents who say the same thing. Respondents based in Asia-Pacific are the least likely to track all of their data centre projects actively, with only 24% saying that they do so.

“While the US has trailed other markets in many respects concerning ESG, those involved in the US data centre sector tend to do a better job than most of their international colleagues when it comes to tracking ESG-related metrics. We expect this gap to widen, as the Securities and Exchange Commission (SEC) recently released its proposed environmental disclosure rule for public company reporting,” said Mike Bedke, partner at DLA Piper. “We are only in the comment phase, without any formal rules having yet been adopted. However, the proposed rules would have broad impacts on both public and private companies. The rules are likely to require a tremendous amount of data collection and tracking with respect to fulfilling the ESG reporting mandates and disclosures.”

These regional differences are due in part to regulatory changes adopted by the EU as part of its Green Deal. “In particular, the sustainable finance disclosure regulations (SFDR) and the EU Taxonomy are intended to drive capital toward investments in energy efficient buildings including, where possible, buildings that are aligned with the objectives of the Paris Agreement, such as data centres,” says Davies.

*“Do you actively track ESG-related metrics on the data centre projects your organisation (invests in / finances / develops)?”*

Fig 15.

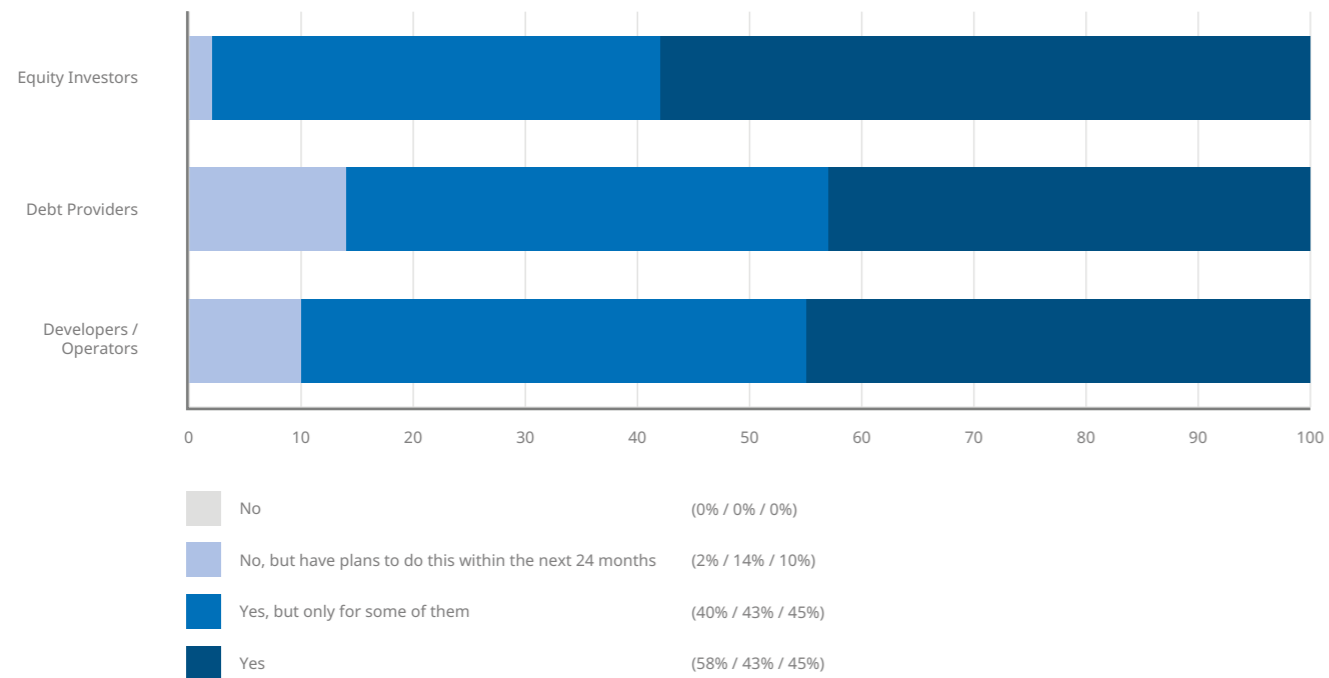
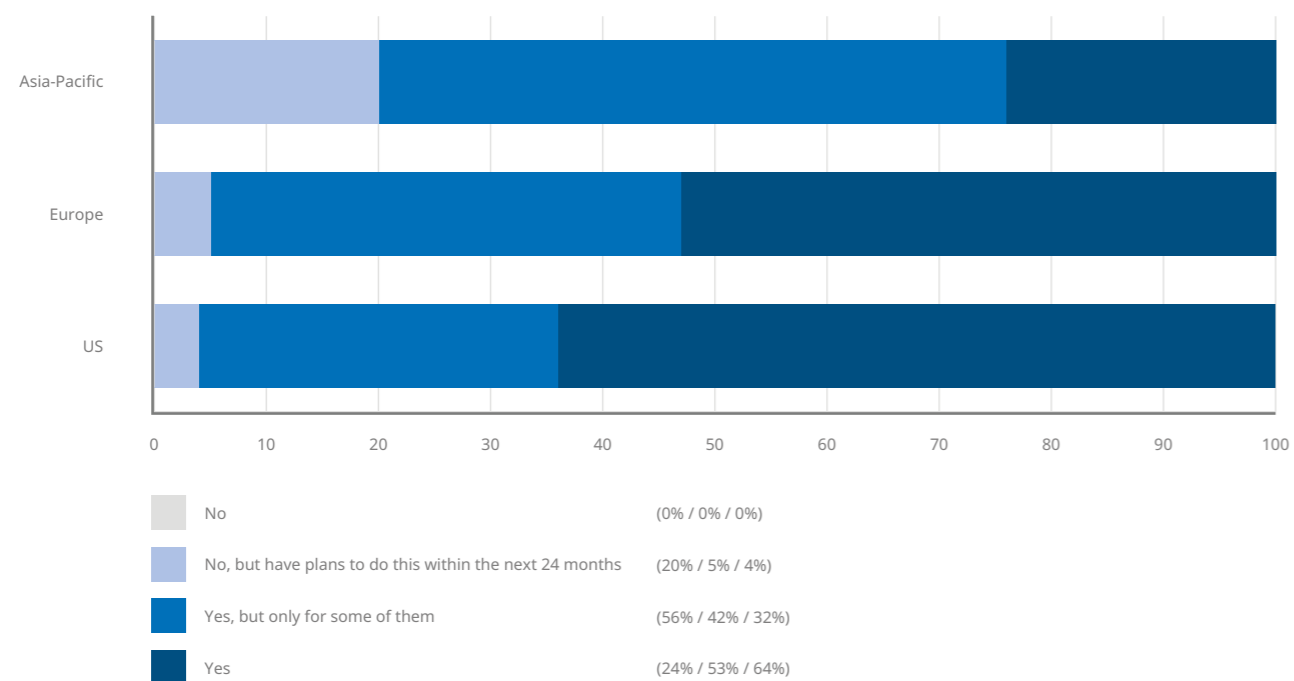


Fig 16.



**Carbon commitments**

Our survey shows that net zero carbon emissions are firmly on the agenda for a majority of respondents. More than two-thirds (68%) of equity investors and 60% each of debt providers and developers/operators say that the data centre in which they had most recently invested either has a target to achieve net zero emissions by 2030, or had already achieved this.

The picture is more fragmented in terms of geographies. Europe leads the way, with 20% of respondents based in the region saying that the data centre in which they most recently invested already has net zero carbon emissions. This compares with 12% of those in the US and just 4% in Asia-Pacific.

Europe-based investors are also more likely than their global peers to have invested in a data centre with a commitment to be net zero by 2030: 58% say the data centre they most recently invested in has such a target, versus 52% of those polled in the US and 32% of those polled in Asia-Pacific.

When considering how to reduce carbon usage, however, it can be easy to overlook other ESG concerns, for instance water usage effectiveness, or WUE. Certain energy-efficient cooling systems use large quantities of water, which poses a growing concern, especially in drought-affected areas such as the Western US.

Moreover, although the emphasis is on the environment at present, ESG encompasses a wider range of issues. “In European regulation the transition needs to be fast and fair,” says Davies. “That is to say, while initial focus has been on energy efficiency, greenhouse gas emissions and net zero we expect there will be additional scrutiny in a range of dimensions in the supply chain and value chain, including increased emphasis on human rights and particularly in the context of construction workforces and construction materials input into data centres.”

*“While the US has trailed other markets in many respects concerning ESG, those involved in the US data centre sector tend to do a better job than most of their international colleagues when it comes to tracking ESG-related metrics.”*

— Mike Bedke, partner, DLA Piper

“Does the data centre you most recently invested in / financed / developed have a target to be net zero carbon emissions by 2030?”

Fig 17.

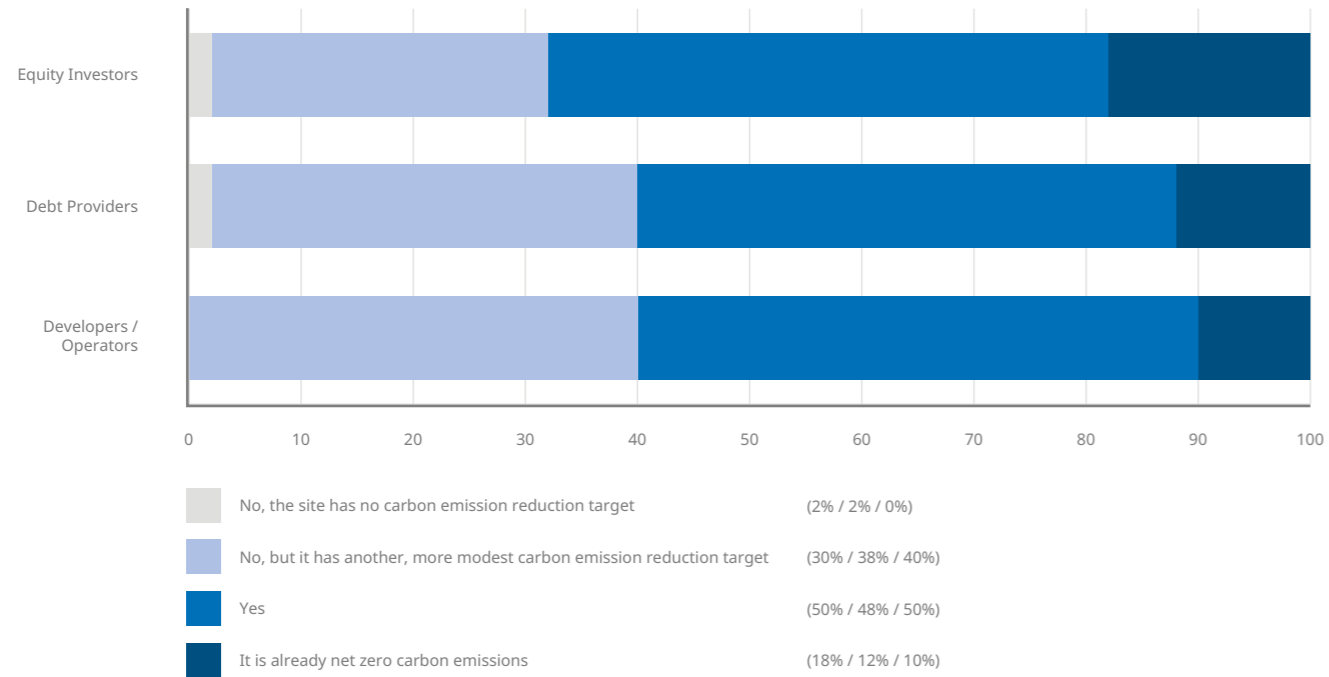
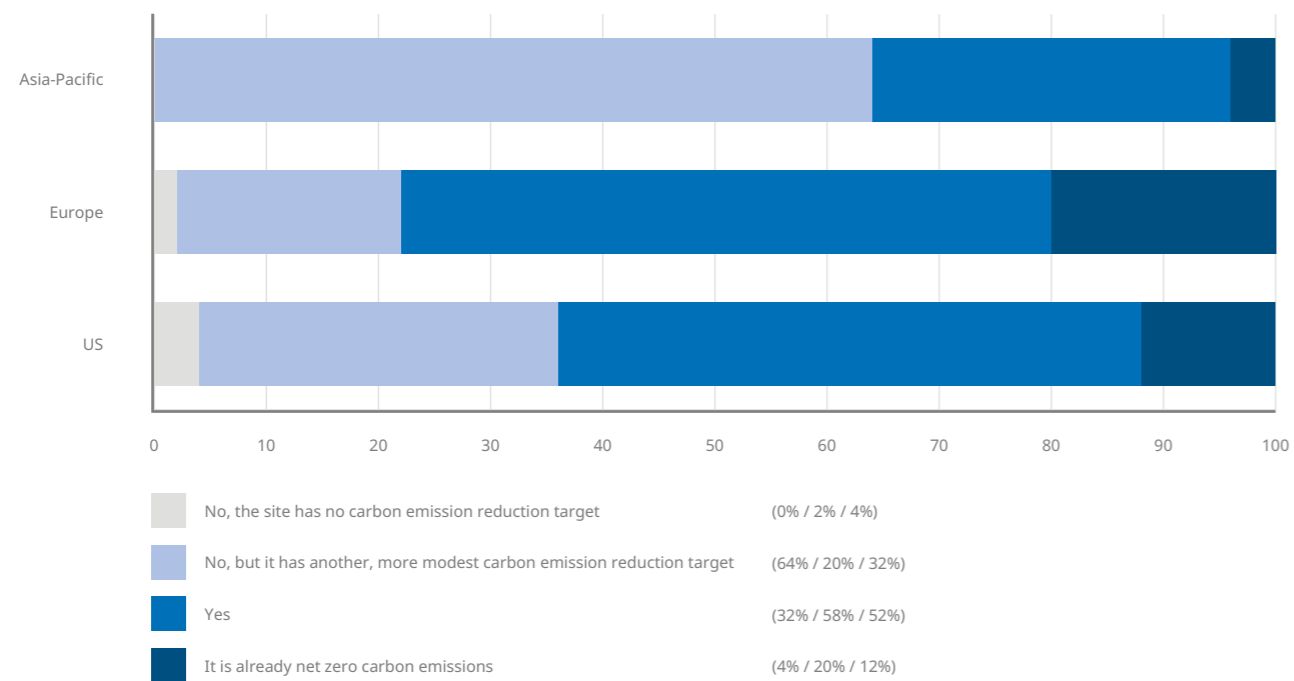


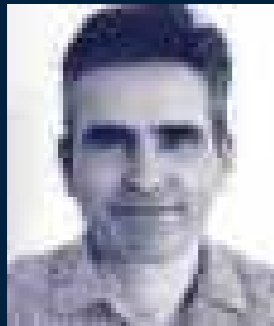
Fig 18.



## Q&amp;A

## A bright future for debt

John Wilson, Director at SMBC Leasing (UK), explains why debt providers are increasingly interested in data centres and how debt products are helping to spur dealmaking.



**What factors are driving the significant uptick we've seen in data centre transactions?**

A couple of things are happening. First, the size of hyperscalers' deployments is getting much larger and efficient, and competitive debt is helping data centre operators finance the capex investment required to meet this demand. Second, we have seen traditional infrastructure funds pivot to data centres from other asset classes, particularly as the pandemic highlighted the importance of internet and public cloud infrastructure.

**Do you see that momentum continuing?**

Absolutely. You have sustainable growth coupled with cash flows that are supported by some of the world's largest and most creditworthy tech firms. The critical nature of what the data centre operators are providing makes for a compelling, sustainable growth story for investors.

**Our survey was conducted just before Russia's invasion of Ukraine. What impact do you think the changing macroeconomic outlook will have on data centre investment?**

It's still too early to tell. There may be indirect consequences in terms of supply chain disruption. This is adding to the complexities that were already there, so you are seeing increasing costs in terms of components and shipping. Lead times are longer. All of that feeds into inflation and interest rates have increased significantly, albeit it has to be remembered from a historically low base.



**Market liquidity risk was seen by many respondents as an obstacle to investing in data centres. What's your view?**

The current shortage of data centres for sale means that any available are considered highly desirable, with multiple bidders as part of any sale process. Against this background, we are seeing different investor groups coming into the sector. They may have lower return requirements and therefore are able to trade assets between each other. All of this is contributing to liquidity and M&A activity in the sector as investors' funds need to be deployed.

**What sort of new investors are you seeing?**

Big infrastructure funds and sovereign wealth funds are coming into the market. They want sustainable growth and relatively low risk. These investors are a force for good, bringing affordable long-term capital and are not seeking short-term gains. Another thing we are seeing is growing interest in sale and leasebacks. This is where an operator acquires an existing data centre that is being only partially used by the current owners. Any unused, stranded capacity is leased to new customers while the original owner stays in place. We've been very successful in closing transactions of this sort. Everybody benefits.

**How important is ESG?**

ESG gets massive scrutiny from us. We have to be able to articulate what the ESG policies are for any project – for example, compliance with environmental laws and energy performance standards. In terms of metrics, many operators are signatories to the industry's self-regulation principles and going forward, I think you will see common metrics emerging especially as fund managers need to be able to report to their investors. Everyone is aligned on ESG. Hyperscalers are focussed on their carbon zero commitments and operators are motivated because being the most energy efficient feeds through to their bottom line and IRR. The operators who focus on ESG are likely to be the ones that will gain the support of the hyperscalers as tenants in their data centres.

**Do you see a bigger role for debt going forward?**

Yes. Equity investors are looking at the most efficient use of their capital as economics get tighter. Debt effectively lowers their cost of capital and equity providers are looking at maximising the debt products that are out there. This is a very capital-intensive industry and the cost of funding is critical to getting the sums right. Debt needs to be competitive in order for the market to continue to be able to grow. We've seen a number of public-to-private acquisitions take place. Arguably these new privately-owned operators now have access to different types of debt that they may not necessarily have had under public ownership.

# Navigating different types of projects

Respondents are willing to take risks to secure a discount – but within limits. Poor power usage effectiveness (PUE), cited by 53% of equity investors and 50% of developers/operators, was seen as the risk that respondents were most willing to tolerate. Meanwhile, between 32% and 40% of all investors would consider investing in a data centre with high obsolescence risk, with only 20–32% prepared to invest in a data centre that is poorly interconnected.

Despite their risk appetite, an overwhelming majority of respondents draw the line at investing in a data centre with poor ESG credentials, with between 90 and 100% of all types saying they would not consider backing such an asset, which amplifies the increasing importance that solid ESG metrics are having (and will continue to influence) the data centre investment market.

Equity investors are the most risk-tolerant group, while debt providers are the most risk-averse. However, geography rather than respondent sector accounts for the biggest variation in risk appetites. Respondents based in Asia-Pacific stand out as the most willing to take on risk. More than two-thirds (68%) say they would consider investing in a data centre with poor PUE if offered at a discount, versus 48% of investors in the

US and 27% in Europe. In fact, this pattern is repeated across all four risk scenarios in charts 19-26, with Asia-Pacific investors the least risk-averse, Europeans the most cautious and US investors somewhere in between, which is perhaps an indication of the maturity of and opportunities available in the different regional markets.

Not only are Europe-based respondents the most risk-averse, our research shows that they are taking these risks more seriously than they did even a few years ago. When polled in 2019, 59% of European debt providers and equity investors said they would consider investing in a data centre with poor PUE if offered at a discount, in contrast to the 27% of European respondents who said the same in this year's survey. Similarly, only 11% of respondents to this year's survey said they would consider investing in a project with poor connectivity or high obsolescence risk if offered at a discount. This is dramatically lower than the 56% of those surveyed in 2019 who said they would consider a project with poor connectivity and the 46% who said they would consider projects with high obsolescence risk.

*“Would you potentially consider (investing in / financing / developing) the following if offered at a discount?” (Yes /No)*

## Data centre with high obsolescence risk

Fig 19.

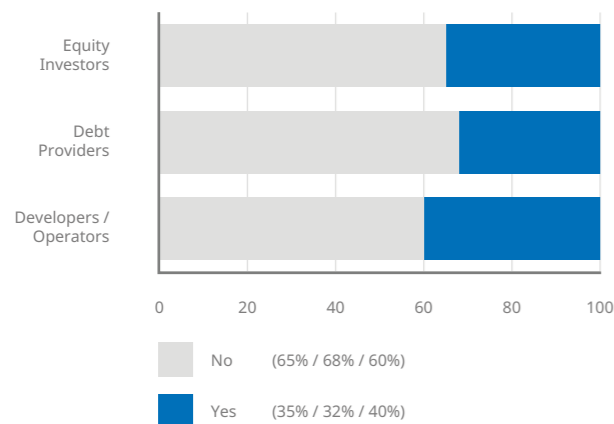
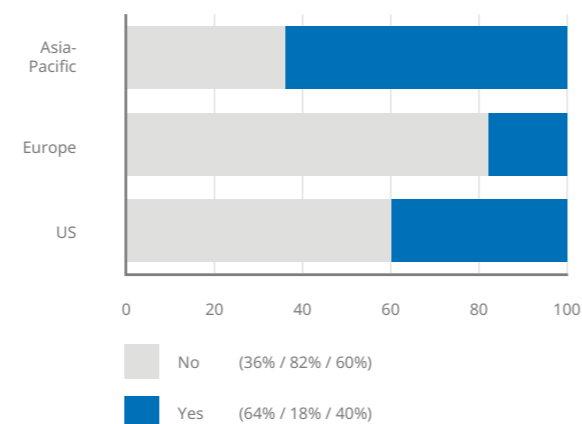


Fig 20.



## Data centre that is poorly interconnected

Fig 21.

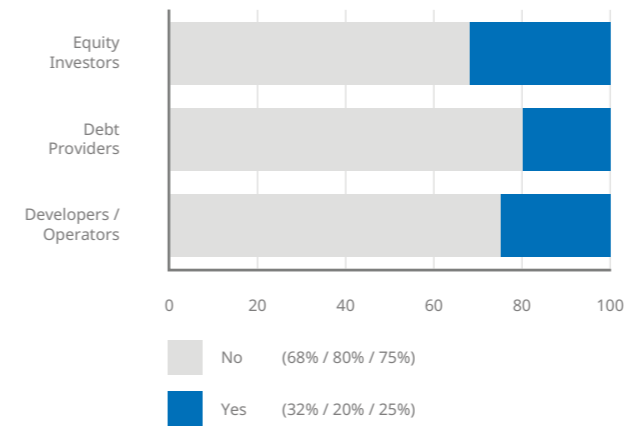
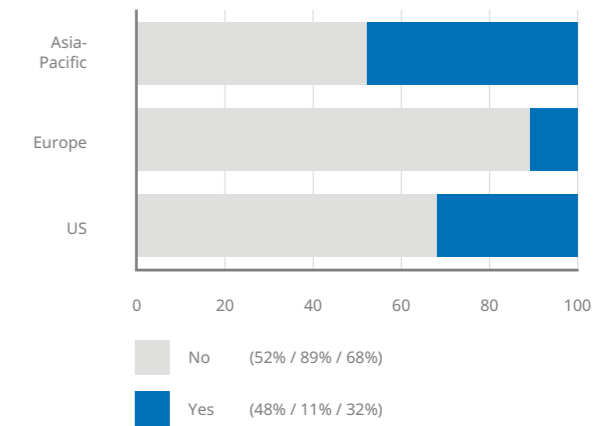


Fig 22.



## Data centre with poor ESG (Environmental, social and governance) credentials

Fig 23.

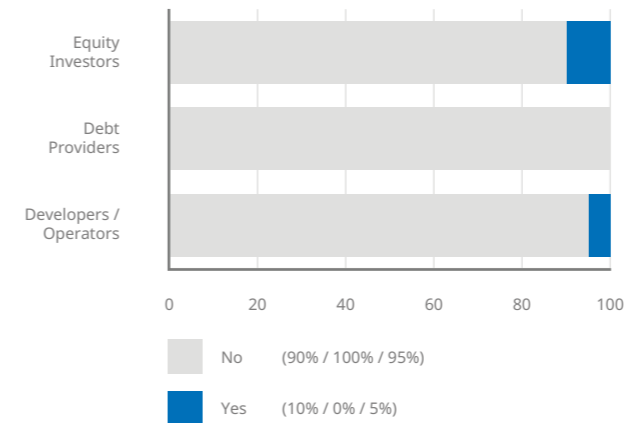
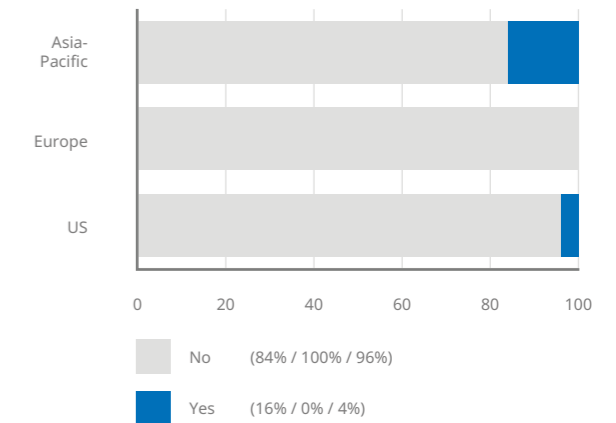


Fig 24.



## Data centre with poor PUE (power usage effectiveness)

Fig 25.

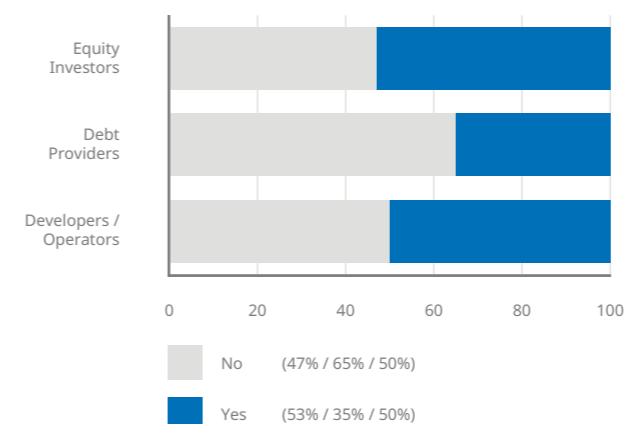
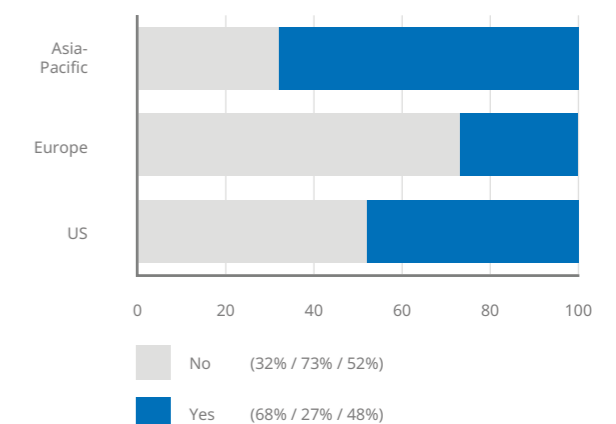


Fig 26.



**Premium potential**

Energy and ESG factors are the top drivers when it comes to generating a premium for data centre investments. Starting with energy, our survey shows that a site with good power availability and a cost-effective and/or cheaper power supply is something that 90% of equity investors, 89% of developers/operators and 85% of debt providers say they would pay a premium to invest in.

A data centre site with very good to excellent ESG credentials is another prize to be won – 70% of developers/operators and 75% of both debt providers and equity investors say they would be happy to pay a premium to invest in or finance a site of this sort.

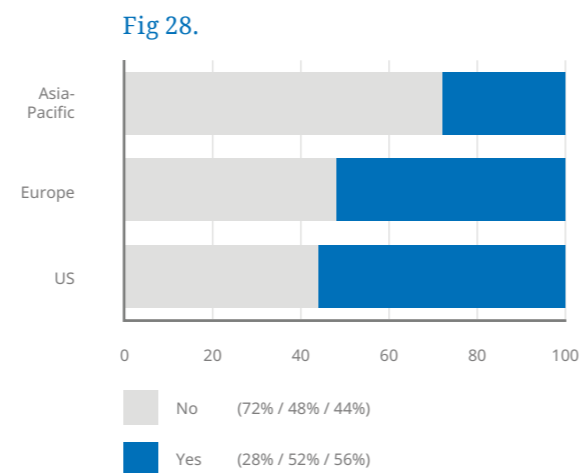
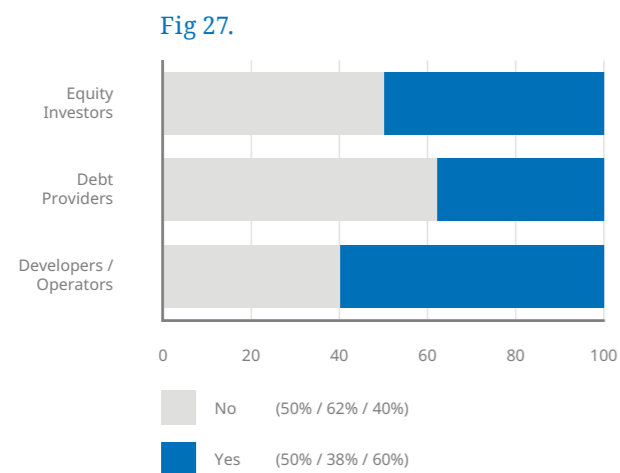
Turning to geographic differences, European investors stand out as the group most likely to pay a premium for excellent ESG credentials (84%), although given Europe's exacting environmental standards, investors may have little choice but to do so. By contrast, only 56% of those based in Asia-Pacific would pay a premium, reflecting the fact that the ESG regulatory market is not as evolved in that region yet.

While Asia-Pacific investors are less inclined to pay more for ESG than their US and European counterparts, they are much more willing to pay for a site with good power availability – 96% of Asia-Pacific respondents say they are prepared to do this. Respondents in this region are well aware of the need for resilient electricity supplies: for example both India and China experienced rolling blackouts in the second half of 2021.

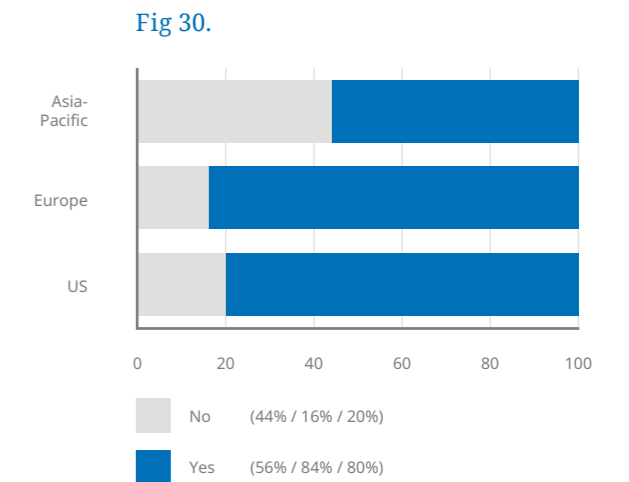
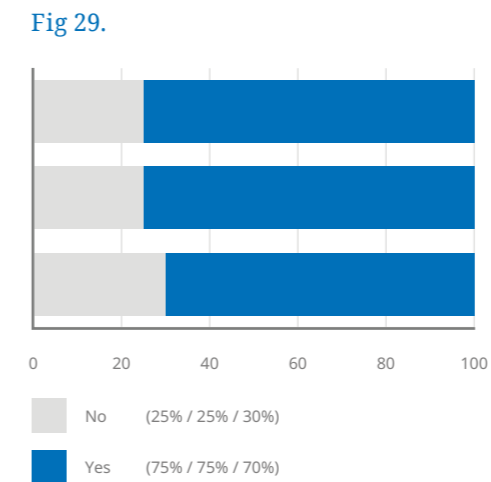


*“Would you potentially consider (investing in / financing / developing) the following if offered at a premium?” (Yes /No)*

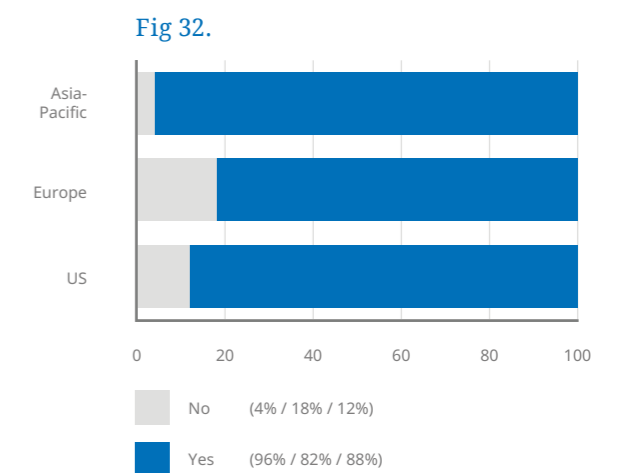
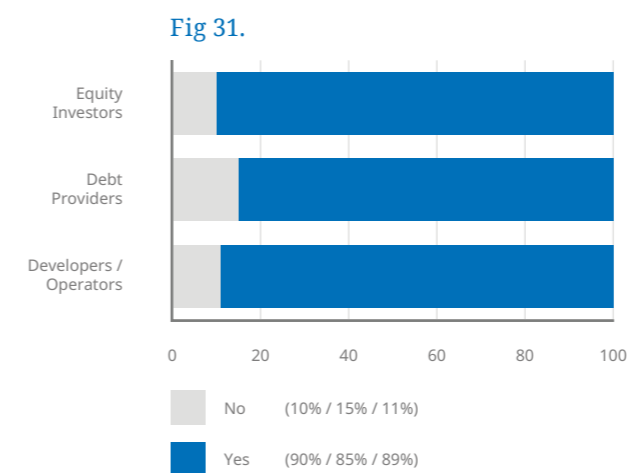
*A site with excellent potential to be converted to data centre (such as manufacturing site with good fibre cable access)*



*A site with very good / excellent ESG credentials*



*A site with very good power availability and cost / effective power supply*



### Choosing the right investment

Developers/operators, equity investors and debt providers all have different appetites when it comes to selecting data centre investments, which probably reflects their different investment thesis and strategy. Developers/operators are notably open-minded: respondents from this group polled a minimum of 40% for each one of the seven data centre investment categories identified in Chart 33.

Despite their wide-ranging appetites, developers/operators are also specialists. This is highlighted by their enthusiasm for shell-and-core projects, cited by 90% of developer/operator respondents. Given the level of technical know-how required for successful delivery of such projects, this high score is understandable – equity investors and debt providers are more likely to shy away from such projects (cited by only 20% and 15% respectively). In a similar vein, 80% of developers/operators would consider buy-and-build investments versus 43% of debt providers and 50% of equity investors.

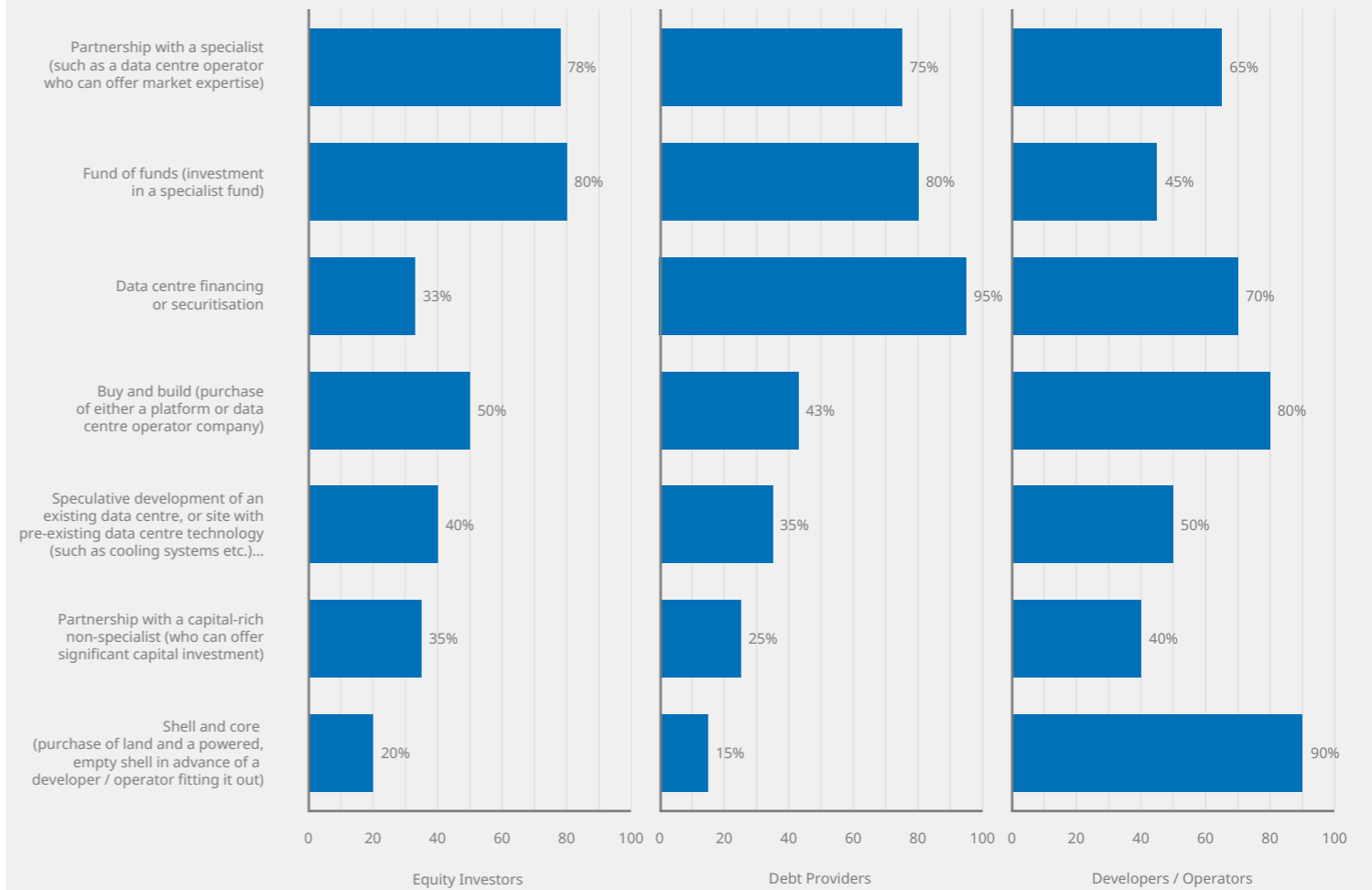
Equity investors are typically keen to avoid construction-related risk, which is one reason why investing in specialist funds is the most frequently cited point of entry for this group (mentioned by 80% of equity investors), with specialist partnerships coming a close second (78%).

Debt is the cornerstone of data centre financing, both for new build projects and for the acquisition of existing ones. Not surprisingly, 95% of debt providers point to data centre financing or securitisation as a type of investment they would consider. Debt providers (like equity investors) are also keen on specialist funds: 80% are willing to consider investing in data centres via a fund of funds.

We expect to see increased fluidity of investment approach as more players move into the market lured by attractive returns.

### “Which of the following types of data centre investments would you consider (investing in / financing / developing) over the next 24 months?”

Fig 33.



## Q&amp;A

## Nordic viewpoint

Tor Kristian Gyland, chief executive officer of Green Mountain, on why Europe's leading companies are heading north in the search for low-carbon data centre capacity.



***The value of data centre transactions more than doubled in 2021. What drove this?***

The primary reason is lack of resources – the successful management teams are already working in existing data centre companies. So if an investor wants to go into this business, the only way to do it is through acquisition. Having a good ESG agenda and a strong message increases the value of the company. That's why there has been such interest – and still is.

***Our survey was conducted before Russia invaded Ukraine. Do you expect the changing macroeconomic situation to affect data centre investment?***

It's still a bit early to say. We haven't seen any major effects of the crisis in Ukraine and we don't see customers backing off. The challenge we see today is more related to supply chains and getting access to equipment post-pandemic. But demand is strong and increasing.

***Complex and restrictive policies and regulations were seen as an obstacle by respondents. Where is the impact being felt?***

Older data centres – those built ten to 15 years ago – will probably face challenges moving forward. The EU Energy Efficiency Directive means that you have to reuse your heat. On top of this, constrained power supplies have led to restrictions in some cities. Green Mountain has focused on reusing heat since we started. We are well ahead – and we support the regulations because they give us a competitive advantage.



***Most respondents expect ESG scrutiny to increase in the next 24 months. What does this mean in practice?***

We have a huge advantage being in Norway because all the power is green and renewable – and we are self-sufficient in energy. The cold climate is another advantage. We are the market leader in energy efficiency and we are seeing growth because of this.

***What specific ESG measures are you taking?***

For us, the race is not to net zero but to carbon negativity. So it's an even higher standard. That means utilising the heat out of data centres. At our Stavanger data centre, we are working with a land-based lobster farm, while at our Telemark site we support trout farming – all heated by the data centre. And we are cooperating with one of the largest greenhouse companies in Norway to investigate vertical farming and biogas. You need to reuse heat if you are building a data centre today.

***Do you think businesses currently using data centres in Frankfurt, London and Dublin will migrate operations to Norway?***

It's already happening. For example, we have seen a large German firm move parts of its data centre to Norway to meet their ESG objectives. The carbon saving is tremendous. More and more businesses are doing this. Our data centres in a certain part of Norway are able to reach 54% of all businesses in Europe with a less than 20 millisecond round trip. That means you could move close to 90% of the workload to Norway. And we offer low-cost power – in Norway, electricity is 25% of the price in the Frankfurt region. So you are not only being green, but also saving a lot of money.

# Is the data centre bubble about to burst?

*Respondents are upbeat about the prospects for data centre investment – despite some concern about a bubble.*

Data centres continue to attract a wide range of different investors. Looking at investor groups in more detail, data centre operators/developers are expected to drive the greatest growth in investment over the next 24 months.

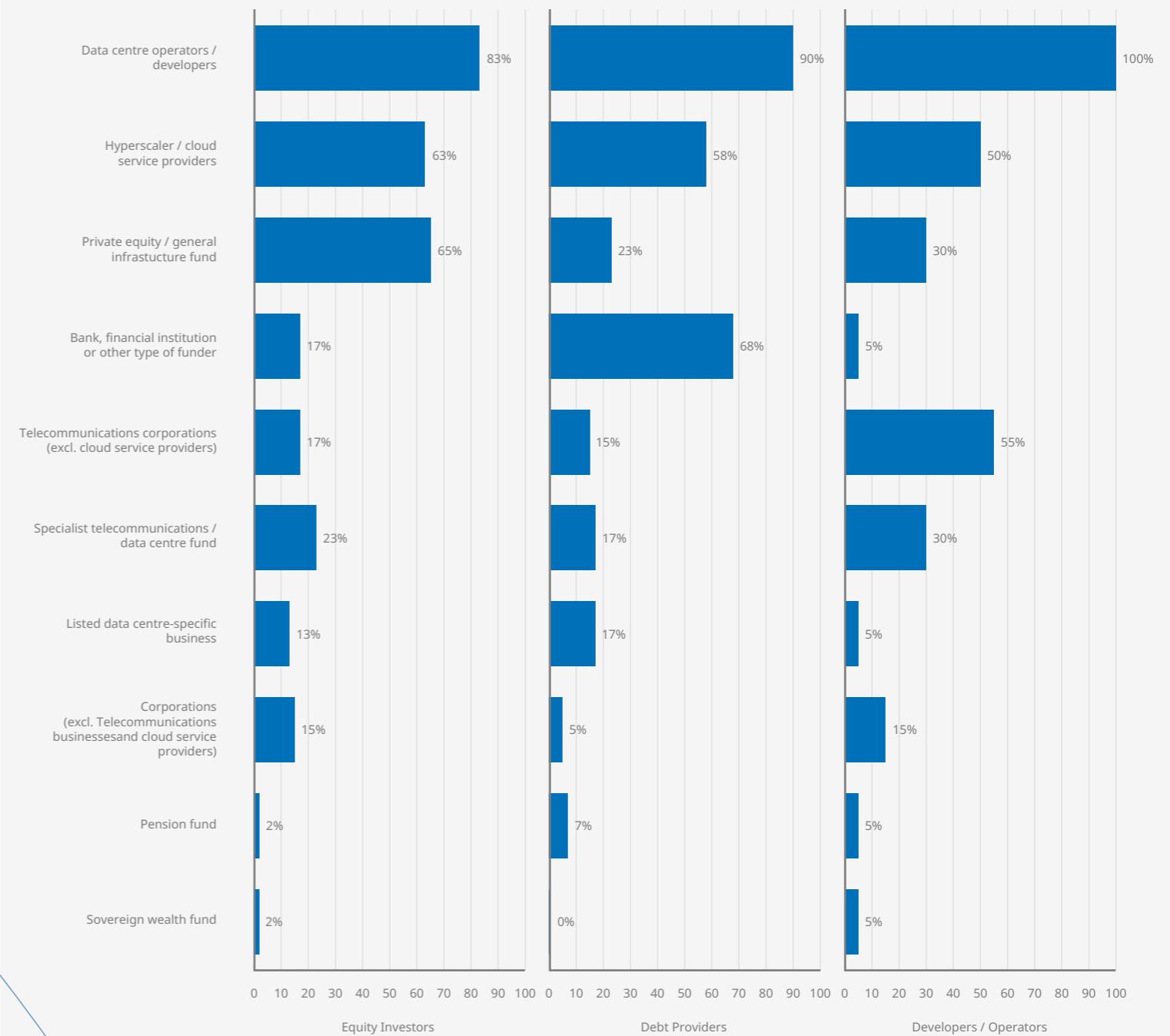
Most respondents also expect notable investment growth to come from cloud service providers/hyperscalers – 50% of developers/operators, 58% of debt providers and 63% of equity investors think these organisations would be among the top three providers of growth for the sector. This is a notable change from our 2019 survey, which found that only 36% of respondents thought cloud service providers/hyperscalers would provide the biggest growth over the following two years. This is in part due to the accelerated digital growth that we have seen as a result of the COVID-19 pandemic over the last few years.

Meanwhile, private equity and general infrastructure funds are expected to be among the biggest providers of investment growth over the next 24 months by 65% of equity investors.

Interestingly, listed data centre-specific businesses are now seen as less of a growth generator than they were in 2019. Back then, 40% of debt providers and 44% of equity investors said they thought listed data centre businesses (eg large global REIT structures) would be among the biggest providers of growth. By contrast, only 17% of debt providers and 13% of equity investors surveyed this year thought the same.

*“Which type of investments do you think will provide the biggest growth in investment (including debt investment) in data centres over the next 24 months?” (Please select top three)*

Fig 34.



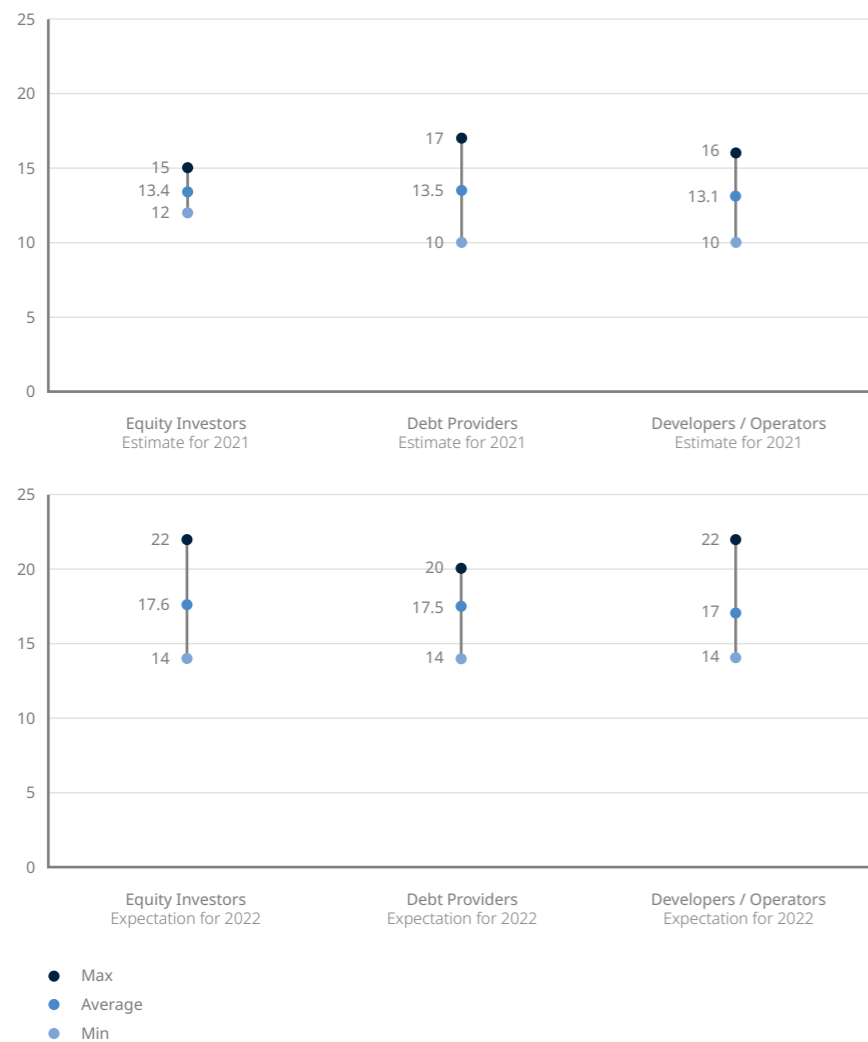
**Rising IRR**

Overall, respondents expect the IRR for equity investors of data centres to be higher in 2022 (on average 17.0–17.6%) than they estimate it was in 2021 (on average 13.1–13.5%). This marks a significant increase in expectations for IRR. In our 2019 survey, debt investors thought that IRR would be 11% while equity investors thought it would be 13%. “Investors have been making pretty decent returns on data centres – particularly post-COVID, because there is so much customer demand for the underlying services,” says Day.

(a) “On average, what do you think the IRR for equity investors of data centres was in 2021?” (Please give a percentage %)

(b) “And what do you think the average IRR for equity investors of data centres will be in 2022?” (Please give a percentage %)

Fig 35.



**Bubble trouble?**

Data centres are certainly a “hot” asset class and there has been speculation in the market of whether we are in a bubble. However; nearly three-quarters of respondents (74%) **do not** believe that data centre infrastructure is currently experiencing a price bubble that could burst in the coming months or years. Of the minority that do believe data centres are in the midst of a price bubble, 85% think the bubble will burst as soon as within two years. Nine in ten of this minority group also say that data centre infrastructure is overvalued by more than 50% in some of the worst cases they have seen.

(a) “Do you think data centre infrastructure is currently experiencing a price bubble that could burst in the coming months or years?”

(b) “If yes to (a), when do you think the price bubble is most likely to burst?”

Fig 36.

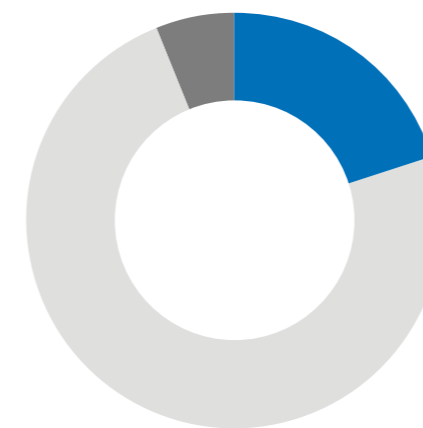
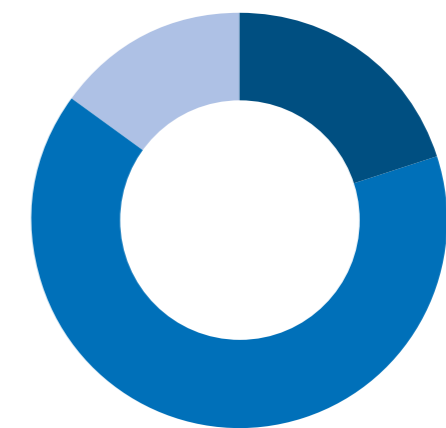
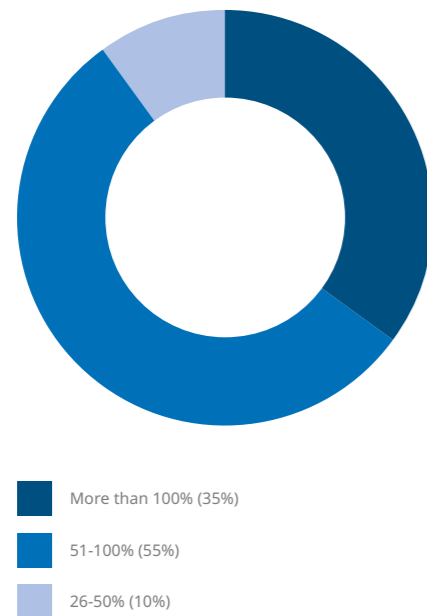


Fig 37.



(c) “If yes to (a), by how much do you think data centre infrastructure is overvalued in some of the worst cases you have seen?”

Fig 38.



Most respondents are sceptical about the immediate likelihood of a major correction. But many take the risk seriously all the same. Before committing to data centre investments and/or development projects in the past year, 48% of equity investors and 50% of developers/operators say they took into careful consideration the possibility that data centre infrastructure might be currently experiencing a pricing bubble that could burst before their investments reach maturity. By contrast, a third of debt providers and 35% of developers/operators did not consider this at all.

Given that a strong majority of respondents said they did not believe that the sector was experiencing a price bubble despite most saying they had considered the matter, it is perhaps safe to assume that most respondents believe that although costs are high, they are justifiably so. When considering the nature of the industry – which involves constant innovation and investment in new technology to avoid the threat of obsolescence, as well as the growing importance of ESG matters – the gulf between high-quality assets and the rest of the market is vast. Against the background of soaring demand, especially for the most technologically advanced providers, it is perhaps unsurprising that investors view high multiples as entirely reasonable.

The extent to which a price bubble is taken into consideration has a strong geographical component. To put this in perspective, while most respondents in the US and Europe say they at least looked at this prior to their most recent data centre investment or development, 72% of respondents in Asia-Pacific say they did not look into this at all.

This geographic variation could reflect differences in valuation multiples across regions. Whereas a strong majority of respondents viewed US-based data centres as among the most overvalued in the world, Australia, India and Malaysia were among the top five countries where data centres were perceived to be the most undervalued. This is perhaps unsurprising, given that although the data centre industry is booming across the board, the US and Western Europe remain the most mature markets.

“We’ve been seeing strong demand for Australian data centre assets and development sites from offshore hyperscalers, potentially seeing value in a market that is still under-scaled and undervalued but with strong growth prospects and a stable and well-regulated operating environment,” said Shane Bilardi, a partner with DLA Piper.

“Prior to your data centre investment(s) / development over the past 12 months, did your organisation consider that data centre infrastructure might be currently experiencing a price bubble that could burst before maturing?”

Fig 39.

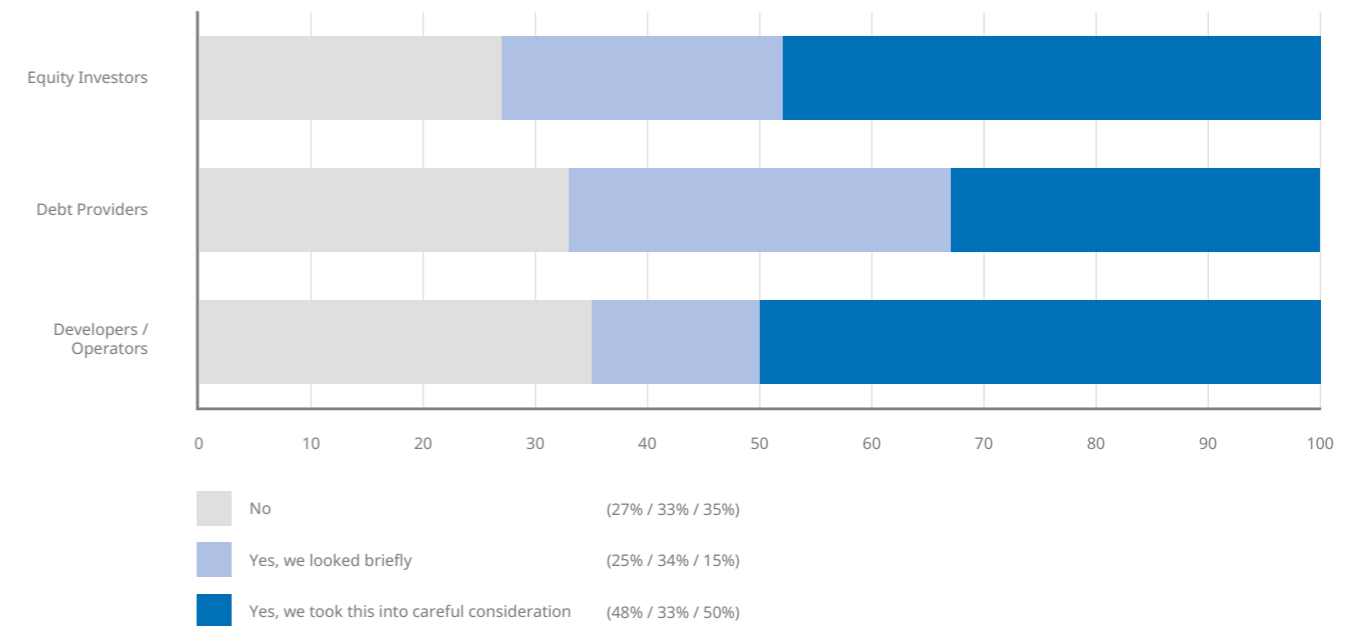
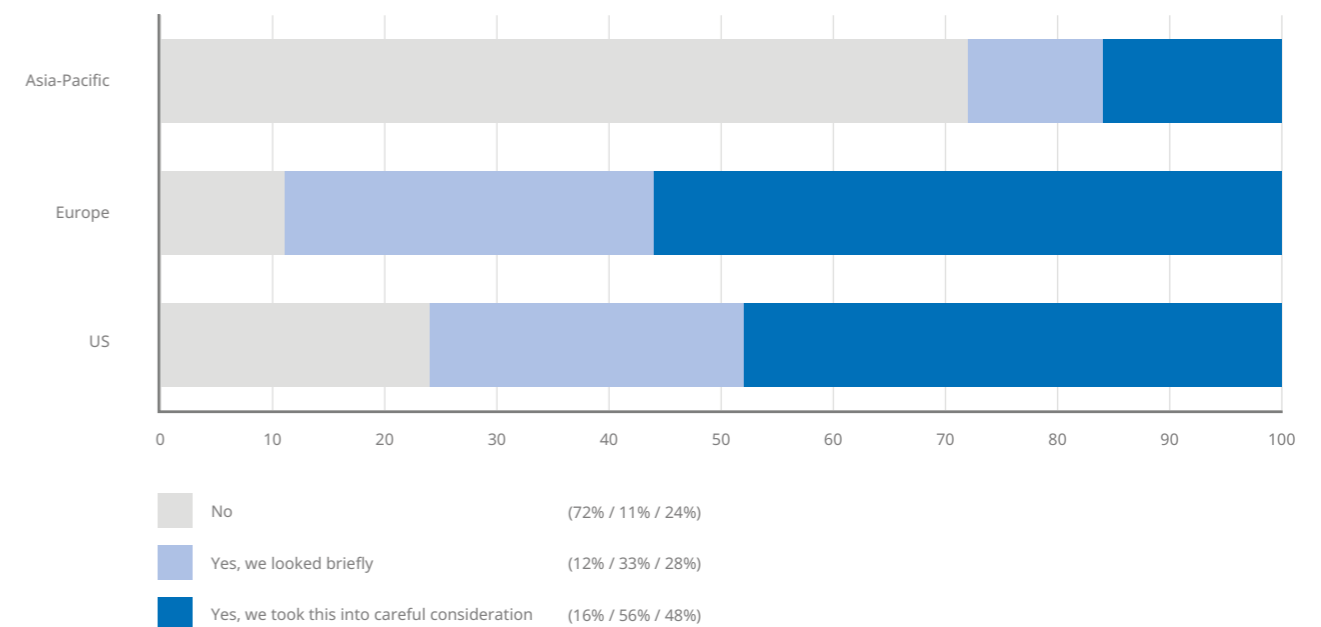


Fig 40.



**Relative values**

Focusing on the related question of which countries are overvalued in terms of the data centre market, 77% of respondents point to the US. The American market is certainly very hot: the US accounts for almost half of global hyperscale capacity and currently has the biggest pipeline in terms of upcoming data centre projects. Germany and the UK are also perceived as being overvalued, cited by 75% and 62% of respondents respectively.

Clearly the greatest hyperscale demand is in the most mature markets of the US and Western Europe. We have also seen a lot of activity in the Nordics region, which was a key growth area identified in our previous 2019 European report. Access to an abundance of renewable energy, cooler climate and relatively safe from a geo-political perspective, together with improved connectivity capabilities still point towards the Nordics being a growth market, albeit valuations are very high for this region as a result.

Only three of the top ten countries that are considered to be overvalued are in Asia-Pacific – suggesting that the region in general still offers good value for money relative to the US and Europe. The relatively low number of Asia-Pacific countries on the list of overvalued geographies also goes some way to explaining why such a high proportion of respondents based in the region (72%) are unconcerned about a bubble.

This finding is corroborated by the list of countries that are considered to be the most undervalued in terms of data centre projects. Seven of the 11 countries selected by respondents are in the Asia-Pacific region. Australia is highlighted as being the most undervalued by nearly half (49%) of respondents, followed by India (39%).

Although these markets present excellent investment opportunities, there are significant challenges ahead. “With Australia’s data centre market tipped to grow by nearly 100% over the next three years, cloud builders seeking larger chunks of real estate will face tough strategic decisions due to a lack of availability of land, the need for electricity and water, and surging construction costs,” said Kate Pickthall, real estate partner at DLA Piper.

“Yet, with the market booming and valuations rising across the board, Australia and other countries in the Asia-Pacific region could represent an excellent buying opportunity for investors,” said Pickthall.

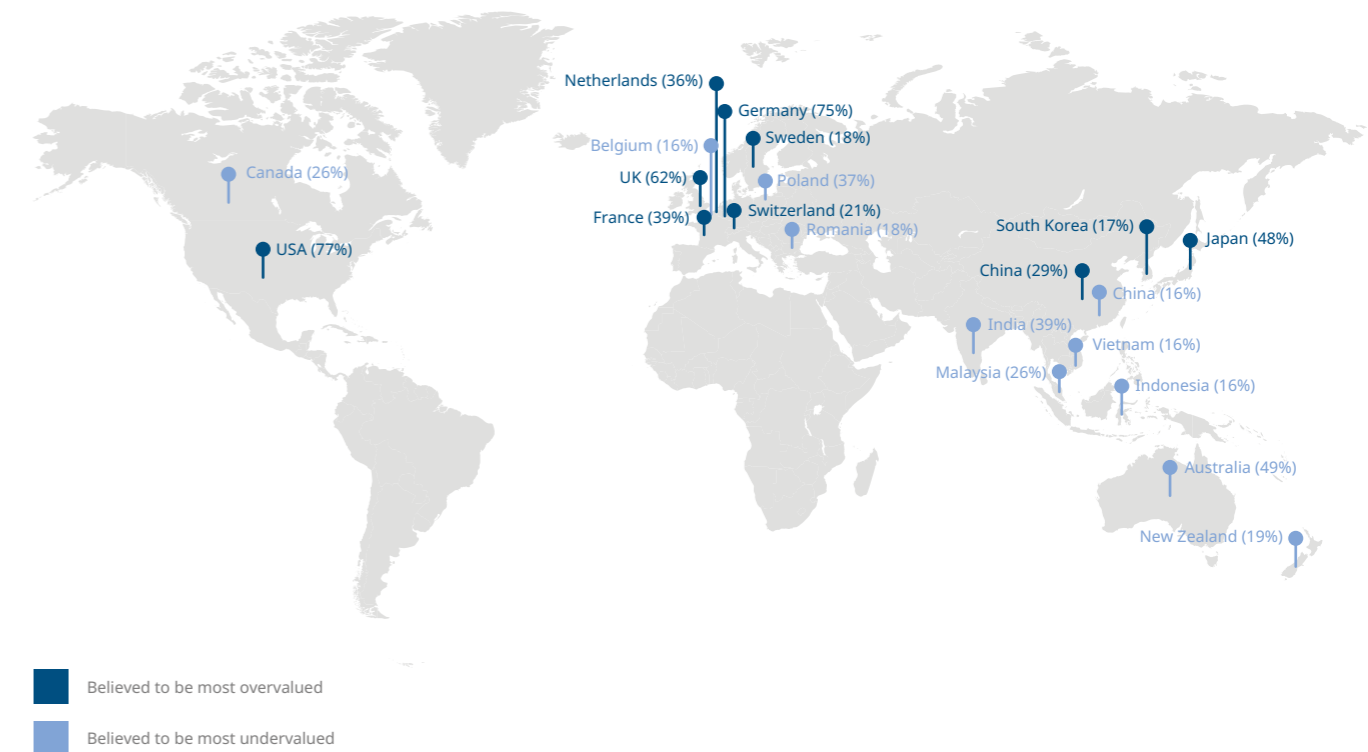
Moreover, findings from our survey suggest that the data centre industry in Asia-Pacific still has a long road ahead when it comes to improving not only sustainability but realising the attendant cost savings when water and power usage are minimised. The opportunity exists not only to snap up undervalued targets, but for investors with experience implementing stringent ESG standards to improve performance and create value.



(a) “In which countries globally do you believe data centre projects are the most overvalued?” (Please name up to 5 countries)

(b) “In which countries globally do you believe data centre projects are the most undervalued?” (Please name up to 5 countries)

Fig 41. (Top 10 answers shown only)



**Growth drivers**

Despite data centres in the US being considered some of the most overpriced in the world by over three-quarters of respondents, more than half (54%) nonetheless expect the country to see some of the greatest growth in data centre investment in the next 24 months – highlighting just how strong the growth in demand is, even in one of the most mature markets for data centre infrastructure.

That said, a higher proportion predict that the biggest sources of growth in data centre investment will be in Asia-Pacific, notably China – 79% of respondents chose this among the top five countries where they expect to see the biggest growth. The driving factor here is the rapid growth of Chinese hyperscalers and major tech companies. India is also a favourite, with 56% expecting the country to be among the countries which will experience the most growth in the next 24 months.

*“Which countries globally do you think will see the biggest growth in data centre project investment over the next 24 months?” (Please name up to 5 countries)*

Fig 42. (Top 4 answers shown only)

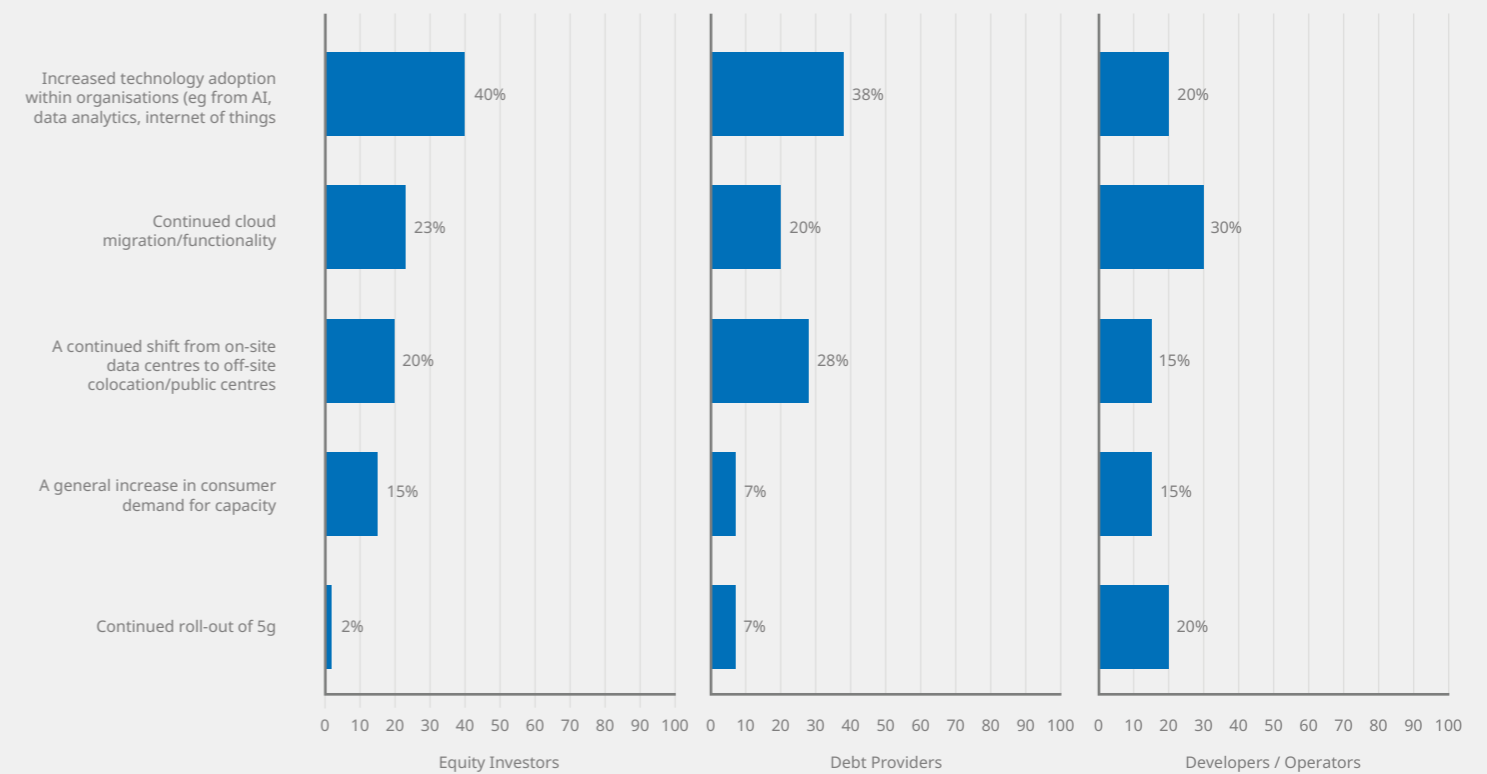


Looking at specific drivers, 40% of equity investors and 38% of debt providers believe that increased technology adoption within organisations (such as use of AI, enhanced analytics and the Internet of things) will be the single-biggest driver of data centre demand in the next 24 months. Developers/operators, on the other hand, are more likely to point to greater demand coming from continued cloud migration and cloud use / transformation (30%).

Interestingly, the continued rollout of 5G receives a relatively low ranking as a growth driver from both equity investors (2%) and debt providers (7%) – despite the fact that 5G is expected to drive a fourfold increase in mobile data traffic before the end of the decade. Developers/operators, however, are more likely to see 5G rollout as a driver of demand – 20% of them think that it will be among the biggest demand drivers over the next two years.

*“What do you think will be the biggest driver of data centre demand over the next 24 months?”*

Fig 43.





**Hopes and expectations**

Looking at markets from a real estate perspective, rent charges are expected to rise faster than the underlying rate of inflation in most regions in 2022 – at least for facilities with superior technology. Delving into the details, four in five equity investors and debt providers expect such data centre rents in 2022 to increase by 10% or more compared with those in 2021.

This is building on already high expectations in recent years – when we surveyed European data centre investors in 2019, the overwhelming majority (96%) expected rents to increase in their region by 5% or more in the following year.

Even for data centres with relatively inferior technology, 77% of equity investors, 52% of debt providers and 50% of developers expect rent charges in the next two years to increase, albeit by a smaller margin.

“Factors driving rents include lack of available sites and the insatiable demand for more data centres. But this is tempered by the clout that the hyperscalers have when it comes to negotiating,” points out Hasek. “The other factor is increased costs linked to construction and supply chain disruption: these costs have to be passed on through increased rents, otherwise returns are going to be impacted.”

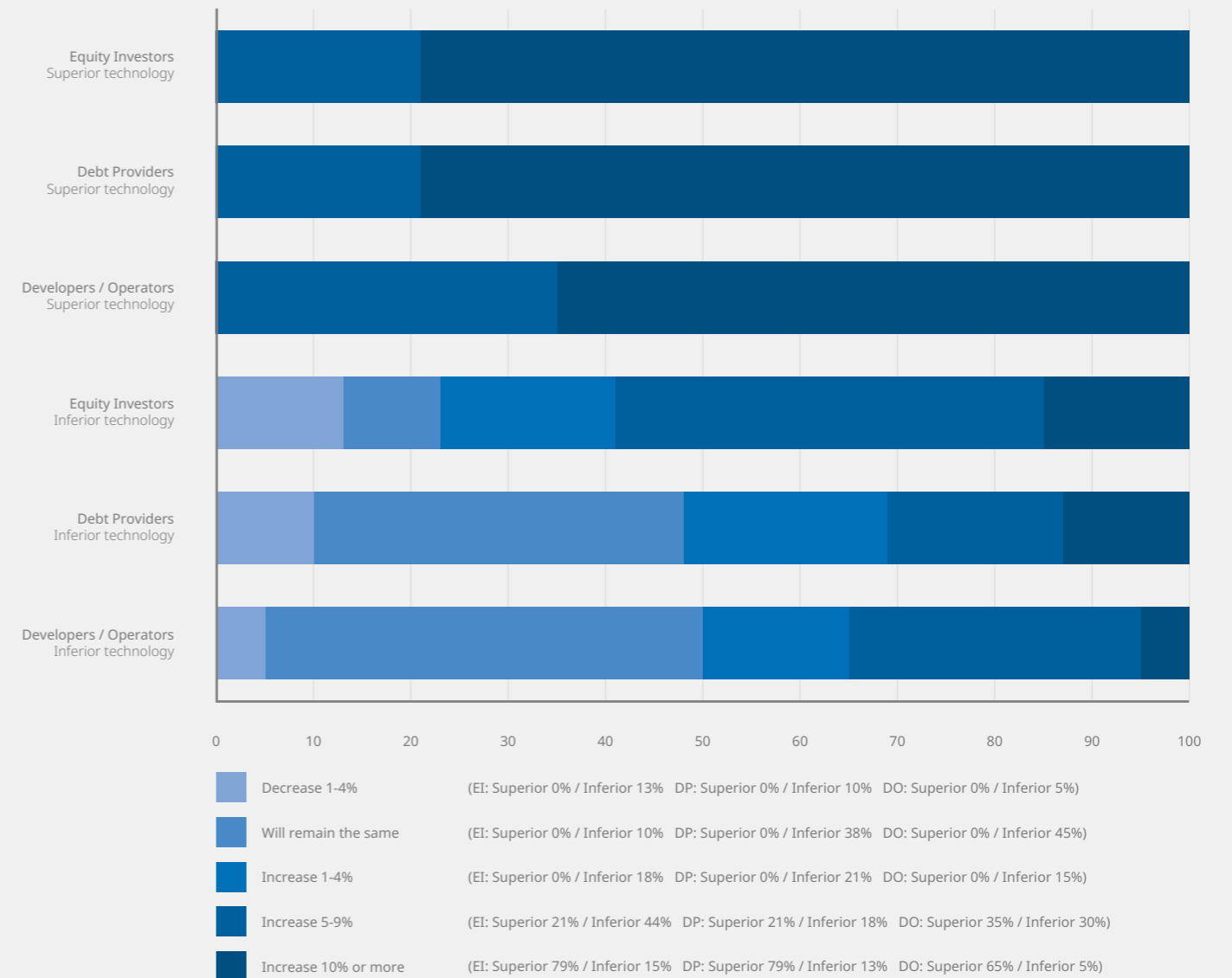
Turning to trends, respondents are mixed as to what might shape developments over the coming 24 months. However, there is a strong energy-saving theme running through our survey responses highlighting again the importance of ESG as a lead for investor appetite in this space and the critical role that energy/power plays in any data centre business. Looking at this in more detail, the greatest share of equity investors (43%) point to an increased focus on converged and hyper-converged solutions (which have energy-saving potential), followed by liquid and assisted cooling technology, mentioned by 30%. Developers/operators also highlight convergence and hyper-converged solutions (40%), along with an increased focus on cooler climate locations such as the Nordics (also cited by 40%). Debt providers, meanwhile, point to an increased focus on carbon footprint minimisation (35%), while 33% highlight an increased focus on converged solutions.

There is a growing awareness in the industry of the importance of saving energy. “The more of our lives we shift to the online domain/metaverse and the data demands that come with that, the greater the responsibility we have to ensure we don’t make the same mistakes we have made in the built environment, whether that be in terms of our carbon footprint or ethical impact”, says Davies.

(a) “How do you expect rent charges in 2022 to change compared with those in 2021 for data centres with superior technology?”

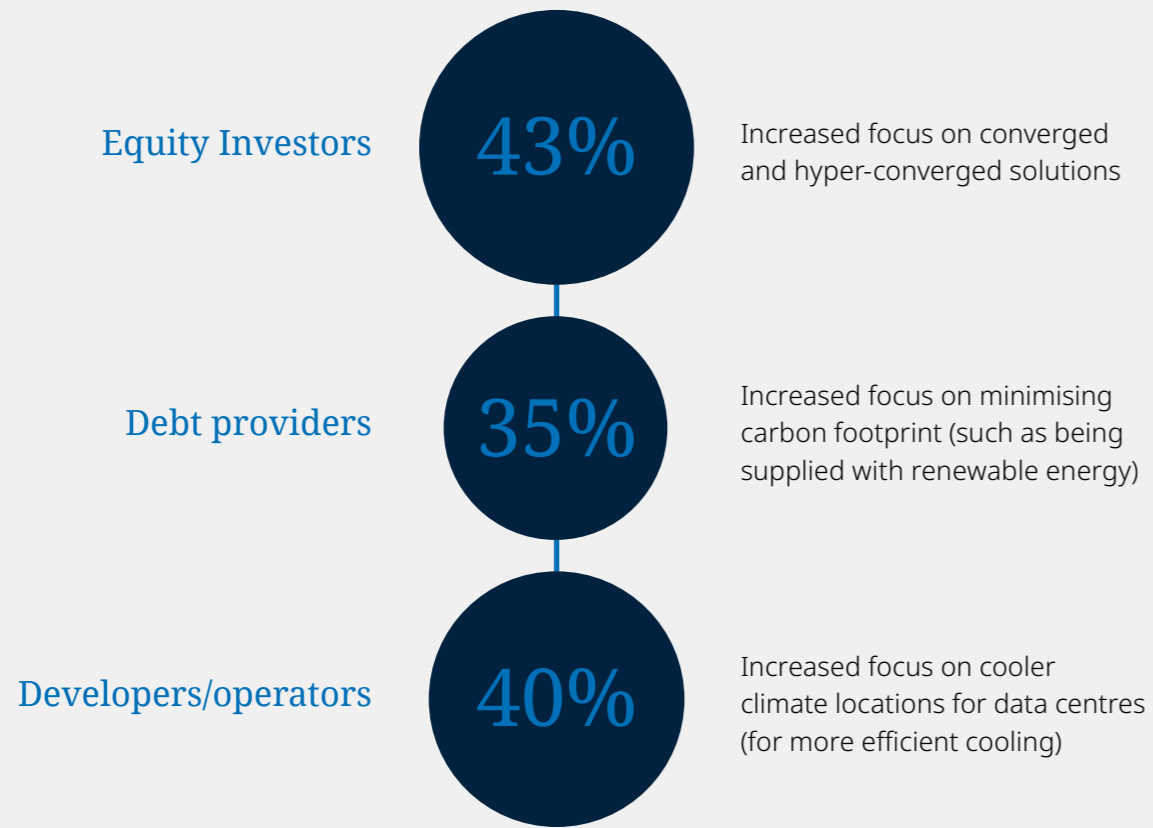
(b) “How do you expect rent charges in 2022 to change compared with those in 2021 for data centres with inferior technology?”

Fig 44.



“What do you think will be the overriding trend in the data centre infrastructure market over the next 24 months?” (Please select top two)

Fig 45.



## Q&amp;A

## Self-regulating metrics

Matt Pullen, EVP and managing director Europe at CyrusOne, outlines the challenges facing data centre owners – and what self-regulation for the industry could look like.



**What is behind the growth in data centre transactions?**

Fundamentally, it's being driven by the continued use of digital technology and enterprise outsourcing to the cloud. There is outsized growth in hyperscale revenues and that flows into a data centre market that's projected to have 11% CAGR just from the colocation point of view. So it's no wonder that the world is interested in the assets that are contributing to this marketplace.

**What are the major challenges facing data centre operators?**

We have seen increasing lead times and energy restrictions. For example, new schemes in London and Frankfurt are being told that there will be no power supply until 2026-27. In Ireland, we have the issue of power contracts with only a proportion of the supply fixed and the balance flexible (capable of being withdrawn for periods of time). As a perverse consequence, the operators in the market might need on-site generation to guarantee supply. There are also issues around availability of materials. Where you once had lead times of 12-16 weeks, it's now 50 weeks. The situation has been made even more challenging by the war in Ukraine and the ban on imports from Russia.

**What regulatory factors have you got your eye on?**

National security legislation is one. I was part of Zenium when it was sold to Cyrus back in 2018. That sale occurred just as national security legislation had been implemented in Germany. It took nine months to get approval. That type of legislation is becoming widespread. It could be a liquidity concern for some investors, because it raises questions about how easy it is to get in and get out if assets are defined as critical national infrastructure.



**What is your position on ESG?**

ESG is significant for us. As a company, CyrusOne has said it will be climate neutral by 2040. From a personal perspective, I chair the Climate Neutral Data Centre Pact. We are talking to Brussels about a self-regulatory initiative where we establish metrics and create a certification framework for data centre operators. Under the European Green Deal, there is a requirement for data centres to be climate neutral by 2030. What the industry didn't want was for unworkable legislation to come through.

**Is there a roadmap for this?**

The Pact is aiming to set targets with metrics for 2025 and 2030. There are five pillars: energy efficiency, the use of clean energy, water utilisation effectiveness, the circular economy – which means zero waste and reuse of equipment – and circular energy systems, which include reusing waste heat.

**Do you expect rents to rise?**

I don't anticipate headline rents to rise in 2022 in a material way. This market is growing fast, but a vast proportion of demand is driven by a small number of customers with massive purchasing power. As the sector matures, returns are normalising. The big headwind is increased build costs. There will need to be price increases.

**Respondents expect China will see the biggest growth in data centre investment over the next 24 months. Do you agree?**

According to Structure Research, China's projected hyperscale revenue growth – in absolute terms – over the next five years is about the same as mainland Europe (excluding the UK). Structure Research predict that the highest percentage growth in the colo market will be seen in LatAm, followed by EMEA, APAC and North America.

**Are we looking at an asset price bubble?**

We have seen some very high multiples paid and it is hard to see that as being accretive over a five-year horizon. But it probably is accretive if you are an infrastructure player buying a small platform with a 10-15-year horizon. There is a vast amount of money coming in from infrastructure players. I don't think the bubble is going to burst, or that there will be yield compression. But pricing has probably plateaued.

# Conclusion

*The outlook for data centre investors is overwhelmingly positive, with respondents across the board looking to ramp up both the volume and value of their investments. But risks remain, despite the strength of the fundamentals. So, what factors should be considered?*

## **Focus on sustainability**

It is hard to overstate how much the landscape has changed over the past few years when it comes to ESG. Whereas in the past ESG regulations were an afterthought or exercise in box-ticking, the industry has evolved into regarding sustainability as fundamental to its operations – rightfully so. Not only is this an important consideration as governments around the world ramp up regulatory scrutiny, it is a matter of better business performance as well – after all, electricity is one of the biggest run costs for data centre operators and prices continue to surge.

That isn't to say that power usage is the only factor to consider when it comes to improving data centre sustainability. Data centres use millions of litres of water a day for cooling purposes. Not surprisingly, water usage effectiveness (WUE) is an increasing area of focus for both regulators and communities, especially in regions facing scarcity.

## **Be prepared to spend**

Valuations have climbed up and up in recent years, fuelling speculation that a market correction was on the horizon. Our research suggests, however, that while asset prices have risen, this is due to burgeoning demand, especially for the highest quality service providers – that is, data centres that are not only fully fault tolerant, but energy and water efficient. Higher prices are not the result of investor speculation in the market, but an understanding of how much further the industry has to grow and how high-quality operators can continue to grow their margins. Respondents, after all, were clear: IRR in the industry is expected to grow and rents are expected to increase across the board, especially for data centres with superior technology.

Although there are discounts to be found in the form of lower-quality assets, the industry understands that these are not bargains worth hunting: technology and obsolescence risk was consistently seen as among the top obstacles for investment in data centres. Moreover, a majority of investors across all types and in all regions have made clear that they would not consider buying assets with high obsolescence risk, poor interconnectivity or poor ESG credentials, even offered at a discount. The risks – and costs to improve the asset – are simply too high.

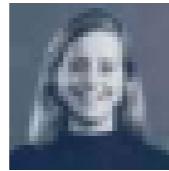


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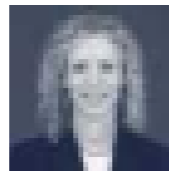
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