The Choice Between Data Centers and Carbon Emissions

Transcript

Mike Disabato:
What's up everyone? And welcome to the weekly edition of sustainability now, where we cover how the environment, our society and corporate governance effects and are affected by our economy. I'm your host Mike Desto, and this week we look at how companies are building data centers and dealing with their associated emissions. Thanks as always for joining us. Stay tuned. Data center investment has become pretty astounding. It's set to hit the trillion dollar mark in the coming years. In the US alone, we have spent 40 billion US dollars on data center construction as of June, 2025, which is a 30% increase from the previous year following a 50% surge in 2024. According to US Census Bureau data, and I likely don't need to tell you why. Developers of artificial intelligence systems need data centers to run and train their AI models. They need to build the literal structures they need to get the high tech chips to put into those structures.
They need electricity to run the data centers, which means they need more power plants to divide the increased demand for electricity. This has created a central tension of sorts with the growth and data centers creating a possible new era of returns for real estate investors. But the demand these centers have on natural resources creating complicated realities for the companies that are held in a large number of sustainable portfolios and rely on those data centers for their growth. I'm obviously talking about companies like Microsoft Alphabet and nvidia. It's the central tension, these increased return possibilities and the carbon emissions that are associated with them. That is the focus of a recently published report by my guests and colleague today, Tom Lahey and Yew Young Chung. They, along with their co-author, Federico Deja, explored the growth of the data center asset class and what it means for real estate investor funds like REITs and for technology companies and how those companies, the technology companies for example, are downplaying the emissions associated with these data centers and what this all means for investors. So to begin with, I wanted to start off with Tom to tell me about how this new era in real estate investment that is the data center is looking at the moment.

Tom Leahy:
I mean, data centers have become a household name in the last couple of years in the way that they weren't previously. I mean, real estate investors have always invested in data centers. So we track deal volumes going back to 2007. And so we've seen activity in data centers, but it really picked up from let's say 20 20, 20 21 onwards in terms of acquisition activity. But the real boom, the real estate boom is really happening on the construction side. So we estimate there's over half a trillion dollars worth of data centers under construction around the world. And there's been a huge increase in data developed, even development even in the last 12 to 18 months. And that's obviously been accelerated by the adoption of AI technologies and the cloud computing boom. And so you can see a real gold rush going on. And for real estate, real estate institutional investors are now looking at data centers and want to get a piece of the action. So if you look at the survey data produced by various organizations looking at where real estate investors want to invest their capital over the next year, two year, three year, five years, data centers were number one in 2025. And as a corollary to that new energy infrastructure was number two. So those two I think very much go hand in hand. But yes, there's been a huge boom in real estate, but it's

really coming from the development and construction angle as much as it is from the acquisition of stabilized assets.

Mike Disabato:
So real estate investors want to get in on the AI gold rush and they see data centers as their bread and butter and the way to do that, but tech companies are where the returns really are ostensibly not the buildings that hold the systems that they're using. OpenAI has the trillion dollar valuation, not data center, construction and co. Now, that's not necessarily a problem for real estate investors. Not every investment needs to make massive almost bubble like returns. But what are real estate investors seeing as they begin to take advantage of all this demand for new build?

Tom Leahy:
Yeah, that's a good question. I mean, as an asset class, it's not in its infancy because there are well-established data center specialists in the market, largely the listed players. The likes of digital realty would be a good example. And so those players have been in the market for a long time. But for the traditional real estate investors, they're only just starting to dip their toe in this water. So for example, someone like GIC who's the Singapore Sovereign Wealth Fund, they have made two big data center purchases this year, and those are their first major data center purchases on record. They've acquired assets before but on a much more piecemeal basis. So in terms of where the returns are, I think it's an asset class in its relative infancy in terms of proving itself on a relative return basis versus other more stable, more stabilized core real estate assets like office or retail. For example.

Mike Disabato:
I want to ship now for a second to yon Young and discuss data center carbon emissions, which have definitely gotten a lot of attention as of late. What is interesting is data centers used to be seen as an energy efficiency play. If you can imagine, if you remember back in the 2006 to 2015 era when everything started to get uploaded into the cloud, data centers were considered energy efficient because they replaced millions of inefficient, underutilized on-premise servers and hyperscalers like Google or Amazon with AWS or Microsoft invested heavily in these custom cooling systems, these power supply optimization systems and just sufficient data center designs, which made cloud data more efficient than onsite servers for their per compute unit it's called. Now that has changed just simply due to the aggregate demand, right? Y young,

Yoon Young Chung:
I mean data centers use a huge amount of energy or electricity, they should run 24 hours a day, seven days a week, and the cooling systems that keep servers from overheating are just as hungry, energy hungry as the machine themselves. And our analysis in the paper found that a single large scale data center, roughly a 50 megawatt facility, can produce about the same annual carbon emissions as around 100 energy efficient office buildings. So think about that for a second. One facility, one data center, the footprint of a small office district.

Mike Disabato:
Now depending on who owns the data centers, be it the tech companies themselves or the real estate companies, the emissions will be on their books. But what's interesting is if we focus on these tech giants, many have been very outspoken as champions for transitioning to a low carbon economy and

they are often rewarded for that by sustainable investors. Microsoft, for example, is usually one of the largest holdings in a sustainability fund. And now this creates a conundrum for an investor that has sustainable priorities. Do they want to take advantage of the AI boom or keep their portfolio emissions low? And that's a conundrum that these tech companies would prefer they don't have.

Yoon Young Chung:
So you've probably heard large tech companies say their data centers run on 100% renewable energy. It sounds great, but our analysis based on their sustainable reports show that the disclaim open depends more on accounting tools. Then on physical reality, large tech companies like ipa, Microsoft and Amazon have all set their own climate targets moved by 2030 or 24, and they're also among the world's largest data center operators. The backbone of two, today's cloud and AI infrastructure. And those goals cover all scope of emissions including their supply chains. And when it comes to their climate strategy, it's simple power their data centers and operations with renewables. That means long-term contracts for renewables like solar or wind and those renewable certificate.
And now when a company buys a renewable certificate, it's not necessarily buying green electricity, it's buying proof that renewable energy was generated somewhere. So a data center in Virginia might be powered mostly by natural gas, but the company can buy credit from a wind farm in Texas and can still claim the operation is 100% renewable and that's perfectly acceptable under the current rules. But it doesn't mean that the electricity powering those servers or data centers are actually green. And this distinction really matters because data centers cannot choose when they use electricity, they run around the clock. Even if the wind is not blowing or sun is not shining, those servers are still drawing power from grids open dominated by coal or gas. And that's why it's important to distinguish between market-based and location-based emissions.

Mike Disabato:
Market-based and location-based emissions. The location based method measures the emission intensity of the grid where you actually consume electricity. It's a geographic, it's a physical view. It's what your grid is in the location you're at. Now, the market based method measures the emissions associated with the specific electricity products or contracts that you've actually bought. You've purchased the ability to say that you're using renewable energy. The location based number shows the underlying grid reality and the place you're at. While the market based number gives credit or not credit for contractual purchases and renewable contracts, mind you, this isn't to say that the purchase of a renewable energy credit is bad. If you're in an area where the grid just doesn't have a high mix of renewables, you can't really do anything about that. And you want to figure out, well, how can I cut my emissions?
That's a fine way to go about it, to get to a greener place than you would've otherwise. Google agreed to a 3 billion US dollar 20 year purchasing plan agreement with Brookfield for hydroelectric power in Pennsylvania to deal with that issue. Met assigned a 20 year deal with Constellation Energy Corporation to source electricity from a nuclear power facility in Illinois for some of their data centers that are not based in Illinois. These agreements highlight an emerging shift towards securing a continuous low carbon energy supply, even in areas where that's not possible. And the tech industry broadly is exploring ways to try and clean up the grid and locations they're operating in with novel tech like funding the build of small modular reactors. The problem is, if you're only reporting location-based emissions, even with these laudable aspects to try to clean up the grid wherever you can and you're not reporting market-

based emissions, then the picture's a bit skewed. You look like you're doing much better than you actually are in practice. And what Tom Yun Young and their co-author Federico found was there's a widening gap between what tech companies have been reporting their carbon emissions to be and what they actually are with regards to data centers.

Yoon Young Chung:
Let's take Amazon one of the world's largest cloud providers through Amazon web service, and in 2024, it's real world CO2 emission from power use. Were about 17.8 million tons, but its market also figure after renewable contracts and credit was only 2.8 million tons. So there is a huge gap between what they are reporting or the real world carbon footprint from their power usage.

Mike Disabato:
And that gap is likely to grow as the centers are built. And the insatiable investment in AI continues because according to research from the International Energy Agency, which is an international organization providing global energy analysis and policy advice, renewable energy investment is not keeping up with data center built capacity and 40% of data center capacity in the future will likely need to rely on grid's power by fossil fuels as it's going now putting any net zero goal for a company with exposure to data centers, be it tech or real estate into unreachable territory. So I wanted Tom to kind of discuss this dilemma from a real estate investor side since we heard it a bit from the tech side.

Tom Leahy:
So yes, that sets up the central dilemma that I think is facing the real estate industry and institutional real estate investors is how do you square your desire to get exposure to this growing asset class, which is becoming enormously important for the globe and productivity and enhancements and all the great stuff that AI is going to bring us. But you also have to take into account as an investor with many investors have goals around reducing their carbon emissions coming from their portfolios is how do you square those two desires, the desire to get exposure to a hugely growing asset class while at the same time trying to systematically reduce your portfolio's carbon footprint. We know major real estate investors, investment managers, LPs and gps, all have commitments to reduce their portfolio carbon emissions. So the question is how do you do that? And there are various ways you can do it through power purchase agreements and there are other methods of trying to offset the emissions, but those methods aren't perfect and that brings together the central dilemma.

Mike Disabato:
Yeah, and I guess the big issue is can you actually justify missing out on the AI boom as you try to avoid emissions in your portfolio? And I'm thinking about this from a large institutional investor's perspective to justify to their plan participants, for example, that they missed out on the tech sector rally due to increased emissions and concerns around increased emissions. Unless they have a really vocal participant base that really wants them to adhere to that, they might have a fiduciary duty to pursue those types of returns.

Tom Leahy:
I don't think there's a firm answer to that yet, which is why one of the reasons why we wrote our piece is that there isn't a, if you look at the forecast growth in data center demand and capacity over the next 10 years, it's going to outstrip the growth in the generation of renewable energy. So the AI boom is having a

real impact on global carbon emissions. But you're right, from an investor's perspective, they've got a fiduciary responsibility to your pension fund participants. And if you believe the growth story in data centers and these are crucial assets globally going forward, then you have to create a way to invest in them, but perhaps also while be cognizant of the impact that they potentially will have on the environment. But I don't think there's an answer to that question yet.

Mike Disabato:
Young, do you feel the same way? Or maybe better yet, as everyone starts to see the sort of impact these data centers are having, will there maybe be a better set of transparency structures for the market as to how polluted these assets really are for companies? And so investors that do care about this sort of thing can really vocalize the importance of actually paying attention to these emissions with these sort of high soaring tech companies being showing as strong returns as they are lately.

Yoon Young Chung:
I mean, one thing is really upcoming. That's the issue, is about to get more attention because greenhouse gas protocol, that's the global standard for how companies measure. And Reaper emissions is now on the review for its first major update in almost a decade. And the focus is on making carbon reporting more accurate and transparent, making sure renewable energy claims reflect what's really happening on the grid. So if those updates move forward, they could reshape how companies talk about being 100% renewable. And for investors, that's going to be kind of the way things get really interesting because data centers, as Tom said, data centers are one of the hottest property segments right now, and many people want to exposure to the digital growth story or AI growth story. But as reporting standards evolve portfolios with higher exposure to these data center assets could appear more carbon intensive On paper,

Mike Disabato:
We will see if nothing else, we're definitely in the era of the data center, almost like the factories built during the industrial revolution or the railroads that were laid down across the country. These data centers are becoming ubiquitous and they use as much power as the city of Philadelphia, and they're popping up everywhere because I've yet to hear a state or company or anyone not embrace AI as the way forward. And the only way to do that is to build data centers. So we probably need to build carbon free energy and we will probably need to build nuclear power plants as soon as we can and as much as we can so they can handle the 24 7 need of these centers. So if the will is there to build those structures, then there may be a solution in place for these ever-growing electricity demands and thus ever-growing emissions. And that's it for the week. I want to thank Yun Young and Tom for talking to me about the news with the sustainability twist. I want to thank you so much for listening. If you liked what you heard, don't forget to rate and review us and subscribe if you want to hear myself or any of the other co-hosts of sustainability now each week. Thanks again and talk to you soon.

Speaker 4:
The M-S-C-I-E-S-G Research podcast is provided by MSCI, Inc. Subsidiary M-S-C-I-E-S-G research, LLCA registered Investment advisor and the Investment Advisors Act of 1940. And this recording and data mentioned herein has not been submitted to nor received approval from the United States Securities and Exchange Commission or any other regulatory body. The analysis discussed should not be taken as an indication or guarantee of any future performance analysis, forecast, or prediction.

Information contained in this recording is not for reproduction in whole or in part without prior written permission from M-S-E-I-E-S-G research. None of the discussion or analysis put forth in this recording constitutes an offer to buy or sell or promotional recommendation of any security financial instrument or product or trading strategy. Further, none of the information is intended to constitute investment advice or recommendation to make or refrain from making any kind of investment decision and may not be relied on As such, the information provided here is as is and the use of the information assumes the entire risk of any use it may make or permit to be made of the information. Thank you.

Contact Us

About MSCI

MSCI is a leading provider of critical decision support tools and services for the global investment community. With over 50 years of expertise in research, data and technology, we power better investment decisions by enabling clients to understand and analyze key drivers of risk and return and confidently build more effective portfolios. We create industry-leading research-enhanced solutions that clients use to gain insight into and improve transparency across the investment process.

To learn more, please visit www.msci.com.

msci.com/contact-us

AMERICA

United States	+ 1 888 588 4567 *
Canada	+ 1 416 687 6270
Brazil	+ 55 11 4040 7830
Mexico	+ 52 81 1253 4020

EUROPE, MIDDLE EAST & AFRICA

South Africa	+ 27 21 673 0103
Germany	+ 49 69 133 859 00
Switzerland	+ 41 22 817 9777
United Kingdom	+ 44 20 7618 2222
Italy	+ 39 02 5849 0415
France	+ 33 17 6769 810

ASIA PACIFIC

China	+ 86 21 61326611
Hong Kong	+ 852 2844 9333
India	+ 91 22 6784 9160
Malaysia	1800818185 *
South Korea	+ 82 70 4769 4231
Singapore	+ 65 67011177
Australia	+ 612 9033 9333
Taiwan	008 0112 7513 *
Thailand	0018 0015 6207 7181 *
Japan	+ 81 3 4579 0333

* toll-free

Notice and Disclaimer

This document and all of the information contained in it, including without limitation all text, data, graphs, charts (collectively, the "Information") is the property of MSCI Inc. or its subsidiaries (collectively, "MSCI"), or MSCI's licensors, direct or indirect suppliers or any third party involved in making or compiling any Information (collectively, with MSCI, the "Information Providers") and is provided for informational purposes only. The Information may not be modified, reverse-engineered, reproduced or redisseminated in whole or in part without prior written permission from MSCI. All rights in the Information are reserved by MSCI and/or its Information Providers.

The Information may not be used to create derivative works or to verify or correct other data or information. For example (but without limitation), the Information may not be used to create indexes, databases, risk models, analytics, software, or in connection with the issuing, offering, sponsoring, managing or marketing of any securities, portfolios, financial products or other investment vehicles utilizing or based on, linked to, tracking or otherwise derived from the Information or any other MSCI data, information, products or services.

The user of the Information assumes the entire risk of any use it may make or permit to be made of the Information. NONE OF THE INFORMATION PROVIDERS MAKES ANY EXPRESS OR IMPLIED WARRANTIES OR REPRESENTATIONS WITH RESPECT TO THE INFORMATION (OR THE RESULTS TO BE OBTAINED BY THE USE THEREOF), AND TO THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW, EACH INFORMATION PROVIDER EXPRESSLY DISCLAIMS ALL IMPLIED WARRANTIES (INCLUDING, WITHOUT LIMITATION, ANY IMPLIED WARRANTIES OF ORIGINALITY, ACCURACY, TIMELINESS, NON-INFRINGEMENT, COMPLETENESS, MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE) WITH RESPECT TO ANY OF THE INFORMATION.

Without limiting any of the foregoing and to the maximum extent permitted by applicable law, in no event shall any Information Provider have any liability regarding any of the Information for any direct, indirect, special, punitive, consequential (including lost profits) or any other damages even if notified of the possibility of such damages. The foregoing shall not exclude or limit any liability that may not by applicable law be excluded or limited, including without limitation (as applicable), any liability for death or personal injury to the extent that such injury results from the negligence or willful default of itself, its servants, agents or sub-contractors.

Information containing any historical information, data or analysis should not be taken as an indication or guarantee of any future performance, analysis, forecast or prediction. Past performance does not guarantee future results.

The Information may include "Signals," defined as quantitative attributes or the product of methods or formulas that describe or are derived from calculations using historical data. Neither these Signals nor any description of historical data are intended to provide investment advice or a recommendation to make (or refrain from making) any investment decision or asset allocation and should not be relied upon as such. Signals are inherently backward-looking because of their use of historical data, and they are not intended to predict the future. The relevance, correlations and accuracy of Signals frequently will change materially.

The Information should not be relied on and is not a substitute for the skill, judgment and experience of the user, its management, employees, advisors and/or clients when making investment and other business decisions. All Information is impersonal and not tailored to the needs of any person, entity or group of persons.

None of the Information constitutes an offer to sell (or a solicitation of an offer to buy), any security, financial product or other investment vehicle or any trading strategy.

It is not possible to invest directly in an index. Exposure to an asset class or trading strategy or other category represented by an index is only available through third party investable instruments (if any) based on that index. MSCI does not issue, sponsor, endorse, market, offer, review or otherwise express any opinion regarding any fund, ETF, derivative or other security, investment, financial product or trading strategy that is based on, linked to or seeks to provide an investment return related to the performance of any MSCI index (collectively, "Index Linked Investments"). MSCI makes no assurance that any Index Linked Investments will accurately track index performance or provide positive investment returns. MSCI Inc. is not an investment adviser or fiduciary and MSCI makes no representation regarding the advisability of investing in any Index Linked Investments.

Index returns do not represent the results of actual trading of investible assets/securities. MSCI maintains and calculates indexes, but does not manage actual assets. The calculation of indexes and index returns may deviate from the stated methodology. Index returns do not reflect payment of any sales charges or fees an investor may pay to purchase the securities underlying the index or Index Linked Investments. The imposition of these fees and charges would cause the performance of an Index Linked Investment to be different than the MSCI index performance.

The Information may contain back tested data. Back-tested performance is not actual performance, but is hypothetical. There are frequently material differences between back tested performance results and actual results subsequently achieved by any investment strategy.

Constituents of MSCI equity indexes are listed companies, which are included in or excluded from the indexes according to the application of the relevant index methodologies. Accordingly, constituents in MSCI equity indexes may include MSCI Inc., clients of MSCI or suppliers to MSCI. Inclusion of a security within an MSCI index is not a recommendation by MSCI to buy, sell, or hold such security, nor is it considered to be investment advice.

Data and information produced by various affiliates of MSCI Inc., including MSCI ESG Research LLC and Barra LLC, may be used in calculating certain MSCI indexes. More information can be found in the relevant index methodologies on www.msci.com.

MSCI receives compensation in connection with licensing its indexes to third parties. MSCI Inc.'s revenue includes fees based on assets in Index Linked Investments. Information can be found in MSCI Inc.'s company filings on the Investor Relations section of msci.com.

MSCI ESG Research LLC is a Registered Investment Adviser under the Investment Advisers Act of 1940 and a subsidiary of MSCI Inc. Neither MSCI nor any of its products or services recommends, endorses, approves or otherwise expresses any opinion regarding any issuer, securities, financial products or instruments or trading strategies and MSCI's products or services are not a recommendation to make (or refrain from making) any kind of investment decision and may not be relied on as such, provided that applicable products or services from MSCI ESG Research may constitute investment advice. MSCI ESG Research materials, including materials utilized in any MSCI ESG Indexes or other products, have not been submitted to, nor received approval from, the United States Securities and Exchange Commission or any other regulatory body. MSCI ESG and climate ratings, research and data are produced by MSCI ESG Research LLC, a subsidiary of MSCI Inc. MSCI ESG Indexes, Analytics and Real Estate are products of MSCI Inc. that utilize information from MSCI ESG Research LLC. MSCI Indexes are administered by MSCI Limited (UK) and MSCI Deutschland GmbH.

Please note that the issuers mentioned in MSCI ESG Research materials sometimes have commercial relationships with MSCI ESG Research and/or MSCI Inc. (collectively, "MSCI") and that these relationships create potential conflicts of interest. In some cases, the issuers or their affiliates purchase research or other products or services from one or more MSCI affiliates. In other cases, MSCI ESG Research rates financial products such as mutual funds or ETFs that are managed by MSCI's clients or their affiliates, or are based on MSCI Inc. Indexes. In addition, constituents in MSCI Inc. equity indexes include companies that subscribe to MSCI products or services. In some cases, MSCI clients pay fees based in whole or part on the assets they manage. MSCI ESG Research has taken a number of steps to mitigate potential conflicts of interest and safeguard the integrity and independence of its research and ratings. More information about these conflict mitigation measures is available in our available at https://adviserinfo.sec.gov/firm/summary/169222.