Webinar: There's no AI without Infrastructure™

September 2025

Mark Marifian:

All right. Good morning, everyone, and welcome to our special webinar, There's No AI Without Infrastructure. I'm Mark Marifian, head of Product at Tortoise, and it's a pleasure to have Rob Thummel, our market strategist and senior portfolio manager joining us today. So, as we have in the past, we want to make this as interactive as possible for the audience. So, the way we do that is through Q&A and we certainly encourage everyone to type in questions they may have. Feel free to submit those down at the bottom anytime throughout the call in the Q&A box. For those of you that's new to Tortoise, welcome. We are the energy and infrastructure specialist. Since 2002, we've been a leader in the space. Today, we manage about $9 billion in assets, and our team brings over 100 years of combined experience across the energy value chain, essential infrastructure from wellhead really to the end user.

Today, that expertise extends to the rapidly growing demands that we're seeing with AI, where we're seeing energy and digital infrastructure really form a backbone of innovation. If you go to the next slide, you can see our different investment silos. And so, the top three energy infrastructure, electrification infrastructure, and broad energy, those are all tied to our core business of energy. And then, we also have the energy adjacent silos. What do we mean when we say energy adjacent? This is really referring to companies and strategies outside of traditional pipelines, utility energy companies, power producers, but businesses that really benefit directly from energy growth and where energy is going to play a critical role in supporting that ecosystem. So certainly, AI and AI infrastructure fits the bill with that.

And so that's what the focus is going to be for today's webinar as part of our build out to align our ETFs to different investment silos that we have. We've been busy with our platform this year. Tortoise now offers five ETFs, three active and two passive. And I would just highlight that on August 4th we launched the Tortoise AI Infrastructure ETF. The ticker is TCAI. And so, TCAI is really focusing on the convergence of energy, digital infrastructure, data centers, and that's our first product that we have launched in more than six years. We seeded it with 500,000. Today, the ETF assets sit at a little over 30 million, so really happy with the progress that we've had in just a few short months.

So, before we kick it over to Rob, let's just do a few poll questions, get a feel for what the audience is thinking about related to AI and AI infrastructure. So, question number one, do you believe rising electricity demand from AI will be a five-year issue, a ten-year issue, or this is going to be really driving a permanent secular change? I'll just give everyone a minute to it. All right. Permanent secular driver is the number here and just no one voting for five-year at all. The next one, where do you see the greatest bottleneck for AI growth? Is it energy data centers, digital infrastructure? So, what's inside of the data centers or is it policy and regulation? Do that. Okay, more split here, Rob. Energies, a couple for energy, some for digital infrastructure, and then policy and regulation as well.

And then the last one, which area of AI infrastructure do you think offers the best long-term investment opportunity? Data centers, energy, digital infrastructure, or are they all equal? You can queue that. Okay, split across the board again, Rob, with energy and all being equally important to leaders in the clubhouse. So, I think we have a crew that's eager to learn more about AI infrastructure and I anticipate we'll have some good questions. So, Rob, looking forward to your insights.

Rob Thummel:

Well, thanks, Mark. And thanks for everybody for listening. And so., let me just bring this a little bit for everybody and let's just start as what is AI, really quick? So, we appreciate everybody joining us. Mark and I talked about this subject not too long ago, but if you just think about AI, think about it as really a software that learns to approximate human thinking and actions. So, instead of neurons in our brains, AI is running on data and math. So, if you go back to the origin of AI, it goes all the way back actually to Alan Turing in 1930s where he proposed that machines really computers could do more than just crunch numbers. They could actually think. So, you might've heard of the Turing test. It's still used today, but it really gauges the human-like responses of any AI particular application.

So, you fast forward to the early 2000s. This guy named Geoffrey Hinton. He suggested that these neural networks could process large amounts of data acting like our brains, but would use math instead of biology. So, what Geoffrey Hinton suggested and his theory needed to become reality is you needed more data and we needed increased computing power. So, cue NVIDIA and look what happened. Not much later, NVIDIA, which started as a gaming-focused startup, really developed into an AI powerhouse. So how did this happen? Well, NVIDIA developed the first GPU or graphic processing unit, which basically is an advanced semiconductor chip, and it uses parallel processing and parallel processing really revolutionized the gaming industry. It made those video games really cool because you could now be much clearer with whatever game you were trying to play on the screen.

And I actually still remember when my son and I bought a really expensive NVIDIA gaming chip because we were putting that in a personal computer that we put together and that was only six years ago. But parallel process is really the key word because it significantly increased the computing power. And then, NVIDIA added a little secret sauce and it put some software on top of its chip that really allowed developers to figure out how to train and tell the GPU what to do. Well, what's been the result? Well, generative AI was born. OpenAI was created, and NVIDIA rapidly became the largest company in the world by market cap. And Geoffrey Hinton, he's now the Godfather of AI.

Mark Marifian:

We've been queued forward on the slides here. And Rob, we did our first AI webcast 18 months ago. I believe it was April of 2024. What has changed in the last 18 months from when we first started having this conversation?

Rob Thummel:

Yeah, probably one word, Mark, is really adoption. So, when we drafted our first AI white paper shortly after OpenAI was released and the first version of ChatGPT became live in November of 2022. So, ChatGPT went from 100 million users to approaching a billion today. And now, as AI has really crept into our daily life, you can look at this slide, right? So, you wake up, your AI watch wakes you up in the morning, your AI ring advises you about your sleep quality. You use AI to navigate your morning commute, Copilot drafts, emails, DoorDash curates your run lunch. Amazon suggests what's next to buy. And Netflix then at night predicts what show you'll watch to fall asleep. Really, the only thing I think that AI can't optimize yet is your kid's bedtime.

Mark Marifian:

No, it hasn't figured that one out yet for me. Where does AI go from here, Rob? We've seen an explosion of adoption over these recent months, but the bigger question is how do you see this story developing and evolving from here?

Rob Thummel:

Yeah, So, the pace of AI development really has been fast and furious. Look on the next slide, look at everything that AI can do, and it's on the next slide. Claude and Gemini, new chatbots, AI's passing the bar, the CPA exam, the medical boards. I think I heard the other day passed the CFA exam. So, really generative AI is scaling up led by developers of AI consumer applications such as these mega cap tech companies, Microsoft, Apple, Google, Amazon, Meta, OpenAI, Anthropic. But if you go to the next slide, this really illustrates how hyperscalers, Amazon, Microsoft, Google, and Meta are investing record setting levels to train and deploy new AI models. So hyperscaler capital expenditures have doubled since generative AI was born in November of 2022. But the fast and furious pace of AI development is expected to continue into the next decade and beyond.

So, look at this slide. Hyperscaler CapEx is forecasted to grow by almost 25% per year, reaching a trillion dollars by 2030. These CapEx estimates actually might even be conservative. So, NVIDIA CEO, Jensen Huang on his last conference call suggested that hyperscaler CapEx could rise not to 1 trillion, but to $3 to $4 trillion per year by 2030, which implies an annual growth rate of over 40% through 2030. So where do we go from here? Well, just expect autonomous everything. What does this look like? Well, remember the 1980s, and I know many of you are answering this. "I don't remember the 1980s. I wasn't alive."

But for those of us that were, we had the Jetsons, a cartoon with flying cars, robot maids, and all kinds of high tech. Well, today, more than ever, self-driving cars, personal robots and autonomous flying taxis are closer to reality than ever because of AI. This is why Jensen Huang has said, "AI has the potential to be both an industrial revolution and a new industry, and every company country and society will depend on AI. So, AI is the future. It's the future economy. The global AI race for dominance has begun and the US really wants to win that race.

Mark Marifian:

Thanks, Rob. The CapEx numbers are staggering. I think my favorite CapEx number is that the amount being spent, that 315 number, that is greater than the next five sectors of the SEP combined. So, just so much money being spent on AI. Walk me through, translate how that's going to look like in the real world.

Rob Thummel:

Yeah. So, the mega-CapEx, what are they doing? What are they buying? They're buying and building infrastructure. So, McKinsey recently published a report called the Infrastructure Moment, highlighting infrastructure as a critical enabler of long-term economic growth, supporting prosperous societies and elevating standards of livings. So, the development of AI really has expanded the definition of traditional infrastructure that has included power grids, pipelines, toll roads, airports. But now, the modern version of infrastructure includes all of those things plus digital infrastructure such as data centers, fiber optic networks, connectivity and the like. So, these modern types of digital infrastructure all have similar traits to the traditional, including long lifespans, significant capital investment, predictable and resilient cash flows, and all play really critical economic roles.

I watched a CNBC interview last week with Sam Altman, and many of you know him as one of the co-founders of OpenAI, and Sam was interviewed in front of his Stargate project in Abilene, Texas. If you're not familiar with that project, it's massive. It's a $500 billion AI project. And when it's completed, it would be the world's largest AI data center campus. And during this interview, Sam Altman said, "When you hit that button on ChatGPT, you don't really think about what happens. But what happens seems invisible because in seconds or minutes you have an answer to your favorite ChatGPT prompt, but behind the scenes a significant amount of digital infrastructure and energy infrastructure as it work to deliver that response."

So, this really highlights the point that what we've been making at Tortoise for a while there is no AI without infrastructure. So, the next slide really captures a really simplified illustration of the critical infrastructure components that are absolutely essential for your ChatGPT prompt to work and for AI to continue to develop. And it's not just about ChatGPT, it's about every AI application. So digital infrastructure. It includes data centers and the technology hardware inside the data centers, the GPUs network switches, data storage, fiber optic network energy infrastructure as well. Energy infrastructure includes electrification or electricity infrastructure as well as the network needed to deliver the fuel supplies to generate the electricity.

Mark Marifian:

Rob, I just love the slide and the graphic. Can we dive into data centers and specifically what's going on inside of data centers here?

Rob Thummel:

Sure. So, the data centers, they are really the buildings that house the digital infrastructure. In other words, the technology hardware required to operate AI applications. So, at Tortoise, we view data centers as really the heart of AI. So architecturally, they're very plain, but on the inside they're very high performance and high power as far as machines on the inside of these things. So maybe on the outside, when you see them along the road and you're going to see more of them, they look pretty boring, but inside it's like Cape Canaveral.

Mark Marifian:

Good analogy. Walk me through where they're located. Are we being tied to the sources of energy? How are we strategically thinking about the location of the data centers?

Rob Thummel:

Yeah. So today, Mark, there are over 5,000 data centers in the US with the largest concentrations in larger metropolitan areas like Northern Virginia, Phoenix, Atlanta, Dallas, Chicago, and likely to a city near you soon. So, the US is the global leader in data centers and data center development. That's one of the reasons why we're leading this AI charge and winning the AI race presently. The original data centers were actually on college campuses. They were in buildings that housed mainframe computers.

Now, as a shift from analog to the digital world occurred, data centers were built for individual corporations like large banks or maybe a retail store like Walmart to store their customer data. But increasing amounts of data and advanced computing technology really advanced the data center industry to where it is today with thousands and thousands of multi-tenants and what they call co-location data centers, which allow multiple business customers to rent out these facilities and house their digital infrastructure in an off-site location.

The largest really operators of these types of data centers are publicly traded REITs like digital reality. But this AI boom then has really given rise to what I'm going to call GPU as a service, as a type of data center. So, these types of data centers are really state-of-the-art buildings. They include the latest versions of GPUs, and then really, all the other technology infrastructure that are really designed for high performance computing workloads. A recent IPO you might be familiar with, CoreWeave is probably the largest publicly traded company, pure play company. That's an example of these types of GPU as services type of data centers. But of course, the latest evolution in data centers is the development of these massive hyperscaler facilities that sprawl across thousands of acres. They encompass millions of square feet, and these complexes are being built by many of the world's largest technology companies for their own dedicated use.

Mark Marifian:

Yeah, we've seen a lot of project announcements recently. Rob, let's dive into those. What are some of your favorite examples of recently announced data center projects and what are ones you're keeping your eye on?

Rob Thummel:

Yeah, so move on to the next slide. So, I previously mentioned Stargate. So, it's a joint venture between OpenAI and Oracle and Microsoft and NVIDIA. And it's a massive project. It's spending $500 billion. They're building a data center campus near Abilene, Texas, and it'll include 20 data centers. So, that's a large one that's probably going to be the largest. Hyperion, you might've heard of that one. It's the largest data center campus being built in Northern Louisiana by Meta. It will sit on a land position equivalent in size to Central Park once complete. And then lastly, an IPO in a market that's expected to price tonight, Fermi America. The Fermi data complex would be when it's completed, the world's largest advanced data center and intelligence campus, and it's being built near Amarillo, Texas, and it plans to utilize both natural gas and nuclear as its fuel supplies.

Mark Marifian:

Great, great, great detail there. When we're looking at data centers, Rob, what's the investment characteristics that really jump out to you and the team?

Rob Thummel:

Yes, it's just really your traditional demand drivers like this AI-driven economy that really carries over to demand for data centers. So, data centers are growing at a double-digit pace. Vacancy rates. Vacancy rates are really low, they're below 3% and in general, and then in some markets there's zero. So, as you can imagine, rents being charged by data center

operators are rising and lease terms are lengthening leading to this high-quality long duration cash flows, which is what our Tortoise investment process has really been in place for over two decades. That's what we look to identify for most investments we make for our clients. But we also expect the investable universe of data centers to expand as well via more IPOs. I just mentioned the Fermi IPO is one of several IPOs we expect to see over the next several years.

Mark Marifian:

Yeah, it's a great example of how just dynamic the market is right now as well. So, beyond the buildings, beyond the data centers, what else do we consider to be digital infrastructure around?

Rob Thummel:

Sure. So, the computer or the brain running the AI is the GPUs. They're also known as semiconductors or chips, all other's fairly synonymous, at least for the layman like me. And NVIDIA dominates this market with an estimated market share of about 80%. So, NVIDIA has recently released Blackwell chips. They're significantly faster and more powerful than the current Hopper GPU that basically everybody's using in the tech space now. Rubin is the next iteration that's scheduled to be released, and it'll even be more powerful out of NVIDIA.

So, the AI brain is getting bigger and we'll be able to comprehend more or process even more data. And really, if you think about it, technology is really not the limiting factor right now for AI development. Access to electricity appears to be the regulator on how fast AI can really develop. However, AI doesn't run on chips alone. It runs on infrastructure and it runs on specifically technology hardware. So, we're really excited about this opportunity as well.

Mark Marifian:

So, you got digital infrastructure, got data centers, got technology hardware. Now, walk us through a little bit more on the technology hardware side.

Rob Thummel:

Yeah, so look at the next slide. Slide nine. So, technology hardware. This is really the critical systems that optimize the performance of AI. It includes data storage devices and connectivity infrastructure. So, think about this with GPUs are the star quarterback, but storage and connectivity are the offensive line. So, the GPUs get all the headlines, but the storage and the connectivity really keep the performance going. And data really is essential for the continued development of generative AI. The more data, the better. Millions of data storage devices reside inside these modern data centers, and they're really critical and to the performance and advancement of both AI systems, but also their applications.

So, data is measured in bytes and it's anticipated that the data storage market will grow by 25% per year as data storage demand grows to over 14 zettabytes by 2028. So, data storage technologies, they're evolving as well as AI develops. So, the leaders in hard disk drive, flash memory, and solid-state storage are companies like Seagate and Western Digital, and many of these companies are adapting to the growing needs of AI growing by developing faster and lower cost devices for the future.

Mark Marifian:

All right. And then, digital infrastructure. We've got connectivity as well. Walk us through the connectivity piece.

Rob Thummel:

So, every data center campus includes thousands of miles of fiber optic cable networks and hundreds of thousands of network switches. So, these collectively, we consider connectivity infrastructure. That's really a component of digital infrastructure. So, connectivity is really built like a large transportation system or network with the data traveling across these fiber optic cables that act like roads and highways. And then the network switches operate like the traffic lights or the interchanges that manage the flow of the data. So broadly speaking, we expect the growth rate of the companies that

we're investing in to really mirror the growth of the hyperscaler CapEx, which is forecasted to grow between 20 and 40% annually through the end of the decade.

So, the US will need to continue to increase its computing capabilities, increase the amount of data that's available, and then enhance the speed of data transmission, really to maintain our lead really in this global AI race. The companies we're investing in really provide that digital infrastructure that will help the U.S. win the global AI race.

Mark Marifian:

Great. So, we got data storage, we got connectivity, and then we've got one last component and that's cooling. Let's discuss the importance of cooling for AI and data center development.

Rob Thummel:

Yeah. So, cooling infrastructure is even more critical. So, if you think about it, you got to keep all, it's pretty simple. You got to keep all this AI and this technology hardware from overheating. That's the easy part. I can understand that very well. As data centers have really increased in size and the computational power of each of these GPUs has increased and the number of racks that they put inside of these data centers have increased, there's more GPUs per rack, you just need more and more innovative cooling solutions and the need for that has increased. So historically, commercial air conditioners have been the primary way to cool these data centers. So, some of the largest commercial manufacturers, air conditioners or names, Trane and Carrier, they've been the primary cooling data sources for data centers for a while.

But as the physical size of these data centers has increased, so too is the need for efficient, more cost-effective cooling solutions. So, companies with long, long track records, decades of track records, and really thermal management and providing cooling such as Vertiv and Modine. You may not have heard of these companies. Well, they've responded with some innovative technologies like liquid cooling. So, in liquid cooling and these solutions, liquid cooling, really a liquid circulates around a closed loop through these racks sitting inside these data centers to absorb the heat and remove a lot of the heat directly from the GPUs and CPUs. Effectively, this is a way of improving the efficiency of cooling. And so, you don't need to use as much standard just air conditioning, the traditional air conditioning as we think about it.

But cooling still remains one of the largest hurdles to scaling AI development. So additional technology actually are being tested today like immersion cooling, which basically submerges the technology hardware in a fluid or a gel, and that's a better way, it can be a better way to reduce the temperature of all of this critical technology hardware even faster. The best part of all of this, Mark, is this. You look across AI and you look across everything that we're doing. If the US is going to maintain global dominance or gain even more AI dominance globally, we're going to need innovation. And that's happening really at an unprecedented pace. It's creating this expanded set of investment opportunities for us and our team at Tortoise to continue to talk about, and this is what we're really excited about.

Mark Marifian:

Yep. Great. Rob, let's move to energy. It's obviously our bread and butter. How has AI influenced the outlook for energy more recently?

Rob Thummel:

Sure. So, switch to the next slide if you wouldn't mind, Gabby. Thank you. So, AI speaks really two languages. It speaks gigabytes and gigawatts. So, almost every discussion we have and every day we hear about energy. So, CNBC runs this sound bite every day from its longtime energy reporter, Brian Sullivan, where Brian says it's the greatest time ever to be reporting on the energy sector. As an energy investor for almost 30 years, I agree with Brian. And not only is it the greatest time to be reporting on the energy sector, it is also a great time to be investing in the energy sector. With the acceleration of AI, the technology industry is quickly realizing that AI requires more than just bytes of data, but it also needs gigawatts of electricity.

So, to advance, AI is going to depend on computations of power, but also energy. So as a result, the success of AI has brought together the technology and the energy sectors in ways that we've never seen before. So, we're entering the age of electricity where US electricity demand is expected to rise for decades after remaining flat for much of the last 20 years. In this new paradigm, electricity is the new oil. And if we go to the next slide, this is why we feel so strongly about why it's a great time to invest in the energy sector as the age of electricity means that electricity is the new oil.

Mark Marifian:

Yeah, I love this slide. And Rob, the chart references TWH as units for our audience. Walk us through what TWH is. Why does it matter?

Rob Thummel:

Yeah. So, TWH is an abbreviation for terawatt hours. Terawatt hours is basically a unit of energy equal to 1 trillion watt hours. And none of that might mean much to you, but most people think about electricity in the form of kilowatt or kilowatt-hours. The average American consumes about 10,500 kilowatt-hours of electricity per year. The US consumes, as you can see from this chart, has historically consumed about 4,000 terawatt hours of electricity for the last two decades. Texas is the largest state. It consumes about 300 terawatt hours a year. Japan, the fifth largest economy in the world, consumes every year about a thousand terawatt hours of electricity per year. Why am I telling you all this? Well, what this chart is illustrating is that the US is going to have to add 3,000 terawatt hours of new electricity generation over the next several decades and a large portion of that addition is just really due to the pace of development of AI.

Mark Marifian:

Rob, how are we going to go from 4,000 to 7,000? We got to get the electricity from summer, where's it going to come from?

Rob Thummel:

Yeah. So, the US electricity grid is really preparing to grow in a major way. So, if you think about what's going on at the regional level. You have these regional transmission authorities. You've probably heard about some of them, but they cover regulate the electricity markets. They ask for long-term forecasts for demand growth because they need to prepare in advance for this growth. The past two decades, they haven't had to do much because there hasn't been any growth. But most of the growth for AI right now is tied to the East coast and Texas. So, PJM covers the East coast, specifically Northern Virginia, and ERCOT is the regional transmission authority that covers Texas. Both of these areas have seen of expected demand forecasts rise considerably.

Let me give you an example. In the PJM market, once again covers the East coast. PJM market forecasts for peak electricity in demand today are almost 40% higher today than they were in 2022. That's just a few years ago. And this is primarily due to the need for electricity to meet expected demand for data centers in areas like Northern Virginia. It's the same story in ERCOT. Even in our own backyard here at Tortoise, here at Tortoise in Kansas City, the local utility provider Evergy, it's also the electricity provider to Travis Kelsey and Taylor Swift. We could see in our service territory peak electricity demand potentially, and that could potentially be doubled over the next several years if these data centers they're in the queue, move forward and build some facilities around Kansas City.

Mark Marifian:

Fascinating. So, Rob, we know electricity is increasing. Walk us through what the sources of energy in that supply mix. What is it today? How could it change?

Rob Thummel:

Yeah, I'm around here, but just generally speaking, if you think about where's electricity fuel supply coming from here today in the US? A lot of this, we've talked about it, a lot of Tortoise, but I think it's important to remember. The current US

electricity generation mix is around 40% natural gas, 18% nuclear, 17% coal, 19% wind and solar, and the rest hydro and some other sources make up the rest. But at Tortoise, we believe very strongly that natural gas will be the long-term winner here as a cost-effective, efficient low-carbon fuel supply source. So, natural gas will maintain and likely increase its market share as U.S. electricity demand increases by as much as 75% by 2050. Now, this means that US natural gas production could increase by over 30% just by 2030. As a combination of more LNG exports and increased electricity demand really increased this need for more natural gas.

And this is a positive for the entire energy sector, from producers to transportation and pipeline operators as well. The mega-cap tech companies, the hyperscalers, they originally wanted to use wind and solar to power their data centers until they found out that these forms of electricity were intermittent and that battery storage was not available to ensure reliable electricity 24 hours a day, seven days a week, 365 days a year. So, the tech companies have quickly pivoted natural gas of being accepted as an energy supply source. Many of the largest independent power producers, Constellation Energy, Vistra, NRG, Talen. They've been active acquirers of natural gas generation to support immediate need for increased electricity demand. In addition, in Homer City, Pennsylvania, there was a recent announcement of plans to build the US's largest natural gas power plant on a location that was formerly a coal-fired power plant. And clearly this Homer city Pennsylvania facility will support the needs for more power needed in this PJM region as well.

Mark Marifian:

Let's go into nuclear. We talked about the Homer City plant, but there also seems to be a nuclear renaissance occurring, and walk us through some of those announcements you've seen.

Rob Thummel:

Yeah, so nuclear is in the mix as well, Mark. Several nuclear facilities were decommissioned, but they're now expected to be restarted. For instance, Palisades. There's a Palisades nuclear generating facility in Michigan that's coming back. Duane Arnold in Iowa is likely coming back. In addition, when you probably saw this Constellation Energy plans to reopen Three Mile Island, a nuclear plant in Pennsylvania, and it's going to likely provide power to Microsoft and Microsoft's data center campus. But all of this will need government approval and it isn't likely to start up at least Three Mile Island's case until probably sometime close to 2030.

Mark Marifian:

Just amazing though that we're talking about mothballed nuclear plants coming back into the grid. I'm not sure anyone had that on their bingo card a few years ago. So, walk us through SMR, that's another part of nuclear for the audience.

Rob Thummel:

Yeah. We get a lot of questions about SMRs. So SMR is short for small modular nuclear reactors. It is important to note that there are no SMRs currently operating in the US today, and there will be the need for the new SMRs to be approved by the Nuclear Regulatory Commission or NRC. Also, it's important to understand these facilities require highly enriched uranium, which means the US needs more enriched uranium processing facilities as most enriched uranium today is imported from countries like Russia and China and other areas around the world as well. But they will be part of the longer-term solution, just probably beyond 2030.

Mark Marifian:

Great. And then we've talked about Bitcoin miners. What's going on there?

Rob Thummel:

Yeah, this is probably one of the more interesting ones, one of the most fun parts of being a portfolio manager is trying to find diamonds in the rough. And this is one that we found at Tortoise. This is what we do. We look at every single technology, every single company that's going to potentially benefit from these long-term megatrends. And we found one

in Bitcoin miners, but we're not buying because of Bitcoin miners. So, the demand for getting access to electricity, as you can imagine, the data centers, the hyperscalers, they want electricity, they want electricity now. They wanted it yesterday. So, it's very high. So many of these Bitcoin miners are now becoming former Bitcoin miners. And what I mean by these companies, you've never heard of them, Iron, TeraWulf, Cypher, ride platforms.

All of them have access to gigawatts of power that they could use and in some cases are using for Bitcoin miners. But instead, many of these companies are transforming into data center operators by either using their power to support an existing or a new data center that's supported by a mega cap tech like Google or some of these Bitcoin miners are becoming GPU as a service data center operators, like CoreWeave that we discussed earlier.

Mark Marifian:

Yep. Wonderful. So, differentiation of thought. We've covered a lot here. Rob, walk us through your last word.

Rob Thummel:

Yeah, let's go to the next slide. So, let me just really briefly explain where we think we are. So artificial intelligence. It's reshaping the global economy, but its success really hinges upon far more than code alone. There is no AI without infrastructure and digital infrastructure like data centers and technology hardware along with energy really serve as the foundation of this AI revolution. So, more AI means more data centers and more tech hardware. It also means more energy is needed. So those who are able to enable AI development will build the foundation that not only supports the future of AI but defines it. And our Tortoise AI infrastructure strategies really invest in those critical enablers that will support the future development of AI.

And if you have interest in our AI infrastructure or our tortoise products, you can go to our website at tortoisecapital.com or of course contact one of our investment specialists. But if you go to the next slide, you can see what we're doing. You can see where we're focused, where we believe infrastructure is an under analyzed and an under-owned sector where we believe our fund, TCAI is the first and right now only actively managed ETF dedicated to this emerging AI physical infrastructure space. And then if you look on the last slides, we get a lot of questions on, well, how does this fit? How's it positioned? From a style box perspective, this is not really my area of expertise. I focused on the stocks. But we effectively are a large cap blend/growth active ETF.

And the ETF itself doesn't necessarily just, well, it actually doesn't invest in a lot of companies that are in the S&P. There's not a lot of overlap. You can see that from here it's got a high active share. But what the ETF does focus on, or obviously companies focused on infrastructure that generate cash flow, that generate earnings. And we think that those earnings and cash flows will grow and grow quite significantly as AI continues to develop. And we think that this growth rate will be much higher than the S&P 500. So, thank you for your time and your attention here. Mark, I'll turn it over to you if you have any last thoughts and then happy to answer any questions.

Mark Marifian:

Yeah, no, just to put a bow on this slide. 96% active share really jumps out at me. So, we're benching against the S&P 500, but really not a lot of overlap versus the benchmark at all. So, something that we, I think differentiates us certainly. And then how are clients using this? We've had a fair number of conversations with clients over the first 45 days, and this is something that we were curious to as well. What we are finding more and more as clients are interested in, they seem to be focusing on this as a course satellite to their equity allocation. And so that's where we're seeing it fit into portfolios.

So, Rob, with that, I'm just pulling up the questions. We had a few come in throughout the webinar. Let me jump to this one that came at the end. I think you're seeing a lot of announcements on the spend. And so, the specific question is are you nervous about just a few companies driving all the investment? Have we figured out a way to measure the ROI? Yeah, so do a question there.

Rob Thummel:

Yeah, I think it's a really good question and I think it's something. So yes, the answer is yeah. We spent a lot of time on this and I tell you what, so who's spending the money? Obviously, it's the big hyperscalers and then you're seeing investments by companies like NVIDIA. I think what people aren't talking about enough is just the amount of free cash flow that's generated by Amazon, Meta, Microsoft, Google, NVIDIA. NVIDIA alone is going to generate almost $100, 000, 000,000,000 of free cash flow. Everybody I know was a popular subject on CNBC the other day. They're going to put $10 billion. NVIDIA is going to put $10 billion in Oracle, I believe. Is that a big problem?

Anyway, the answer to that is that it's a capital allocation. There's a lot of free cash flow for these companies and they're reallocating this free cash flow in the form of CapEx where they anticipate growth into the future. Which gets to the second question, which is probably one of the biggest risks, and it's something that's still being evaluated, which is what's the return going to be? And we're watching that pretty closely. We listen to the conference calls. We read obviously all of the research. We try to look under every rock we can find about the returns. It's not just the research. We're looking on all forms of research and today there's a lot of it and we can use a lot of different sources, but that's the trillion-dollar question is, will there be the return? And we're going to watch that pretty closely. But I do think the US wants to win the AI race and you're going to have so right now, and it's going to take several decades to develop the infrastructure to win the AI race. And this is a long game.

This AI thing is going to be around a long time and it's going to evolve, but you're going to have to have the infrastructure, the foundation in place to win. And that's really what the companies are spending a lot of money on right now. And that's obviously what we're targeting and the companies we're investing in are going to be those enablers and build the foundation that are going to help the US win this AI race.

Mark Marifian:

Another question similarly along the lines, how do we differentiate between the hype cycle and what is a durable investment theme and what we believe is AI infrastructure here?

Rob Thummel:

Yeah. Well, I think that's pretty simple for us. I mean, we got a great analyst team here and dedicated team to this infrastructure sector, energy infrastructure. It's been our bread and butter for a long time, but we've now extended it into more modern infrastructure as well. And we're doing modeling and every day looking at what are the margins? Well, did you start at the top? Obviously, we do top-down analysis as part of our investment process. We've been doing this for two decades. We do the top-down analysis on the various sub-sectors within this infrastructure category and analyze the major trends obviously and incorporate that top-down analyst into our thought process, into our bottoms-up where we're looking at every single individual company looking at the revenue and the revenue growth, the operating margins.

What direction are they going, how are they allocating their capital spending? What's going on with the management? What's our management buyers or sellers? Looking at all the technologies that are evolving over time that could either be complementary or cause the existing company operations to maybe become, well, I don't know, obsolete is the word, but less plus desirable. We're doing all of that stuff to try to figure out where can we be best positioned to benefit from this rising demand for AI going forward. So, it's a process we've had in place. We utilize our investment process. We've had it in place at Tortoise for two decades and we've now extended it to use it beyond just energy infrastructure, but to now more modern infrastructure like data centers, like data storage devices like network switches, things along those lines that we're investing in every day.

Mark Marifian:

Great. One more that came in Rob, and I think we touched on this, but I'll give you just another chance to expand if you'd like, but just maybe the specific question was on cooling infrastructure. How are we thinking about it as a, where does it fit again within the portfolio buckets? How are we thinking about it from a percentage allocation standpoint? Just any color there I think would be helpful.

Rob Thummel:

Yeah, that's a good question. So, it's really important for AI development. I mean, another one, we do a lot of this investing around here at Tortoise that a lot of this stuff, it seems invisible to the investor, like energy infrastructure, like cooling infrastructure. It's not invisible though to the operators of these data centers. It's not invisible to the economy. I mean, obviously these are physical facilities that we're investing in, whether it's pipelines or air conditioning units or liquid cooling. They're physical structures. That's why we like them as infrastructure, but nobody talks about them. So, they're invisible to investors, but they're really, really, really important and cooling's right there.

So, I think we've probably got a 12 or 13% allocation right now to cooling infrastructure in our TCAI fund because we're really excited about really the technologies that are going along here. Vertiv is when you pull it up, you'll see it's one of our top holdings, this innovative liquid cooling solution. Vertiv's been around, we just talked to the management team the other day. They've been around for decades. I think they said maybe 50 years, but obviously, they haven't been providing liquid cooling solutions. That's more of an innovation. And so, the companies have innovated like Vertiv, like Modine because cooling is so, so important. If we don't have cooling, then obviously none of this stuff's going to work basically. So, we see it as a really a critical essential infrastructure component.

And frankly, the only reason why we'll go up or down in the portfolio is always going to be in the portfolio. It'll just be a valuation call. And that's why we use our investment process both the top down the bottom up to figure out who's best positioned, what are the new technologies, but then also how are these companies being rewarded or not being rewarded? Are they underappreciated or overappreciated? And that all goes into our investment process, and in the end, we come out with an allocation and individual stocks that are tied to, or a component of digital infrastructure and cooling infrastructure as well.

Mark Marifian:

Wonderful. Rob, thank you. You can tell that the passion that our firm has, you can see it through Rob, but we love energy, we love talking about energy, we love talking about infrastructure. Really excited to see where this AI infrastructure story goes just at the beginning of it. So, more to come. Thank you all to our audience for joining us today. Again, if you have any questions, you can always follow up with your sales representative and you can also find us and reach out to us on our website. So, we'll look forward to talking to you soon. Thank you all. And Rob, thanks again for the comments today. We appreciate it.

Rob Thummel:

Thanks, everybody.

Nothing in this transcript should be considered a solicitation to buy or an offer to sell any shares of the portfolio in any jurisdiction where the offer or solicitation would be unlawful under the securities laws of such jurisdiction. Nothing contained in this communication constitutes tax, legal or investment advice. Investors must consult their tax advisor or legal counsel for advice and information concerning their particular situation.

Before investing in the funds, investors should consider their investment goals, time horizons and risk tolerance. The funds' investment objective, risks, charges and expenses must be considered carefully before investing. The statutory prospectuses and the summary prospectuses (click here) contain this and other important information about the funds. Copies of the funds' prospectus may be obtained by calling 855-994-4437 or by emailing info@tortoisecapital.com. Read it carefully before investing.

Shares of exchange-traded funds (ETFs) are not individually redeemable and owners of the shares may acquire those shares from the ETF and tender those shares for redemption to the ETF in Creation Units only, see the ETF prospectus for additional information regarding Creation Units. Investors may purchase or sell ETF shares throughout the day through any brokerage account, which will result in typical brokerage commissions.

Investing involves risk. Principal loss is possible. The fund is registered as a non-diversified, open-end management investment company under the 1940 Act. Accordingly, there are no regulatory limits under the 1940 Act on the number or size of securities that we hold, and we may invest more assets in fewer issuers compared to a diversified fund. An investment in MLP securities involves some risks that differ from the risks involved in an investment in the common stock of a corporation, including risks relating to the ownership structure of MLPs, the risk that MLPs might lose their partnership status for tax purposes and the risk that MLPs will not make distributions to holders (including us) at anticipated levels or with the expected tax character.

The Fund's strategy of concentrating its assets in the power and energy infrastructure industries means that the performance of the Fund will be closely tied to the performance of these particular market sectors. The Fund's strategy of emphasizing investments in AI infrastructure companies means that the performance of the Fund will be closely tied to the performance of one or more industries that are expected to benefit from the growth of AI-capable data centers and related technology and energy infrastructure. Companies in the technology infrastructure sector are subject to many risks that can negatively impact the revenues and viability of companies in this sector including but not limited to risks associated with emerging technology that renders existing products or services obsolete, reliance on outdated technology, intellectual property theft, supply chain disruption, vulnerabilities to third-party vendors and suppliers, business interruption, difficulty in retaining skilled talent, and regulatory compliance.

Investment advisers, including the Adviser, must rely in part on digital and network technologies (collectively "cyber networks") to conduct their businesses. Such cyber networks might in some circumstances be at risk of cyber-attacks that could potentially seek unauthorized access to digital systems for purposes such as misappropriating sensitive information, corrupting data, or causing operational disruption.

Derivatives include instruments and contracts that are based on and valued in relation to one or more underlying securities, financial benchmarks, indices, or other reference obligations or measures of value. The use of derivatives could increase or decrease the Fund's exposure to the risks of the underlying instrument. Using derivatives can have a leveraging effect and increase fund volatility.

We may invest a portion of our assets in fixed income securities rated "investment grade" by nationally recognized statistical rating organizations ("NRSROs") or judged by our investment adviser, Tortoise Capital Advisors, L.L.C. (the "Adviser"), to be of comparable credit quality. Non-investment grade securities are rated Ba1 or lower by Moody's, BB+ or lower by S&P or BB or lower by Fitch or, if unrated, are determined by our Adviser to be of comparable credit quality. Investments in the securities of non-U.S. issuers may involve risks not ordinarily associated with investments in securities and instruments of U.S. issuers, including different accounting, auditing and financial standards, less government supervision and regulation, additional tax withholding and taxes, difficulty enforcing rights in foreign countries, less publicly available information, difficulty effecting transactions, higher expenses, and exchange rate risk.

Restricted securities (including Rule 144A securities) are less liquid than freely tradable securities because of statutory and contractual restrictions on resale. This lack of liquidity creates special risks for us. Rule 144A provides an exemption from the registration requirements of the Securities Act of 1933 (the "1933 Act"), for the resale of certain restricted securities to qualified institutional buyers, such as the Fund. We cannot guarantee that our covered call option strategy will be effective. There are several risks associated with transactions in options on securities. For example, the significant differences between the securities and options markets could result in an imperfect correlation between these markets. Certain securities may trade less frequently than those of larger companies that have larger market capitalizations.

Risks include, but are not limited to, risks associated with companies owning and/or operating energy pipelines, as well as master limited partnerships (MLPs), MLP affiliates, capital markets, terrorism, natural disasters, climate change, operating, regulatory, environmental, supply and demand, and price volatility risks. The tax benefits received by an investor investing in the fund differ from that of a direct investment in an MLP by an investor. The value of the fund's investment in an MLP will depend largely on the MLP's treatment as a