

Artificial Intelligence: What to expect in 2025

How investors could take advantage of the already big and exponentially growing AI market



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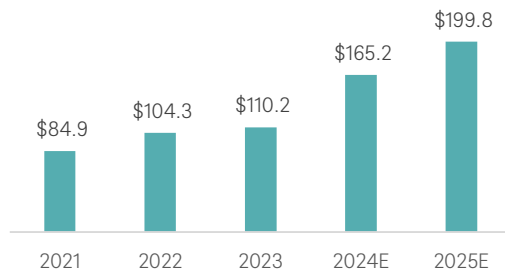
IN A NUTSHELL

- We expect no AI capex slowdown near-term, increasing energy demand, high focus on cybersecurity, sovereign AI and AI agents will continue to dominate our attention in 2025.
- Investment opportunities likely to start moving towards software and service companies able to best integrate AI in their services.
- Intelligence Everywhere is likely to become a big new agent for change and growth.

Anticipation of widespread use of Artificial Intelligence (AI) by many industries has been one of the key stock market drivers in the past two years. In 2025, AI developments could make significant strides across various domains. We expect a shift from generalized applications to industry-specific solutions. Companies will refine their strategies to target specific use cases that deliver measurable results. In this article, we discuss five trends that investors should pay attention to in 2025. We also include a brief interview with DWS Senior Portfolio Manager, Dan Fletcher who maps out for us the AI investment universe, as well as discusses disruption potential of AI from “no code” software to growth in “intelligence capacity.”

1 / Generative AI capex isn't slowing down

Figure 1: Big Tech Capital Expenditure (\$B)



Source: Bloomberg Intelligence (October 2024). “Big tech 2025 capex may hit \$200 billion as gen-AI demand booms.” Analysis includes Amazon Web Services, Microsoft, Google, Oracle, Meta and Apple. Past performance is not a guarantee of future results. Forecasts are based on assumptions, estimates, views and hypothetical models or analyses, which might prove inaccurate or incorrect.

- Bloomberg estimates that Microsoft, Amazon, Google and other big tech companies could collectively increase capital expenditure (capex) to about \$200bn in 2025.¹
- Over \$90bn in incremental capital spending in 2024-25 vs. 2023 is expected to be dedicated mostly to expanding generative AI (gen AI) infrastructure.¹
- “AI bears” may believe that overbuilding AI infrastructure sets future expectations too high. Others are concerned that AI model progress will outpace physical infrastructure, leaving the latter outdated. “No one will ever train a frontier model on the same data centre twice”—by the time the model has been trained, the GPUs will have become outdated, and frontier cluster sizes will have grown.²
- Cloud providers believe that they don’t have a luxury to wait and see how the technology evolves. The fear of being left behind drives a cycle of competitive capex escalation.

¹ Bloomberg Intelligence (October 2024). “Big tech 2025 capex may hit \$200 billion as gen-AI demand booms”

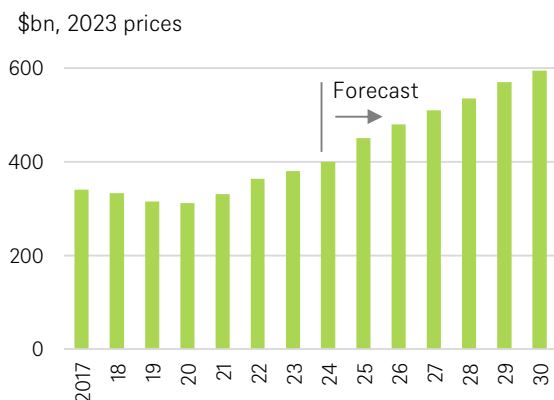
² Sequoia (July 2024). “The Game Theory of AI CapEx.” A “cluster size” in the context of generative AI refers to the number of compute nodes (like servers with graphics-processing units, or GPUs) that are grouped together to form a computing cluster used to train or run large generative AI models.

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2 / Spending on power infrastructure is surging around the world. And AI is only a part of it

Figure 2: Global power grid infrastructure investments

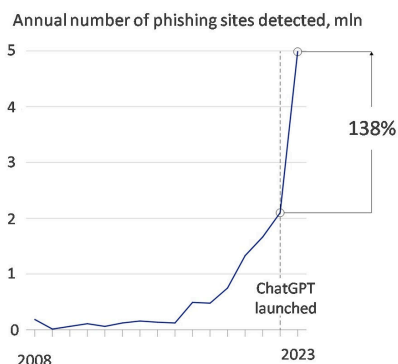


Source: International Energy Agency, IAE (2024). "World Energy Investment 2024." Past performance is not a guarantee of future results. Forecasts are based on assumptions, estimates, views and hypothetical models or analyses, which might prove inaccurate or incorrect.

- The International Energy Agency (IEA) estimates that global investment in grid infrastructure reached nearly \$400bn in 2024, up from a little over \$300bn in 2020 and reversing a decline that began in 2017 on the back of slowing demand in China.³ The IEA forecasts that spending will rise to around \$600bn annually by 2030.
- Electricity consumption from data centres, AI and the cryptocurrency sector could double by 2026.⁴
- Total electricity consumption of data centres could reach more than 1,000 terawatt-hours (TWh) in 2026, compared to 460 TWh in 2022.⁴ This demand is roughly equivalent to the electricity consumption of Japan.
- Other factors driving the new electricity supercycle include overall world's economic growth linked to total energy needs, decarbonization of electricity generation, electricity's rising share of energy consumption ("electrification"), and grid fortification.⁵

3 / Cybersecurity: AI turbocharges both sides

Figure 3: Use of gen AI has accelerated phishing as the primary method of attack



Source: McKinsey (November 2024). "The cybersecurity provider's next opportunity: Making AI safer."

- AI has the potential to significantly enhance cybersecurity capabilities improving the process how we detect, respond to, and prevent cyberattacks.
- AI is also being used by bad actors as a tool to fuel more sophisticated cyberattacks and increase their volume, as exemplified by the rise in AI-enhanced social engineering and the substantial financial impact of data breaches. In 2023, the total cost of cybercrime had more than doubled since 2015.⁶
- Organizations spent around \$200bn on cybersecurity products and services in 2024, up from \$140bn in 2020.⁶ The vended cybersecurity market is expected to grow 12.4% annually between 2024 and 2027, outstripping historical levels of growth.⁶
- Despite there no real timescale for the arrival of advanced technologies such as quantum computing, companies need to think of potential challenges to current cybersecurity systems. While encryption is the bedrock of modern life, underpinning virtually every aspect of tech-enabled society, quantum computing can render today's methods of encryption completely unusable.

³ International Energy Agency, IAE (2024). "World Energy Investment 2024"

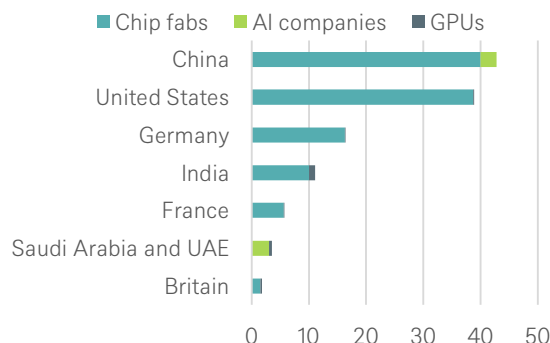
⁴ International Energy Agency, IAE (2024). "Electricity 2024"

⁵ The Economist (January 2025). "A new electricity supercycle is under way"

⁶ McKinsey (November 2024). "The cybersecurity provider's next opportunity: Making AI safer"

4 / Sovereign AI race continues: No one wants to fall behind

Figure 4: AI-related investments pledged by governments (2023 or latest).

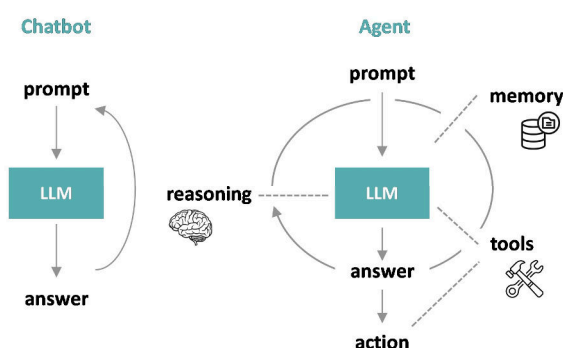


Source: The Economist (January 2024). "Welcome the era of AI nationalism." GPUs refers to Graphic Processing Units. Past performance is not a guarantee of future results.

- The electronics supply chain appears to be only the start of tech's global decoupling. Disruptions from Covid-19 and geopolitical tensions between the U.S. and China pushed tech companies to rapidly invest in making their supply chains more resilient, particularly with respect to semiconductors.
- Now de-globalization movement is spreading to data and AI, with countries spending billions to subsidize "sovereign AI." This refers to a nation's capabilities to develop, deploy and control its own artificial intelligence technologies. It encompasses both physical and data infrastructures.
- In the past year the governments of the U.S. and China have pledged \$40-50bn each for AI investments.⁷ Other countries have started to announce their own AI initiatives as they do not want to be left behind or stuck with a critical technology that is under foreign control.
- Most of these investments will go towards purchases of graphics-processing units (GPUs) and factories to make such chips, as well as, to a lesser extent, support for AI firms.

5 / AI agents are expected to take over AI chatbots

Figure 5: AI agent uses a Large Language Model (LLM) for reasoning, planning and taking actions.



Source: DWS. Adapted from Neurons lab (March 2024). "Intro to LLM Agents with Langchain: When RAG is Not Enough."

- While ChatGPT and other chatbots alike have dominated the industry for the past two years, AI agents are expected to claim 2025.
- AI agents can handle tasks that require decision-making, real-world interactions, and autonomy. While chatbots require constant user interaction, AI agents can execute entire workflows from start to finish, once given an initial set of instructions.
- AI agents can be deployed across various industries, including autonomous vehicles, robotics, personal assistants, healthcare, financial trading and many others.
- Large tech companies are working on enterprise agents that could potentially displace traditional software-as-a-service (SaaS), while payment companies are developing integrations to enable AI agents to send and receive payments.
- The rise of multimodal LLMs has led to the emergence of so-called control agents, which interface with graphical user interfaces (GUIs) to complete tasks in a similar way to a PC user. Those agents begin to take on the character of a "digital worker," the ultimate goal of the agent field.

⁷ The Economist (January 2024). "Welcome the era of AI nationalism"

PM view



Dan Fletcher

Senior Portfolio
Manager
Growth Equities

We talked to Dan Fletcher, a Senior Portfolio Manager at DWS about his vision for Artificial Intelligence in 2025 and beyond. You can find more of his thinking in a recently published article titled “Intelligence Everywhere,”⁸ where he discusses the AI potential to become a big new agent for change and growth.

Dan, as a portfolio manager, could you map out for us the AI investment universe as you see it?

First of all, we are acutely aware that identifying a significant trend like AI is a necessary but not a sufficient condition for generating investment alpha. Not all trends are investable. The challenge is finding companies who derive a meaningful part of their opportunity, growth, and revenue from that trend, and who will sustainably benefit. And of course, just as significant is avoiding the companies which will be disrupted.

We categorized potential beneficiaries on a spectrum from “Foundation” to “Accelerating Scientific Innovation,” [Figure 6](#). The mega technology companies, such as Amazon and Meta currently address much of the opportunity set. After figuring out where a company falls along the AI opportunity spec-

trum, we come back to our first principles which are: a) How big and fast is their market growing? b) How substantial and durable is their advantage? and c) How much of that potential is in the consensus view? We believe that those who build and/or are good at applying generative AI (Gen AI) will emerge as dominant leaders in a whole new world of growth.

In which area do you think the application of generative AI has been most effective so far?

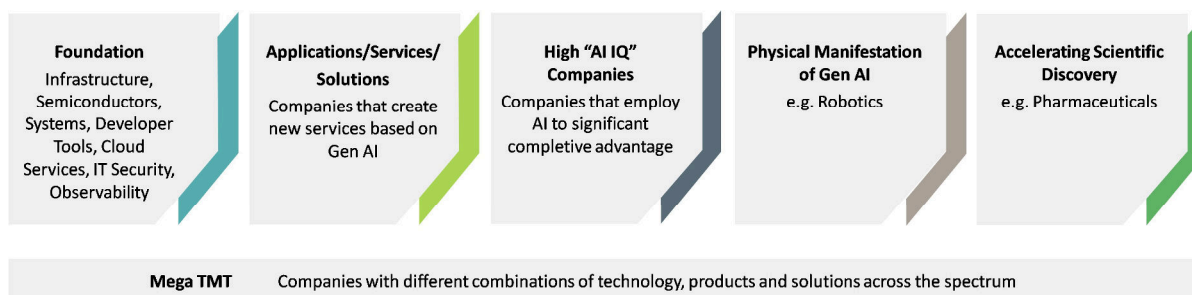
One of, if not the main, areas where Gen AI has been effective so far is in helping write software. Google has publicly stated that more than a quarter of their new code is produced by AI. This capability will continue to improve, and an industry aspiration of true “no code” programming, where the project is described in natural language, suddenly seems within reach, including complex projects. Measurable impact on the software industry may not be that far off. How providers and users of software/SaaS choose to adapt will be one of the most closely watched trends over the next 18 months. Will providers be fast enough to make Gen AI a key part of their offering? Will users adopt this or build the capabilities themselves?

What are the more long-term implications of AI for accelerating growth worldwide?

One of the long-term drivers of growth can be an increase in so called “intelligence capacity.” To date, the world’s total capacity of intelligence (that is only things humans can do) has been derived, not surprisingly, solely from us humans and bound by our growth. But going forward our machine intelligence will add to that. Of course, not all “intelligence” is the same, but there is a large range of functions that only humans currently do that can be done by an AI.

“Thought hours” is one way to think about this resource, the total amount of hours of thought available, and how much machine intelligence will add to this. It is reasonable to assume that the investments in AI infrastructure worldwide will increase the rate of growth of overall intelligence capacity. This has potential to be highly productive and transformative. In the same way a civilization’s progress can be propelled and measured by its energy consumption, growth in intelligence capacity may one day be considered a key factor in worldwide growth and progress.

Figure 6: AI investment universe.



Source: Adapted from DWS (December 2024). “Intelligence Everywhere”

⁸ DWS (December 2024). “Intelligence Everywhere”

Glossary

Alpha: Refers to returns in excess of a benchmark's return.

Artificial Intelligence (AI): Is the theory and development of computer systems able to perform task normally requiring human intelligence.

Capital expenditure (capex): Are funds used by a company to acquire or upgrade physical assets such as property, industrial buildings or equipment.

ChatGPT: A large-scale AI language model developed by OpenAI that generates human-like text.

Cluster size: In the context of generative AI, refers to the number of compute nodes (like servers with graphics-processing units, or GPUs) that are grouped together to form a computing cluster used to train or run large generative AI models.

Cryptocurrency: A crypto asset recorded on a Blockchain that is often neither issued nor controlled by any centralized authority.

Generative AI: A branch of AI focused on creating models that can generate new and original content, such as images, music, or text, based on patterns and examples from existing data.

Graphic Processing Units (GPUs): Are electronic circuits that were originally designed to accelerate the rendering of 3D graphics. Over time, they became more flexible and programmable. GPUs are a vital part of artificial intelligence (AI) systems because they are designed to process large amounts of data simultaneously.

Large Language Model (LLM): A type of AI model that can comprehend and generate human-like text and is trained on a broad dataset.

Quantum computing: Is a type of computing that leverages the principles of quantum mechanics to solve complex problems much faster than traditional computers by utilizing quantum bits (qubits).

SaaS (software-as-a-service): A cloud-based model that allows users to access and use software applications over the internet, instead of installing them on their own device.

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