

Financial Times 번역요약본 ('25. 3/4)

1. Pollution from Big Tech's data center boom costs US public health \$5.4bn ('25. 2/23)

- 미국 UC Riverside 대학과 캘리포니아 공대 (Caltech)이 연구한 자료에 따르면, AI 개발을 위해 미국 내에 지어진 데이터센터에서 발생하는 전력 생산 때문에 발생한 공기 오염 등으로 야기된 공공 보건 비용이 지난 5년간 54억불 (약 8조원)에 달하는 것으로 추정. Microsoft, Alphabet, Amazon, Meta 등은 2023년에 1510억불이었던 AI 개발 비용을 올해는 3200억불로 예상하고 있으며, 최근 OpenAI와 Softbank는 5000억불에 달하는 “스타게이트”라고 불리는 미국 AI 인프라 공동 벤처를 설립할 계획을 발표하였음. 회사들은 그들이 제공하는 사회, 경제 및 환경적 이익을 고려하지 않았다고 반발하고 있지만, 다른 조사에 따르면 미국의 데이터 센터에서 사용하는 전력량은 2023년 미국 전체의 4%에서 2028년까지 7-12%로 증가할 것으로 예상됨.

2. Chinese investment surge into Vietnam raises risk of Donald Trump retaliation ('25. 2/25)

- 트럼프 집권 이후 미국의 관세 부과를 피하기 위한 중국의 베트남 투자가 더 증가하고 있음 (2023년 베트남 투자금액에서 중국이 차지하는 비중은 22%에서 2024년 28%로 증가). 하지만 미국의 관세를 회피하려는 이러한 중국의 노력은, 베트남이 대미 수출에서 큰 폭의 흑자를 기록하고 있다는 취약점을 가지고 있음 (2024년 베트남의 대미 무역 흑자는 1235억불 (약 170조원)을 기록하여, 중국과 멕시코에 이어 세 번째 대미 무역 흑자를 기록함. 원자재의 절반 이상이 중국으로부터 오고, 단순 조립이나 고도의 기술을 필요로 하지 않는 생산 등에 의존하고 있는 등, 베트남의 공급망은 중국에 고도

로 의존하고 있음. 미국도 이러한 중국의 간접적 관세 회피를 파악하고 있으며, 베트남도 대미 흑자를 줄이기 위해 하이테크부터 농산물까지 미국으로부터의 수입을 늘리겠다는 유화책을 제시함.

3. US companies left out of defence stock rally amid Trump's Pentagon cuts ('25. 2/25)

- 트럼프 재선 이후 한 달간 유럽의 방위비 부담을 증가하라는 압력과 미 국방성의 예산 삭감 등으로 인해, 미국 6대 방위산업체의 주가는 평균 4%가 하락한 반면, 독일의 Rheinmetall의 주가는 40% 상승하였음. 한국의 한화 에어로스페이스의 주가는 폴란드와 루마니아 등 나토 국가들의 방산 수요로 70% 넘게 상승함. 미국 펜타곤의 국방 예산은 8500억불 (약 1200조원)에 달하는데, 2026년에는 8%를 줄이는 것을 목표로 하고 있음. 미국의 방위 산업은 대규모 정부 예산에 집중하고 있는데, 대부분이 유지 보수, R&D, 검사와 평가 등에 집중되어 있어서 큰 영향은 없을 거라는 분석도 있음. 한편 기술주도 업체인 Palantir and Anduril의 주가는 올해 들어 40%가 올랐으며, 이는 이 기업의 대표인 Peter Thiel과 Musk와 미국 부통령인 JD Vance와의 친밀한 관계 때문으로 분석하기도 함.

4. Estonia launches AI in high schools with US tech groups ('25. 2/26)

- 발틱해의 조그만 국가인 (인구 1백3십만) 에스토니아에서 전국의 고등학생들에게 AI 기술을 교육하는 “AI Leap (도약)”이란 프로그램을 OpenAI 등과 함께 펼치기로 함. 에스토니아는 유럽 국가 중 국제 피사 (Pisa) 평가에서 높은 점수를 받는 국가의 하나이며, 강한 교육 문화가 자리하고 있음. 에스토니아 대통령은 “우리는 교실에서 교사를 대체하려고 하는 것이 아니라, 학생들이 창의적인 생각을 발전시키고 AI의 중요성을 알게 하려고 하는 것”이라고 강조함. EU

data production rules (데이터 보호 규칙)에 따라 학생들의 데이터는 외부로부터 차단될 것이고 AI 회사들의 훈련 모델에 포함되지 않을 것임. 세계의 여러 나라에서 학생들이 AI를 사용하지 못하도록 하기 위해서 교실에서 핸드폰 사용을 금지하고 있는 추세와 다른 에스토니아의 정책은 새로운 실험으로 평가받고 있음.

Artificial intelligence

Pollution from Big Tech's data centre boom costs US public health \$5.4bn

Research suggests the price of treating illnesses related to building of computing infrastructure in the US is on the rise



Data centres cause pollution through high electricity use © Elijah Nouvelage/Bloomberg

Cristina Criddle in San Francisco and **Stephanie Stacey** in London FEBRUARY 23 2025

Big Tech's growing use of data centres has created related public health costs valued at more than \$5.4bn over the past five years, in findings that highlight the growing impact of building artificial intelligence infrastructure.

Air pollution derived from the huge amounts of energy needed to run data centres has been linked to treating cancers, asthma and other related issues, according to research from UC Riverside and Caltech.

The academics estimated that the cost of treating illnesses connected to this pollution was valued at \$1.5bn in 2023, up 20 per cent from a year earlier. They found that the overall cost was \$5.4bn since 2019.

The issue is set to be exacerbated by the race to develop generative AI, which requires huge computing resources to train and power fast-developing large language models.

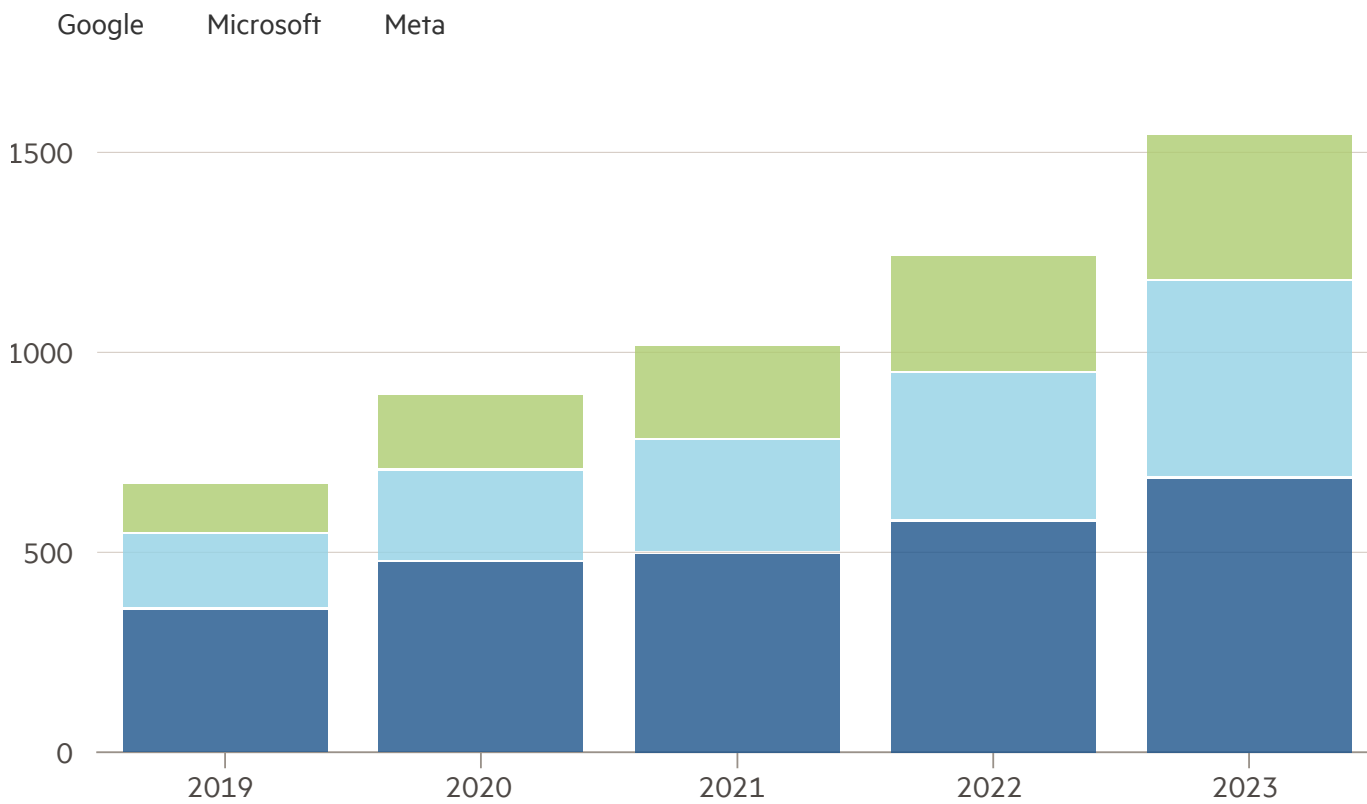
Microsoft, Alphabet, Amazon, and Meta have forecast AI spending could exceed \$320bn this year, up from \$151bn in 2023. Meanwhile, OpenAI and SoftBank last month unveiled plans for a massive [\\$500bn US AI infrastructure joint venture](#) called "Stargate".

The findings from UC Riverside and Caltech were derived by using a widely used modelling tool from the US Environmental Protection Agency. The EPA model translates the estimated air quality and human health impacts into a monetary value.

The estimates suggest Google generated the largest health costs of \$2.6bn over the five years between 2019 to 2023, followed by Microsoft, at \$1.6bn, and Meta, at \$1.2bn. Each company's associated public health cost rose year-on-year. Other firms, such as Amazon, were not included in the analysis as they do not release key data needed to model their impact.

Big Tech's AI ambitions drive mounting public health costs

Estimated public health costs from air pollution related to data centres (\$mn)



FINANCIAL TIMES

Source: UC Riverside, Caltech

Data centres cause pollution through high electricity use, often sourced from fossil fuels. Back-up generators, needed in case of an outage, are commonly powered by diesel, which also contributes to air pollution. Meanwhile, the waste from the hardware such as chips can release harmful chemicals into the environment.

Big Tech's impact on public health was calculated by distributing Google and Microsoft's North American electricity consumption figures over their US data centre locations and using their public sustainability reports. For Meta they used its disclosed per-location electricity usage data, which the first two companies do not provide.

The analysis does not account for the purchase of market-based instruments that are meant to represent investments in new renewable energy in the US and that tech companies buy to offset the pollution from their electricity consumption. These instruments include renewable energy certificates.

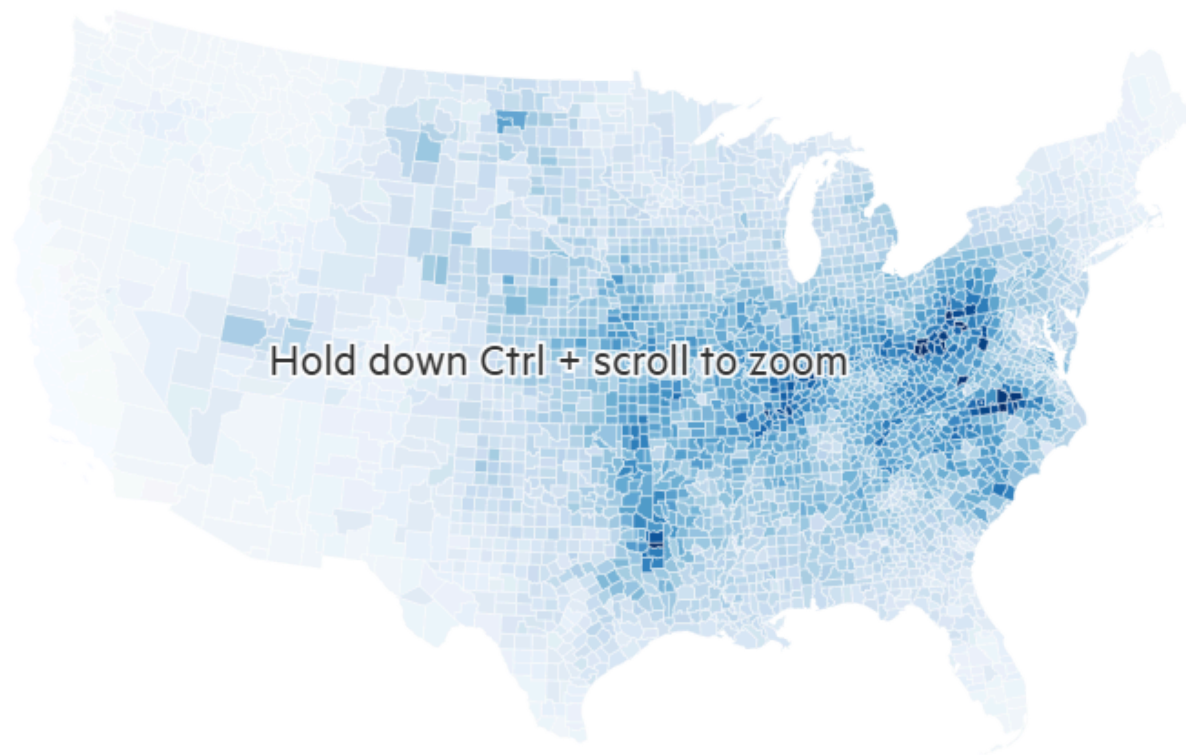
Instead, the research focuses on the pollution generated in the specific area where the data is being processed, in an accounting approach known as "location based".

"Unlike carbon emissions, the health impacts caused by a data centre in one region cannot be offset by cleaner air elsewhere," said Shaolei Ren, associate professor at UC Riverside.

Counties with more low-income households were particularly affected

Per capita healthcare costs associated with air pollution related to data centres in 2023 (\$)

Choose company: Google ▼



FINANCIAL TIMES

Source: US Census Bureau, Simple Maps • Calculated using 2023 population estimates for all counties outside of Connecticut. Data for Connecticut is for pre-2021 counties and uses population figures for 2021.

Google, Meta and Microsoft said their usage of back-up generators was below the estimated levels for the research, which is based on a median estimate of usage from publicly disclosed levels. The companies did not give detailed, per-location figures for their usage of back-up generators.

Google added that the health cost estimates were overstated and that it did not “account for our clean energy purchases in the local markets where we operate” and therefore “promotes an inaccurate emissions estimate generated under false pretences, undermining the progress of clean energy resource growth and creating a false narrative of health harms.”

The company added that its purchases enable it to achieve, on average, around 64 per cent carbon-free energy.

Microsoft said it was focused on “delivering significant local, economic, social and environmental benefits to the communities where we operate”.

Meta said it complies with air quality requirements and remains committed to “maintaining net zero greenhouse gas emissions for our global operations, building innovative and sustainable infrastructure, reporting transparently on our sustainability goal progress, and supporting the communities where we operate.”

Due to where data centres are located, such as West Virginia or Ohio, the health impact disproportionately affected lower-income households, according to the research.

Ren said there was an opportunity for tech groups to reverse the trend of a “growing public health threat” by strategically placing their data centres in less populated locations to have less impact.

According to a separate report by Berkeley Lab, supported by the Department of Energy, US data centre energy use represented about 4 per cent of total US electricity consumption in 2023 and is forecasted to rise to between 7 and 12 per cent by 2028, driven largely by AI workload demand.

“There is a concern around pollution as [AI] is energy intensive and people are using it more and more,” said Antonis Myridakis, a lecturer in environmental sciences from Brunel University London. “It is an important factor contributing to air quality and public health, it is not something we can ignore.”

Additional reporting by Kenza Bryan and Camilla Hodgson

Vietnam

Chinese investment surge into Vietnam raises risk of Donald

Trump retaliation

Shifts to avoid trade war have increased Hanoi's vulnerability as surplus with US has grown



China's strict curbs during the Covid-19 pandemic also pushed some companies to diversify outside the country © FT montage; AFP/Getty Images

A. Anantha Lakshmi in Jakarta 5 HOURS AGO

Chinese companies are fuelling almost one in three new investments in Vietnam, in a sign of how they have relocated operations abroad to avoid Donald Trump's trade war with Beijing.

But this shift is likely to increase Vietnam's vulnerability to tariffs as Trump targets countries that have racked up big trade surpluses with the US.

[Vietnam](#) has been one of the biggest beneficiaries of trade tensions between the world's two largest economies. Its surplus with the US reached a record \$123.5bn last year, the third-largest after China and Mexico.

Part of that has been driven by the exports of companies such as Apple and Intel, which have moved production lines from China to Vietnam to spread supply chain risks and avoid punitive tariffs.

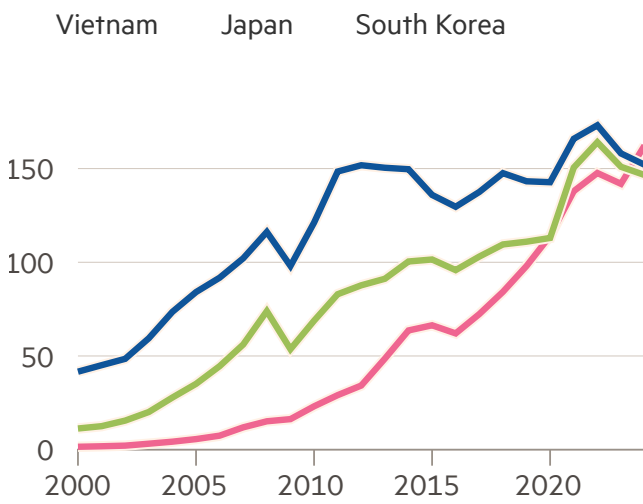
But Vietnam is also increasingly getting investment from Chinese companies, accounting for 28 per cent of new projects last year, up from 22 per cent in 2023.

"Chinese capital is forced to come to Vietnam, even though it is not cheap any more," said Meir Tlebalde, chief executive of Sunwah Kirin Consulting Vietnam, which advises foreign investors.

She said many Chinese clients were under pressure from buyers in the US and Europe to move out of China.

Vietnam overtakes Japan and South Korea as China's 3rd-largest export destination

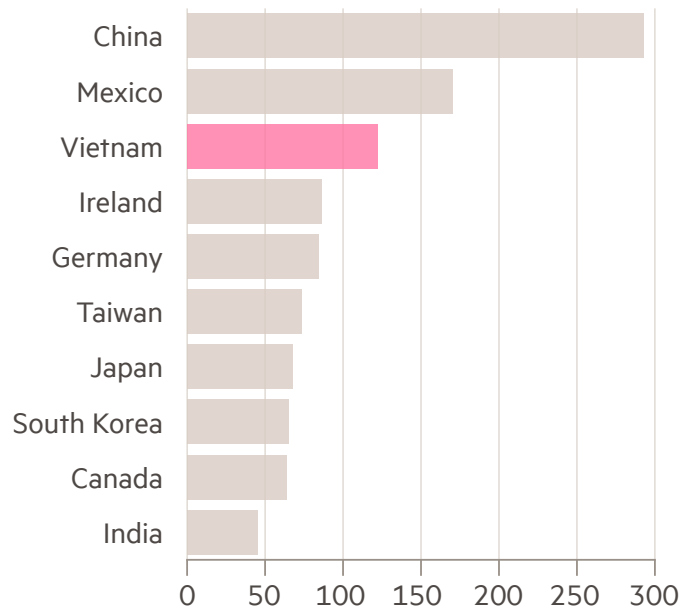
China's exports (\$bn), 2024



Source: General Administration of Customs, CEIC, FT calculations • China's largest export partner in 2024 was the US with \$524.3bn, followed by Hong Kong with \$292.7bn

Vietnam has 3rd-largest trade surplus with US

Trade surplus with US (\$bn), 2024



Source: US International Trade Commission

Most Chinese manufacturing investments in Vietnam were being made to avoid US tariffs and secure a different “certificate of origin” for goods produced by Chinese companies, she said.

However, Vietnam’s supply chain is still highly reliant on China. “At least half of the raw materials come from China,” said Tlebalde.

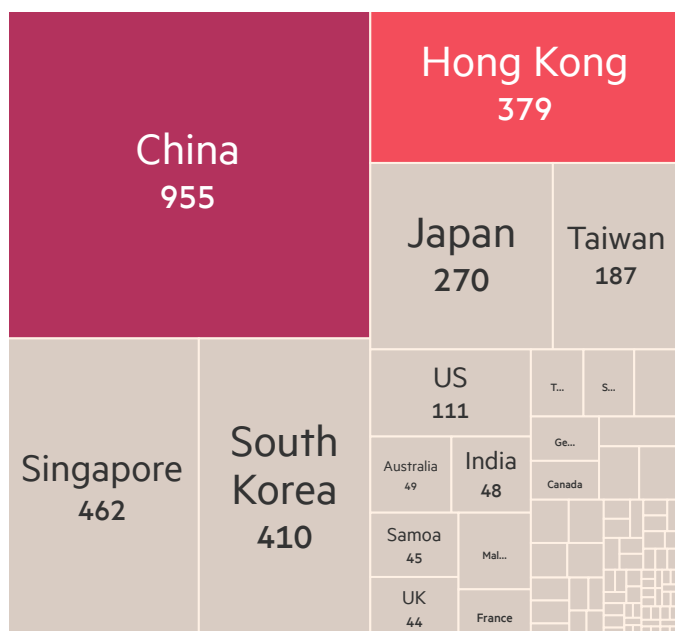
In the first month of 2025, Chinese companies accounted for 30 per cent of projects, according to the most recent government data. Chinese investments also came via Hong Kong and Singapore, the latter of which was the top investor in dollar terms in Vietnam last year, analysts said.

The surge in Chinese investments in Vietnam and its dependence on Chinese raw materials could attract [renewed scrutiny from the Trump administration](#), which has accused Beijing of circumventing tariffs by sending products through third countries.

Vietnam, as with many other countries, is also highly exposed to Trump’s threats of [reciprocal tariffs](#) on US trading partners. He has also threatened to levy 25 per cent tariffs on steel imports, which could also hit Vietnam, the US’s fifth-biggest supplier of the metal.

China had the most new investment projects in Vietnam last year

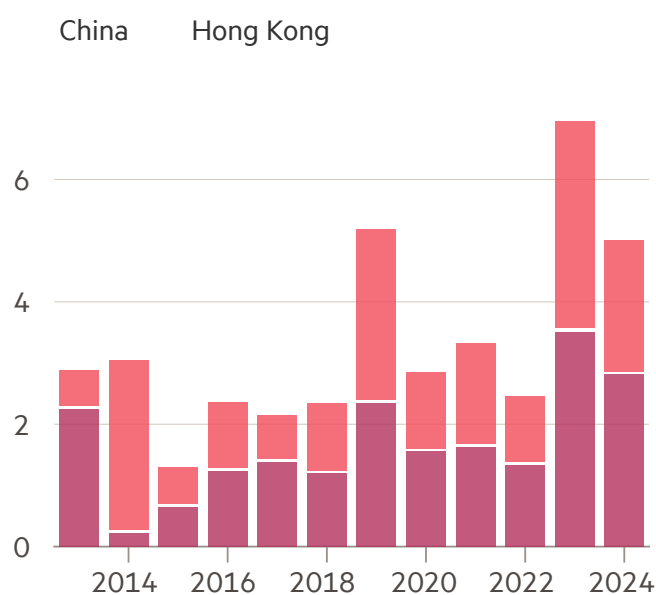
Number of new projects, 2024



Source: Vietnam's Ministry of Planning and Investment

China has increased investments in Vietnam

Newly registered capital (\$bn)



Source: Vietnam's Ministry of Planning and Investment, CEIC, FT calculations

High tariffs would have a big impact on Vietnam's economy, deterring investment and putting a damper on one of the fastest growth rates in the world. The US accounts for nearly 30 per cent of Vietnam's exports.

"There are some concerns that the US could see that [increased Chinese investment] as indirect tariff avoidance by Chinese companies, and they could investigate more goods coming from Vietnam," said Jack Nguyen, chief executive of Incorp Vietnam, which advises foreign investors in the country.

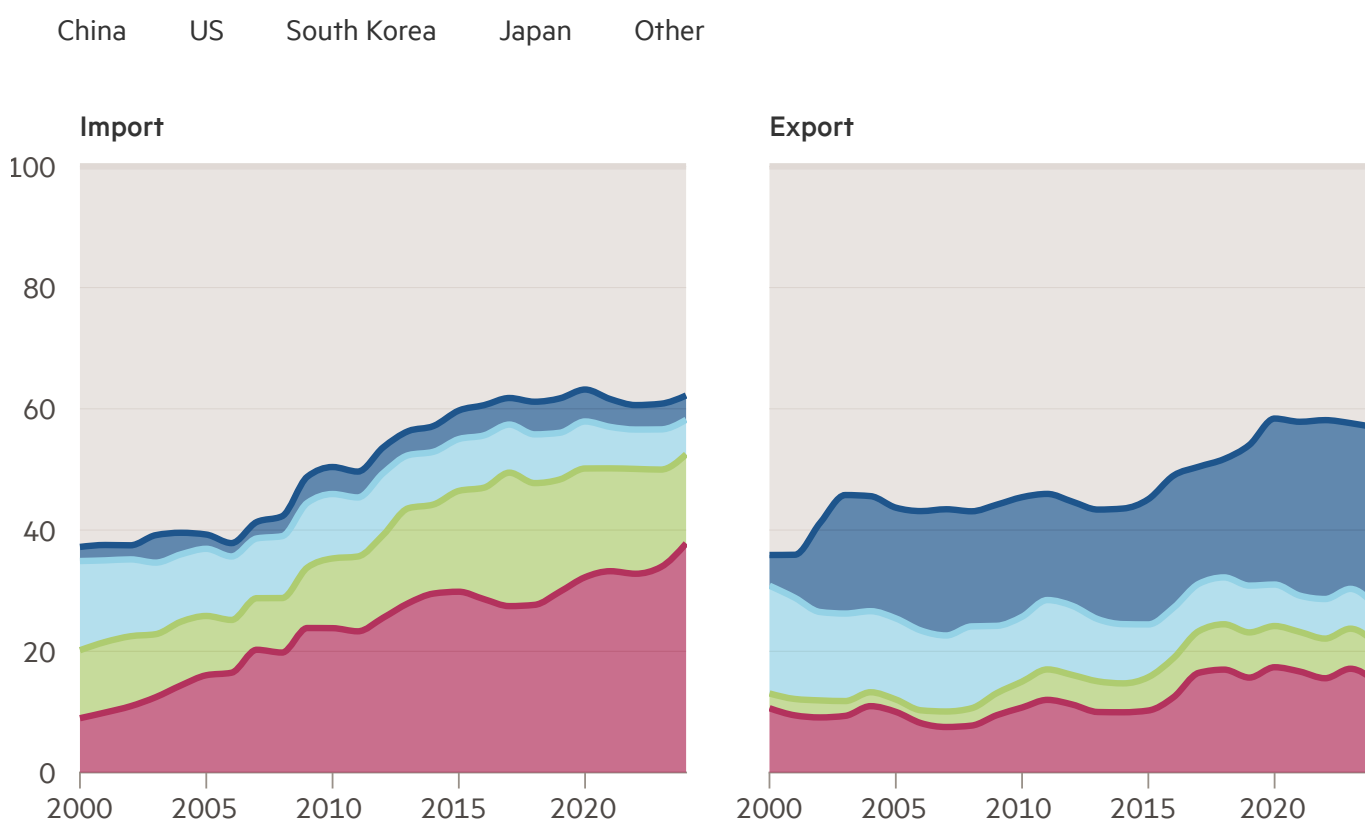
Most Chinese investment in Vietnam is in assembly and low-to-mid-end manufacturing, from cars to solar panels. China's strict curbs during the Covid-19 pandemic also pushed some companies to diversify outside the country.

A small percentage of Chinese goods were also relabelled "Made in Vietnam" without any value-added and rerouted to the US, experts said, a practice that is illegal.

Hanoi had already increased due diligence on Chinese products and investments, Nguyen said. "They would not allow Vietnam to be used as a transshipment country to the US at the risk of the US coming down hard on Vietnam."

38% of Vietnam's imports came from China, while 30% of exports went to US

Share of total value (%)



Source: World Bank, Vietnam Customs

Vietnam's Prime Minister Pham Minh Chinh acknowledged risks to his country, telling an audience in Davos last month that Hanoi was developing "political and economic solutions" to tackle its trade imbalance.

He added that Vietnam would purchase between 50 and 100 planes from Boeing in the next 10 years as well as other high-tech US equipment — and agreed to golf with Trump "all day long" if needed.

This month, trade minister Nguyen Hong Dien said Vietnam was willing to increase agricultural imports from the US and that it would not impose any measures that would restrict trade with the US.

Vietnam may also have to step up pressure on the rerouting of Chinese products. Hung Nguyen, a supply chain expert at the RMIT University Vietnam, said Hanoi could push Chinese companies to invest in higher-value manufacturing and tighten local content requirements to force them to set up a supply chain in the country.

"I anticipate [Vietnam] will use technical barriers to reject some Chinese investments," he said.

But Nguyen Khac Giang, a visiting fellow at Singapore's Iseas-Yusof Ishak Institute, said Vietnam would have to "walk a fine line" between China and the US, its two largest trading partners.

"I would not expect Vietnam to openly push back against Chinese investment," said Giang.

Koen Soenens, general sales and marketing director of industrial zones developer Deep C, said 80 per cent of investments from Chinese and Taiwanese companies in Vietnam were from those that depended heavily on exports to the US and Europe. Chinese companies now account for over 40 per cent of Deep C's sales, up from just 15 per cent in the early 2020s.

Additional reporting by Haohsiang Ko in Hong Kong

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Aerospace & Defence

US companies left out of defence stock rally

amid Trump's Pentagon cuts

Fears over spending come as European groups' shares soar on White House's threat to cut support for region's security

Sylvia Pfeifer and Clara Murray in London and Steff Chávez in Washington 3 HOURS AGO

The US's top defence companies are missing out on the sector's global rally after Donald Trump called on Europe to spend more on its own security while also vowing to cut the Pentagon's budget.

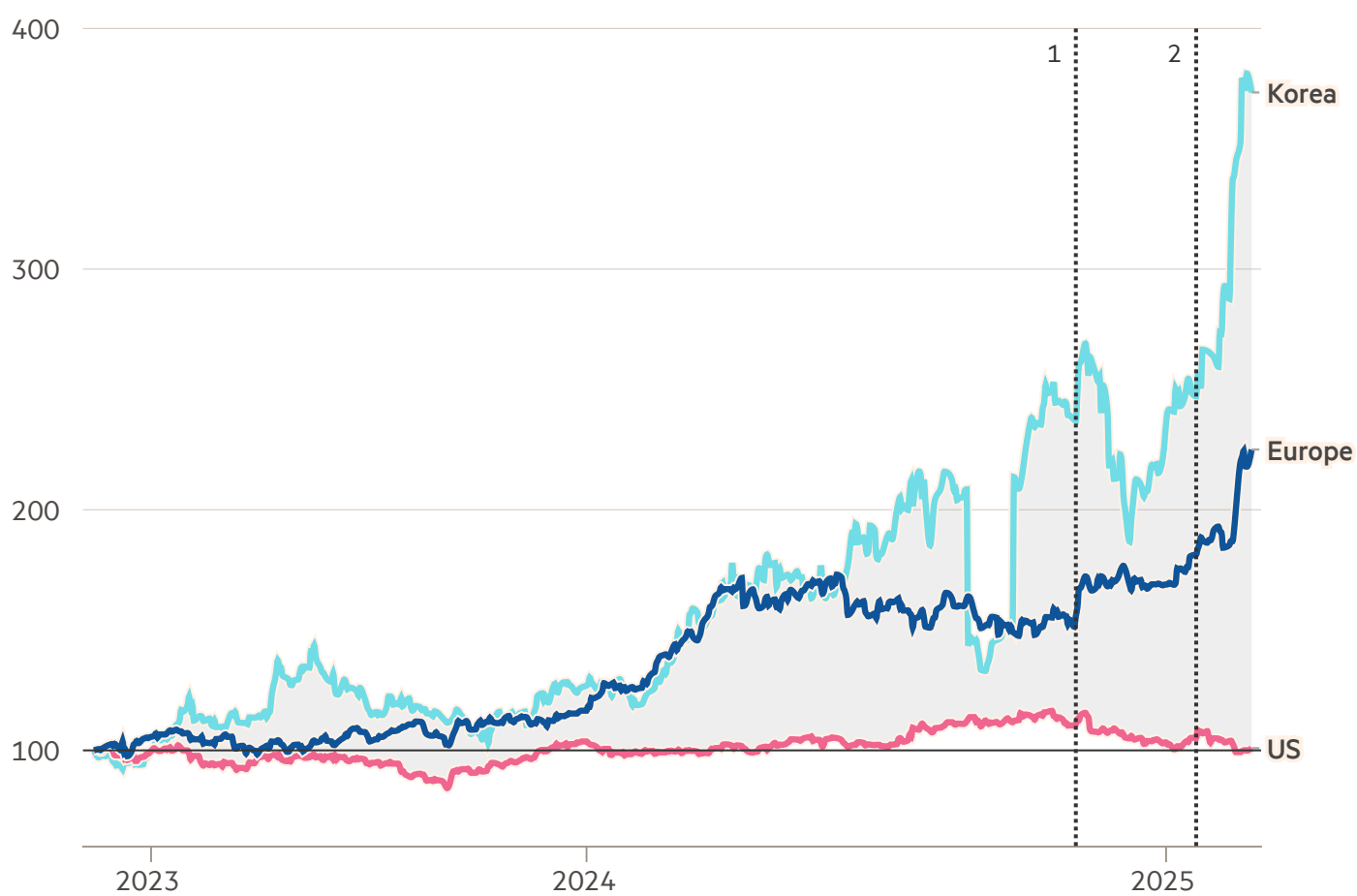
Shares in the six largest [US defence companies](#) have fallen 4 per cent on average since Trump returned to the White House, while those of Europe's top defence groups, led by Germany's Rheinmetall, have surged almost 40 per cent in the same period.

South Korea's defence companies have also emerged as winners as they tap into Europe's rearmament drive. Shares in Hanwha Aerospace, the country's largest player which has benefited from demand from Nato countries such as Poland and Romania, have risen more than 70 per cent.

European and South Korean defence stocks are outperforming their US peers

Average daily share price, selected aerospace and defence stocks, by region (February 2023 = 100)

1. Donald Trump re-elected
2. Trump takes office



FINANCIAL TIMES

Source: FT markets • US stocks: RTX, Lockheed Martin, General Dynamics, Northrop Grumman, Boeing, L3Harris Technologies. Europe: BAE Systems, Rheinmetall, Airbus SE, Saab AB, Leonardo, Thales. Korea: Hanwha Aerospace, Hanwha Ocean, Hyundai Rotem, Korea Aerospace Industries, LIG Nex1. Data to February 24 2025

The diverging fortunes underline how Trump's threat to scale back American military support for [Europe's security](#), alongside a cost-cutting drive across government led by tech billionaire Elon Musk along with last week's purge of the Pentagon's upper echelons, are reshaping investors' views of the sector.

The industry faces unprecedented disruption, said Byron Callan, managing partner of research group Capital Alpha Partners.

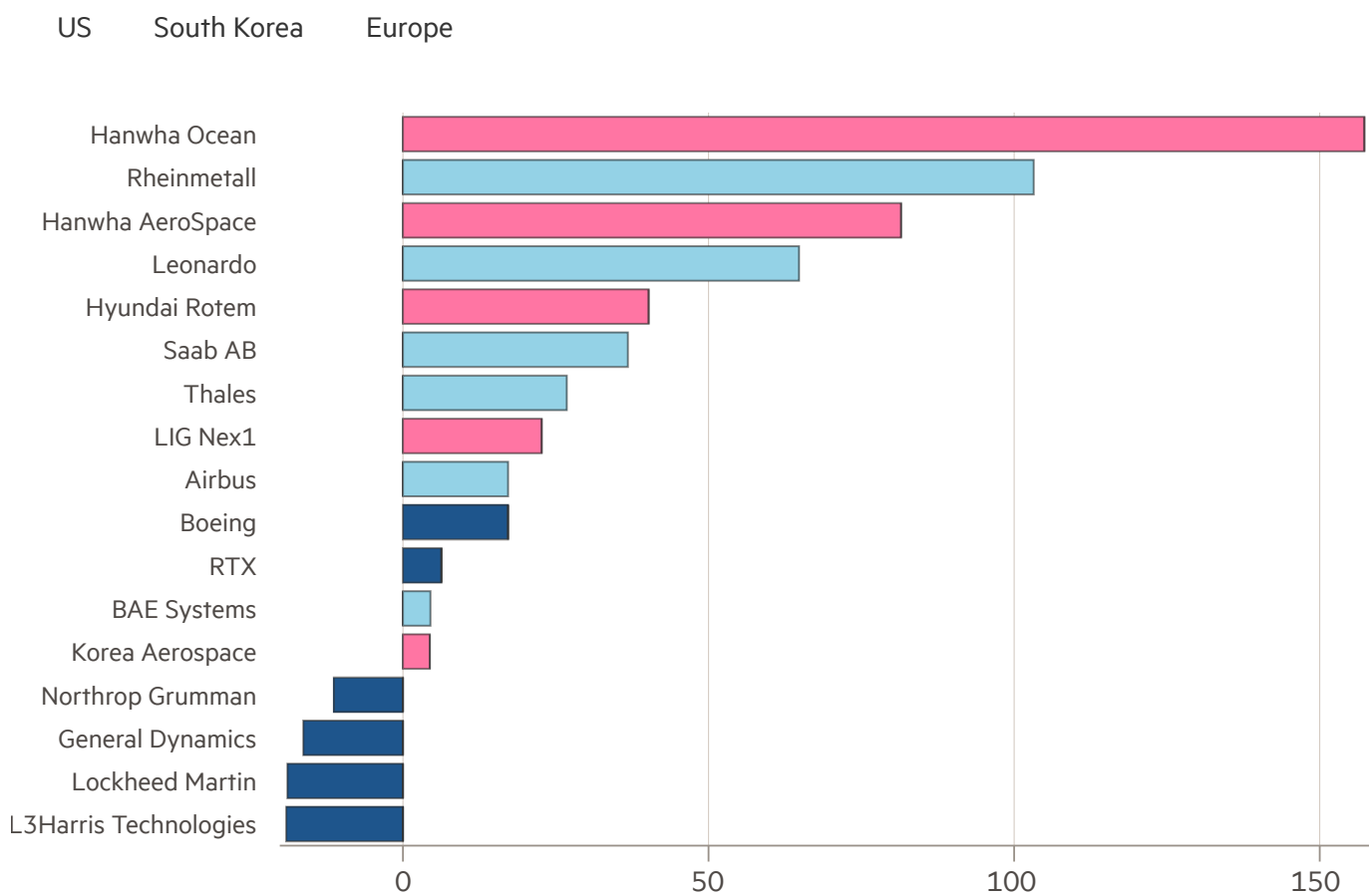
There was uncertainty on several fronts for the US sector notably "about current and future programmes, the prospect of chainsaw-like cuts to government's workforces and how other countries might react to changes in US international policies", he said.

The performance of the US defence sector lagged behind Europe and Asia before last year's presidential election, but Trump's victory and his first month in office has widened the gap. However, shares in some US groups that have large civil aerospace businesses, notably Boeing and RTX, are higher.

Shares in Rheinmetall, Germany's largest defence contractor, and Italy's Leonardo rose more than 10 per cent last week as Trump's decision to start peace talks with Russia over the [Ukraine war](#) strengthened expectations that Europe will ultimately have to [shoulder more of the burden](#) for its own security.

US defence stocks have fared badly since Trump was re-elected

Change in share price, November 4 2024 to February 24 2025, selected aerospace and defence stocks (%)



FINANCIAL TIMES

Source: Refinitiv, FT markets

German contractors' shares rallied further on Monday on hopes of higher spending by the incoming government led by Friedrich Merz, despite some concerns on whether his plans may be stymied by parties opposed to arming Ukraine.

US defence groups, on the other hand, are among companies that are heavily reliant on federal spending and are braced for cuts to the Pentagon's \$850bn annual budget. The defence department said it was aiming to cut 8 per cent — or \$50bn — of spending in fiscal year 2026. Similar-sized cuts are expected in subsequent years.

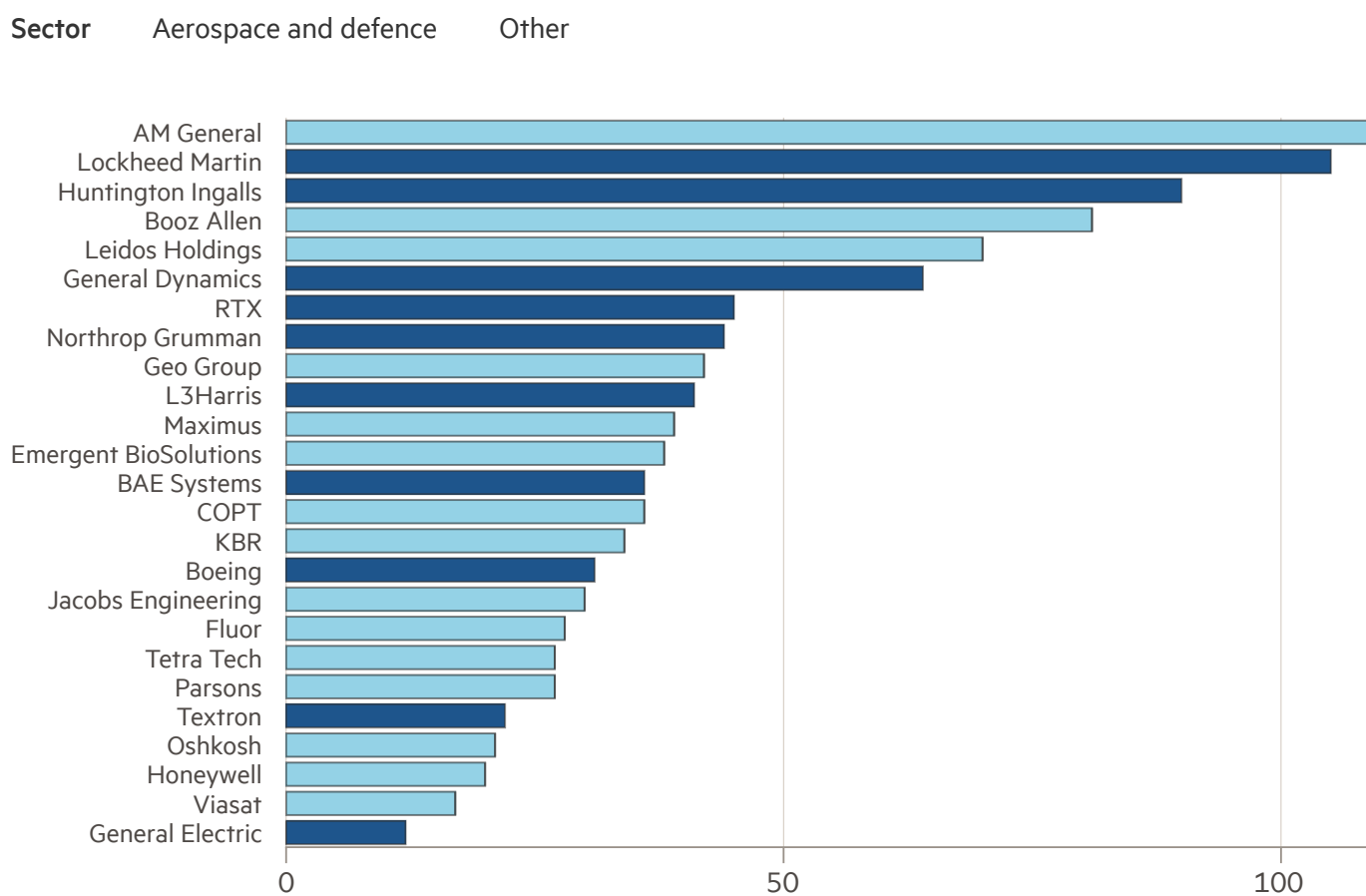
US defence secretary Pete Hegseth met with a so-called 'Department of Government Efficiency' team at the Pentagon last week, noting the focus of the cuts were "headquarters and fat and redundancies and top-line" items.

The sector received the largest amount of federal contract funding, according to analysts at Barclays, with Lockheed Martin, General Dynamics, RTX and Northrop Grumman among the top-10 beneficiaries of US government spending.

While the bulk of any cuts is expected to fall on areas such as civilian salaries, maintenance services, training and education, the industry's large contractors were unlikely to be spared altogether, according to analysts.

Many of the US companies that rely most on government spending are in aerospace and defence

Revenues from US government contracts as share of total, 2023 (%)



FINANCIAL TIMES

Source: Barclays • Percentages over 100 are due to differences in revenue recognition and calendar periods. Companies with over 10% of revenue from government obligations only

The most addressable portion of the US defence budget for the large government contractors, the so-called primes, is procurement, R&D and testing and evaluation. This represented “about 35 per cent of the total Department of Defense budget and may not be spared from cuts altogether”, said Morgan Stanley analysts.

Although the geopolitical backdrop and likely support for national security spending in Congress remained “constructive” for the sector, “the new administration’s signalled approach to government reform is injecting a wide range of uncertainty”, they added.

The prospect of technology-led groups such as [Palantir and Anduril](#) securing large slices of the Pentagon’s budget has also unnerved investors in traditional defence primes.

Shares in Palantir, chaired by Peter Thiel, a close confidante of Musk and vice-president JD Vance, are up 40 per cent this year on bets that close links to the Trump administration will boost sales to the US military and spy agencies.

Several defence executives have recently played down the impact of any cost-cutting, emphasising the country’s need for strong defence investment.

Christopher Calio, chief executive of Raytheon’s parent RTX, acknowledged there was “a lot of noise out there” at a recent investor conference but stressed there was “bipartisan support for a strong defence and a strong defence industrial base”.

There was also a “general alignment around . . . a peace-through-strength narrative and the need to project power globally”, he added.

In the shorter term, executives and analysts said there could be delays to contract awards given the change in administration. Doge could also likely try to renegotiate the terms of existing contracts rather than target actual programmes.

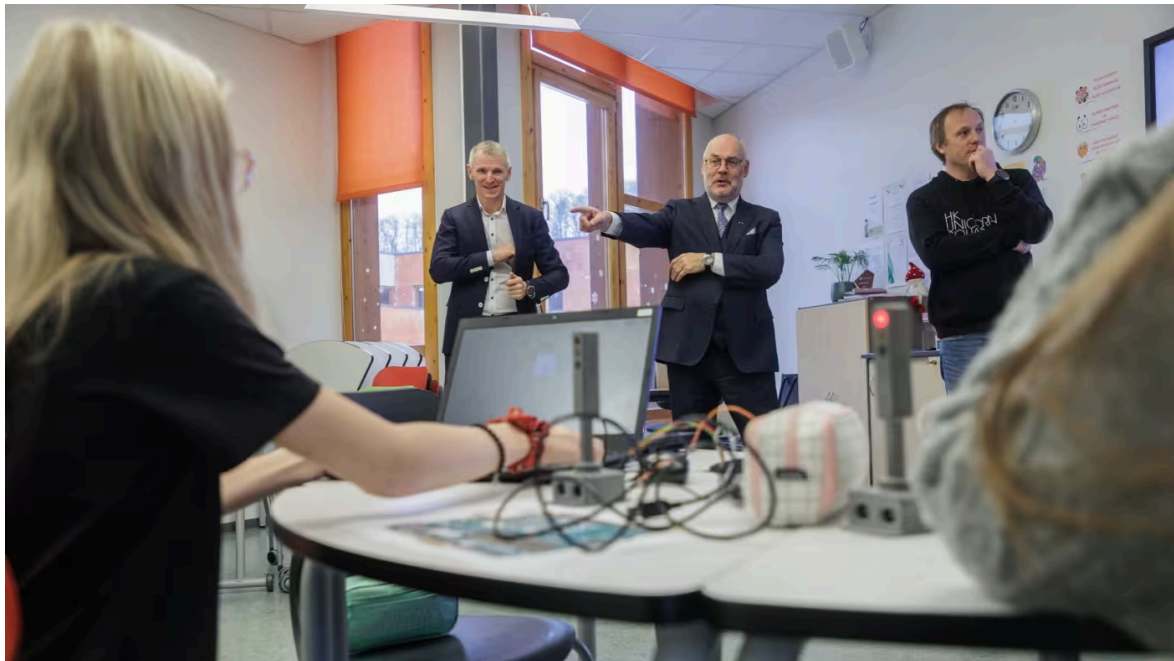
“In the first quarter, like often is the case, as we look at an administration transition in the US, there are some delays in getting things on contract,” said Kathy Warden, chief executive of Northrop Grumman, earlier this month. The company, she added, had therefore projected that growth would “gradually increase throughout the year”.

Additional reporting by Joseph Cotterill in London

Artificial intelligence

Estonia launches AI in high schools with US tech groups

Nationwide drive with OpenAI and Anthropic to help students prepare for jobs of the future



A classroom in Estonia. The AI Leap initiative aims to develop critical thinking among students and awareness of AI © Konstantin Sednev/Postimees/Scanpix Baltics/Reuters Connect

John Thornhill in London and **Richard Milne** in Oslo

Published YESTERDAY

Estonia is teaming up with OpenAI and Anthropic to launch a nationwide drive to teach artificial intelligence skills to high school students, aiming to help prepare them for jobs of the future.

The initiative, known as AI Leap, draws on the Baltic country's public digital infrastructure built over the past 30 years and its strong educational culture. [Estonia](#) is ranked top among European countries in the international Pisa education tests.

Estonia's President Alar Karis said the initiative was not intended to replace teachers in the classroom but to develop critical thinking among students and awareness of [AI](#). "We have to learn how to use it," he told the Financial Times. "AI is everywhere."

From September, 20,000 high school students, aged 16 and 17, will have free access to AI-learning tools. About 3,000 teachers are already beginning training workshops on using AI tools in the classroom.

The initiative will be extended to vocational schools — and possibly younger pupils — next year, adding another 38,000 students and 2,000 teachers.

The government said it was in advanced talks with OpenAI and Anthropic to use their AI tools for free, but would be open to working with other companies. The extensive digitisation of Estonian society over the past few decades has provided training sets for Estonian language AI models even though the country has a population of just 1.3mn.



Education minister Kristina Kallas says schools need to innovate to take account of AI capabilities © Thierry Monasse/Getty Images

Students’ data, which is subject to EU data protection rules, will be firewalled and not included in the training sets of the technology companies’ AI models. The US tech companies have said they are keen to support the Estonian initiative to strengthen their own expertise in education.

Education minister Kristina Kallas said that education had been tightly bound up with Estonia’s national identity since the 17th century as the country fought to preserve its language and culture under foreign occupation.

“Headmasters and teachers were the founding fathers of the state,” she said. “Education has been the social lift for Estonia to become a nation.”

The AI Leap initiative will be run by a public-private foundation, which has had input from Estonian entrepreneurs, including Taavet Hinrikus, the co-founder of Wise, and Jaan Tallinn, an early developer at Skype. The initial budget for AI Leap is €3.2mn, rising to €6mn next year.

Kallas said schools needed to innovate to take account of AI capabilities. The scheme aims to emphasise schools serving poorer communities — with free computers given to students where necessary — to help close the digital divide.

Teachers will decide how to incorporate AI into their lessons, Kallas said.

“It’s not the apps, or iPads, or laptops, or ChatGPT that’s crucial here. It’s the teacher,” she said. “We need to trust the teachers to know what they’re doing.”

Given the capabilities of generative AI models, asking students to write essays has become a “useless” exercise, she said.

But that made it all the more important for pupils to develop their own critical thinking skills and know how to evaluate the outputs of AI models, she added.

That would also help to inoculate the former Soviet state against disinformation coming from neighbouring Russia at a time of heightened international tensions over the war in Ukraine.

Education systems around the world have been struggling to deal with AI, with many schools looking to ban the use of mobile phones in the classroom to prevent students from using it.

But Hinrikus, the Wise co-founder, said schools had to be prepared to experiment more with technology. “It’s clear that AI is coming and people who are better at using AI will have an enormous advantage,” he said.

Karis brushed aside concerns that Estonia would depend on the US for technology just as some experts worry about its dependence on Washington for security against the threat of neighbouring Russia.

“We have several allies also where security is concerned, it’s not just the US. The transatlantic bond is important for Europe,” he said.

“We have to rely on big [companies] because even with the new tools, we can’t develop everything by ourselves. We need to have allies, we need to collaborate and so forth.”