

The Patrick Jenkins Interview ASML Holding NV

## ASML chief: 'There is only one company making those machines'

Christophe Fouquet has built Europe's biggest business through a total monopoly over the most advanced chipmaking equipment



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### Patrick Jenkins

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Anyone worried about the short-termism of the technology sector, the bravado of so many tech bros and the easy prickability of the AI bubble should take a reality-check trip to Veldhoven, the unremarkable Dutch municipality that is home to Europe's biggest company.

ASML, arguably the most consequential yet low-profile company in the AI ecosystem, employs nearly half the town (population: 47,902) and another 25,000 besides, doing the no-nonsense work of making and marketing the ever-larger machines that churn out ever-smaller computer chips.

As for the company's chief executive, Christophe Fouquet, a tech bro he most certainly is not. This grounded French physicist is both a refreshing antidote to the salesmen of Silicon Valley and a more convincing advocate for the durability of technological advance.

The secret of this 42-year-old company's success, Fouquet tells me in a nondescript meeting room at ASML's headquarters, has been teamwork. "If I had to summarise it, this has been a lot about extreme co-operation with the ecosystem, which is, first, our customers, but also our supply chain," he explains, portraying ASML as the epitome of the collaborative European company, in stark contrast to a thrusting American one.

ASML, though still unknown by many people outside the tech sector, is an increasingly crucial linchpin in the global manufacture of chips. It has an extraordinary share of the market for chipmaking lithography machines, including a total monopoly on the most advanced extreme ultraviolet, or EUV, machines that are essential in the manufacture of chips for complex AI applications.

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"I think there's been a bit of a catch-up moment for a large part of the world, how a few companies have become critical for the future of the entire economy," Fouquet says, pointing to the 88 per cent jump in the company's share price over the past year and its market value of €591bn.

He explains how investors that were enthused by Nvidia's AI vision for chip design first realised how vital Taiwan's TSMC was to the manufacture of those chips. "And then they started to wonder, 'Oh, by the way, how does TSMC make those chips?' And then they realised that they used this EUV machine [and] suddenly everyone realises there is only one company, ASML, making those machines."

In a competitive global economy, how on earth did the world allow only one company in a small Dutch town to become another AI choke point to add to the squeezes on data centre construction and energy supply? “It’s complexity really,” Fouquet says, and I remember the jaw-dropping physics behind the \$400mn EUV machine I had seen earlier in the day. The size of a double-decker bus, the machine prints circuits on to silicon wafers by firing 60,000 droplets of molten tin per second at them, using mirrors, lasers and short-wave light in a kind of vacuum-sealed nano-photocopier.

“Our customers were asking themselves . . . ‘If I only have one supplier, am I OK?’ . . . You could always say, ‘I’m going to get a second one’, but the amount of learning, the amount of investment and the amount of time you need to create that is huge.”

So trust is essential. “Our profit will grow with the [profits] of the industry, but we are not going to abuse the situation.” He admits “this is sometimes a difficult discussion” with shareholders: they might prefer the company to boost profit margins and put more debt on the balance sheet to accelerate investment and juice returns.

“We have that question every day . . . But it’s not about the money, that’s the beauty of it. If I could put a few billion down and get another 20 per cent capacity, I would do that. But because of the supply chain, it’s far more complex than that.”

ASML’s supply chain is something else. Where a typical industrial product might have a few dozen suppliers, an ASML EUV has more than 100,000 parts provided by 200 principal suppliers and 2,000 companies overall. That, Fouquet says, might limit the ability to increase production rapidly, but it has been key to the company’s performance, as the science has become ever more elaborate. “The more complex our products became . . . the more advantage we got in terms of competitiveness. We could [develop] a lot faster than anyone else.”

Rather than trying to make everything itself, ASML outsources to the best manufacturer of each component — Zeiss for optics, Trumpf for lasers, VDL for mechatronics. This has helped it crack problems that its competitors, notably Japanese groups Nikon and Canon, have failed to, leaving them focused only on previous-generation deep ultraviolet (DUV) technology. “We really needed the best brands across the world to get it done. I can tell you, if we had taken it upon ourselves . . . to do everything on EUV, there is no way we could have done it.”

On occasion, when suppliers have looked vulnerable, ASML has bought them to safeguard production. Laser maker Cymer, acquired in 2013, was one example. More recently ASML has taken an 11 per cent stake in French AI challenger Mistral. But collaboration normally trumps acquisition.

There is one big fly in the ointment: the US government. Its [ban on exporting EUV technology to China](#) blocks ASML from selling its most advanced, most profitable products to an AI market that is second only to the US. Although President Donald Trump has no direct jurisdiction over ASML (and is far less strict on Nvidia, which is allowed to sell its own EUV-made chips to China), the US has put pressure on the EU and on the Dutch government to impose an embargo on ASML — a source of clear frustration for the company.

“We understand that some technology may be restricted for obvious and legitimate concerns, but if we go too far, we are going to create the opposite results of what we’re trying to achieve in the first place,” says Fouquet. Namely, he says, China will be spurred to innovate itself — [Huawei recently emerged](#) as a pivotal force in China’s development of DUV machines, for example. “If you over-restrict, you bring desperation,” he goes on, no longer mild-mannered but exercised now. “And desperation creates a huge appetite for people to accelerate their own technology and, potentially, at some point, become strong competitors.” So is that his message to Trump?



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“It’s not a message to Trump. It’s a message to all people who make those decisions,” he says bluntly. “I think the Dutch government decides for itself what it wants to export, or not, to China. So that’s first a message to the Dutch government [and] a message for the EU.”

We have yet to discuss the most clichéd question of all: whether AI — and thus the demand for the EUV machines and the other tech that underpins it — is a bubble ripe for bursting.

Fouquet admits the markets are jittery. But he insists this is no short-term sugar rush: the AI “revolution” will endure. “I think the AI effect on society and industry is going to take 10 to 15 years. We’re only seeing the tip of the iceberg.”

ASML is confident its EUV technology will evolve over a similar period. Transistor circuits will be stacked on top of each other. Mirror apertures will be increased to focus light more precisely.

Fouquet presents himself as an accidental CEO, a career semiconductor engineer who just grew with the industry. After studies in Grenoble and London, he worked in Israel and the US before landing at ASML 18 years ago and becoming the boss two years ago. (Having a physicist in charge again, after a financial manager, was a relief, confides one colleague.)

What tech is he most excited about now? “Humanoids will be among us . . . a few years from now,” he says. “We are just at the beginning of that cycle. [They] will be doing some of the tasks we all hate doing — the gardening, or emptying the dishwasher.” (He skates over my protest that many people love gardening.)

But what about truly transformative inventions? He is enthusiastic about the scope for “space tech” to revolutionise telecoms and energy production. But does he believe, for example, that nuclear fusion is finally within commercial reach? Are there lessons to learn from ASML’s success in developing a pioneering technology such as EUV after 20 years of trying? “For EUV”, Fouquet explains, “ASML thought the need would be absolutely there, therefore we put all our energy in it, almost at some point putting even the company at risk to get it done. I don’t think that you have that in some of those technologies [like fusion]. You need at some point people to believe that this is absolutely critical to get it done.” And rather than “200 people or 200 companies” pursuing the idea with splintered inefficiency, you need a monomania: “[You need] concentration when it comes to technology.”

After all this highbrow talk, I’m curious to know quite how the ASML boss reconciles running a company in the vanguard of the AI revolution with being a father to six children. Fouquet’s answer is refreshingly unscientific. “You could see the children as a burden,” he says. “But for me, it’s always made me stronger because the time I spend with my family, the time that I spend outside this office, is my rebalancing art . . . It gives me joy, and I think coming to work with joy is a lot better than not.”

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