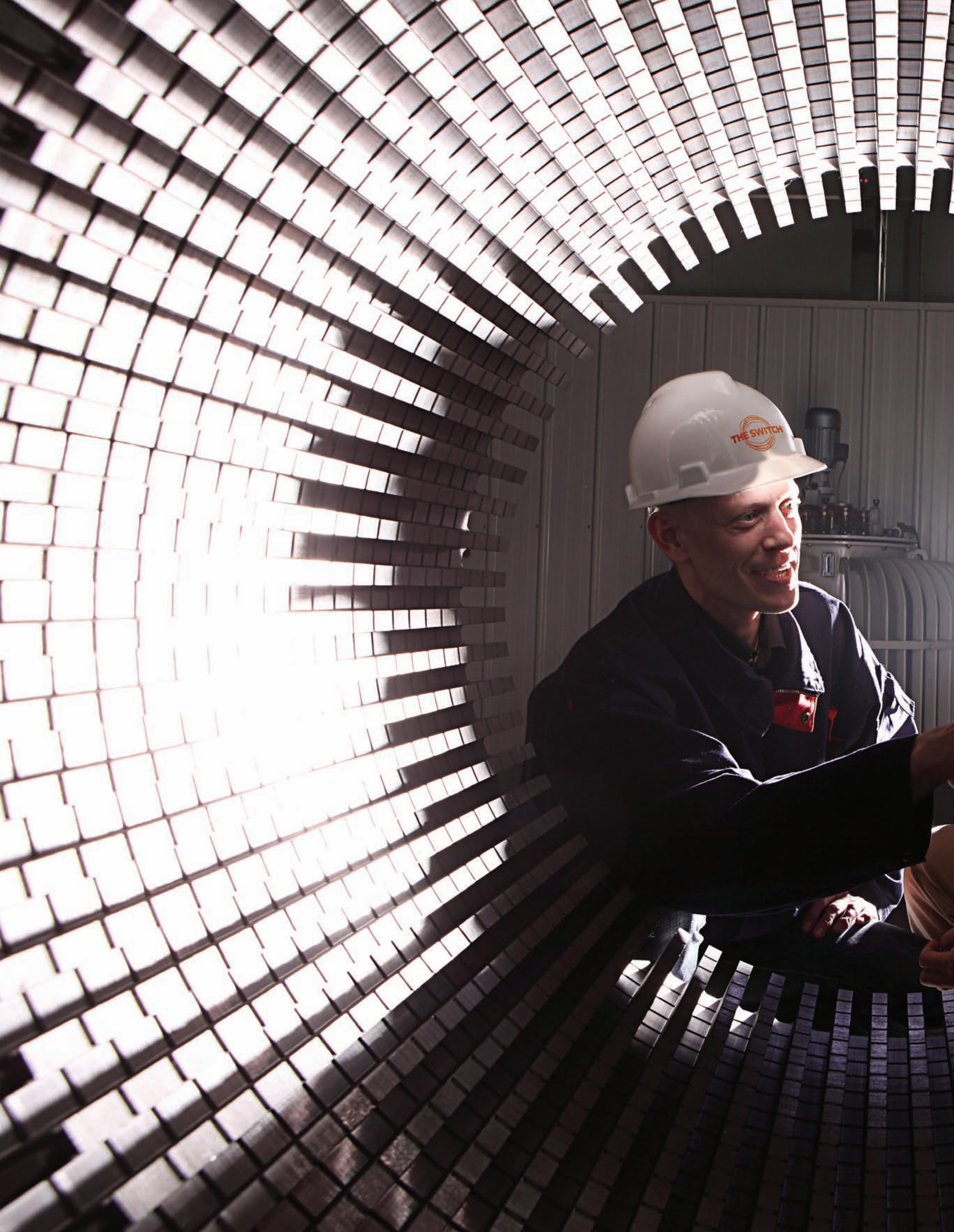

THE SWITCH

Hunger for the new

Permanent-magnet generator maker The Switch has found that China is more receptive to new technology than Europe, writes **Darius Snieckus**

When Jukka-Pekka Mäkinen looks back on his early travels around China a decade ago, one impression stands out from his kaleidoscope of memories: the Chinese hunger for the new.

"I'd fly through Beijing, never staying more than a night, and out into some of the most remote places in the country, and you'd be at a factory in what felt like the middle of nowhere, and the managers were all very progressive, always looking for the latest technology," says the chief executive of Finnish permanent-magnet generator (PMG) maker, The Switch.

"It was all happening so quickly. From hardly any wind industry to speak of, suddenly — because of the government investment at the time in technology development — say, 80 turbine manufacturers popped up.

"In 2004, our tailor-made offering [of PMGs and full power converter (FPC) packages] was a very compelling story and this led to our early discussions with Goldwind and others."

As in Europe, conventional double-fed induction generators were king in the embryonic Chinese sector when The Switch arrived — only Goldwind among the top-table manufacturers was working with direct-drive machines.

However, there was a growing appetite for the next generation of drivetrains, and the Finnish company quickly found itself collaborating on pioneering PMG projects with academic institutions such as the Shenyang University of Technology.

"China was starting from zero in many ways, so they didn't want yesterday's technology — they had done their homework and they wanted the latest, the best equipment available," suggests Mäkinen. "In these days, PMGs were one of the technologies seen as key as the wind turbine manufacturers started to build up production."

For The Switch, the first fruits of China's hugely ambitious pro-renewables stimulus policy were not long in coming. In 2006, an order for a batch of prototype and zero-series converters was clinched from Goldwind, and, inside a year, a contract for 1.5MW direct-drive PMGs for turbine maker Dongfang. The wheels were quickly turning.

"The European conservatism, then and now, means that PMGs are more common in China today," says Mäkinen. "The Chinese, I think, saw that, ultimately, PMGs were the technology for the future."

Today, The Switch is delivering "hundreds of units a year of PMGs and FPCs" in China, which now accounts for 50% of the company's total sales.

The Chinese wind industry, emboldened by an industrial culture focused on new technology and breakneck expansion, has gone from next to nothing to a nationwide fleet of turbines 75GW strong, including almost a third of the 45GW of turbines installed last year around the world.

"We have grown with Goldwind and Dongfang and others over the intervening years," says Mäkinen. "We have around 5,000 installations in China, so we have built up a huge installed base — from the tropics to the Arctic — to learn from over the years."

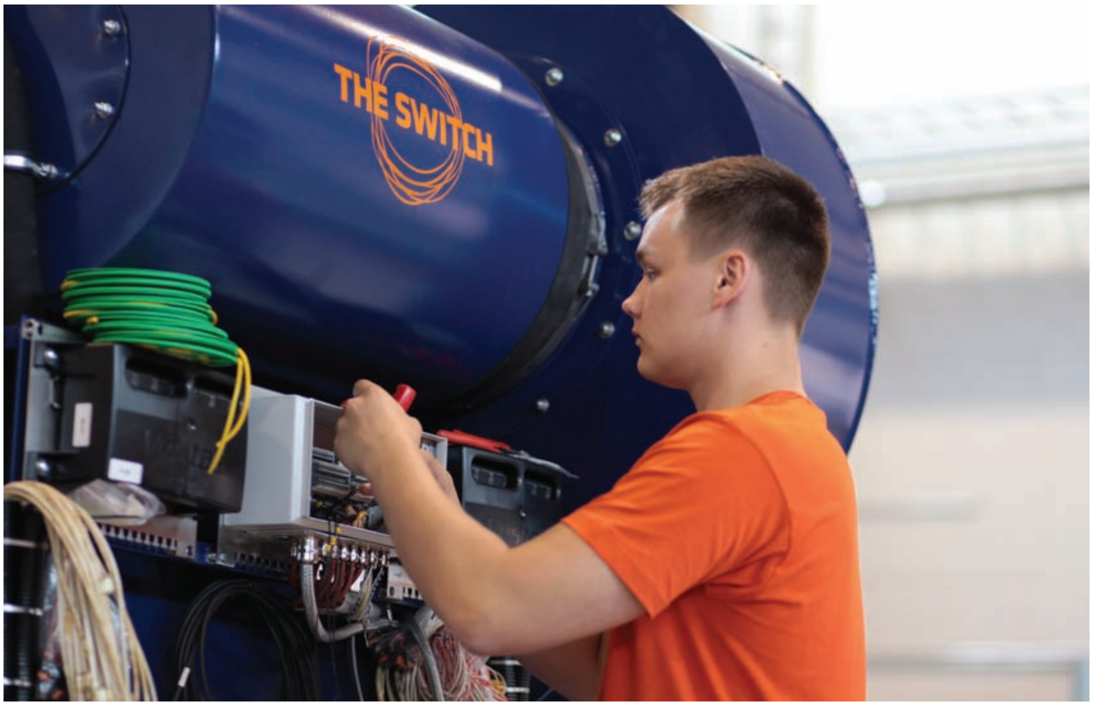
One of the spin-offs of The Switch's success in the country has been the outgrowth of its own "model factory" concept.

Based on an automotive industry template to transplant a European-style manufacturing line directly into a foreign factory in one, the idea is to set up a manufacturing facility that can flexibly speed up — or slow down — project deliveries depending on volume demands, while maintaining high-specification quality control.

The Switch's model factory, which can fabricate generators and converters up to a capacity of 5.5GW a year, is scaleable and can be tailored to meet a turbine maker's sometimes changeable manufacturing requirements.

"Rapid swings in production

Photography | The Switch



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END RESULTS: The Switch boss, Jukka-Pekka Mäkinen

volumes up or down; changes in product mix when new technologies become commercially available or as improved features are developed; even changes in lifecycle to keep pace with the ongoing evolution in the industry — this approach allows for fast ramp-ups and ramp-downs, ensures manufacturability, and most importantly, is repeatable for consistent quality," says Mäkinen.

"End results are better, with fewer variations — regardless of geographical location.

"This allows not only for cross-checking for quality control but also cross-learning from one model factory to another, so that we are always improving the manufacturing process."

Along with manufacturing facilities in Lu'an and Hangzhou, The Switch has a 70,000-square-metre factory built for it by Dongfang in 2008 in the northeast city of Deyang — 120km from the epicentre of the Great Sichuan Earthquake that struck in May that year, killing almost 70,000 people and leaving as many as 11 million homeless.

"We were signing the contract when the earthquake hit," remembers Mäkinen. "In the very Chinese way, we all quickly regrouped and by the end of the summer construction had begun."

The Deyang factory has now ramped up to supply PMGs to The Switch's customers across the region.

Construction of manufacturing facilities in China has been accompanied by a build-up of key personnel. David Zhao, a mechanical engineer by background — who previously held senior management positions at Vestas as well as in the telecommunication industry — has been brought in as the country's general manager. David Ho — a Chinese-Canadian whose laurelled business career includes a stint as Nokia's Greater China president and as head of private equity firm Permira — joins The Switch board.

"David Zhao is the first time we have a Chinese manager," notes Mäkinen. "He has a very strong operational background and is just a very solid guy. And with him, we don't need to translate everything.

"David Ho is a very intelligent and energetic individual with a quite extraordinary track record with some of the world's largest companies. We feel he will be a help in many respects — with the added advantage of being able to demystify China for us, to crystallise things, to help us navigate our way forward. He is a really big asset to the board."

The appointments of Zhao and Ho, Mäkinen says, were the final pieces in the assembly of a "China platform".

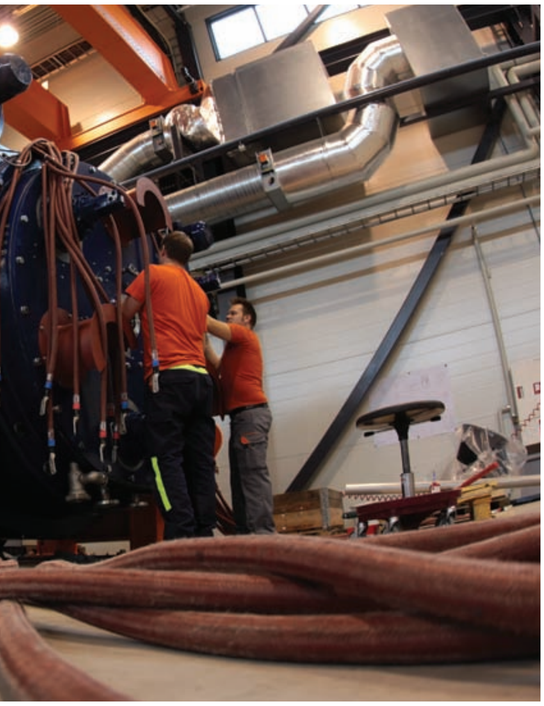
"We believe everything is in place now," he says. "We are ready for the future with a committed, independent organisation in the country."

Early indications are that Mäkinen's optimism will be vindicated. After a rollercoaster ride through 2010-12, where revenue peaked at €135m ($180m) before slipping down to €44m, this year looks to be bumper for The Switch in China.

In June, it finalised orders worth "well over" €100m for PMGs and FPCs for "a number of Chinese customers", as well as seeing its first 5MW high-speed drivetrains installed in the field for CSIC HZ Windpower.

The bespoke drivetrain packages represent the highest power range that The Switch has commissioned to date — and are the next step in its development of PMGs for offshore turbines such as Vestas' 8MW model.

Two further 5MW packages are



ENERGETIC: The Switch board member David Ho; *far left and left:* trials of The Switch's PMG technology at the company's facility in Vantaa, Finland; and *below left*: engineers at its factory in Deyang, China

currently running in prototype turbines in China, one for Dongfang and another turbine maker.

"We have established a position in China as a key technology provider," states Mäkinen. "We have a proven track record of independent operation and collaboration with Chinese companies on their terms. The supply chain is now more developed, and the PMG and FPC are seen as mature technologies — they have gone through the proving process from bigger and badder technologies to near-mainstream and we now know how to manufacture them efficiently in China.

"After a rocky stretch, we are back on the growth path, heading in the right direction."

The Switch's experience in China has also opened Mäkinen's mind to new commercial philosophies.

"China just does it. Not like us in Europe who plan and plan and plan and still sometimes it doesn't work. I believe in their more active approach: get things rolling and make adjustments as you go. Sure, there have been some quality issues in some of the turbines that have gone up in China, but these issues are being resolved and China is now the biggest power in the wind industry today." R

'SOLID GUY': China manager David Zhao