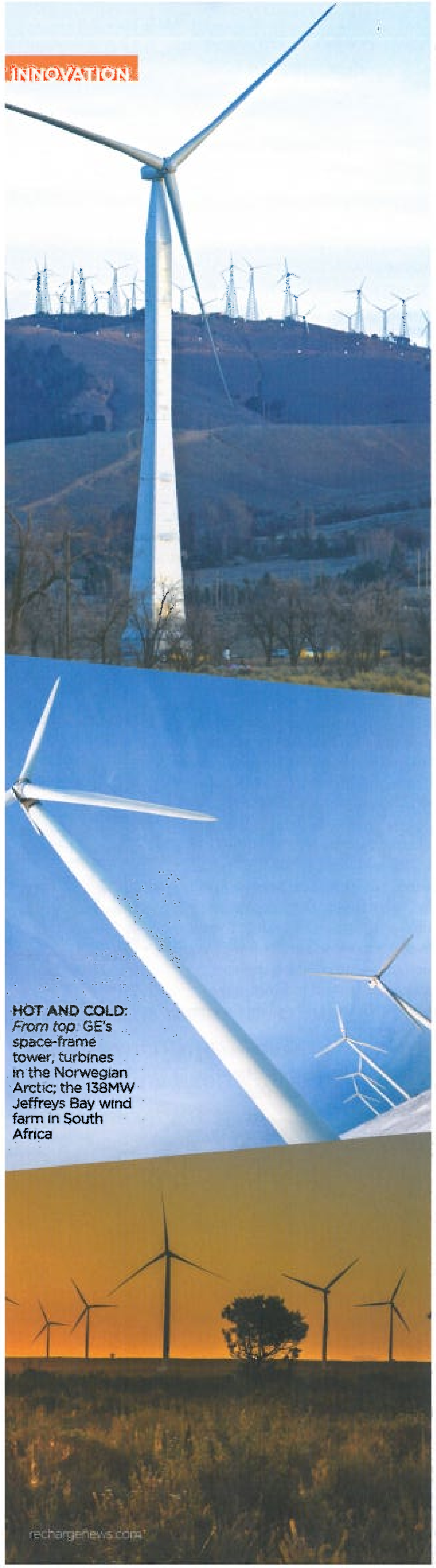

HOT AND COLD: *From top:* GE's space-frame tower, turbines in the Norwegian Arctic; the 138MW Jeffreys Bay wind farm in South Africa

new mass-producible technologies that use "contemporary" manufacturing techniques will be important, it will be concepts such as GE's "digital wind farm" (DWF) — which knits together turbines, hardware, smart sensors and efficiency-boosting software to increase production by up to 20% — that will be the step-change.

"We are investing in the power of the industrial internet, which is the combination of intelligent machines, advanced analytics and people at work," says Harris, "and we're seeing that there are ways to optimise existing assets better than ever before and provide greater economic benefit to operators and investors."

Cahuzac adds: "For operating wind farms, big data techniques can improve the asset performance analysis and enhancement, and help to develop predictive maintenance routines."

This would not be tinkering on the edges of wind-power economics: GE calculates that the global industry could add $50bn in "extra value" if all 50GW of wind farms being built this year were outfitted with such technology.

As it labours to squeeze the most it can out of its onshore resource, the European wind sector finds itself on the brink of true globalisation. The markets classed as "emerging", as Kettwig notes, "could be every country or market worldwide".

"We have the technical knowledge and the turbines to produce energy in every kind of condition — from the Arctic to hot and humid regions around the world, from coastal sites to sites in the interior. Everything is possible and everything has to be done," he states.

Cazuhac points to Africa as a key "frontier" for the onshore industry. "[There are already] a few big projects commissioned in South Africa, for instance, and in five to seven years, I am convinced that nearly every country in the world will have discovered wind energy."

While Harris agrees that the coming years will be "full of exciting prospects" for the industry, he argues that the markets coming into focus around the globe should be divided into "new installed capacity" and "volume growth" to better understand the opportunities.

"I'm firmly of the belief that we are on a journey of continued development and expansion," he says. "It's easy to make the prediction that mature markets will provide stable baseline, and emerging markets are critical to the next ten years of growth; but this does not do justice to the vibrant and diverse opportunities that we are seeing.

"From a capacity perspective, China, India, US, Germany and Brazil will all be up there, but from a pure volume growth it will be dominated by countries that are pushing market-specific policies: Egypt, South Africa, Pakistan, South Korea — and maybe even Russia will surprise us."

However bright the skies look for wind power in the long term, no sector is better schooled in how quickly the industrial weather can change. Pitfalls aplenty might lie ahead, whether caused by shifting political policy or public misconception.

"There are still so many people who are underestimating the industry and there are so many things to do, especially regarding the political framework and the general commitment of governments to really fight against climate change," says Kettwig.

For Harris, the biggest problem facing the wind sector in the near future "is how we are perceived and the misconceptions surrounding wind generation, both in terms of cost and technical capability".

"Until we address this, we will constantly be struggling with policy shapers to provide frameworks for stability and with planning systems that do not allow the latest and most efficient technologies to be deployed — and we will not realise our full potential."

Cahuzac — perhaps appropriately as the head of a company about to pioneer a trio of offshore wind farms off France — believes fortune favours the brave.

"The wind-energy sector is still considered as immature by some people, even in Europe. Indeed, it's a recent industry, but what we have already achieved in terms of cost reduction and capacity growth is meaningful.

"And it is just the beginning: the pace of growth is accelerating worldwide, raising new challenges for the wind industry such as large-scale grid integration or direct competition against other conventional or renewable technologies. As the industry wants to address these challenges, we must be extremely ambitious and aim higher than ever before."

Cliff Harris, Antoine Cahuzac and Hans-Dieter Kettwig are Event Ambassadors for the EWEA 2015 conference in Paris in November.

Photography | Zbigniew Wanduch | Keith Adkins

Partnerships, not purchases, are key to Chinese growth

CARLO CECCHI

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Illustration | Lauren Crow

The opening chapters of "the China Story" were, to all intents and purposes, one long tale of economic and industrial success, with the occasional narrative twist. The process that began nearly 40 years ago and was turbo-charged at the beginning off the millennium has delivered unprecedented prosperity to millions.

Since China opened up to the global trade system and liberalised its economy, the ability to deliver volume manufacturing and low-cost products has been the main engine of its rapid development. "Made in China" is a global brand, appearing on everything from the cheapest trinket to the most expensive gadget.

But this key competitive advantage alone can no longer support a rapid acceleration in development. China, which has been experiencing a slowing economy for some time, has turned to high-end technology to boost growth.

Until recently, most Chinese deal-making with overseas companies consisted of state firms buying up raw materials such as coal or iron ore.

> Selecting the right partner allows the buyer to gain benefits from specialist expertise, as well as scaleability and speed of decision-making

But under the current Five-Year Plan, Beijing is aiming to rapidly close the technology and quality gap that separates it from Western economies, through a strategy of mergers and acquisitions involving hi-tech foreign businesses.

In particular, the country's leaders have set specific targets concentrating on smaller, value-added European companies with outstanding technology and strong R&D, including many in the wind and marine-energy sectors.

As state-owned enterprises (SOEs) have stepped up their global investment activity in the past 12 months, mergers and takeovers have become the fastest way for Chinese firms to short-cut into foreign markets, and cash-strapped firms and a weak euro have provided ample opportunities.

But this approach does not guarantee the development of new products, nor will it foster the upgrading of existing technologies. This is evident in China, where there have been no clear technological breakthroughs made in the wind and marine-energy industries, even though domestic companies have made huge investments and acquisitions in both sectors.

Successful technology transfer and integration require an approach that goes well beyond a simple cash transaction, so the traditional M&A model is not enough.

Chinese buyers will have to understand that access to Western markets does not mean unfettered access to technology. More importantly, it does not represent a guarantee of continuing engineering competence or the ability to keep innovating.

To move efficiently into the manufacturing of high-end technology, SOEs need to become pioneers in new technology by selecting the correct partner — one that actually owns the intellectual property. Together, they can develop smart, long-term, market-oriented relationships based on mutual trust and a share of the risk and profit.

Selection of the right partner enables an OEM to scale production up and down for particular components as required. When you have everything in-house in a vertically integrated manner, rather than outsourcing, your ability to adapt production to market fluctuations is hindered.

In addition to scaleability, a "networkable" approach allows companies to embrace an asset-light, flexible business model, giving the buyer benefits from specialist expertise and speed of decision-making.

Wind OEMs and their component suppliers need to focus on their core competences. By embracing specialisation and partnership, rather than vertical integration or M&As, Chinese businesses will find that they can tap into a partner's cumulative experience, which leads to significantly improved quality and enables continued innovation.

That's why The Switch has adopted this collaborative model, which enables us to form strong alliances to deliver complete, assembled machines or to license products to any partner that is willing to help pioneer new technology.

Another benefit of this form of partnering is the possibility of gaining access to state-of-the-art technology. As well as helping Chinese companies bridge the technological gap, this will improve quality and reliability.

In the future, acquiring value-added tech assets is likely to remain a difficult undertaking. Chinese SOEs will need to abandon their overambitious approach, and embrace the global, flexible partnerships that are at the core of many technological breakthroughs today.