

MARCH 2016



EMERGING MARKETS

Featuring an interview with ReNew Power's Sumant Sinha

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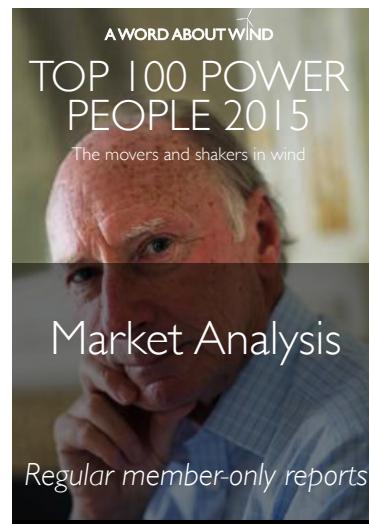
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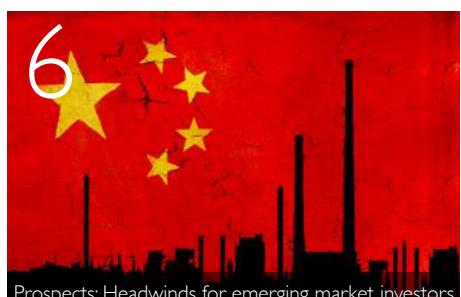


"The events offer a great format for networking, as well as finding out what other players in the market are really doing"

*Karl Smith,
Director,
Green Investment Bank*

CONTENTS

New prospects: Economic turbulence buffets wind investors	6
Q&A: Henrik Stiesdal discusses technology and new markets	9
Interview: ReNew's Sumant Sinha talks about growing in India	11
Analysis: Denham Capital on the need to focus on fundamentals	16
Opinion: Paul Elberse on the Patagonian potential of Argentina	19
Interview: Lekela Power's Chris Antonopoulos discusses Africa	21
This year: Key dates for your diary in 2016	27



Prospects: Headwinds for emerging market investors

9

Q&A: Henrik Stiesdal on emerging technology



Interview: ReNew Power's Sumant Sinha on India



Analysis: Denham's Steven Mandel on fundamentals



Interview: Lekela's Chris Antonopoulos on Africa

16

Opinion: Paul Elberse on the potential of Patagonia

19

21

EDITORIAL



by Richard Heap,
editor at A Word About Wind

"Investors can still find opportunities if they focus on fundamentals: supportive policies and growing energy demand."

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It is a tough time to go into emerging markets. Falling commodity prices and China's slowdown have combined to harm the prospects of some of wind's most promising markets.

Investors need to tread carefully and make smart decisions—and the insight in this report from top emerging markets investors can help with that. In here, you will find vital business intelligence on the key wind markets in Africa, Asia and South America.

One of the most interesting of these is India, where Narendra Modi started a renewables revolution when he was elected prime minister two years ago. India is looking to grow its total installed wind capacity by 30GW over the next seven years, and the barriers to entry for overseas investors are lower than in fellow Asian superpower China.

And there is no-one better to give insight on India than cover star Sumant Sinha (page 11). He is founder and chief executive of ReNew Power, the largest independent power producer in the Indian wind sector with a portfolio of around 900MW. In this interview he tells us how wind is set to develop in India over the next five years; and how firms from outside India can hope to gain a foothold in a nation of over 1.2billion people.

He also explains why ReNew is set to focus more of its attention on India's burgeoning solar sector over the rest of this decade, and talks about the firm's new sovereign wealth investor, the Abu Dhabi Investment Authority. Even if you aren't planning to enter India, this is key business information that you will not want to miss.

We have also got on-the-ground insight about the African market from Lekela Power chief executive Chris Antonopoulos (page 21). Lekela has

built a 1.1GW project pipeline, mostly in wind, since it was formed by Actis and Mainstream Renewable Power one year ago. Antonopoulos has worked on projects worth a combined \$4bn in Africa in his career, and talks about wind's prospects as countries seek to address energy shortages.

And, in Latin America, we hear from Paul Elberse from Uruguay-headquartered finance house Ficus Capital (page 19) about optimism in Argentina under incoming president Mauricio Macri. Meanwhile, private equity firm Denham Capital looks at the prospects for overseas investors in key markets including Brazil (page 16).

This all shows that investors can still find opportunities if they focus on the fundamentals: supportive policies and growing demand for energy. We run down the latest GDP growth figures in 20 key emerging markets in our data-led introductory feature on page 6.

But we are not done there. We have also been to meet bona fide wind superstar Henrik Stiesdal (page 9), former chief technology officer at Siemens, to discuss the emerging trends in wind power tech and how this can open up new markets. He gives us his views on energy storage, floating turbines and supply chain optimisation following his nearly four decades in the wind industry. He also discusses his life outside the German giant.

So to re-cap: three big interviews, including two of our Top 100 Power People, and on-the-ground insight from emerging markets across the world. What are you waiting for? Get stuck in, and then let us know what you think.

All the best,

Rich



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EMERGING PROSPECTS

Investors should focus on countries with supportive policies and growing energy demand as wind is buffeted by global turbulence.

Emerging markets are on a knife edge. Investors took \$735bn out of these markets in 2015, which is the first time in more than 25 years that there was more money flowing out of these areas than going in. The Institute of International Finance has forecast that a further \$450bn is set to come out in 2016.

The reasons for this \$1.2trn exodus are well known. Commodity prices have been falling, and the oil price crash of the last 18 months means that oil is now hovering at around \$35 a barrel. This has hit large commodity exporters including Brazil, Russia and South Africa.

Meanwhile, the slowdown in China has raised broader questions about the health of the global economy, and raised the risks of corporate defaults in emerging markets. In 20 key emerging markets for wind, GDP growth in eight of them was lower in 2015 than 2014 (see graph 1, page 7), and in 12 of them was lower in 2015 than 2013.

This shows that investors in wind have to tread carefully when choosing markets to enter. There are plenty of countries looking to build wind farms to cope with energy shortages and meet the goals agreed at United Nations climate change talks in Paris in December, but investors cannot

The slowdown in China has raised questions about the health of the global economy, and raised the prospect of corporate defaults in emerging markets.



Graph 1 - GDP growth in 20 key emerging markets

Country	2013	2014	2015	2016 (f)	2017 (f)
Argentina	2.9	0.5	1.7	0.7	1.9
Brazil	3.0	0.1	-3.7	-2.5	1.4
Chile	4.2	1.9	2.1	2.4	2.9
China	7.7	7.3	6.9	6.7	6.5
Costa Rica	3.4	3.5	2.8	4	4.2
Egypt	2.1	2.2	4.2	3.8	4.4
Ethiopia	10.5	9.9	10.2	10.2	9
India	6.9	7.3	7.3	7.8	7.9
Jordan	2.8	3.1	2.5	3.5	3.8
Mexico	1.4	2.3	2.5	2.8	3
Morocco	4.7	2.4	4.7	2.7	4
Pakistan	4.4	4.7	5.5	5.5	5.4
Panama	8.4	6.2	5.9	6.2	6.4
Poland	1.7	3.4	3.5	3.7	3.9
Romania	3.5	2.8	3.6	3.9	4.1
South Africa	2.2	1.5	1.3	1.4	1.6
South Korea	2.9	3.3	2.5	3.5	3.7
Thailand	2.8	0.9	2.5	2	2.4
Turkey	4.2	2.9	4.2	3.5	3.5
Uruguay	5.1	3.3	1.5	1.9	2.8
Green text = better than previous year					
Red text = worse than previous year					

Source: World Bank, Global Economic Prospects

Graph 2 - Wind growth in those 20 key markets

Country	New capacity in 2015 (MW)	Total capacity at end of 2015 (MW)	% growth in 2015
Argentina	8	279	3%
Brazil	2754	8715	46%
Chile	169	933	22%
China	30500	145104	27%
Costa Rica	70	268	35%
Egypt	0	610	0%
Ethiopia	153	324	89%
India	2623	25088	12%
Jordan	117	119	5850%
Mexico	714	3073	30%
Morocco	0	787	0%
Pakistan	0	256	0%
Panama	235	270	671%
Poland	1266	5100	33%
Romania	23	2976	1%
South Africa	483	1053	85%
South Korea	225	835	37%
Thailand	0	223	0%
Turkey	956	4694	26%
Uruguay	316	845	60%

Source: Global Wind Energy Council

rely on stable growth in energy demand or an easy ride from the local economy to provide growth. As ever, supportive politicians will be crucial to growth.

Figures from the Global Wind Energy Council shows that the size and growth rate of the wind industry in key emerging markets is varying wildly (see graph 2, opposite). For example, while China and India are classed as developing economies, they are respectively the largest and fourth-largest wind markets by capacity worldwide, and saw 27% and 12% growth last year. Their size and established local players make them difficult markets to break into.

At the other end of the spectrum, the staggering 2015 growth figures for Jordan and Panama reflect the fact that both are small markets and can be skewed by the completion of one large scheme. In Jordan, the 117MW Talifa scheme was commissioned in September; and, in Panama, the 235MW extension of the Penonome project was inaugurated in November.

These are both interesting new markets but there is no indication they will match those high growth rates in 2016, and investment opportunities in both will remain limited. Growth in previous years is no guarantee of continued growth in years to come.

For proof of that, just look at Poland. In 2015, 1.3GW of new wind capacity was completed to take total capacity to over 5GW, but the Polish Wind Energy Association is forecasting that only 100MW-150MW would be added this year.

The Polish government is introducing a 'contracts for difference' tendering scheme but has not yet revealed the dates of the first auctions, which means the first new schemes to be completed under this system would not come online until 2017.

Growth in previous years is no guarantee of continued growth in years to come. For proof of that, just look at Poland.

Brazil still looks like a relatively good prospect for established investors, even though it is mired in its worst recession since the 1930s.

The election of a pro-coal government in October is also set to harm the prospects for wind, as it is proposing legislation to hugely increase the distance that turbines can be built from homes, and has raised the prospect of jail time for those who do not comply. It is also mulling plans for wind farm owners to renew their permits every two years, which is set to hit returns. Investors should watch these plans with interest.

And the lack of new wind additions in Egypt and Morocco in 2015 does not give a true reflection of the potential in these markets, where the governments are pushing for new wind capacity and have been seeking developers. The Moroccan government awarded Enel Green Power, Morocco's Nareva and Siemens the right to build 850MW in late 2015.

For investors, growth cannot be taken for granted, and it will take thorough research to find markets with good prospects.

Even a market such as Brazil still looks like a relatively good prospect for established investors, even though it is mired in its worst recession since the 1930s.

Companies like Odebrecht, Renova and Tractebel are looking to offload operational wind farms to cut their debts and recycle capital for new developments. This gives established investors a good opportunity to enter the market while the government continues to push for more wind farms.

In Mexico, we also see the potential for wind to help meet new energy demand and help the government to meet obligations under the Energy Transition Law, which was adopted in December.

This sets a goal for Mexico to achieve 35% of clean energy in its electricity mix by 2024. Total wind capacity in Mexico grew by 714MW to over 3GW in 2015, and the new pro-renewables laws can only strengthen the wind industry's growth prospects in the country, even though the government has also thrown its support behind natural gas.

But no market will be immune from turbulence in the global economy, and pro-renewables sentiment can change quickly in any country. Investors will have to make decisions with care — and leave themselves able to exit quickly if needed. ■

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Q&A: HENRIK STIESDAL, WIND PIONEER

Wind technology guru Henrik Stiesdal stepped down as chief technology officer at Siemens Wind Power last January to focus on his own projects. We met him to talk about tech innovation, new markets and what he is working on now.

What are the key challenges for wind?

There is a big challenge on offshore with the cost, so we need to move fast in cost reductions, particularly on the infrastructure. This is not always easy, because a wide range of processes and habits have been taken over from the oil and gas industry, where cost has been much less of an issue. But you cannot say that is a reason to not go offshore. We go offshore because we need the space and we don't want the visual challenges of onshore.

Onshore simply has the problem that there is limited space. That is not so bad in the US or China, but in Europe it is an issue, so offshore has the solution to that but it has the problems too.

And the biggest trends in wind tech?

The most eye-catching trend is the usual suspect – turbines getting bigger. However,

it is interesting to note that the big volumes being installed in the United States and China are generally with the technologies as we know them. The biggest volumes in the US are the 1.7MWs, and in China it is the 1.5MWs-1.8MWs, so it's certainly not just about the turbines getting bigger. It's also very much about the industrialisation.

What will be key innovations?

It is clear that floating turbines would broaden the market a lot, if we get that technology in place, and of course that is very attractive. You also have the remote sensing of wind by lidar, and other things like smarter regulation of rotors may make turbines cheaper, but that's still a long shot.

Do you see much potential in big data?

I'm not sure. Data allows you to do predictive maintenance and approach things in a more rational manner, but I think that

machine technology should be very reliable and I'm not sure that a service operation would actually want all that data. I think they would be just as well doing what they are good at and do ordinary O&M on machines that are inherently very reliable.

What innovations would help firms move into new markets?

The main thing is that the supply chain has to be quite normal. By that I mean it's not enough to sell a turbine somewhere. You also need the infrastructure that can install it, transport it, and maintain it. You need to have simple organizational structures that allow you to go out and establish yourself in countries without it becoming a disaster.

You need machines and ways of educating local people so that they can do your work without requiring high levels of initiative and so on. It is not only about it being simple. It is more about having a way whereby

you can manage this change of educating people and controlling them out there.

You have been working on projects including floating turbine foundations and thermal storage. Are these a way to get involved in a new business?

No, I don't do anything that could turn into a new full-time job. I have great fun working on my research with partners, and I like to make my research publicly available.

On my floating foundation system, I am being aided by some old buddies from the US. They provide sparring and do the more demanding simulations and so on. That is wonderful. And DNV GL has also been extremely helpful out of Norway and Denmark. On the storage side. I am blessed with a lot of interaction with smart people.

What is the best way to do storage?

What I'm looking at is grid-scale thermal energy storage. I cannot know at this stage whether there is a snake in the paradise somewhere, but until now it looks like the best bid for genuine grid-scale storage.

A lot of the storage ideas that are being considered simply do not have the potential to deliver enough kilowatt hours. When people speak about flow batteries or flywheels or pumped hydro or whatever I

"It is very nice to be on my own. I felt for many years this big burden that so many people depended on me, and now I have nobody depending on me."

sometimes get very tired. It is as if they deliberately turn a blind eye to realities. Flow batteries and flywheels will never deliver the energy, there are not enough mountains where we can do pumped hydro, so such solutions will not change the game.

It sounds like you get a lot of enjoyment from your work. Does it differ from life at Siemens?

Yes, it is very nice to be on my own. I felt for many years this big burden that so

many people depended on me, and now I have nobody depending on me.

Also, I ended up spending a lot of time on administration and what felt as non-value-creating activities, and now I only do work that creates value. I miss my colleagues, but I truly enjoy the no-administration, fast-decision setup of a single-person company.

In your statement on leaving, you mentioned about spending more time with your family.

One of the things that gradually made the decision of retirement from big-company management happen was sitting in meetings around the world thinking 'What if I did not see as much of my parents as I'd have liked?' My father is 91, my mother is 89. If somebody calls tomorrow and says 'Your father died', was I doing the right thing by sitting in a meeting and not getting home enough? I had to do something.

And I also thought that I was not spending enough time with my two daughters. I don't regret the time spent on work, but I felt that now was the time to enjoy it. ■



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RENEW'S ENTHUSIASM

ReNew Power founder and chief executive Sumant Sinha talks to Richard Heap about the prospects for renewables in India and how overseas firms can get involved.

India has overtaken China as the world's fastest-growing large economy, and its leaders are seeking new wind farms of 30GW in the next seven years. So why is Sumant Sinha, founder of India's largest wind developer ReNew Power, not more bullish about the prospects for wind?

There is one simple reason: solar. The Indian government is looking to install three times more solar than wind by 2022 — around 95GW — and that is set to push more wind developers into the solar sector: "Of course, wind is still very sizeable. Currently India is doing around 2.5GW of wind a year, so even to get to 5GW a year is doubling the market... but, on a relative basis, solar is going to be growing at a faster clip," he says.

This is forcing Sinha to shift ReNew's strategy. In this interview with *A Word About Wind*, he talks about the prospects for the business over the next five years; his views on how the Indian economy is likely to affect renewable energy; and the challenges for overseas businesses who might be looking to break into the labyrinthine Indian market.

POWERING INTO SOLAR

Sumant Sinha started his career working in investment banking, where he spent a decade in New York and London with Citicorp Securities and ING Barings. He moved back to India in 2002 to work as chief financial officer at conglomerate Aditya Birla Group; and moved to the renewables sector in 2008 as chief operating officer at Indian turbine maker Suzlon.

During his two years at Suzlon he led aggressive measures to improve the firm's finances as it struggled to adapt to slowing demand in Europe. In early 2007, Suzlon bought 87% of German manufacturer Repower, now Senvion, in a deal that valued the firm at €1.2bn, so it could expand in Europe. However, the financial





Vital statistics

Name: Suman Sinha

Born: February 1965 in Giridih, India

Educated: Indian Institute of Technology, Business School; Indian Institute of Management, Columbia University

Lives: Gurgaon, India

Career: Worked in investment banking in New York and London for ten years with Citicorp Securities and ING Barings before returning to India in 2002 as CFO of Aditya Birla Group. Joined Suzlon as COO in 2008 before leaving in 2010 to set up financial consultant Savant and wind and solar developer ReNew.

Personal interests: Tennis, cricket

crisis that started in the second half of 2007 hit demand, and Sinha was brought in to steer the firm through tough times.

Sinha left Suzlon in 2010 and set up two firms. First, he founded investment banking and consulting firm Savant Advisors; and, after that, he founded independent power producer ReNew Power in late 2010 to work in renewables, primarily wind. Over the last five years, ReNew has built a wind and solar portfolio that is set to exceed 1GW this month. This means the firm is the largest independent power producer in India's 25GW wind sector.

He is also son of former Indian finance minister Yashwant Sinha, and brother of Jayant Sinha, the current finance minister.

Sinha says he has enjoyed making the shift from a manufacturer to a developer:

"In Suzlon, you have to sell more turbines than you sold in the previous year... and all your costs are there, so you have to get to a certain minimum level of sales from zero every year. In the IPP business if you don't get good quality projects then you don't do any projects, but your cash flows are still there. It's an annuity kind of business," he says.

Since he founded ReNew its focus has been on wind: 900MW of its 1GW portfolio is in wind, and it has operational projects in the states of Gujarat, Karnataka, Madhya Pradesh, Maharashtra and Rajasthan. It has completed around



ReNew's power: 60MW Jath wind farm in Maharashtra

"A couple of things are militating against wind in India. The most important is that, fundamentally, India is a solar-rich country."

400MW in the last year, including a 50MW project in Rajasthan, 40MW in Karnataka, and three schemes totalling 120MW in Madhya Pradesh. Its pipeline for the next year is "several hundred megawatts".

But now Sinha is looking to change the company's main focus to solar, which he says it set to make up a larger proportion of ReNew's portfolio than wind by 2020. The company has around 500MW of new solar capacity in its development pipeline.

"A couple of things are militating against wind in India," he says. "The most important of those is that, fundamentally, India is a solar-rich country. Our natural resource in solar is better than our natural resource in wind; and, as costs for solar are coming down, what's happened is that solar tariffs have now come down below where the wind tariffs were at."

"And the outlook for continued cost reductions is a little bit stronger for solar than for wind, so there is a general sense that will drive more solar additions as well," he says. India's leaders also see the wind sector as far more developed than so-

lar, with 25GW of installed wind capacity compared with 5GW for solar, so think that wind needs less support.

Sinha adds that wind farms in India are most productive in the monsoon season, which is when demand for energy is lower because cooler temperatures mean far fewer people run air-conditioning systems. This combination of factors means that the government is set to push harder for solar than wind, and means that ReNew must shift its plans accordingly.

"We are returns-focused investors and we're pretty agnostic about wind and solar. They're both clean sources of energy, and I think we'll go wherever we can do better risk-adjusted projects," he says.

SOVEREIGN SUPPORT

The company is also in a good financial position to pursue new opportunities.

ReNew's largest investor is Goldman Sachs, which has invested \$370m over four funding rounds since 2011. The most recent of these was in October, when Goldman invested an additional \$50m in the company in a funding round that also saw ReNew secure a big new investor: Middle Eastern sovereign wealth fund Abu Dhabi Investment Authority, which invested \$200m.

This means that ReNew has raised total equity of \$655m over its five-year history, and Sinha says the firm can build up to 3GW of capacity with the funding it has.

ReNew's relationship with its Middle Eastern backer ADIA is still new, and Sinha says it is too early to know how hands on this investor will be: "They've been in the company for three months. I think they are fundamentally long-term investors, they invest in the management and, ultimately, they trust management to do the right things."

ReNew has no need to raise additional equity at present, but Sinha is still considering a listing for the company in the next few years. He revealed in summer 2014 that he was planning an initial public offering in 2015, but did not think it was the best time to proceed.

"We looked at that and then decided to raise some more private capital and keep going, and that's why we did the ADIA transaction. We thought we'd keep growing the business to a much larger size before we do something," he says. That is the goal, but it will not be an easy one given

"There's a lot of the local private sector that doesn't have the capital to invest today. They can team up with foreign capital and go forward, and I think that will happen more this year."

the economic headwinds currently facing business in India.

The country's Central Statistics Office last month forecast that GDP growth would be 7.6% in 2016, which would be up from 7.2% in 2015. Sinha is more bearish because the nation's Index of Industrial Production, which details growth in key parts of the economy including electricity and manufacturing, is only showing growth in industry of around 2% or 3%.

"Even if there's growth in the economy industry's certainly not seeing it, the factories are not seeing it and, when I talk to my colleagues in other areas of the economy, nobody is really seeing demand revival," he says. Slow growth in the industrial sector means that growth in demand for new energy sources, including wind and solar, will also be slow.

And Sinha says this is hindering investment plans: "There's a lot of the local private sector that doesn't necessarily have the capital to invest today. They can team up with foreign capital and go forward, and I think that will happen more this year. We'll probably start seeing the beginnings of a more broad-based revival this year and through next year."

This should open opportunities for renewables investors to get into the Indian market over the next few years, but there are big challenges for them to do so. One of the biggest is to understand how business and politics work in a nation with 1.3 billion people and 29 states. The largest, Uttar Pradesh, has a population of 199 million, which is bigger than Pakistan's.

CONNECTION CONUNDRUMS

Wind and solar firms in India face similar challenges as those in other parts of the world. These include difficulties acquiring sites; building the export cables to link projects to the grid; grid reliability; and getting paid on time by power distribution firms. One of the biggest of these is securing rights of way to build export cables.

"Sometimes projects just get stuck for a year at a time. You have situations where there's a 250MW project, it's up, but you just can't run it because it's not connected," he says. "You might be going through a village and the village just says: 'We won't give you right of way.' It's usually just to get a little more payment for the right of way that they're giving you."

One of the reasons that ReNew focuses on smaller projects, of around 50MW and smaller, is that they are less susceptible to delays with potentially disastrous results.

"It isn't very smart to do large-size projects in India," says Sinha. "The execution is difficult and, if you commit to a large project and it doesn't get done within the year, then you risk losing your PPA [power purchase agreement] or having the PPA terms renegotiated, which isn't very smart. You can get delayed by months on a land acquisition problem."

Investors also have to be very active in finding appropriate sites in the first place.

One way overseas investors can enter the Indian market is by acquiring or partnering with a local player. For example, Enel Green

The future: Sinha is planning more projects like ReNew's Manesar solar farm



"If a Republican wins [the US presidency], it will be unmitigatedly bad for climate change. If a Democrat wins there is still some hope."

Power chief executive Francesco Venturini told us that the Italian utility bought BLP Energy, a subsidiary of Bharat Light & Power, for €30m last year as it could take ten years to gain the knowledge it needed if it tried to do so alone. In another big deal last year, Sembcorp Industries bought a 60% stake in India's Green Infra.

However, Sinha plans to keep growing before he would consider selling out: "It's not of interest to us, and the reason is there is tremendous opportunity in the sector right now in India, and selling anybody at this stage would be premature. It might be relevant for us if we were running out of capital or had other financing issues, but we have very strong investors and we are very well-provisioned as far as capital is concerned," he says.

There should be little to hinder ReNew given the political support for renewables in India, and the global climate deal that was signed in Paris in December.

Sinha was present at the United Nations talks and is happy that 196 countries reached an agreement on limiting climate change, even if the deal could have been stronger. But his big concern globally is

the outcome of the US presidential election this November, as if a Republican becomes president then the US could walk away from the COP21 deal.

"If a Republican wins the presidency then I think that will be unmitigatedly bad for climate change. If a Democrat wins then there is still some hope. The US can unilaterally walk out on the agreement, nobody can do anything about it, and the whole thing will collapse."

By contrast, he has a positive view on India's prime minister, the pro-renewables Narendra Modi, who won power in May 2014. While it took 18 months for his government to get the first solar auction up-and-running, it is now looking to award contracts of 1GW a month.

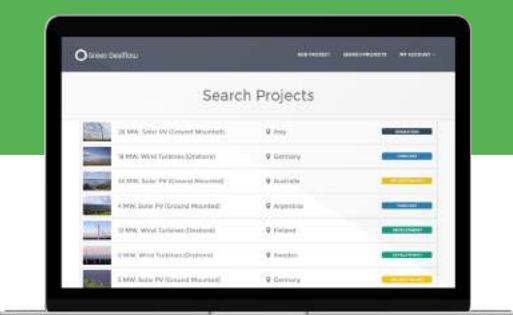
"They're doing a lot of work on the financing side, both equity and debt, and all of that took time to work through the system. Now you'll start seeing much stronger pick-up, certainly on the solar side. In wind, it remains to be seen."

India may be a huge market with big plans, but the investment opportunity is anything but straightforward. ■

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INVESTORS SHOULD FOCUS ON FUNDAMENTALS

Investors play a key role in taking wind into new energy-hungry markets, writes Steven Mandel, vice president at Denham Capital.

Today is a unique time, where the growth and convergence of renewables and the emerging markets provides some exciting investment prospects.

Rising electricity demand, scarcity of supply, high marginal costs of existing energy generation, and the increased competitiveness of renewables are the fundamental drivers of this opportunity. The International Energy Agency has reported that nations outside of the Organisation for Economic Co-operation and Develop-

ment (OECD) are set to be responsible for nearly 90% of all generation capacity additions over the next decade. The majority of this is set to come from renewables, with wind requiring 270GW of new-builds. This represents capital investment of \$400bn in wind.

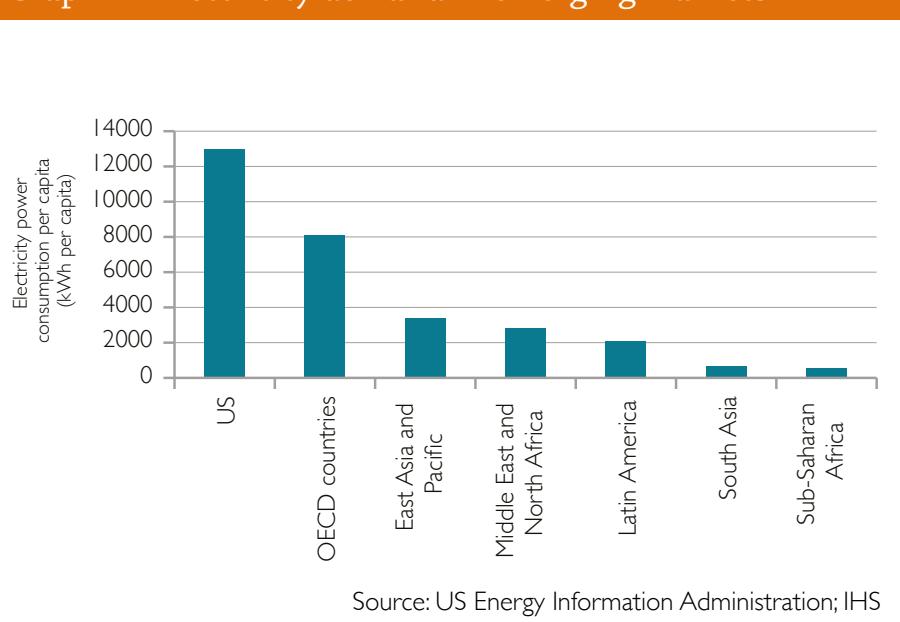
PENT-UP DEMAND

The growth of renewables including wind in emerging markets is a fundamentals story and not a cyclical phenomenon. Energy demand in these regions is still far below OECD nations (see graph, opposite).

Over the last decade, even during periods of economic downturn, power demand has been resilient across non-OECD economies, with annual growth in demand averaging above 6%, and surpassing the OECD in total power generation. Still, nearly 20% of the populations across developing regions, or 1.2bn people, live without access to modern electricity. That is a population equivalent to that of the entire OECD.

As power needs are vitally under-served, reduced gross domestic product (GDP) growth does not always correlate to lower power demand. If you travel to these regions, visit a business, walk into a school, or speak with individuals from all demographic backgrounds and ask what

Graph 1 - Electricity demand in emerging markets



Onshore wind can compete with thermal technologies in select emerging markets, and in many cases undercut them, without reliance on subsidies.

would enable improved living standards and spur growth, they would answer access to affordable power.

And yet the existing power generation that is available in these markets tends to be provided by older, inefficient equipment and/or expensive fuels, such as diesel, which drive costs above \$200/MWh, which is four or five times the wholesale electricity price in the U.S. or Europe. A report published by McKinsey last year noted that expensive electricity could drag down GDP growth between 1% and 3%.

In many markets wind is an ideal solution. While it is true that wind does not blow all day, in many high resource emerging markets the wind blows more than anywhere else in the world, where capacity factors of 40%-50% are regularly achieved.

Onshore wind has experienced major technological improvements over the last decade, resulting in a 40% reduction in 'levelized' new build costs, which is expected to decrease by an additional 18% over the next decade. This means that wind can compete with thermal technologies in select developing emerging markets and in many cases undercut them, without reliance on subsidies.

Onshore wind can also be constructed much quicker than fossil fuel alternatives. For example, a 100MW wind farm can be built in 12 months, whereas a large fossil fuel power station may take more than four times as long.

WIND INVESTMENT PROSPECTS

The cost effectiveness of renewables has prompted government implementations of large-scale, renewable programs, where long-dated, inflation linked, or hard currency PPAs are offered to developers. For example, in South Africa, the Department of Energy has awarded 3.4GW of wind projects since its formal renewables auction program was launched in 2011.

Meanwhile, in Brazil, over 13GW of wind power capacity has been awarded in similar auctions since 2009. In both South Africa and Brazil, renewables are narrowing the supply-demand imbalance, where wind farms are being built at under \$50/MWh, a discount of more than 100% to the marginal cost of power.

The key to execution is backing the right team and sound structuring. Significant capital, but even more so expertise, is required to expand renewables in emerging

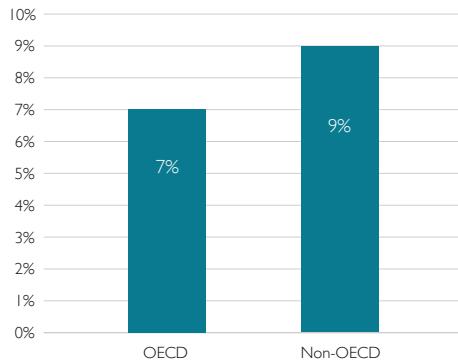
Brazilian trailblazer: growth in Brazil's wind market provides a benchmark for the rest of Latin America



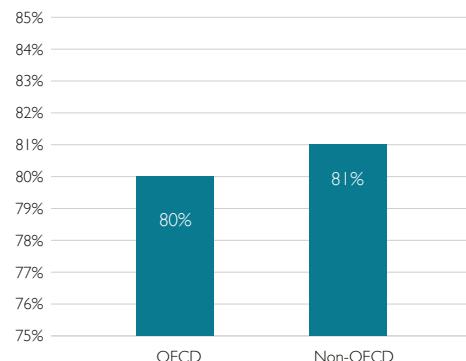
Source: Danish Wind Industry Association via Flickr

Graphs 2 and 3 - Project finance default and recovery rates

Average Project Finance Default Rates



Average Project Finance Ultimate Recovery Rates



Source: Moody's 30-year study

Both Brazil and South Africa have served as benchmarks for other governments in the broader Latin America and MENA regions.

markets, and particularly wind, which tends to be more technical compared to solar.

The critical element for success when investing in power development is in backing the right teams that not only have the technical expertise, but also understand the importance of being low-cost, along with structuring, the rigours of project finance and staging of investment capital.

In cases where the credit-worthiness of the off-taker or country-specific risks are a concern, additional prophylactics such as World Bank guarantees, the involvement of development finance institutions and, where appropriate, political risk insurance/partial risk guarantees should be pursued. These all provide frontline risk mitigation, which we at Denham believe is paramount to achieving a sound structure and more important than purely geography. For more on project finance default and recovery rates, see the graphs above.

We have been active in both South Africa and Brazil through our wholly-owned renewable IPPs BioTherm Energy and Rio

Energy. They are headquartered in their home markets and have developed nearly 600MW of wind projects combined that are currently in operation, construction or have secured PPAs.

Both South Africa and Brazil have served as benchmarks for other nations in Latin America (LatAm) and Middle East/Africa to launch similar renewable programs. Mexico, Chile, Morocco and Egypt are just a few examples where renewable tenders have been formally launched or announced, and are expected to bring significant wind capacity to the grid.

To capitalise on such opportunities, Denham recently backed a new LatAm/MENA (Middle East and North Africa) wind-focused platform, Jenner Renewables, led by Jorge Calvet, ex-chairman and chief executive of Gamesa.

The opportunity to invest in wind across emerging markets is growing, and investors — including ourselves — can play a key role in bringing more cost competitive wind capacity online in years to come. ■

MACRI OPENS POTENTIAL IN PATAGONIA



Paul Elberse is managing partner at Ficus Capital and America Renovable
www.ficuscCapital.com

Abrupt change in Argentina's investment climate led by new president Mauricio Macri is set to surprise wind investors

Countries in Latin America have made strong moves towards renewables over the last few years with Brazil, Chile and Uruguay rolling out major wind parks; and several countries in the region generating a substantial portion of their total energy needs from renewables.

But Argentina has notably missed out, for reasons that were largely politically-motivated as well as the unattractive macro investment climate.

Now the election of a more market-oriented government, led by president Mauricio Macri, last month is set to lead

to the implementation of reasonable policies and best practices for infrastructure investment. Even with supportive policies like these, though, Argentina has a long way to catch up in terms of renewable energy.

There are plenty of reasons that wind firms should take Argentina seriously.

It has some of the best conditions for wind globally, with better resources than wind giants like Denmark, Germany and Spain, and has unsatisfied energy demand.

There is also a legal impetus for action. Currently, the country has 279MW of installed wind capacity, according to the Global Wind Energy Council. However, if it wants to comply with Law 27.191, which says that 8% of energy should come from renewables by 2017, it will have to install at least a further 1GW of renewable energy projects by then. By 2025, renewables should represent 20% of the mix, which means an extra 8GW-9GW is needed.

And several provinces have excellent conditions. Patagonia is known for some of the world's strongest and steadiest wind conditions with wind speeds of between 9-12m/s and plant factors of around 50%.

Argentina also has an electricity network that covers the largest part of the country — with +95% of the population having access to electricity — and can absorb

Voyage to Patagonia: Mauricio Macri is set to open up Argentina's wind market



Source: Quim Pagans via Flickr

ample additional capacity, with technical engineers known to be of excellent quality. The few limiting factors for wind have been the macro-economic conditions and lack of long-term funding.

With the new rules of the game, large financial and multilateral institutions are ready to participate in the roll out of new projects under a clear set of rules.

Typical projects will be around 100MW to 200MW with outliers in some areas. Power purchase agreements will be assigned through public tenders at prices, which will leave investors with comparable net yields – corrected for country risk, finance costs, maturity of the PPAs and fiscal aspects — as in neighbouring countries.

And we anticipate good demand from overseas. Solid local investors have traditionally worked very well with foreign investors in a range of sectors; and culturally, the Argentines are close to the

European and US investor mentality. Solid partnerships can be structured.

We also see that Argentina is resolving its debt issues with 'holdout' creditors, which would help the country to regain access to new sources of international funding. This would then spill into infrastructure generally and wind specifically.

Once the first wind farms with these investors are structured successfully then it should help kickstart local capital markets.

We now see an early rush of interest from investors seeking to understand opportunities in Argentina and how they can develop new projects.

This is in stark contrast to countries like its much smaller neighbour Uruguay, where established pension fund money is buying out earlier-stage developers.

It does show that established are interested in this part of the world, and may yet be swept along by the Patagonian winds. ■

"Culturally, the Argentines are close to the European and US investor mentality. Solid partnerships can be structured."

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LEKELA SUNRISE

Lekela Power chief executive Chris Antonopoulos talks to Richard Heap about expanding across Africa and how companies should approach deal-making in the continent

The beauty about Africa is that the resources for wind and solar are perfect. Much better than we have here in Europe. If you want to implement renewable power, Africa is the place to do it."

That is the view of Lekela Power chief executive Chris Antonopoulos, and must also have been in the minds of emerging markets investor Actis and developer Mainstream Renewable Power when they set up London-headquartered Lekela in 2015. The pair formed this \$1.9bn 60:40 joint venture last February to build a wind and solar portfolio of between 700MW and 900MW in Africa by 2018.

One year on, the company already has a project pipeline of 1.1GW, mostly in the wind sector, and is looking to grow beyond its three current countries: Egypt, Ghana and South Africa. Antonopoulos talked to A Word About Wind about how

Lekela has built that portfolio, how wind businesses should approach deal-making to succeed in Africa, and the number of new investors now moving in.

ACCUMULATED WISDOM

While that 1.1GW pipeline is impressive after only one year, it has not happened from a standing start. In South Africa, for example, it is currently reliant on projects from Mainstream, which has been in the nation since the government launched the Renewable Energy Power Producer Procurement Programme (REIPPPP) in 2011. Mainstream has so far completed 238MW of wind and solar farms in South Africa, with 360MW under construction and 4.9GW more planned.

Mainstream's first wind farm in South Africa was the 138MW Jeffreys Bay, which had backing from a consortium including Actis portfolio firm GlobeEq and local investors Old Mutual Life Assurance Company and Thebe Investment Corporation. The project is still owned by that consortium, which means it cannot be transferred to Lekela, but was a key development in laying the groundwork for the formation of the joint venture. This was the first time Actis and Mainstream had partnered.

Actis and Mainstream took this relationship further in 2013 when they formed a 60:40 joint venture, Aela Energia, to build up to 600MW of renewables in Chile. And the pair followed this model with Lekela, which was the eighth joint venture that Actis has set up to build renewables in emerging markets. Its others include Atlantic Energias in Brazil and Zuma Energia in Mexico.

Debut project: Noupport Wind Farm is set to be Lekela's first completed scheme





Vital statistics

Name: Chris Antonopoulos

Date of birth: 27 January 1963

Born: Flawil, Switzerland

Educated: ETH Zurich

Lives: London and Zurich

Career: Spent 13 years at power technology company ABB's venture capital investment arm ABB Energy Ventures, including three as president. Set up Zurich-based investment and development adviser Arox in 2004, before moving to Bombardier

Transportation as group vice-president of sales and business development in 2006. Eight years later, in March 2015, he became CEO of Lekela.

The approach at Lekela is that it has first right of refusal on whether to acquire future Mainstream projects on completion.

This means the 80MW Noupoort Wind Farm is set to be the first completed wind farm in Lekela's portfolio, with commissioning scheduled for July. Mainstream is building two more wind farms in South Africa — the 140MW Loeriesfontein 2 and 140MW Khobab — that are due to complete in 2017, and a further two where construction is due to start this year (see table, p.23).

"The way it works is that the projects that have been, are being or will be developed by the two shareholders in Africa will be referred to Lekela, and we then decide whether we want to proceed," he says.

"So we will have 610MW soon in South Africa, which is clearly a key market for us."

The arrangement also helps Mainstream recycle capital for new developments, but Antonopoulos stresses that this does not mean Mainstream is hands-off when schemes move into Lekela.

"It is not like they are checking out," he says. "They continue to be engaged not only as a capital provider, but we also use them to do construction management. In countries where Mainstream is well-established, like South Africa, it would be foolish not to use their knowledge and resources."

This relationship also gives Lekela a foothold in Ghana, where its shareholder is working on plans for a 225MW wind farm

Lekela Power project pipeline

Country	Project name	Technology	Capacity	Status
South Africa	Noupoort	Wind	80MW	In construction (completion due July 2016)
South Africa	Loeriesfontein 2	Wind	140MW	In construction (completion due 2017)
South Africa	Khobab	Wind	140MW	In construction (completion due 2017)
South Africa	Kangnas	Wind	140MW	Construction due to start in 2016
South Africa	Perdekraal East	Wind	110MW	Construction due to start in 2016
Ghana	Ayitepa	Wind	150MW	Construction due to start in 2016
Egypt	Egypt FIT Solar	Solar PV	50MW	Construction due to start in 2016
Egypt	Egypt FIT Wind	Wind	50MW	Construction due to start in 2016
Egypt	Gulf of Suez	Wind	250MW	Financial close due in 2017

Source: Lekela Power

on the eastern coast. Mainstream secured a grid connection agreement with Ghana Grid Company Limited in September 2015, and now wants financial close so it can start on the first phase. Construction on the 150MW first phase is due to start this year.

Antonopoulos expects the scheme to reach financial close by the end of summer 2016, and begin producing the first energy in early 2017. He says the scheme is significant for Ghana because it could meet 5% of the country's needs quickly in a time of energy crisis. The country's hydro industry has been hit by low levels of rainfall; and thermal generation is being affected by insufficient supply of gas.

"Ghana is under an extreme energy shortage and needs the electricity as soon as possible. Our project is one of only six that has been nominated by the government as a priority project in the power sector — and Ayitepa is the only project out of those six that is renewable," he says.

Lekela's third key market is Egypt, where it has three projects. In July, the firm signed two deals with the country's New & Renewable Energy Authority, to develop a 50MW wind farm in the west Suez region and a 50MW solar scheme in Aswan under the government's feed-in tariff scheme. It is planning to reach financial close on the solar project in late 2016 and the wind farm in 2017.

It followed these in November by doing a deal with the Egyptian Electricity Transmission Company to build a 250MW wind farm in the Suez region. It plans to submit a feasibility study by March, and is looking to reach financial close on the scheme by the end of 2017.

This means that 55% of the firm's development portfolio is in South Africa, with 32% in Egypt and 13% in Ghana. This shows a good spread in three key regions — north Africa, sub-Saharan and south — and Antonopoulos says he does not want the firm to be too exposed to any of them.

"We do not have a hard and fast rule, but I would not like to be more than 40% in one particular market because, after all, Lekela is a pan-African platform," he says, and adds that Lekela has two priorities when doing business: first, to stay in the countries in which it is operating for the long term and, second, developing a platform where it can be sustainable regardless of political change.

CULTURAL UNDERSTANDING

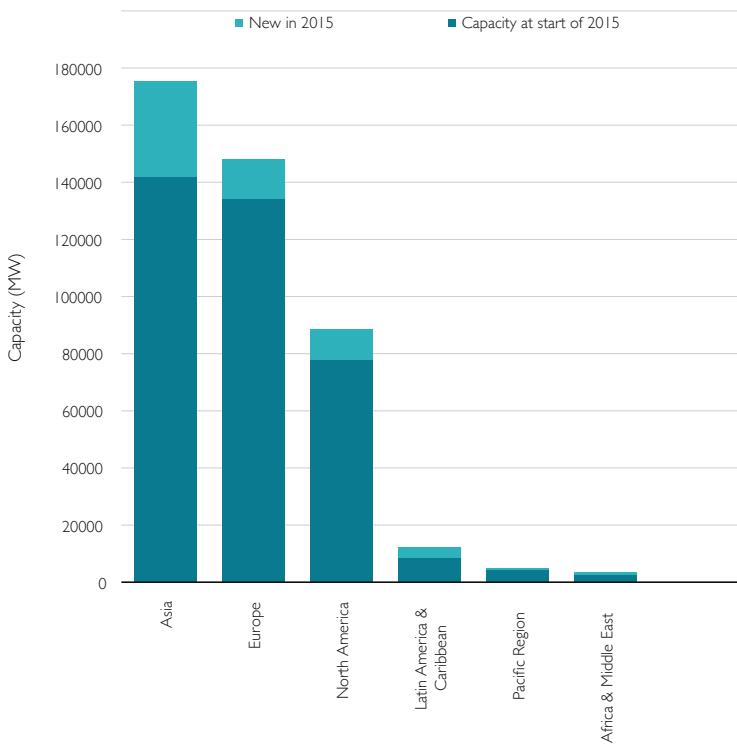
He says a key element of its strategy is employing people who know the local cultures and have worked in their specific country before. Lekela's head office in London is only set to have around 12-15 staff, with everyone else employed locally: "Whenever we go to Egypt or Ghana, we are employing local guys to help us with the development. You cannot only come with white faces."

His second point about political change and instability is key as the unstable political regimes in some parts of the continent can be bewildering to new investors. However, Antonopoulos says the firm manages this by carrying out security studies on any markets it plans to work in. For example, despite the rise of Islamic State, he is comfortable with the areas Lekela operates in Egypt.

"There are regions that are difficult so we stay away from those, but clearly before

"Whenever we go to Egypt or Ghana, we are employing local guys to help us with the development. You cannot only come with white faces."

World regions by total wind capacity in 2015



Source: Global Wind Energy Council

“You still have people going to see governments and they are promising things that are not really achievable.”

we do any equity investments in those projects we bring in consultants who advise us about safety. We would never just blindly do a project. There are certain areas where we currently are not going in to: areas where you have Boko Haram, Islamic State or similar situations, we would not do any projects in.”

This does not appear to phase Antonopoulos, who has significant experience in Africa. Before he joined Lekela in March 2015, he was group vice-president at Bombardier Transportation in charge of global sales and business development. Before joining Bombardier in 2006 he spent almost two

decades working in sales and business development roles in energy and infrastructure; and has been involved in power and infrastructure projects in Africa with a total value of more than \$4bn.

He says that building a wind farm is much simpler than a coal-fired power station or large transport project because most stages: “If you develop a coal-fired project... then the construction is much more complicated, and so is the operation, the commercial structure, the framework of agreements you have,” he says. “For wind and solar, it is relatively simple.”

He adds that there is also a willingness from governments to embrace renewables in order to take advantage of abundant natural resources, falling technology costs, and the competitiveness of wind and solar. The big challenges he says are securing government guarantees that subsidies would be paid even if the state utility went bust; and that this technology is still very new in most nations.

With only 3.3GW of wind installed in the Africa and Middle East region at the end of 2015 (see graph, opposite), which is 0.7% of the global total, it is natural that most African governments are still learning about the sector. This means they can fall victim to undeliverable promises.

“You still have people going to see governments and they are promising things that are really not achievable, and then when you come and try to be honest the government says: ‘Yes, but the person over there told me that they could do it for this or that,’” he says. However, it is vital to get government support because many African utilities operate unsustainable business plans.



Local content: Mainstream's tower factory in Cape Town, South Africa

“Competition is increasing, no doubt about it, but I would still say we have less competition in Africa than in other markets.”

He says that some African utilities “cannot survive commercially [on their own] because they have subsidised rates to their customers, and the economics are terrible”, and so securing the support of central government is the “biggest challenge that I find currently doing business in Africa”.

REIPPPP REWARDS

But this is changing as more countries seek to adopt a similar tendering model as South Africa’s REIPPPP, which was introduced in 2011 so developers could bid for subsidies via a competitive auction process. It is now up to its fifth tendering round and has given a model of success. This has helped to attract more investors to Africa, and grow wind’s supply chain.

We now see a mix of overseas and local companies getting into Africa. For example, a recent 850MW tender in Morocco gained bids from major European firms Acciona, Alstom, EDF, Enel, Gamesa and Siemens; and MENA investors such as ACWA Power, Fipar Holding, Nareva and Qatar Electricity & Water Company.

The success of REIPPPP is also supporting the South African supply chain. South

Africa is now able to specify that 40% of parts in its wind projects should come from local suppliers, and 50% in solar.

Meanwhile, in north Africa, we saw in June 2015 that Siemens agreed a deal to build a blade factory after it signed contracts to develop wind farms in the country totalling up to 2GW. This can help to support developments in the nascent sub-Saharan wind market.

For now, Lekela is focused on continuing to build its project pipeline, and Antonopoulos says he is soon to talk to shareholders about revising the company’s targets upwards. Lekela already has a pipeline of 1.1GW, which is 200MW above its top target, although it must grow this. The influx of firms means more competition.

“Clearly, the market is waking up. Therefore, competition is increasing, no doubt about it, but at the same time I know the other markets outside Africa — Europe, the Americas, Asia and so on — and I would still say we have less competition in Africa than in the other markets,” he says.

As more companies look to grow overseas, that will not last long. ■

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A WORD ABOUT WIND

