

SWISSQUOTE

FINANCE AND TECHNOLOGY UNPACKED

ENTERTAINMENT
The Amusement
Park Business

DORMA+KABA
A Happy
Marriage

ANALYSES
How to protect
your portfolio
after Brexit

DOSSIER

ENERGY TAKES A NEW TURN

Why wind turbines, solar and hydropower
are taking the lead over fossil fuels

FIRST SOLAR ► VESTAS ► SQM ► SUNPOWER ► SOLARCITY ► SIEMENS ► ABB

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40



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MB&F
HM6 "Space Pirate"



Gaby Wormann
Mecre



MB&F
Legacy Machine 101



Frank Buchwald
Nixie Machine

Who said Geneva was boring ?

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TO BREAK THE RULES,
YOU MUST FIRST MASTER
THEM.

THE VALLÉE DE JOUX. FOR MILLENNIA A HARSH,
UNYIELDING ENVIRONMENT; AND SINCE 1875 THE
HOME OF AUDEMARS PIGUET, IN THE VILLAGE OF
LE BRASSUS. THE EARLY WATCHMAKERS WERE
SHAPED HERE, IN AWE OF THE FORCE OF NATURE
YET DRIVEN TO MASTER ITS MYSTERIES THROUGH
THE COMPLEX MECHANICS OF THEIR CRAFT. STILL
TODAY THIS PIONEERING SPIRIT INSPIRES US TO
CONSTANTLY CHALLENGE THE CONVENTIONS OF
FINE WATCHMAKING.



ROYAL OAK
CHRONOGRAPH
IN YELLOW GOLD

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Le Brassus

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The new wind map



By Marc Bürki,
CEO de Swissquote

Green energy detractors have plenty of arguments in their favour. They can cite that China alone has opened its fourth nuclear power plant this year or that India has planned to double its coal output between now and 2020.

p. 28

But that's just a narrow sliver of the global landscape. Several indicators show that the energy **transition** is really happening. Over the course of one year, China installed 30 gigawatts (GW) of wind power capacity on its soil, the equivalent of nearly 30 nuclear reactors. And India has set a target to install 175 GW of renewable power by 2022, versus its current production of 35 GW.

Last year, emerging and developing countries invested \$156 billion in renewable energy, for the first time exceeding the investments of more advanced countries, at \$130 billion. The Global Wind Energy Council reports that, across the planet, wind turbines now produce more electricity than the world's nuclear reactors, i.e. 433 GW compared with 350 GW.

p. 46

Oddly, **Switzerland**, which is typically a cut above the rest in its capacity to innovate, comes in at the bottom of the list of clean energy producers. Not including the country's dams – which no longer make any money due to the fall in electricity prices – Switzerland only generates

168 kilowatt-hours per person in wind and solar power, while its German neighbour produces ten times as much, with 1,557 kWh per person.

Although the aesthetics of wind farms on nature's landscapes is still hotly debated, these turbines at least offer a response to climate change and clean energy strategy. Shifting towards renewable energy would bring Switzerland greater energy independence, not to mention jobs. The Wind Atlas of Switzerland suggests that wind power could cover 7% to 10% of Swiss energy consumption by 2050, with the most promising areas being high in the Jura Mountains and the Gros-de-Vaud region. And that does not include the extremely high potential of solar power, which is even better suited to our country.

p. 56

Preparing for the future of energy includes, at the other end of the chain, efforts to optimise sustainable electricity **storage**, an area in which huge progress is needed. The firm that will develop that technological breakthrough may not yet exist, but that shouldn't keep companies from competing to make more efficient batteries, especially for electric vehicles. And the Californian company Tesla, which recently opened its "Gigafactory" in Nevada, already seems to have a head start in that game.

Enjoy!



DOSSIER

THE ENERGY TRANSITION



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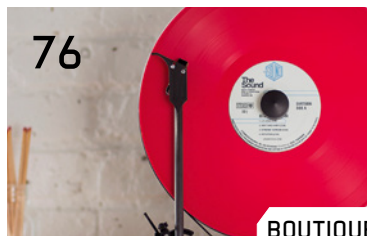
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founder of Birdly

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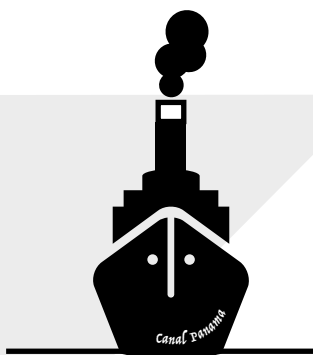
SCANS



“We want to create a robot capable of forming an emotional bond.”

Kazuo Hirai,

President and CEO of Sony.



\$5.3 billion

The cost of the Panama Canal expansion, completed in late June. The project will double the capacity of this key sea lane for the global shipping industry, and the canal will also be able to accommodate ships 1.5 times larger than with the two older sets of locks.

FINE ART IMAGES HERITAGE IMAGES / NEWSCOM



consumption

THE DETERGENT WAR RAGES ON

Procter & Gamble and Henkel are engaging in a fierce battle over the powder laundry detergent market in the United States. The American group currently holds 55% of the market. Its German competitor has recently bought Sun Products, which manufactures the detergents All and Wisk, for €3.2 billion. This acquisition has raised its market share to 21.3%. It

also signed an exclusive deal with Walmart to sell its brand Persil. But the situation is not all rosy for Henkel. The medium-range brands from Sun Products are struggling to stand their ground against Procter & Gamble's high-end detergents and the offer from the discount detergent maker Church & Dwight.

PG HEN3 CHD

energy
**PROPANE COMES
 TO THE RESCUE
 OF U.S. FRACKERS**

Companies that gambled on the shale oil boom in the United States have been slammed by the fall in oil prices. But some have bounced back thanks to another fossil fuel, propane. American exports of this fuel used for combustion engines, barbecues, furnaces and water heaters hit a record peak of 884,000 barrels a day in February. Over the year, the United States is expected to take the spot as the world's leading exporter, ranking ahead of Qatar, Saudi Arabia, Algeria and Nigeria. This success is due to the domestic expansion of pipelines and gas terminals, which have doubled in capacity in the past year.



266

The number of banks in Switzerland at the end of 2015, according to figures from the Swiss National Bank. That number is down from 275 a year earlier. And in 1996, the country was home to 400 institutions.

transport
INDIAN TRAINS PICK UP SPEED



Contract signed
 between Japanese
 Prime Minister
 Shinzo Abe and his
 Indian counterpart
 Narendra Modi.

India has one of the longest railway networks in the world. But its trains are terribly slow. That is expected to change soon with a high-speed railway line planned between Mumbai and Ahmedabad. Shinkansen high-speed trains, built by the Japanese manufacturer Japan Railways Group, will

be covering that distance in two hours. The project, at an estimated cost of 980 billion rupees (13.9 billion Swiss francs), is expected to be completed in 2023. The country also plans to renovate about 10 other lines to accommodate "higher-speed" trains that can reach up to about 150 km/h.

RANKING

THE FIVE PHARMACEUTICAL GROUPS THAT INVESTED MOST HEAVILY IN RESEARCH IN 2015

(see also p. 26)

1. ROCHE
€ 7.8 BILLION
2. PFIZER
€ 6.95 BILLION
3. NOVARTIS
€ 6.6 BILLION
4. JOHNSON & JOHNSON
€ 6.2 BILLION
5. MERCK
€ 6 BILLION

Source: Universum

THE FIVE BIGGEST STREAMING MUSIC SITES

(in number of paying users, in July 2016)

1. SPOTIFY
30 MILLION
2. APPLE MUSIC
15 MILLION
3. PANDORA
3.9 MILLION
4. RHAPSODY (NAPSTER)
3.5 MILLION
5. DEEZER
3 MILLION

Source: Statista

THE FIVE BIGGEST SOCIAL MEDIA COMPANIES

(in number of active users per month)

1. FACEBOOK
1.65 BILLION
2. WHATSAPP
1 BILLION
3. MESSENGER
900 MILLION
4. WECHAT
760 MILLION
5. QZONE
650 MILLION

Source: Statista

SCANS

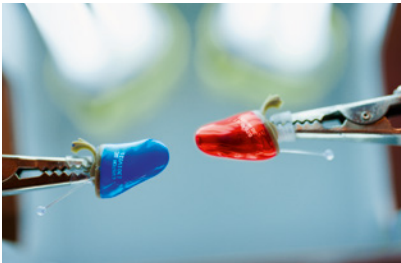


“Mining is about margins, not volume.”


David Garofalo,
CEO of Goldcorp,
on the rise in
gold prices.

health

SONOVA INNOVATES



SONOVA GROUP

Sonova, a Swiss manufacturer of hearing devices and a world leader in that market, announced in late June that it was launching a line of next-generation devices. These hearing aids, sold under the Phonak brand, are unique in that they are fitted with lithium-ion batteries, and have battery life of 24 hours. This is the first hearing device to use this type of technology. The product is also equipped with a system that analyses incoming sounds and optimises its settings in real time. Sonova predicts that hearing ability will improve by 60% in loud environments. The company's share price has gone up by 10% since late June.  SOON

construction

SCHINDLER PLANS
TO RISE HIGH IN CHINA

China has become the world's largest market for lifts. Now with 1.3 billion people and 4 million lifts, the country far surpasses the mere 900,000 lifts in the United States. China is also where two-thirds of new lifts are installed every year. And the Lucerne-based lift maker Schindler wants to move up in

the market, recently taking a 25% stake in a joint venture with the German-Chinese group Volkslift Elevator. The Chinese market for lifts is currently led by the Finnish group Kone, the U.S.-based Otis and the Japanese companies Hitachi and Mitsubishi, with Schindler in fifth place.  SCHN



SCHINDLER

FLOP

The most secure telephone
in the world fails to impress

When it was launched in November 2015, the BlackBerry Priv appeared destined for success. Designed to ensure a higher level of security for users, it seemed to be the ideal tool for companies concerned about protecting their data. Its launch, in the wake of Edward Snowden's revelations, was meant to capitalise on the fears of part of the population regarding government surveillance. The device has a system that allows users to create a virtual wall in their telephone between their personal and professional data. It also allows

them to send encrypted text messages and makes use of an ultra-secure password system that works by combining images and numbers. In addition, each device is equipped with DTEK, an app that constantly analyses the telephone's security level, warning users when another app tries to access sensitive information. But the phone has suffered from its high price tag. At \$700, it has failed to find an audience, with only 600,000 units sold during the first quarter of 2016.

 BBRY



\$8.6 billion

The amount spent by the Chinese Internet giant Tencent to buy a majority stake in Supercell Oy, the Finnish group that developed the game Clash of Clans. This deal makes it the most expensive video game developer in the world.

transport SAUDI WOMEN LOVE UBER

Women are not allowed to drive in Saudi Arabia. But a growing number of them are joining the working world. Riyadh plans to increase the participation of working women from 22% to 30% of the workforce. This shift has caused on-demand car services to explode. Uber, after recently receiving a \$3.5 billion cash injection from a Saudi sovereign wealth fund, now has 19,000 drivers and 395,000 users throughout the kingdom. Its main competitor, the Dubai-based company Careem, says it has 30% to 40% more users. And women make up 80% of the customer base at both companies.

technology PHILIPS MOVES INTO THE FUTURE OF HEALTH CARE



Philips has recently shed its lighting division, enabling it to focus on another fast-growing sector, connected health care. The Dutch firm plans to boost its presence in the industry through acquisitions. In 2014, it bought the smart catheter manufacturer Volcano Corp for \$1.2 billion. Health care currently

accounts for 45% of the group's revenue, and the connected health tech market is expected to grow to \$60 billion between now and 2020. But Philips faces competition from Medtronic, IBM, Alphabet (Google) and Apple, which are also developing digital health solutions.

— PHIA

KICKSTARTER



ABLY

CLOTHING THAT NEVER GETS DIRTY

Filium is a coating that makes textiles completely waterproof. The technology motivated brothers Raj and Akhil Shah, two fashion designers based in Seattle, to launch the clothing line Ably. No liquid can penetrate the fabric, making it capable of surviving a storm or spilt coffee unscathed. As the apparel does not soak up sweat either, wearers can go straight from the gym to the office without changing. The fabric remains clean for weeks, meaning clothes can be worn longer between washes. And that's good news for the environment. The two entrepreneurs have developed a line of cotton T-shirts and hoodies that have been "Filium activated". A Kickstarter fundraising campaign was launched and reached its target in two months.

FUNDS RAISED
\$540,112

AVAILABLE
SEPTEMBER 2016

SCANS



“Serving as the leader of the free world requires effective leadership, sound judgment, a steady hand and most importantly, the temperament to deal with crises, large and small. Donald Trump lacks each of these characteristics.”

Daniel Akerson,

former CEO of General Motors, a lifelong Republican endorsing Hillary Clinton.



39%

The percentage of software installed in the world without a proper license, costing the industry billions, according to a survey by the Business Software Alliance.

automobile

FORMULA E JOLTS THE WORLD OF AUTO RACING

The popularity of the Formula E championship, the electric version of Formula 1 racing held in urban settings, continues to grow (see Swissquote Magazine No. 1/2016). The 2016 season ended on a high note in early July, with Swiss driver Sébastien Buemi winning the championship for Renault e.dams, which also took home the constructors' title, beating big names such as Audi and DS. Renault plans to make good use of this triumph,

bolstering its image and its technology to fuel sales of its mainstream electric vehicles. And the excitement is set to continue in Season 3, with Jaguar joining the ranks and six new racetracks opening, all in the heart of major cities. In addition to Paris, Berlin and London, the championship will now zip around Hong Kong, Marrakesh and Montreal before the two-leg final round through the streets of New York on 29 and 30 July.



The joy of Swiss racing driver Sébastien Buemi after his victory at the Punta del Este Grand Prix in the beginning of the season (19 December 2015).

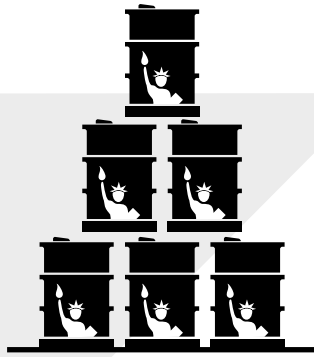
FRANÇOIS FLAMAND

IPO

LINE MAKES A MEMORABLE ENTRANCE

The listing of Line, the Japanese messaging company, on the New York and Tokyo stock exchanges in mid-July was the largest technology IPO of 2016. Launched in 2011, the company's share price surged 27% in New York and 32% in Tokyo on its trading debut. The corporation raised \$1.3 billion, giving it a market value of \$8 billion. With 218 million users, Line is present in Japan, Thailand, Taiwan and Indonesia. It offers

users a unique platform which allows them to send messages, make calls, stream music, play games and even make electronic payments. In 2015, the company made \$1 billion essentially by selling virtual stickers. It is now setting its sights on other markets but faces stiff competition in the form of Facebook and WeChat, which are already well established in the western world and China respectively. — LN



264,000,000,000

In barrels, the recoverable oil reserves held by the United States, according to estimates from Rystad Energy. For the first time, the country comes in ahead of Russia (256 billion) and Saudi Arabia (212 billion).

tourism
**KUONI,
TRAVELLING LIGHT**

Kuoni is looking for ways to sell its trips outside of its own network of agencies. The Zurich-based group has developed an ambassador system in the United Kingdom. Under the programme, independent agents spend a day learning more about the brand and its services. About 30 people will be trained this year and 80 next year. In France, the Swiss group will set up Kuoni "corners" at partner travel agencies, consisting of a space in the agency reserved for the tour operator's package holidays. This strategy will raise Kuoni's profile in both countries without incurring the costs of opening additional agencies.

— KUNN



"Watch prices have risen too quickly."

Cyrille Vigneron,
Managing Director
of Cartier.

Defence

**F-35: THE 400 BILLION-DOLLAR
FIGHTER JET**

In early August, eight years after the launch date that was initially planned, the Air Force announced that its newest fighter jet is ready for combat. Developed by Lockheed Martin since 2001, this technological marvel purportedly cost a staggering \$400 billion. The F-35 is capable of vertical take-off and landing and can evade even the most sensitive radar devices. It also offers futuristic IT systems such as the F-35 Helmet Mounted Display with a 360-degree view for pilots. Its sophisticated technology combined with project delays have caused the cost of each individual plane to skyrocket to an estimated \$160 million. Nevertheless, the Pentagon and Lockheed Martin hope to reduce the unit price to \$80 million by 2019. The American defence contractor is relying on the F-35 to account for 20% of its turnover for a total of \$10 billion, a figure that the company hopes to double by 2020 as it increases production up to 150 jets per year. — LMT



HEATH CAJANDIG

SCANS



“Africa’s insurance market is a giant waking up. When incomes rise, you have more assets to insure.”

Lukas Müller,

Head of north and sub-Saharan Africa at reinsurer Swiss Re.

tourism

CLUB MED NOW TARGETING CHINESE SKIERS

The Chinese conglomerate Fosun, which bought Club Med in early 2015, has launched an ambitious campaign to expand the French hotel chain. Ski resorts are its main focus, as these destinations are gaining popularity among China’s middle class, now wealthy enough to afford holidays in the snow.

Fosun has opened a Club Med in Yabuli, a huge ski resort in northeastern China, and has bought the Tomamu ski resort on Japan’s northern island of Hokkaido for 900 million yuan (133 million Swiss francs) to open another. As of 2017, Fosun plans to build five Club Meds a year in the mountains in China. — FNI



Ice bar at Tomamu ski resort in Hokkaido, Japan.

REIJI KURIHARA / THE YOMIURI SHIMBUN / AFP

fashion

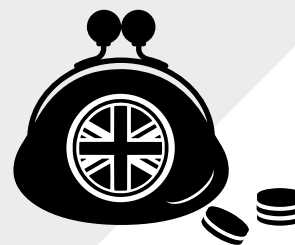
CONVERSE LOSES ITS EXCLUSIVE RIGHTS OVER CHUCK TAYLORS



RICHARD B. LEVINE / NEWS.COM

The Chuck Taylor sneaker by Converse, designed in 1917, has a distinctive look. Its legendary style has made it both one of the most popular fashion items and also one of the most copied. The Nike-owned brand sued 31 companies in 2015 for trademark infringement in a U.S. court and before the International Trade Commission to prevent the fake footwear from entering the country. Among the accused violators were Walmart, Kmart, Skechers and Highline United. In the summer of 2016, the commission ruled that only the diamond-patterned outsole constituted a valid trademark.

— NKE



– £850

The average drop in annual income for UK households post-Brexit in the “optimistic” scenario from the Centre for Economic Performance at the London School of Economics.



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TRENDS



RIO TINTO

the figure

JEAN-SÉBASTIEN JACQUES

Meet the new boss at Rio Tinto

Position
CEO of Rio Tinto

Nationality
French

**Salary
in 2015**
\$3.38 million

Jean-Sébastien Jacques stepped in as the new CEO of Rio Tinto on 2 July 2016. This 45-year old French engineer with a master's degree from Ecole Centrale Paris joined the Anglo-Australian mining group in 2011 as head of operations for the copper division. After being appointed as the division's chief executive in 2013, he also took responsibility for the group's coal assets two years later. One of his biggest projects was

overseeing the commissioning of the enormous Oyu Tolgoi copper mine in Mongolia. His new duties as CEO include dealing with the steady drop in raw materials prices over the past five years. Unlike his counterparts, Mr. Jacques does not plan to focus the group's businesses on a small number of operations. Instead, he wants to invest in new areas, such as lithium, the metal used to make electric car batteries. The firm is currently looking into exploiting a lithium deposit in Serbia. Before joining Rio Tinto, Jean-Sébastien Jacques worked at Tata Steel Group from 2007 to 2011, and prior to that at Pechiney (aluminium) and Corus Group (steel).



the country

NIGERIA

Oil under threat

The Nigerian economy is on the brink of imploding. The country is beset by its heavy dependence on oil, while the price per barrel has been plummeting for the past two years. And the rise of the Boko Haram Islamist insurgency in the north has not helped things. The situation has recently worsened with the re-emergence of a rebel movement in the Niger Delta to the south. The militant group is responsible for sabotaging several pipelines. This has reduced oil production, which totalled 1.8 million barrels in the first quarter of 2016 – 380,000 less than expected. In the second quarter, production fell to 1.6 million barrels a

day. This decrease cost the Nigerian economy 1 trillion naira (3.45 billion Swiss francs) between January and June 2016. On top of that, the local currency has been showing erratic behaviour. President Muhammadu Buhari pegged the currency to the dollar for 16 months, restricting the availability of foreign currencies and causing inflation to skyrocket. He lifted the peg in late June, setting off a sharp devaluation in the naira.

Population
182.2 million

**GDP per
inhabitant
in 2015**
\$2,640

Growth in 2015
2.7%

**Main
industries**
oil, cocoa,
rubber



the innovation

DASH

Company
AmazonLaunch
March 2015Cost
not disclosed

Pushing Amazon's buttons

Amazon knows that, to increase its sales, it has to make online shopping as quick and easy as possible. Users of the U.S. online marketplace have been able to make their purchases in a single click for several years now. But Amazon wanted to take it to the next level. In 2015, the Seattle-based group introduced the Dash Button, first tested as an experimental project. These little devices feature

Internet-connected buttons and come with a product logo (laundry detergent, dish washing liquid, etc.). All users have to do is stick it onto a flat surface in their bathroom or kitchen for example. When running low on a product, they just press the button to restock. Amazon deployed its large-scale launch of Dash Buttons in the first half of 2016, with some 150 versions available today. U.S.

consumers can now instantly order a wide range of products, including Play-Doh, Nerf guns and Campbell's soup. Amazon says that it receives an order from a Dash Button every 30 seconds. Each button costs \$4.99 and comes with a discount coupon for the same amount. — AMZN

THE MATCH

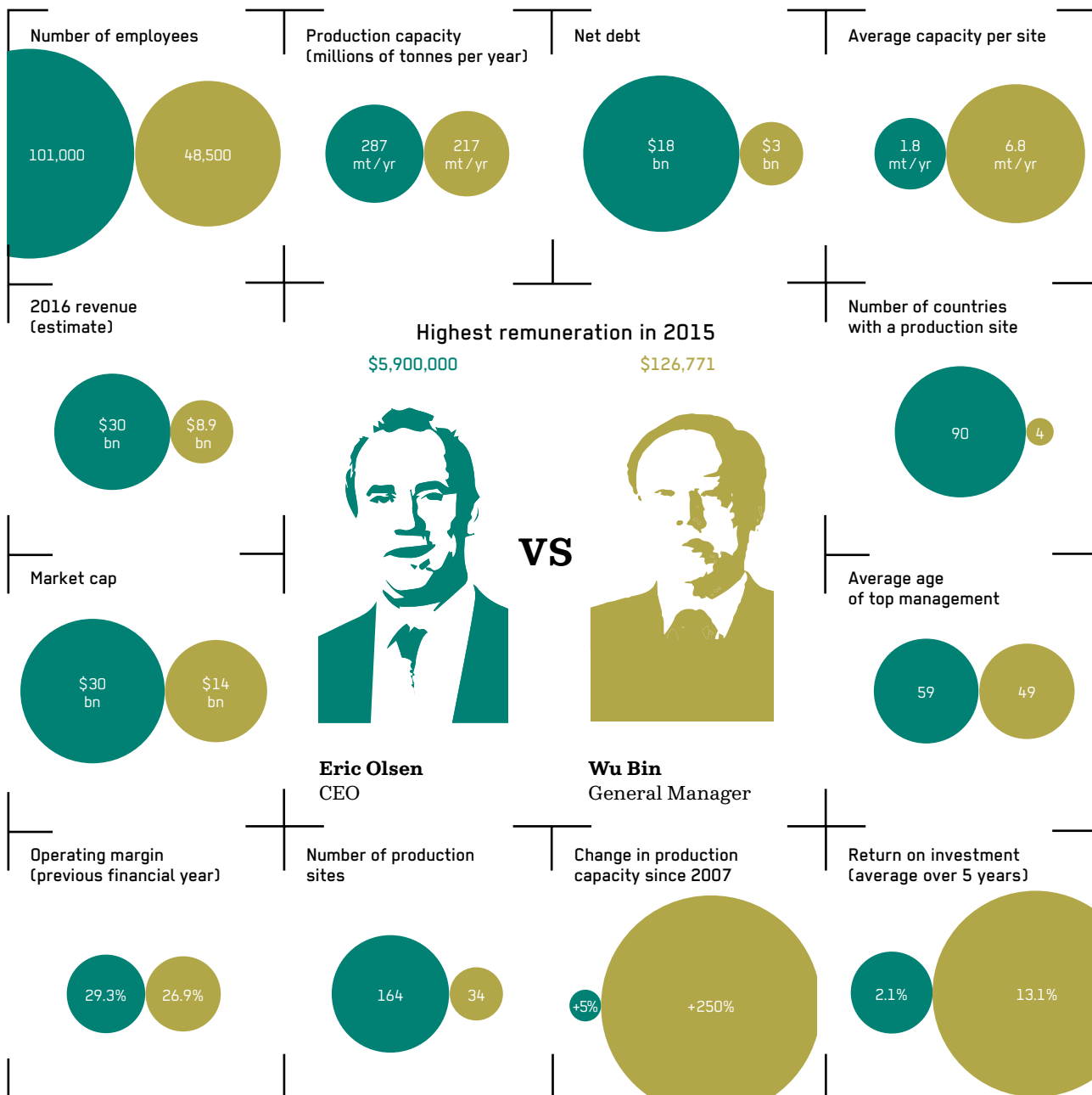
LafargeHolcim vs Anhui Conch

BY DANIEL SCHNEIDER

Last year, the French company Lafarge merged with Switzerland's Holcim in an effort to secure a lasting position as the world's largest cement maker. Lafarge-Holcim predicted the deal would generate cost savings of around \$1.4 billion over three years, and free up resources which the group could use to strengthen its position in strategic markets. But the merger has presented more challenges than

the group expected. Meanwhile in China, Anhui Conch Cement Company is attaining enough critical mass to compete with LafargeHolcim. Owned by the Chinese government, Anhui Conch is just starting to expand outside China. The Chinese cement manufacturer made the logical decision to branch out first into Asia – home to 60% of the world's population – and has launched operations in Indonesia,

Vietnam, Myanmar, Cambodia and perhaps soon in Russia. Anhui Conch's low level of debt means that it can buy up national cement manufacturers and invest billions to upgrade factories, or even billions, to upgrade factories. Meanwhile, Lafarge-Holcim is forced to streamline its activities in Asia, where it sold over 1.1 billion equity participations between July and August.  914



Sources : annual reports ; GlobalData

*This may be the
only time you ever see
an H. Moser.*



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VERY RARE

Dorma+Kaba: A Happy Marriage

Satisfied shareholders, confident analysts... one year after the merger of Switzerland's Kaba and Germany's Dorma, all systems are go for the new group, ranked as one of the top three companies in the security and access control solutions sector.

BY JEAN-CHRISTOPHE PIOT

A plan going forward without a hitch: while mergers are rarely free of snags, the rapprochement between Germany's Dorma and Switzerland's Kaba, announced in September 2015, has taken shape with no major difficulties and without any complaints from the competition authorities. At stake: the creation of a new industrial giant with 16,000 employees, present on every continent and valued at 3 billion Swiss francs. With a 5.2% share of a particularly fragmented global security and access control solutions market, Dorma+Kaba takes second place behind the leader, Sweden's Assa Abloy (14.6%) and just in front of Ireland's Allegion (4.9%).

This success is the reward for an operation carefully planned out in terms of capital: though the Kaba holding company has a 52.5% share in the new entity, the Mankel and Brecht-Bergen families, who own Dorma, control 9.1% of the Swiss market. This subtle game of intersecting interests, which prevents either of the two companies from overriding the other, has made possible a merger that has been under consideration for a few years. An equally sensible search for balance took place in the choice of executives: the appointment of the managing director of Kaba, Riet Cadonau, to the position of CEO of the new group caused no more upheaval than the appointment of the chairman of Kaba, Ulrich Graf, to the head of the board of directors. This is a far cry from the difficulties Lafarge and Holcim experienced in a similar context.

Beyond the issues of power, the merger between Kaba, a listed company, and Dorma, a family-owned company, is well-advised on the industrial front. "The two companies have different histories, but comparable sizes and, above all, complementary business activities," says Xavier Castaner, a professor at HEC Lausanne specialising in mergers and acquisitions. Kaba, in addition to the keys that made its brand a household name in Switzerland, had already expanded its product range to electronic access solutions and physical access systems, but the portfolio of the Zurich-based company lacked all of the Dorma specialities, such as the movable walls and sliding glass doors seen at the largest shopping centres in the Middle East. "This merger gives their clients - airports, shopping centres, companies seeking to secure their access points - a consistent product range available from a single partner," says Castaner.

Kaba, already well established in the American market, benefits from Dorma's strong presence throughout Asia and the Pacific

This complementarity also exists on a geographical scale: Kaba, already well established in the American market, benefits from Dorma's strong presence throughout Asia and the Pacific. So is the operation a success? This is still to be determined, believes Castaner, who doesn't measure the success of such a grouping until >

NUMBERS

1862

Franz Bauer founds a lock and security cabinet factory near Zurich, the future Kaba. Dorma was founded in Bavaria in 1908 by two brothers.

16,000

The number of employees in the group, spread over some 50 countries.

1.135

In billions of Swiss francs, the group's revenue at the end of its first half-year of existence.

+15%

The increase in the share price of Dorma+Kaba since April of this year.

-440

The net number of jobs to be eliminated in Germany between now and 2018. Ultimately, Dorma+Kaba plans to eliminate 800 jobs worldwide.

3

In billions of Swiss francs, the market capitalisation of Dorma+Kaba.

three to four years after the legal merger. "Dorma and Kaba share the same concern for quality, but not necessarily the same corporate culture. A merger's success cannot be measured solely on economic or financial criteria. Disorientation, fears about job security, different practices... Socially, a merger is never easy."

In fact, nine months after the first day, the tangible consequences are beginning to be felt on the ground. As part of the merger, the business activities have been reorganised into six segments. Four of them have been grouped under Access Solutions,

divided by geographical area; their combined income makes up nearly 90% of the company's total revenue. The two remaining entities, Movable Walls and Segment Key Systems, are dedicated to the international market for keys and movable walls. In order to meet its objectives for 2018 - organic growth that surpasses global economic growth by at least 2%, an EBITDA margin of 18% and 60 to 70 million Swiss francs of savings a year - the group is making use of potential synergies, rethinking its investments in R&D and gradually reorganising its production system. All this is happening very discreetly: apart from the unavoidable financial

announcements, the new firm is cultivating a certain reserve towards the media. In mid-June, it unveiled its future plans for its business activities in Germany by way of a simple press release. On the agenda are measures that promise to be painful on the employment front, with the elimination of 440 jobs and the transfer of certain production activities to Asia. Though the German headquarters of Dorma+Kaba will remain well situated in Ennepetal, near Düsseldorf, the production of certain locks will be transferred to Singapore. Its site at Ocholt is to be automated, the factory at Velbert will be subjected to cost-saving measures, and the

ANALYST OPINION

"THE MERGER ENABLED THE GROUP TO REACH A CRITICAL MASS."

When the merger was announced, many analysts demonstrated a level of caution that is normal for such a context. "Statistically, most mergers result in a drop in share prices," says Martin Flueckiger, an analyst with Kepler Cheuvreux. Hence a certain degree of caution, fed by the decline in profits of the new group by nearly one-third in the first half-year.

Nearly one year later, the tone has changed. "In a fragmented competitive context, the merger enabled the group to reach a critical mass, which should result in market share gains for some segments. The announcements made in Germany show that Kaba wishes to reform its organisation at all levels and make quick use of potential synergies," adds Flueckiger. This will accelerate the frequency of innovations and improve the production cost structure, even if it means relocating part of the production - outlooks that explain Kepler Cheuvreux's change of position. The financial services company now recommends the company's shares for purchase and puts their potential price at 800 Swiss francs, well above its previous estimates.



company is talking of a “clean-up plan” for the Rietberg site.

“A merger’s success cannot be measured solely on economic or financial criteria.”

Xavier Castaner, professor at HEC Lausanne specialising in mergers and acquisitions

This term sounds particularly harsh to Tristan Boyer, a researcher at IPAG Paris specialising in mergers, although the limited communication does not surprise him. “The company is destroying jobs in Europe to create 160 in Asia, relocating part of its production to Singapore and China...it’s easily understandable why the group doesn’t want to discuss this subject.” The fact remains that to the economist, this relocation seems to herald a cultural disruption and the beginning of a certain financialisation. “These are typical measures taken by a company that wishes to strengthen its competitiveness in order to cope with pressure

from its competitors,” he notes. “Now, the group is doing well; and it is progressing more rapidly than its main competitors. So why is it eliminating jobs so quickly?”

Financial analysts perceive these announcements differently (see the inset on p. 20). After showing caution for a time, following the announcement in April of a drop in half-yearly profits, they see these clear-cut decisions as proof that the new group has decided to take full advantage of the operation’s potential synergies – to the great benefit of the shareholders. ▲

— DOKA



ANTHONY ANEX / KEYSTONE

Riet Cadonau,
Dorma+Kaba CEO.

ANALYSIS

THE POINT OF VIEW OF SPECIALISTS

INVESTOR INTERVIEW

“Halal beauty products are becoming increasingly attractive”

Sales of halal products are on the rise. Food sector giants such as Nestlé and Danone are amongst those leading the way, explains Alan Rownan, analyst at Euromonitor.

BY BENJAMIN KELLER

Islam is the fastest growing religion in the world. According to the Pew Research Center, the number of Muslims worldwide was 1.6 billion in 2010 (23.2% of the world's population). This number is expected to rise to 2.8 billion (29.7%) in 2050, nearly exceeding the number of Christians on the planet. In Europe, the Muslim share of the population will grow from 5.9% to 10.2%. This growth is accompanied by ever increasing market opportunities for halal products and services that comply with Islamic laws (see the inset opposite). And it's not just food that we are talking about.

How much is the global halal market worth ?

Sales of halal-certified packaged food and drink products totalled \$45 billion in 2015. This figure is expected to increase by at least \$13 billion by 2020.

Who are the main market players ?

Nestlé and Danone are leading the way in the food sector, with sales of \$3.6 and \$2.6 billion respectively in 2015. Chinese stakeholders are also investing heavily to ensure that they comply with halal requirements. With 23 million Muslims living in China, this is an attempt not only to cater to their needs, but also to try to

convince non-Muslim consumers to buy halal products in light of past food hygiene scandals that have rocked the country.

In countries like the United Kingdom, it's surprising to see that it's not just Muslims that buy halal meat. Halal hasn't always received a good press and we all remember the controversial debate that gripped France.

Criticism is often aimed at the way the animals are treated during the production of halal meat (editor's note: it is primarily the fact that animals have their throats cut without being stunned beforehand that causes controversy in non-Islamic countries). However, these negative opinions often stem from a lack of knowledge or insufficient explanations. **If serious ethical questions really did exist then we wouldn't see brands such as Kellogg's offering halal-certified breakfast cereals, as is currently the case in the United Kingdom.** A brand of this stature wouldn't take the risk of upsetting its customers.





A "certified halal" stamp at a make-up stand in Birmingham.

DAREN STAPLES / REUTERS

ONE LABEL FITS ALL

The term halal (lawful in Arabic) means anything that complies with Islamic laws and applies to numerous products and services. Certain food products, for example, are completely forbidden whilst others have to be prepared according to strict rules. Animals have to have their throats cut and their blood drained as part of a specific ritual. Some believers also think that battery farming does not comply with halal practices and eating pork, or by-products such as gelatine, is forbidden. Other products, such as cosmetics and drugs, must not contain any pork by-products either.

The rules for certifying halal products differ according to the country. For meat products, many consumers prefer to go to specialist butchers. Is this a problem for multinationals?

The waters are definitely muddled when there are several arguments on the same side of the debate. This was the case in the United Kingdom where the Halal Food Authority (HFA) and the Halal Monitoring Committee (HMC) previously clashed regarding halal standards. But this hasn't stopped the multinationals from already catering for Muslim consumers in markets sectors where halal products are not commonplace. Even though there are different definitions regarding exactly what constitutes halal, the current trend is a move towards greater standardisation. This is crucial for multinationals who wish to target Muslim consumers at a global level. In China, for example, lectures and seminars have been organised with the aim of aligning market standards with those of its predominately Islamic neighbours.

Is it just the food sector that is concerned by halal?

Halal beauty products are becoming increasingly attractive. With the younger generation of Muslims combining fashion with their religious practices, new opportunities are arising in sectors including makeup, skincare and haircare, in addition to traditional areas such as oral care and soaps. You can now buy halal foundation, blusher, lipstick, anti-ageing creams and skin lightening products. This sector is currently dominated by niche companies. Brands such as Indonesian-based Wardah, IBA Halal Care in India and OnePure Beauty, based in Dubai, are ones to watch. ▲



Alan Rownan
Ethical Labels Analyst
Euromonitor

THE QUESTION

How to protect your portfolio after Brexit

The British vote on 23 June has stunned markets. Three experts explain how you should adjust your portfolio to this new environment.

BY CLÉMENT BÜRGE



GUY MONSON
Chief Investment Officer
at Sarasin & Partners

Analyst Guy Monson believes that investors should focus on medium-sized UK companies.

“Investors should protect themselves in two ways. First they need to reduce their exposure to the pound sterling. Then they should closely monitor European companies that export a lot to the United Kingdom, such as German carmakers. The drop in British consumption will have a negative impact on their earnings. Brexit will also create new opportunities. A weak pound will benefit medium-sized British firms that export to Europe, namely consumer goods manufacturers and pharmaceutical companies. The sluggish currency will also help them finally sell their goods in Asia and the United States. So they should keep an eye on companies listed on the FTSE 250, the index comprised of medium-sized companies traded on the London Stock Exchange.”



JIM LEAVISS
Head of Retail Fixed Interest
for M&G Investments

Expert Jim Leaviss thinks that British bonds are the best way to take advantage of the drop in the pound sterling.

“Investors who think long term should come out ahead by focusing on bond markets. The risk of default for European bonds was already overestimated before the vote. This error in judgement was accentuated in the aftermath of Brexit. The weak pound will also fuel inflation in the United Kingdom, making inflation-linked bonds more attractive. UK government and corporate bonds are now among my favourite products. Meanwhile, some of the safest investments currently include German bonds, the dollar and yen. However, I'd avoid putting my money in the currencies of emerging countries, such as the Mexican peso, as Brexit has had a dire impact on them.”



RICHARD PEASE
Fund Manager at Crux Asset
Management

This star fund manager of a British fund recommends pulling out of Southern Europe and concentrating on firms that operate in Swedish or Norwegian currency.

“Investors should avoid firms in Southern Europe, as these companies are going to suffer disproportionately from the political woes in Europe. They should instead focus on Northern European companies with strong capitalisations that operate in Norwegian kroner or Swedish kronor rather than euros or pounds. That said, firms listed on the FTSE 100 are global. The fall in the pound sterling will rapidly increase their earnings per share. Brexit is putting companies' business models to the test of soundness. Only the best will make it through the Brexit earthquake. I think that investors should simply hold on to their quality shares and wait for the storm to blow over.”

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THE FOCUS

Pharma: Swiss groups fight back

After losing patent protection for big-name products, Roche and Novartis are reviewing their strategy and investments to focus on cancer immunotherapy. It's a risky bet, but one that could pay off. We asked the pundits for their insights.

BY MARIE MAURISSE

2016 has definitely been a rough year. After a period of outstanding performance, the pharmaceutical industry is going through a phase of uncertainty. The high price of prescription drugs in the United States is one of the issues in the presidential campaign, preventing companies from maintaining any clear visibility of the market. Meanwhile the fallout from Brexit is cause for concern in Europe.

“Eleven of Roche’s treatments undergoing clinical development received breakthrough therapy designation, demonstrating its continuous ability to innovate.”

In addition to these challenges, the leading Swiss pharmaceutical firms are grappling with loss of patent protection on some of their major drugs. Glivec or Gleevec, a leukaemia treatment by Novartis, is now in the public domain and faces competition

from generics, many of which are manufactured by Indian companies. This is a harsh blow for the Basel-based pharma group, for which the drug generated revenue of nearly 5 billion Swiss francs a year. Novartis is also dealing with eroding sales of Tasigna, another leukaemia treatment, and the poor performance of Diovan and Exforge, two drugs used for hypertension that are threatened by generics from the American market.

Meanwhile, Roche is bracing for the loss of its exclusive rights to three successful cancer drugs between now and 2019. MabThera, Avastin and Herceptin each generate revenue of 7 billion to 8 billion Swiss francs a year. “And the first biosimilar drug to compete with the cancer treatment Rituxan will probably hit the market next year,” says Nick Turner, an analyst at Mirabaud.

So the environment is strained. But the two giants are well aware of the expiry of their patents and have been preparing their change in strategy for a long time. Novartis will lose additional patents in 2019 (Gilenya used for multiple sclerosis and Afinitor for breast cancer). But Agathe Bouché Berton,

an analyst at Bordier & Cie, believes that “the impact won’t be as huge. These treatments generated revenue of \$4.4 billion in 2015 versus \$10.7 billion for Diovan and Glivec/Gleevec combined before the patents expired. And the development of recently released drugs is expected to offset the patent cliff.” The new drugs the analyst is referring to are Cosentyx, a treatment designed for psoriasis, and Entresto, a new drug used for heart failure. Despite a disappointing launch, Entresto’s sales are expected to grow in the medium term. A study published in the medical journal *JAMA Cardiology* in June 2016 stated that this drug could save the lives of 28,000 people per year in the United States alone.

Roche also has reasons to embrace the future with optimism. “The loss of patents notwithstanding, the company is likely to continue its long-term growth given the quality of its portfolio,” Bouché Berton says. “Eleven of its treatments undergoing clinical development received breakthrough therapy designation, demonstrating its continuous ability to innovate.”

And these days Roche is turning to immunotherapy, a revolutionary approach to treating cancer. Instead of fighting the disease by injecting outside chemical treatments, immunotherapy aims to stimulate the patient’s own immune defences. This promising technique featured prominently in some encouraging studies presented at the prestigious conference held by ASCO (American Society of Clinical Oncology) in June. Forecast sales are expected to reach \$22 billion by 2022.

Investing in oncology is a bold choice, says Jérôme Schupp, head of research at the Swiss bank SYZ. “Cancer treatments have a low success rate. But when one of them reaches the end of the development process and passes clinical trials, the gains are huge as these drugs are expensive.”

The market is currently dominated by the American group Bristol-Myers Squibb and its medicine Opdivo used to treat advanced melanoma (skin cancer). Its competitor Merck & Co has set its sights high with Keytruda, an immunotherapy drug approved by the U.S. Food and Drug Administration (FDA) in 2014 also developed to fight

melanoma. The former American president Jimmy Carter was treated with Keytruda in 2015 and announced a few months later that he had no trace of any tumours in his body. This “miracle” recovery received extensive press coverage in the United States and gave the brand a windfall of publicity. Merck & Co forecasts revenue of \$4.5 billion for Keytruda in 2020.

Amid this fierce competition, Roche has placed great hope in the huge advances it has made with its antibody Tecentriq, manufactured by its subsidiary Genentech. Clinical trials have shown a reduction in bladder tumours in a quarter of the patients tested and extended life expectancy compared with people treated using chemotherapy. The FDA approved the market launch of Tecentriq in May 2016 for treating bladder cancer, a particularly virulent form of the disease. The drug is expected to be considerably profitable. More than 77,000 Americans suffer from bladder cancer, and the treatment developed by Roche costs \$12,500 per month and per patient.

“Novartis appears to have missed the first train, but seems to be taking the second.”

In the starting blocks, Novartis is also putting much energy into developing its immuno-oncology division. “By the end of 2016, ten main active ingredients will be studied in clinical trials performed on humans,” Bruno Strigini, director of the division, said in June. Will that be enough to catch up? “Novartis appears to have missed the first train, but seems to be taking the second,” says Lorenzo Biasio, an analyst at Credit Suisse.

But for now, all eyes are on the match between Bristol-Myers Squibb and Roche. “The U.S. firm estimates Opdivo sales at \$9.8 billion in 2020, while Roche forecasts \$3.9 billion in 2020 with Tecentriq,” Biasio says. “I’d say that Bristol-Myers Squibb’s expectations are quite high, and they might be better off remaining more prudent.” ▲



Dossier prepared by
Clément Bürge,
Stanislas Cavalier,
Benjamin Keller,
Julie Zaugg

DOSSIER

THE ENERGY TRANSITION

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THE GREEN REVOLUTION IS UNDERWAY

Global investments in renewable energy reached a record level in 2015. Financiers' appetite for solar and wind energy is a sign of the level of maturity the sector has attained. As they become competitive, energy sources of the future are changing in scale.

BY STANISLAS CAVALIER

Construction of the Turnow-Preilack solar farm near Cottbus in East Germany (7 April 2009), which is currently one of the world's biggest solar farms.

The time is long past when renewable energy was scoffed at for being bottomless “subsidy pits”. They now tempt investors who see them as less risky investments than traditional resources. From this perspective, 2015 was an exceptional year: global investments in renewable energy reached \$286 billion – a new record, and twice the amount spent on new gas or coal plants. This expansion was driven mainly by wind energy (capacity increased by 17% last year, to 433 gigawatts) and photovoltaic solar energy (up 28%, to 227 gigawatts).

The production costs associated with onshore wind and photovoltaic solar technology should further drop by 41% and 60% respectively by 2040

“It’s unquestionably a craze,” says Jacques Percebois, director of the Centre de Recherche en Économie et Droit de l’Énergie (Centre for Economics and Energy Law Research, or CREDEN) at the University of Montpellier. “Investors are not

philanthropists worried about global warming or the future of the planet. If these assets are tempting them, it’s because their fundamentals have radically improved in the last few years. Today, wind and solar energy are generating rather strong returns.”

As a result, the sector is “going green”, at least outside of Europe (see the article below). On 21 June of this year, Elon Musk, the founder of Tesla, announced his intention to acquire the number one solar energy company in the United States, SolarCity, for \$2.6 billion. And ambitious projects are on the increase in a number of countries. A gigantic wind farm is under construction on a Tibetan plateau in the Chinese province of Gansu. It will have an output of 20,000 megawatts by 2020. Closer to home, a Norwegian project supported by Credit Suisse and the Bernese group BKW will complete the construction of the largest onshore wind farm in Europe by 2020. For its part, Morocco has begun construction of the largest solar thermal farm in the world in the Sahara Desert.

This dynamism is all the more remarkable given the fact that oil prices have been falling for some time. However, it is not enough to persuade industrial players to rely on these alternative sources. The cost of renewable energy has also fallen significantly. The 2010 crisis, which had led to the bankruptcy of prestigious companies like Flexcell in Switzerland, SunTech in China and Prokon in Germany, was advantageous in that it brought about a concentration of the sector and an emergence of larger players that were more financially robust >

ADVANTAGES FOR SOUTHERN COUNTRIES

The renewable energy craze is now centred around Southern countries more than their Northern neighbours. For the first time in 2015, investments from emerging and developing nations exceeded those coming from more advanced countries (\$156 billion compared to \$130 billion). China alone pledged \$103 billion, or 36% of the global total. Conversely, investments dropped by 8% within developed countries. The most conspicuous drop was seen in Europe (down 21% to \$48.8 billion). This trend is expected to get worse over the next few years. “The real sources of growth for renewable energy are currently outside of Europe,” says Geoffroy de Clisson, the founder of Green Cape Finance,

a clean technology and energy consulting firm. The main reason is structural: to continue their development, emerging countries constantly need more energy, while consumption is stagnating or dropping in rich countries.

Europe, especially, is suffering from an electricity overproduction crisis, due particularly to the granting of large subsidies for renewable energy. “Energy prices on the European stock market have collapsed, partly because of government aid which has distorted the market,” explains Jacques Percebois of the University of Montpellier. “While the subsidies have had beneficial effects, allowing for the development of a number of

projects, they have also produced harmful consequences by becoming, in certain cases, allowances.”

Thanks to a voluntarist policy, Germany, for example, has increased the share of renewables in its electricity mix from 6.5% in 2000 to 32.5% in 2015. The problem is that this hasty development is costing taxpayers a great deal: €23 billion a year. Faced with simmering discontent, Berlin decided on 8 June of this year to radically change its system of renewable energy subsidies: no more guaranteed prices for the repurchase of kilowatt-hours and more room for public tenders. Other countries such as France are following this example.

and more technologically experienced. This situation led to a decrease in production costs, especially in the solar photovoltaic industry. According to a study by the consulting firm Alcimed, the price of solar energy has dropped from €24 per watt in 1980 to €0.56 today, i.e. a 43-fold decrease!

“The incredible drop in renewable energy production costs has surprised everyone, even the biggest optimists,” says Tim Buckley, director of Energy Finance Studies at the Institute for Energy Economics and Financial Analysis (IEEFA), an American research organisation. “Governments, companies and investors are realising that it is now relevant to bank on renewables, from both an environmental and economic point of view. Interest in renewables has clearly grown.”



“The incredible drop in renewable energy production costs has surprised everyone.”

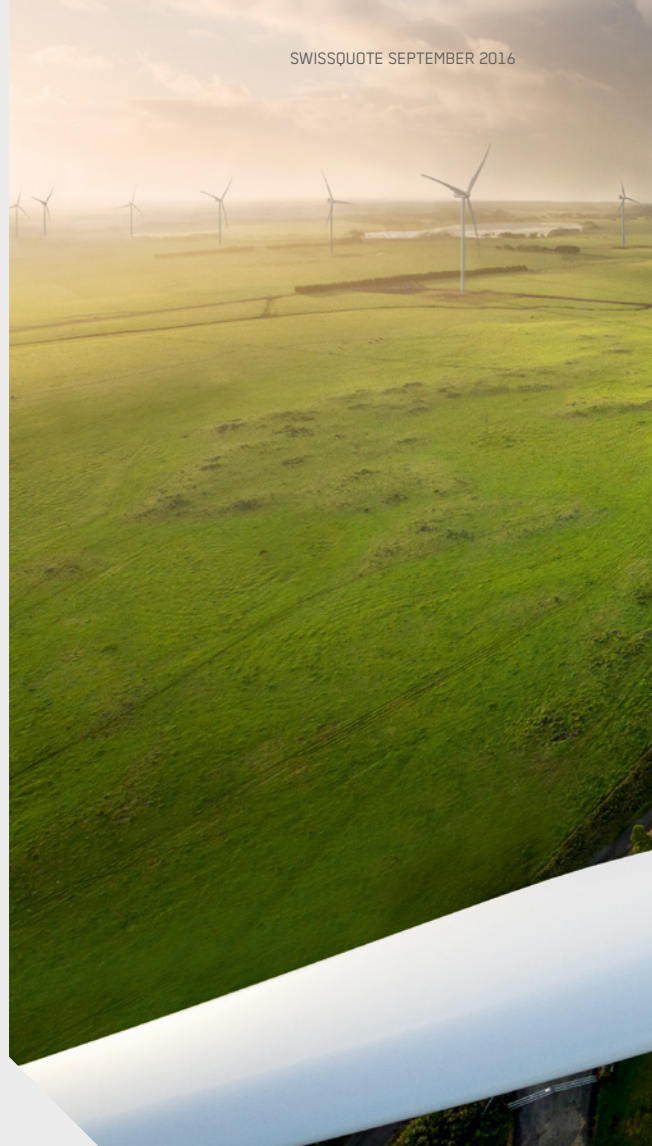
Tim Buckley, Institute for Energy Economics and Financial Analysis (IEEFA)

In keeping with this interest, on 10 June of this year, India announced the cancellation of its plans to construct four enormous coal-fired power plants in favour of green energy (a total of 16 gigawatts, or the equivalent of nine nuclear plants the size of Fessenheim, in Alsace).

“The transformation of the electricity sector in India as well as China is speeding up,” says

Tim Buckley. These countries continue to diversify their energy mix by decreasing their share of coal, and more quickly than expected. China in particular has already largely passed its point of peak coal.”

Another advantage of renewable energy: “Companies can invest step-by-step, for example installing 10 megawatts and then 10 more if the results are satisfactory,” explains Jacques Percebois of the University of Montpellier. “On the other hand, with a coal-fired plant, right away you have to construct an enormous unit that will only be amortised 30 years later, and only if the conditions don’t deteriorate.” As a result, renewable energy is being awarded more and more tenders, even when in competition with



fossil fuel-based energy. In Chile, for example, the first solar farms developed without any subsidies are being completed, such as the Salvador (Sunpower, 70 megawatts) and Luz del Norte (First Solar, 141 megawatts) projects, whose electricity is sold at wholesale rates.

INNOVATIVE ECONOMIC MODELS

The situation is clearly less rosy in Europe. The Old World is being weighed down by an electricity overproduction crisis, aggravated by weak demand. “In developed countries, certain policies have proved to be disappointing,” says Tim Buckley, who still says he is firmly convinced that energy transition will impose itself on a global scale, even without government help.

This is, moreover, what is happening in the United States, where investment in renewable energy (largely dominated by solar energy)

The Macarthur Wind Farm field in South East Australia consists of 140 turbines and generates a total capacity of 420 megawatts.



VESTAS

rose by 19% in 2015 to \$44.1 billion thanks to two purely capital-intensive models. The first was introduced by SolarCity, whose flagship service consists of installing solar panels at its customers' homes for free; they then commit to buy the electricity that is produced from the company for 15 to 20 years, all at a rate lower than that of traditional suppliers.

The second innovation, described by Deutsche Bank as the "most significant change in the solar sector in 2014", is the work of "YieldCos" or yield companies. These businesses purchase solar and wind farms and then list themselves on the stock market. "YieldCos are a tremendous success with investors because they generate a dividend return that is both safe and above average, generally on the order of 6%," says Jacques Percebois. In the United States, a dozen YieldCos are already listed on the

stock market, and the phenomenon was introduced in Europe in 2015 with the listing of Saeta Yield, the largest European YieldCo, on the market.

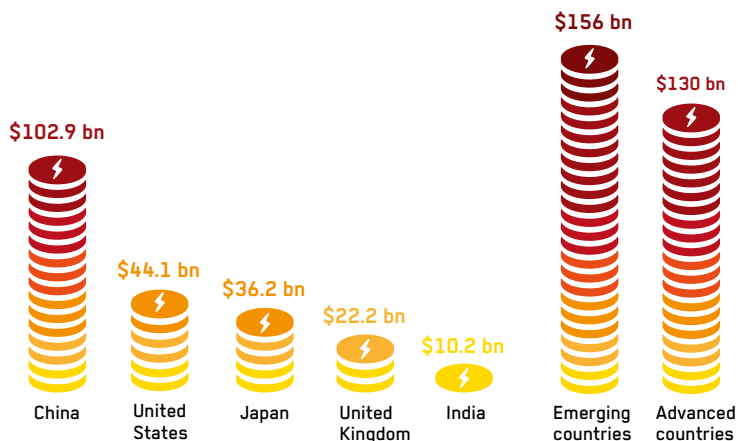
This type of model is expected to be emulated worldwide because renewable energy will become more and more profitable. According to a study by Bloomberg New Energy Finance (BNEF) published in June, the production costs associated with onshore wind and photovoltaic solar technology should drop by 41% and 60% respectively by 2040. At that time, green energy is expected to power 70% of all European electricity, compared to 32% at present. "The prices of gas and coal will remain low," BNEF projects in its report, "but this will not prevent a fundamental transformation of the global electric system during the next few decades towards wind and solar." ▲

2015 THE ENERGY TRANSITION

NEW INVESTMENTS IN RENEWABLE ENERGY

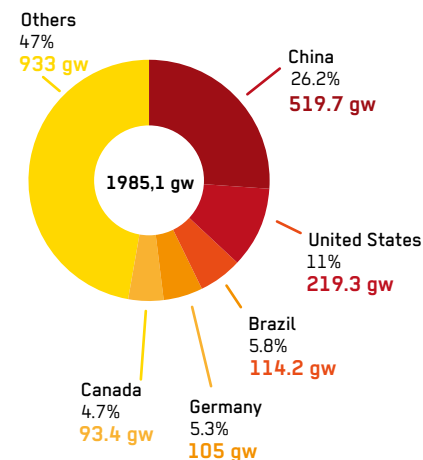
(except hydroelectric plants with a production capacity exceeding 50 MW)

The top 5 countries



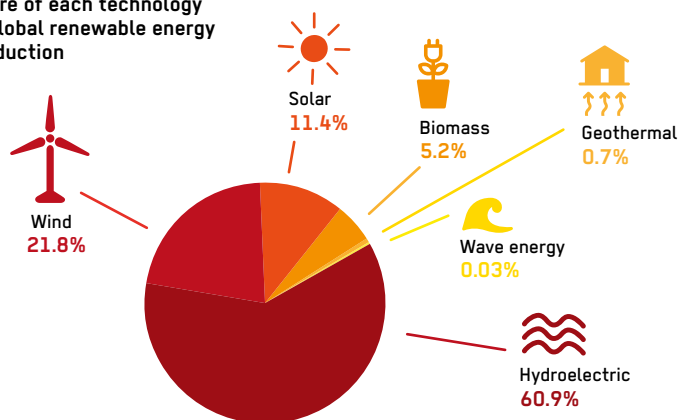
RENEWABLE ENERGY PRODUCTION CAPACITIES

The top 5 countries



HYDROELECTRIC AHEAD OF WIND AND SOLAR

Share of each technology in global renewable energy production



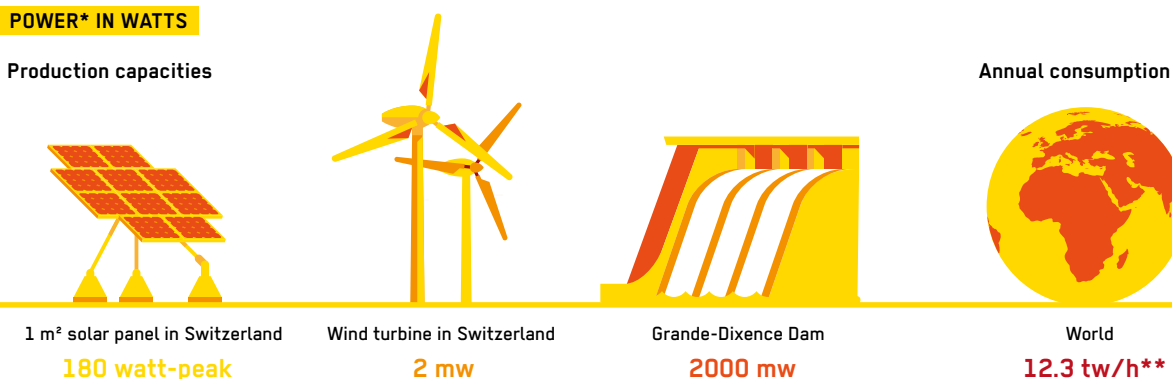
JOBS IN ABUNDANCE

Direct and indirect jobs in renewable energy worldwide



POWER* IN WATTS

Production capacities



Annual consumption



*An installation with a power capacity of 1 MW is capable of producing 1 MW per hour

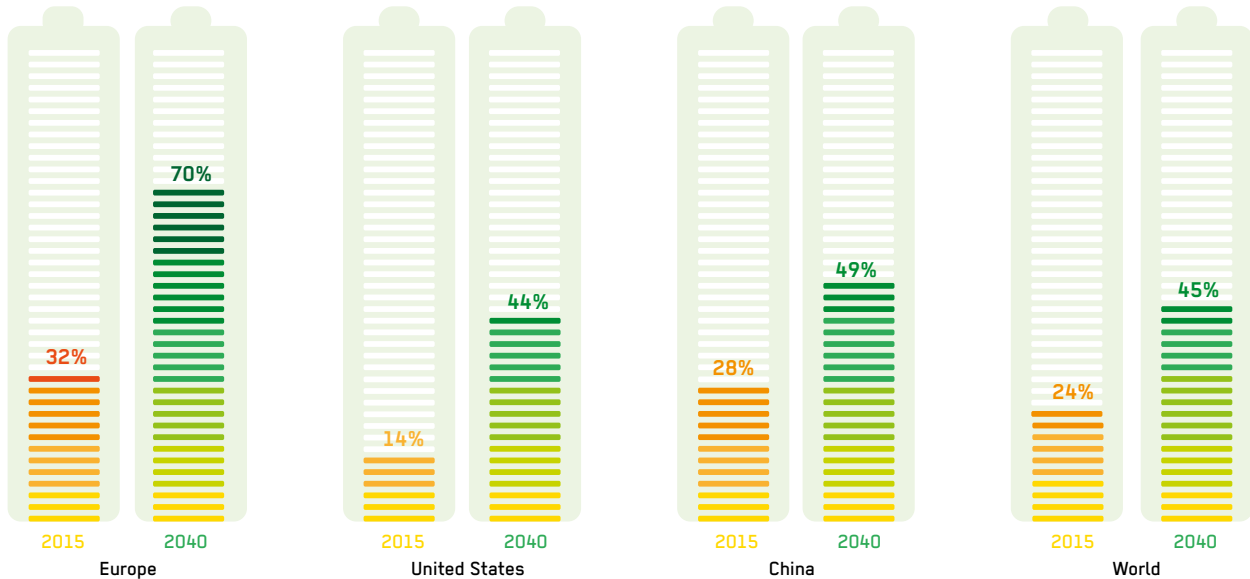
**1 tw = 1000 gw = 1000 billion watts

2040

THE WORLD GOES GREEN

PROGRESSIVELY GAINING GROUND

Share of renewables in energy production



FOSSIL FUELS LOSE GROUND

\$7,800 bn



Cumulative investments in renewable energy by 2040

\$3,200 bn



Cumulative investments in fossil fuels by 2040

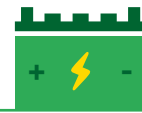
INCREASINGLY CHEAPER TECHNOLOGIES

Estimated change in cost by 2040



Onshore wind

-41%



Lithium-ion batteries

-76%



Solar photovoltaic

-60%



Coal

+49%

BOOM IN ELECTRIC CAR SALES

2015 462,000

2040 41 m*

*I.e. 35% of all sales of new light vehicles.

AN ERA OF GIGANTIC PROJECTS

Several immense energy production sites have emerged in the last few years. They are working to boost the world's production of green power. An overview.

BY JULIE ZAUGG



ONSHORE WIND

ROY RANDALL

ALTA WIND ENERGY CENTER

A forest of turbines in the California desert

MOJAVE DESERT, CALIFORNIA,
UNITED STATES

OPERATING SINCE: 2013

POWER: 1,547 MEGAWATTS

The Mojave Desert, an extremely arid and windy region of south-east California, saw the opening of the first wind

power projects in the United States in the 1970s. But the building site of the Alta wind farm launched in 2011 represents a clear change of scale: with 600 turbines spread over 1,300 hectares, this site is now the largest wind farm ever constructed. Developed by the company Terra-Gen Power and with the financial support of Citibank, Barclays Capital and Credit Suisse, it supplies 257,000 California households with electricity.





LONDON ARRAY

OFFSHORE WIND



NORTH SEA, NEAR LONDON
 OPERATING SINCE: 2013
 POWER: 630 MEGAWATTS

LONDON ARRAY

White blades in the North Sea

Flying over the North Sea, off the Thames Estuary, you can see the turbines spread as far as the eye can see, their immense blades turning slowly to the rhythm of the sea breezes. There are 175 of them, and they are part of the London Array project, the largest offshore wind farm in the world. Buried in the seabed lies more than 200 km of array cabling linking the turbines - supplied by Siemens - to each other and to the offshore substations. The generated current is then channelled to the households of London. This farm, whose construction cost €1.8 billion, is co-owned by the British group E.ON, the Danish company Dong Energy, the Canadian institutional investor Caisse de dépôt et placement du Québec and the subsidiary of the Abu Dhabi sovereign wealth fund Masdar.



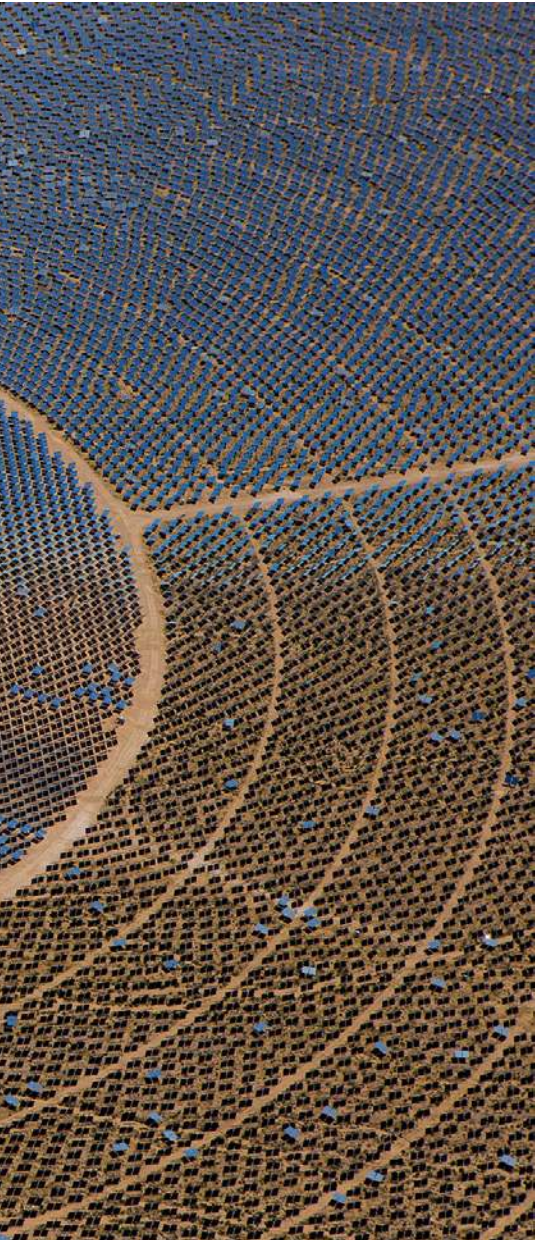
SOLAR THERMAL

MOJAVE DESERT, CALIFORNIA, UNITED STATES
 OPERATING SINCE: 2015
 POWER: 392 MEGAWATTS

IVANPAH

170,000 mirrors reflecting the sun

Solar thermal energy does not directly convert the sun's rays into electricity. Instead, it uses them to heat water-filled towers by way of mirrors. This heat, which can reach 540°C, turns water into vapour, which activates turbines and generates power. The largest installation of this kind, Ivanpah, is located in the Mojave Desert in California. The climate of this area, which sees 330 to 350 days of sunlight a year and whose elevation (1,500 metres) keeps the air dry and clear, explains this choice of location. This solar farm is made up of 173,500 mirrors, each one measuring 21 m² and spread over an area of 1,416 hectares. The installation supplies 140,000 California homes with electricity. Its construction, under the aegis of the American companies BrightSource Energy and Bechtel Corporation, cost \$2.2 billion. Google also pumped \$168 million into the project.



GILLES MINGASSON



ROBERTO SCHMIDT / AFP

GEOTHERMAL

OLKARIA POWER STATIONS

Energy from the centre of the earth

RIFT VALLEY, KENYA

OPERATING SINCE: 2014

POWER: 585 MEGAWATTS

The Rift Valley in Kenya holds one of the largest concentrations of geothermal energy in the world.

This vast reserve of heat trapped in the earth's crust was generated at the time of the planet's formation as well as during more recent radioactive activity. It rises to the surface when two tectonic plates collide. Such is the case in this vast plain that runs through Kenya from north to south. It has become the site of the Olkaria project, which fulfils more than a quarter of the country's electricity needs. Built in four phases, the complex is made up of three public plants and one private plant, developed by the American group Ormat Technologies. A fifth geothermal plant will soon be completed, which will bring the total output generated by Olkaria to 725 megawatts. The Kenyan government believes that this arid region has the potential to generate 2,000 megawatts.



SOLAR PHOTOVOLTAIC

SOLAR STAR

Solar panels in Gold Rush country

ROSAMOND, CALIFORNIA,

UNITED STATES

OPERATING SINCE: 2015

POWER: 579 MEGAWATTS

Near Rosamond, a small California town north of Los Angeles which saw its greatest moments during the Gold Rush, the ground

is not brown—it's blue. This is because it is covered with 1.7 million photovoltaic solar panels. These large silicon plates, comprised

of cells that absorb the electromagnetic waves emitted by the sun and convert them into electricity, occupy an area of 13 km². They make up the Solar Star solar farm, powering 255,000 California households. Built by SunPower Corporation, this installation now belongs to BHE Renewables, a subsidiary of Warren Buffett's company Berkshire Hathaway.



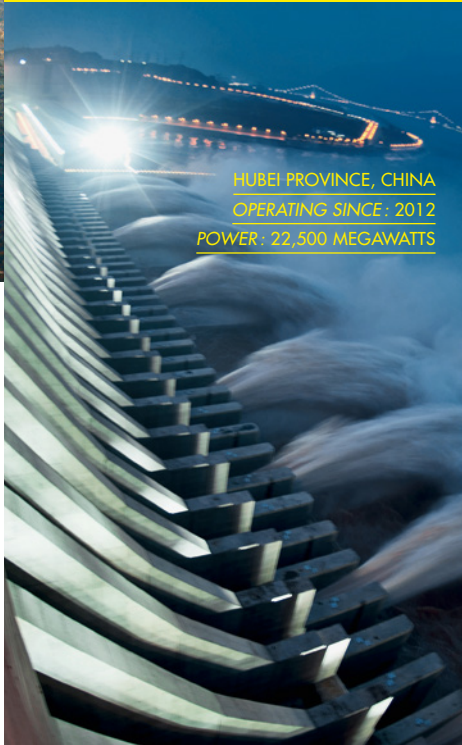
TFG TOP PHOTO GROUP / NEWS.COM



HYDROELECTRIC

THREE GORGES DAM**The dam that exhausts all superlatives**

A truly monumental work, the Three Gorges Dam is the largest electric power station in the world. At 2,335 metres long and 181 metres high, the dam's construction led to the displacement of 1.24 million people. The 1,045 km² reservoir created by this gravity dam, which cuts across the Yangtze River in Hubei Province in central China, led to the flooding of 153 towns, 1,350 villages and 1,300 archaeological sites. This project, which cost 148 billion yuan (21.6 billion Swiss francs), supplies nine provinces and two cities with electricity. Operated by China Three Gorges Corporation, a state-owned company, the dam has 32 main turbines, each of which has a capacity of 700 megawatts. The equipment was supplied by two joint ventures: the first was composed of Alstom, ABB, Kvaerner and Haerbin Motor, and the second comprised Voith, General Electric, Siemens and Oriental Motor.

HUBEI PROVINCE, CHINAOPERATING SINCE: 2012POWER: 22,500 MEGAWATTS

TFG TOP PHOTO GROUP / NEWS.COM



BIOMASS

ALHOLMENS KRAFT POWER STATION**A plant fuelled by wood and peat**OSTROBOTHNIA, FINLANDOPERATING SINCE: 2002POWER: 265 + 160 MEGAWATTS

the world, located in the region of Ostrobothnia in western Finland, this installation produces both electricity and vapour. It can generate 265 megawatts of the former and 160 megawatts of the latter. Devel-

The largest biomass power station in

oped by the Finnish company Metso, the plant uses wood residue and peat as fuel. It burns 300,000 bales of forest residue a year. The vapour generated by the plant supplies a paper mill as well as part of the city of Jakobstad with heat. The electricity produced is equivalent to the amount of energy needed to light a road that circumnavigates the earth.

TIDAL

SIHWA POWER STATION

An immense underwater wall traversed by the tides

SIHWA LAKE, SOUTH KOREA

OPERATING SINCE: 2011

POWER: 254 MEGAWATTS

Completed in 2011, this immense barrage, which forms one of the watersheds of Sihwa Lake in northwest South Korea, makes use of the energy generated by the tides when they pass through its turbines to produce electricity. It has a capacity of 254 megawatts. Operated by Korea Water Resources Corporation, a state-owned water man-

agement company, this project cost 313.5 billion won (258 million Swiss francs). The barrage was built in 1994 to protect the population from floods and facilitate agricultural work, and turbines were subsequently added to it. In this region, the tidal range can reach 5.6 metres and even 7.8 metres in the spring - an ideal environment for producing energy.

RENEWABLE ENERGY AROUND THE WORLD



HYDROELECTRIC

China is on the cutting edge in terms of hydroelectric capacity (28% of the world total), followed by Brazil, the United States, Canada and Russia. Turkey, India and Vietnam have recently unveiled large-scale dam projects.



SOLAR PHOTOVOLTAIC

For quite a while, Germany reigned supreme in solar photovoltaic energy, but it has now been surpassed by China, with Japan and the United States following on its heels.



WIND

China clearly dominates onshore wind, with one-third of global capacity, followed by the United States (18%). The rest is essentially divided between Germany, India, Spain, Great Britain and Canada. In offshore wind, Great Britain leads the way, alongside Denmark and Germany.



SOLAR THERMAL

This technology, which calls for strong sunlight, has historically been dominated by the United States and Spain. But India, Morocco and South Africa are catching up.



GEOTHERMAL

The United States, the Philippines, Indonesia, Mexico and New Zealand produce the most energy from the heat of the earth's crust.



BIOMASS

The United States, Germany, China, Brazil and Japan convert the most plant residues into electricity.



MARINE ENERGY

Great Britain, Ireland, Denmark, Norway, Sweden and Spain are the most advanced in terms of tidal energy. Projects for producing electricity from wave power have emerged off the coasts of Scotland and Portugal.

INTERVIEW

"Switzerland has been resting on its laurels"

Scientist and author François Vuille, a specialist in global energy issues, spoke with *Swissquote Magazine*. He touched on the issues involved in the global energy transition and the challenges that renewable energy must still overcome before lighting the way for the planet.

BY STANISLAS CAVALIER

Both politicians and citizens are still ill-informed when it comes to the energy transition." A tireless populariser, François Vuille believes that as a researcher, his calling is not just a scientific one. Along with Professors Daniel Favrat and Suren Erkman, this specialist in global energy issues wrote the book *Comprendre la transition énergétique (Understanding the Energy Transition)*, published by Presses polytechniques et universitaires romandes, in October 2015. This volume is meant to make sometimes complex issues easy for everyone to grasp. An interview.

In 2015, global investments in renewable energy reached a record level. Does this mean that the energy transition, which has been forecast for so long, is now underway?

At the global level, out of all energy

types, renewable energy is now receiving the most new financing. This trend is being accompanied by massive disinvestment in energy from fossil fuels because they are being weighed down by many uncertainties, such as the introduction of a high carbon tax, extraction costs and the availability of unconventional sources like shale gas. So the energy transition, i.e. the change to low-carbon energy, seems to be underway.

That said, although the share of renewable energy is increasing within the global energy mix, the weight of fossil fuels (coal, gas and oil) remains staggering. Today, they still meet about 80% of global demand. Moreover, investments in nuclear energy remain stable worldwide. Countries like Belgium, Germany, Italy, Sweden and Switzerland have decided to give up nuclear power, but others such as India and China are still turning to

this type of energy because their energy needs are increasing.

Why is this transition so urgent? Can't we use fossil fuels for a few more years?

The vast majority of the scientific community believes that greenhouse gases, which are generated by the use of fossil fuels, play a major part in global warming. If we wish to limit the rise in temperatures to below 1.5°C by 2100—an objective that the countries signing the COP21 agreement set for themselves—we must quickly reduce our dependency on fossil fuels.

But the situation is still urgent even if we forget about the climate. Easily accessible oil and gas resources will soon be depleted. We are now resorting to unconventional resources such as shale gas, oil sands and deep-water deposits, which are more difficult





A GLOBAL THINKER

After beginning his career as a strategy consultant in the transport and sustainable energy sector, François Vuille is now the **director of development of the Energy Center** at the Swiss Federal Institute of Technology in Lausanne (EPFL). This centre promotes multidisciplinary research projects, in collaboration with industry players, in areas such as transport, energy storage and energy distribution. François Vuille is also the lead author of two major reports commissioned by the International Energy Agency (IEA). He also sits on various energy policy commissions at the regional and national level. Earning a degree in physics from EPFL in 1995, he obtained a doctorate in astrophysics in 1999 and a master's degree in energy engineering in 2003.

to exploit. These new products present a much higher environmental risk, as the Deepwater Horizon oil spill in the Gulf of Mexico showed. And in Canada, the ecological impact of the exploitation of oil sands has been catastrophic.

Despite their increased scarcity, fossil fuels are quite inexpensive right now, and there is still enough to last for many years...

It's true that there is still a great deal of oil left, which would probably allow us to continue living as we currently are for decades. But at what cost? The current price of energy does not in any way reflect its intrinsic value. Before taxes, one litre of petrol is worth 70 Swiss cents, the same price as a bottle of water you buy in a shop. This is nothing for a product that had to be extracted, transported and refined. Though it's at about \$50 today, a barrel of oil will cost much more in the years to come due to the more general use of unconventional fossil fuels, which are more expensive to extract. Moreover, when the amount of carbon dioxide (CO₂) released and the environmental impact are factored into the cost, oil becomes even more expensive.

For a country like Switzerland, which still meets 67% of its energy needs with fossil fuels and imports 80% of its primary energy, it seems economically risky to me to maintain such a dependence, given the uncertainty surrounding future prices and energy supply security. Over the last few years, Switzerland has been importing more than 12 billion Swiss francs of energy every year. How much will it be tomorrow if the price of oil takes off? On the other hand, the price of renewable energy is proving to be much more predictable. The wind and sun are free of charge, and we know how much the associated technologies cost (solar panels, wind turbines), thus their prices are either stable or falling. ▶

Why is the price of electricity so low in Europe right now, to the point where our own hydro-electric plants are in danger?

Europe is currently suffering from a serious energy overproduction crisis. Between 2000 and 2010, significant investments were made in gas- and coal-fired power plants as well as in renewable energy. But because of the economic crisis, demand did not increase as expected. At the same time, renewable energy

was widely subsidised in countries like Germany, which distorted the market by artificially driving prices down. As a result, electricity market prices collapsed. All the more so since the United States, which no longer needs its coal thanks to shale gas extraction, is exporting it to Europe at very low cost.

For the first time, investments in renewable energy by emerging and developing countries

have exceeded those of advanced countries (\$156 billion compared to \$130 billion). Isn't this paradoxical, if the more developed countries are supposed to set the example?

No. Due to their economic development, emerging countries are seeing their demand for energy increase exponentially. They are therefore investing heavily not only in renewable energy, but nuclear energy and fossil fuels as well,



to be able to continue their growth. On the other hand, in countries like Switzerland, a decrease in energy consumption is expected in the next few years. According to projections, the need for electricity will stabilise by 2050 while the need for petrol, heating oil and other fossil fuels should fall sharply thanks to improvements in energy efficiency. In Europe, significant efforts have already been made. In Germany, for example, green energy

is already covering nearly one-third of electricity consumption.

Where does Switzerland stand ?

In the area of new renewable energy sources, like solar, wind and geothermal, we are doing terribly. Compared to our European neighbours, we are clearly falling behind. In 2015, Switzerland was the only European country that had not installed a single wind turbine on its territory! More broadly, the share of renewables in our energy mix is at 21%, thanks essentially to our dams. This puts us in a good position within Europe, but we are still far behind the leaders Norway and Sweden, where renewable energy makes up over 50% of resources. If we don't count hydroelectric power, only 2.9% of Switzerland's electricity mix comes from green energy, compared to 19% in Germany, 16% in Italy and 5% in France.

that the remaining 75% is almost entirely covered by fossil fuels (heating oil, gas, petrol, diesel). Switzerland has only lately and tentatively tried to develop new renewable energy sources. But it will take some time before the effects of the policy change become apparent. For example, at present, it will take eight to ten years to install wind turbines in Switzerland.

Will the anticipated closure of Swiss nuclear power plants speed up the country's energy transition ?

Three possibilities are open to us. One, we can replace nuclear power by purchasing huge amounts of electricity from our neighbours. Two, we can build gas-fired power plants. Three, we can invest in renewable energy and energy efficiency. If we are to take energy supply security and greenhouse gas emissions into consideration, the first two solutions are less attractive because imported electricity generates an average of 130g of CO₂ equivalent per kWh, and electricity from gas-fired plants generates 350 g of CO₂ per kWh, compared to only 29 g of CO₂ per kWh using current Swiss electricity.

From a purely economic point of view, according to a model developed at EPFL, whether Switzerland uses fossil fuels, nuclear power or renewable energy as the basis for its electricity, the cost of the energy system by 2050 will be more or less the same. This is because renewables (essentially solar photovoltaic energy) and energy efficiency solutions (electric vehicles, etc.) will consume less energy and will become more and more competitive. The cost of these technologies will continue to drop, while the cost of traditional energy solutions will go up, due especially to the increased cost of new nuclear technologies and the rise of futures prices of finite resources like oil and gas. ▲

"Shale gas, oil sands and deep-water deposits present a much higher environmental risk than easily accessible oil and gas resources."

The explosion of the Deepwater Horizon oil rig in the Gulf of Mexico on 20 April 2010 remains one of the worst ecological disasters in recent years. The resulting spill was estimated at 780 million litres.

How can this lag be explained ?

More than 90% of our country's production of electricity comes from hydropower and nuclear power plants, which do not generate CO₂ emissions directly. With this in mind, Switzerland has been resting on its laurels, believing that its electricity is already "clean" and that nothing needs to be changed. This perspective loses sight of the fact that electricity makes up only 25% of our final energy consumption, and

Why Swiss dams are worthless

Once considered the hallmark of Swiss energy production, the hydropower industry is experiencing a serious economic crisis. Here's why.

BY STANISLAS CAVALIER



THE DOWNSIDE OF A LIBERALISED MARKET

Since the partial opening of the Swiss market in 2009, customers consuming more than 100,000 kWh, or companies with 100 employees or more, can buy electricity on the free market at 2 to 3 cents a kWh. For other customers - individuals or small companies - prices

are still regulated. According to EICom (the Swiss federal electricity commission), the Swiss general public pays 20.6 cents on average per kWh in 2016. "Electricity companies who have access to this captive market continue to make substantial profits," notes

Franco Romerio. "But those who depend on the wholesale market, like Axpo and Alpiq, are experiencing tough times. They are exposed to international competition but their electricity costs more to produce than energy imported from other countries, particularly Germany."

“ If someone had come to see me 10 years ago and told me Swiss hydroelectric dams would be worthless today, I wouldn't have believed them” explains Franco Romerio, professor of Energy Policy and Economics at Geneva University. “I would have thought: this is science fiction; it's impossible!” And yet one must face up to reality: most large dams, the primary source of renewable energy in Switzerland, are no longer profitable. The situation is so serious that in March, Michael Wider, deputy CEO at Alpiq, had no qualms declaring that hydropower has become a major problem for Alpiq.

The leader in Swiss energy, based in Lausanne, is on the verge of bankruptcy. In 2015, it registered net losses of 830 million Swiss francs. Axpo is also in a delicate position. In 2015, its EBIT (Earnings Before Interest and Taxes) was in the red with a loss of 929 million Swiss francs.

Swiss electric companies are in such a tight spot that they are willing to do anything to survive, including selling off the symbols of Swiss energy independence. Alpiq announced on March 7 2016 that it was selling off 49% of its hydroelectric facilities, the second largest in the country behind Axpo. A dozen pumped storage power plants are concerned, including the famous Grande-Dixence and Emosson dams in Valais.

The value of the portfolio on sale is estimated at between 400 and 480 million Swiss francs. There is only one problem: several months after putting the facilities on the market, the offers the firm has received are highly disappointing. Even though Andreas Meier, the firm's spokesman, claims “the interest is there”, one must accept the obvious: “In Switzerland and in Europe, few investors are ready to take a chance on hydroelectricity,” concludes Franco Romerio.

How did this happen? “Up until the 2000s, projected needs for electricity were grossly overestimated in Europe” explains Franco Romerio. “Electric companies therefore invested in the construction of new gas and coal powered plants, as well as renewable energies. But at the same time consumption stagnated due to the economic crisis.” With a supply much greater than demand, the market took off and is now in a state of chronic excess capacity. As a result, kilowatt-hour (kWh) prices on the wholesale market have plummeted.



“In certain cases, sale prices don't even cover the costs of maintaining the dams.”

Franco Romerio, professor of Energy Policy and Economics at Geneva University

“This decline has been accentuated by very weak international energy costs - coal, gas and oil are currently traded at historically low prices - and subsidies granted to new sources of renewable energy (solar and wind), particularly in Germany,” adds Franco Romerio.

On the EPEX (European Power Exchange), the stock market for electricity, the kilowatt-hour is now worth between 2 and 3 cents, against around 20 cents, and sometimes more, 10 years ago. At the current price, hydroelectric facilities can no longer compete with production costs varying between 6 and 7 cents per kWh on average. “In certain cases, sale prices don't

even cover the costs of maintaining the dams,” emphasises Franco Romerio. “In fact, some Swiss firms have started cutting back on maintenance.”

In the past, however, the strength of the Swiss electricity sector resided in its hydropower industry. From 2000 to 2010, an increase in wholesale electricity prices on the European market allowed Swiss producers to make billions by selling energy from dams to neighbouring countries. That was the golden age of Swiss electricity. Everything was going well on the best of all possible markets and industry players pinned their hopes on very attractive forecasts for potential growth. But nothing happened as planned. Instead of growing, the market collapsed - a situation that is not about to change any time soon.

Axpo predicts prices will remain low for years to come, particularly due to the injection of energy subsidised by Germany into the system. Franco Romerio shares this point of view: “For the moment, nobody predicts an end to cheap and abundant electricity. We'll need to cope with this over the next 10 to 15 years.”

Even though hydropower remains one of the most sustainable and efficient sources of energy, the sector could decline during this period without investors. In order to prevent this scenario, the Swiss government has decided to boost the industry. Within the framework of its 2050 energy strategy, the Swiss Council of States confirmed on 31 May 2016 that it will support the industry financially, as the National Council had decided in March. Facilities producing at least 10 megawatts will benefit from a market bonus of 1 cent per kWh (VAT excluded) for electricity sold on the EPEX at a price below production cost. This support will be limited to six years. Will it be enough to save Swiss dams? ▲

FOCUS ON GREEN GIANTS

These companies are transforming the world of renewable energy. We give some portraits and opinions from analysts.

BY CLÉMENT BÜRGE



Installation of solar panels by First Solar in Brandis-Waldpolenz, near Leipzig. The solar farm's size equals the combined area of 200 football fields.

PAUL LANGROCK/ZENIT/LAIF / KEYSTONE

FIRST SOLAR **LOW-COST SOLAR ENERGY**

Thanks to massive investments in R&D, First Solar has become the most efficient producer of photovoltaic solar panels in the world.

First Solar has managed to create the least expensive photovoltaic solar panels in the world. Its panels are sold at 40 cents per watt, or 15% less than those made by its (mainly Chinese) competitors. "In the solar panel industry, whoever manufactures the product with

the best price comes out on top," explains Jeffrey Osborne, an analyst with the Cowen Group. "In this respect, First Solar is the winner." To reduce its production costs, the company has invested \$775 million in research and development over the last three years, which has

REVENUE: \$3.6 BILLION

EMPLOYEES: 6,350

HEADQUARTERS: TEMPE, ARIZONA, UNITED STATES

allowed it to develop the most efficient machines in the industry. Analysts even predict that by 2019, its panels will cost only 25 cents per watt, due especially to the introduction of assembly lines inspired by the manufacture of flat screen televisions.

SQM**THE LITHIUM KING**

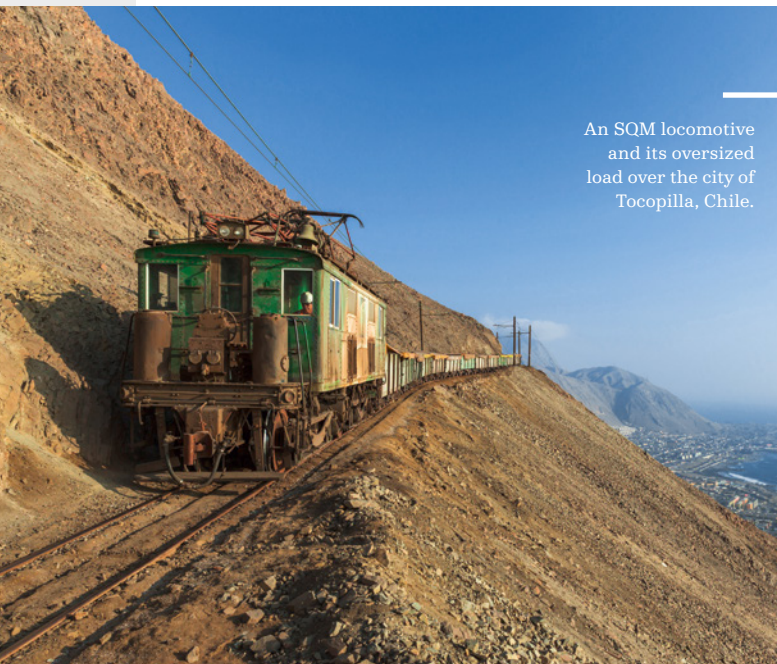
This Chilean company dominates the lithium industry. But the expiry of a mining lease is casting doubt on its future.

Sociedad Química y Minera de Chile (SQM) is the largest producer in the world of lithium – a metal that is essential in the manufacture of mobile telephones and electric car batteries. The company's main advantage is that it was founded when the Chilean government reformed the lithium industry in the 1960s, and it has a privileged relationship with the state. Chile, which has 75% of the world's reserves of lithium, leases the land where the mines are located. And SQM has been able to make use of this advantage. "The company benefits from the lowest extraction costs on the market," explains Maximiliano Cuevas, an analyst with Grupo Security. But doubt has been cast on its future: the lease on its largest lithium mine field is expiring in 2030 and the company is negotiating its renewal, with an agreement expected to be made in 2017. "We estimate that the company has nearly a 60% chance of success in renewing this lease," says Cuevas.

REVENUE: \$1.7 BILLION

EMPLOYEES: 4,250

HEADQUARTERS: SANTIAGO, CHILE



An SQM locomotive and its oversized load over the city of Tocopilla, Chile.

KABELLEGER / DAVID GÜBLER

A FEW MORE...**SUNPOWER****THE EFFICIENCY RECORD-BREAKER**

In June 2016, this solar panel producer beat the record for solar energy efficiency, its new photovoltaic panels converting 21% of the light that touches the surface of the panel into electricity - compared to the rate of 15% to 18% seen in current panels.

REVENUE: \$1.6 BILLION

EMPLOYEES: 8,309

HEADQUARTERS: SAN JOSÉ, CALIFORNIA, UNITED STATES

CHINA LONGYUAN POWER GROUP**THE CHINESE WIND GIANT**

The largest producer of wind farms in China is ideally situated to benefit from the government's new policy: increasing renewable energy sources by 18% every year until 2020.

REVENUE: \$2.9 BILLION

EMPLOYEES: 6,954

HEADQUARTERS: BEIJING, CHINA

CHINA YANGTZE POWER**THE HYDROELECTRIC MAMMOTH**

The largest hydroelectric energy company listed on the stock market, China Yangtze Power manages the Three Gorges Dam, the largest electric power station in the world. The Chinese company sells the electricity it generates primarily to cities in central and southern China (see also p. 40).

REVENUE: \$24.2 BILLION

EMPLOYEES: 7,774

HEADQUARTERS: BEIJING, CHINA

GENERAL ELECTRIC**THE CONGLOMERATE**

General Electric entered the wind energy sector in 2002 when it acquired the Enron division dedicated to wind power. Today, the American conglomerate is one of the three leading players in the field along with Vestas and Siemens. Despite this fact, renewable energy only makes up 6% of its overall earnings.

REVENUE: \$117.4 BILLION

EMPLOYEES: 333,000

HEADQUARTERS: FAIRFIELD, CONNECTICUT, UNITED STATES

**ENEL**

THE UNEXPECTED CHAMPION

This Italian company has diversified its energy production, transitioning from nuclear to renewable energy.

Enel is not just another green energy producer. Similar to France's energy company EDF in the beginning, the Italian company has seen a remarkable transformation since 2010. "Enel has decided to move away from large power plant projects, especially nuclear power, to concentrate on a series of small renewable energy projects all over the globe – a visionary choice," explains Janis Hoberg, an analyst with Bloomberg New Energy Finance. In just a few years, the company has built solar power plants and wind farms in Brazil, the United States, Spain and South Africa. "Enel has managed to receive subsidies and win government contracts in several very different countries, which is impressive," says Hoberg. In November 2015, its CEO announced that the company was going to invest an additional €6 billion in similar projects. "The question now is whether they will be capable of managing such a vast number of projects spread all over the globe," explains Hoberg.

REVENUE: €75.7 BILLION

EMPLOYEES: 67,958

HEADQUARTERS: ROME, ITALY

Maintenance of a Vestas Wind turbine in Lemnhult, in Southern Sweden.

VESTAS WIND SYSTEMS

VESTAS WIND SYSTEMS SMART WIND POWER

The Danish producer is taking advantage of the possibilities of big data to improve the efficiency of its wind turbines.

Vestas Wind Systems has developed the largest fleet of wind turbines in the world. "It has a total capacity of 75 gigawatts spread all over the world (20% of global capacities)," explains Casper Blom, an analyst with AAK. This allows the company to collect a wealth of information on the use of these turbines. "It's the largest collection of data of this type in the world," says Blom. "Vestas Wind Systems uses this data to optimise its machines' energy production, adapting to climatic conditions. This is its greatest strength." The company is currently showing excellent

results: its revenue rose by 22% in 2015. Vestas Wind Systems has a definite presence in the United States, where it generated 50% of its revenue last year. "The US government has just announced the five-year renewal of a major subsidy programme, which will be to its great advantage," says Casper Blom.

REVENUE: €8.4 BILLION

EMPLOYEES: 21,449

HEADQUARTERS: AARHUS, DENMARK





SOLARCITY THE NEW BUSINESS MODEL

Founded by Elon Musk, SolarCity boasts a revolutionary business model: the company leases solar panels to consumers and has them pay for the electricity they consume.

SolarCity has developed an innovative business model: the American company leases its panels directly to consumers, and then has them pay for the electricity produced. Its growth rate is astounding: its customer base has increased by 80% to 90% in the last few years. But investors recently criticised the company's profitability, resulting in a drop in its share price. It then announced that it would slow its pace of growth by 40% in 2016 in order to concentrate on maximising profits. Elon Musk, SolarCity's main shareholder, has just announced his intention to merge the company with Tesla, his electric car company, for a \$2.6 billion price tag. His goal is to create a fully electric system where consumers can charge their cars with their photovoltaic solar panels.

REVENUE: \$399.6 MIO

EMPLOYEES: 15,273

HEADQUARTERS: SAN MATEO,
CALIFORNIA, UNITED STATES

ALBEMARLE CORPORATION

THE LUXURY LITHIUM PRODUCER

The main competitor of the Chilean company SQM, Albemarle sells lithium with high added value. The company also has a 50% share in Talison Lithium, the largest Australian producer of spodumene, an ore rich in lithium, which supplies the Chinese battery market.

REVENUE: \$3.7 BILLION

EMPLOYEES: 6,963

HEADQUARTERS: BATON ROUGE, LOUISIANA, UNITED STATES

NORDEX

A WIND ENERGY PIONEER

In 1995, Nordex was the first company to produce wind turbines with a capacity of 1 megawatt – more than double that of its competitors. In June 2016, it inaugurated the tallest wind turbine in the world (164 metres), in Germany. Its revenue increased by 40% in 2015 (without including the merger with Acciona Windpower in April).

REVENUE: €3.4 BILLION

EMPLOYEES: 4,800

HEADQUARTERS: HAMBURG, GERMANY



SIEMENS

THE “DABBLER”

The German company has invested in several kinds of renewable energy, becoming the largest producer of wind turbines in the world.

In July, Siemens impressed its peers by flying a small aeroplane equipped only with an electric engine. The group intends to use this technology to develop a hybrid engine for Airbus planes. But Siemens has ventured into several other fields associated with renewable energy. It builds small hydroelectric power plants, infrastructure for converting and transporting electricity, and above all, wind turbines. Thanks to its new joint venture with



the Spanish company Gamesa, announced in June, this German corporation has become the largest producer of wind turbines in the world. It now holds a 15% share of the market, compared to 11% for General Electric and 10% for Vestas, its main competitors. This merger, which cost Siemens €1 billion, will grant it greater access to emerging countries, especially in Latin America, where Gamesa has been expanding aggressively since 2012.



Extra 330LE
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only 50 kg.

REVENUE: €75.6 BILLION

EMPLOYEES: 348,000

HEADQUARTERS: MUNICH, GERMANY

Chamber of the Limmern pumped storage power plant in the Glarus Alps, where ABB mastered the logistical challenge of installing four enormous transformers at 200 tonnes each.



CHRISTIAN BEUTLER / KEYSTONE

ABB

THE SHADOW PLAYER



The Swiss corporation manufactures conversion and transport systems that convey renewable energy to electrical grids.

ABB works in the shadow of solar and wind energy producers. The Swiss-Swedish multinational manufactures the infrastructure needed for converting and transporting green power to the electrical grid. According to a report by Goldman Sachs, \$750 billion will be spent in this sector over the next 30 years. ABB is in a leading position to take advantage of this

fact. "It's the largest and highest-performing company in this area," says Alessandro Foletti, an analyst with Bank am Bellevue. It is also attempting to stand out in other sectors associated with green power. "As an example, ABB manufactures charging stations for electric cars and recently formed a partnership with the Chinese company BYD to produce batteries for

these vehicles," explains Foletti. Its only weak point: "Its software is not quite at the cutting edge; it needs improvement," he says.

REVENUE: \$35.5 BILLION
EMPLOYEES: 135,800
HEADQUARTERS: ZURICH,
 SWITZERLAND

INTERVIEW

“Companies are turning to green power for economic reasons”

More and more multinational companies are turning over a new leaf by making use of renewable energy. Specialist Christine Lins explains.

BY JULIE ZAUGG

What sorts of companies are turning to renewable energy?

Some 65 companies worldwide have committed to meeting 100% of their energy needs with green power by 2020 or 2030 as part of the RE100 initiative. Some of these companies have planned to invest in their own means of energy production; others are content with buying green power from outside sources. This is an important step because many of these companies are large corporations with vast client bases. Their commitment sets a valuable example to the public. Among the most well-known are Ikea, Walmart, Facebook, Google, H&M, BMW, Coca-Cola and Crédit Agricole. Swiss companies are also well-represented – Nestlé, UBS, Givaudan, Swiss Re, J. Safra Sarasin, SGS and Swiss Post are part of the movement.

Are there companies who have already reached this goal?

Yes, there are a few pioneers. The American financial group Voya Financial, for example, has been using renewable energy exclusively since 2007. Swiss Post also meets 100% of its energy needs in this way.



QUEEN OF RENEWABLE ENERGY

Austrian Christine Lins has been defending renewable energy for over 15 years. In 2011, she took charge of the REN21 network, which brings together government and industrial players as well as NGOs. Previously, she spent 10 years leading the European Renewable Energy Council (EREC), the voice of companies active in the energy sector.

What has caused these companies to change to green power?

Until recently, they essentially did it for social responsibility reasons, citing the need to protect the environment. But lately, they have also found economic reasons. The price of renewable energy has fallen so low that it is now competitive with energy from fossil fuels.

How can we encourage companies to go even further on this path?

Governments can play a role. Public tenders could exclude compa-

nies that don't use enough green energy. Similar precedents have been set. For example, France has committed to serving only organic food on its trains. Governments could also progressively eliminate subsidies granted for the use of energy from fossil fuels to make green power more competitive, or even legally compel companies to include a certain percentage of renewable energy in their energy mix. Carbon taxes, which have been implemented by some 20 countries, also play an important role in encouraging the adoption of renewable energy on a larger scale.

What are the main challenges left to meet?

Most of the efforts in this area have been made by developed countries. In emerging countries, few companies have made commitments with regard to renewable energy. In addition, the main areas of progress are in supplying energy for powering electric devices and lighting. Things are advancing more slowly in heating and transport, due especially to the fall in oil prices. And there's still plenty of room for progress for companies doing business in the mining and manufacturing industries. ▀

Alternative ways to invest

There are several ways to invest in renewable energy apart from buying company shares. A survey of the most attractive instruments.

BY CLÉMENT BÜRGE

GREEN BONDS A SAFE METHOD

Green bonds allow you to help finance a project with specific environmental benefits.

WHAT ARE THEY?

These are traditional bonds, or loans issued by a government, international organisation or company, meant to finance a very specific project. The aim of “green” bonds is to have a positive impact on the environment. The first product of this type was created in 2007 by the World Bank and the European Investment Bank. In 2015, a total of \$41.8 billion in green bonds was issued, compared to \$37 billion in 2014, according to the Climate Bonds Initiative, an organisation that promotes sustainable investment.

CATEGORIES

There are essentially two types of green bonds: those issued by governments and the World Bank, and those issued by companies. “Bonds are then differentiated by the project they are

financing, whether it’s the construction of a dam in South Africa or the refurbishment of factories in Germany to reduce their carbon emissions,” explains Natacha Guerdat of Conser Invest, a sustainable investment consulting firm. “However, green bonds cover significantly fewer areas than green ETFs.”

INVESTMENT PROFILE

“Above all, these are investments that people enter into to have a positive effect on the environment,” explains Sean Kidney, the CEO of Climate Bonds Initiative. “Because they are investing in a specific project, they know exactly what the impact of their money will be.” Bonds yield stable returns, but on average, they are lower than those offered by ETFs. “The returns are in line with the conventional bond market,” says Guerdat. “For example, one of the latest issue by the World Bank, in June 2016, yields a return of 5.4% with a 2021 maturity. The same applies to EDF, which took out a loan in October 2015 for €1.4 billion subscribed twice over with a return of 2.25% and a maturity of 7.5 years.” The product’s great advantage is its stability. Eighty-five percent of existing loans were issued by supranational bodies like the World Bank and European Investment Bank, which have a credit rating of AAA.

GREEN INDEX FUNDS AN À LA CARTE FORMULA

Index funds yield attractive returns and a rich diversity of options.

WHAT ARE THEY?

Green index funds, also called “green ETFs”, are investment funds that track the value of an index associated with an environmental theme. They bring together companies that do business in sustainable energy or who are involved with technology that has a positive impact on the environment.

CATEGORIES

What sets green ETFs apart is their great diversity. They may concentrate on a particular type of renewable energy such as solar or wind, like the Guggenheim Solar ETF, or a mixture of renewable energy sources, like the PowerShares WilderHill Clean Energy ETF. Some indices also concentrate on a specific region, like the Swiss 1875 Sustainable Global Equity index, which brings together Swiss, European and American companies who do sustainable business.

INVESTMENT PROFILE

There is a great variety of green ETFs, which means the returns and risks are quite different. “Investors should take a good look at the fund composition to find out which companies are included in the ETF,” explains Edouard Crestin-Billet, a specialist on the subject with the Geneva-based bank 1875 Finance. “Some funds are quite specialised,” says Natacha Guerdat of Conser Invest. “The index may triple in the space of a few months, then drop rapidly.” Guerdat recommends investing instead in total indices, which integrate several company types in order to diversify risks. “Investors also ought to pay attention to the composition of index funds - some of them may include companies that are not so green, such as entities associated with nuclear energy.”

CROWDFUNDING CROWDSOURCED INVESTMENT

Some websites allow you to invest in small green energy production projects.

WHAT ARE THEY?

Crowdfunding platforms allow you to finance specific renewable energy projects initiated by individuals or institutions. Investors then receive a percentage of the money generated by the sale of electricity.

CATEGORIES

Various platforms, such as Mosaic, Lumo, Abundance and Windcentrale, have emerged in the last few years. Some sites concentrate on a single energy type; for example, Mosaic essentially finances the installation of solar panels, and Windcentrale funds wind projects. Others mix different energy types. This is the case with Abundance, which raises funds for projects such as the construction of an electric plant powered by cooking oil and the deployment of solar panels in a small town in the United Kingdom.

INVESTMENT PROFILE

Investing in these projects is an attractive way of diversifying investments while funding undertakings with a concrete impact. Investors can invest 5 to 50,000 Swiss francs on these platforms, and the returns are attractive. “Most of our projects yield returns of 6% to 8%,” says Tom Harwood, CEO of Abundance, which has already financed 20 projects for a total of more than £20 million. ▲

STORAGE: A MAJOR CHALLENGE FOR RENEWABLE ENERGY

Wind and solar energy only supply electricity intermittently. Storage solutions are therefore needed to avoid power cuts.

BY STANISLAS CAVALIER

One question is constantly being asked by opponents of renewable energy: what happens when the wind isn't blowing or the sun's not out - in short, when wind turbines and solar panels are not producing energy due to lack of fuel?

It is true that unlike gas- or coal-fired power plants, renewable energy sources are only active intermittently, subject to the vagaries of the weather. The challenge is to store electricity during times of peak production (daytime and summer) so that it can be released during peak demand periods (evenings and winter). But for the time being, no solution exists for storing electricity produced in the summer for use during the coldest months of the year.

Whether they come from the automotive, electronics or industrial fields, many groups are talking about this issue, which has enormous business potential. "The company that finds a sustainable storage solution will reign supreme over 'green gold'," says Franco Romerio, professor of Economics and Energy Policy at the University of Geneva. Most manufacturers are currently

placing their bets on lithium-ion storage batteries, which can be found in mobile telephones and other portable devices. But this technology is coming up against a number of stumbling blocks. First of all, its price is prohibitive. Tesla Motors, an American manufacturer of electric cars, has just dealt a huge blow by announcing the marketing of a lithium-ion battery at a price of \$3,000 for its 7 kWh model, which is 25% cheaper than competing batteries. Tesla is counting on mass production to achieve such a price. The company has built a dedicated factory in Nevada, its Gigafactory, which was officially opened in late July. It will supply not only storage batteries for electric cars, but also models marketed to companies and individuals.

"The company that finds a sustainable storage solution will reign supreme over 'green gold'"

However, this drop in price will not solve all of the problems: these



batteries depend on a rare metal, lithium, of which there are limited reserves. Moreover, lithium-ion storage batteries can only store 100 to 200 watt-hours per kilogramme (Wh/kg). A massive battery is therefore needed to store a large amount of energy, which explains the limited autonomy of electric cars (which can generally run for no more than 300 kilometres).

In order to store the gigawatt-hours of electricity to be produced by renewable energy sources in the future, giant batteries must be produced. As an example, since

October 2015, the Ecole Polytechnique Fédérale de Lausanne (EPFL) has been testing an experimental industrial energy storage device on-site, developed by the Swiss company Leclanché. This lithium-ion unit, the size of a shipping container, can store up to 500 kWh, which is only the equivalent of the average consumption of 50 Swiss households in one day.

Furthermore, should an overload occur, the lithium storage batteries have a tendency to heat up, or even catch fire. This problem is not too serious at the smartphone

level, but it could take on dramatic proportions where giant batteries are concerned. To get past these limitations, some manufacturers are banking on alternative technologies. The Bolloré Group, for example, has developed a lithium metal polymer (LMP) storage battery with a capacity of 240 Wh/kg. The drawback is that it runs out of charge very quickly. Other systems, such as metal-air batteries, promise to revolutionise the industry. In theory, these storage batteries can deliver a capacity of 4,000 Wh/kg. But they are still at the experimental stage. ▀



PATRICK FALLON / REUTERS

Tesla's CEO, Elon Musk, flaunting his new lithium-ion Powerwall battery at an event in Hawthorne, California. This competitively priced product with an elegant design aims to shake up the market of home energy storage.

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COMMUNITY

Pulse, Swissquote's social network

André Burri,
Ing. EPF
Head of Mobile,
Web and Social
Networks

Pulse, Swissquote's new community-based platform, enables users to easily swap investment advice. André Burri, head of the project, explains how it works.



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What is Swissquote Pulse all about ?

Pulse is an easy-to-use platform that facilitates communication between users and enables them to swap investment advice. The platform ensures that confidentiality and the normal guarantees regarding banking secrecy are maintained. The user chooses a pseudonym so that he/she can remain anonymous. There is also an option that allows users to show their identity, for those who wish to do so.

What makes Pulse different from a platform like Facebook, for example ?

Pulse is a network that is primarily dedicated to finance. Members

can give their opinions on aspects of the market, such as the value of a share, in real-time using an intuitive interface. This is similar to sites that rate consumer products, where users can publish comments and give ratings. At Swissquote, we don't sell products directly, but we do enable the public to buy financial products, so there are some similarities. Opinions and recommendations from other users are a real bonus. When someone buys securities, they can find out what other buyers think. Additionally, professionals, notably from the Swissquote team, also give their opinions via the platform and users can even ask them questions.

Can you use Swissquote Pulse without being a Swissquote client ?

Absolutely! You can easily log in via your Facebook account, whilst clients with a Swissquote account can automatically access the network by simply accepting a disclaimer.

Are there any develop- ments planned for Pulse ?

Ultimately, we would like to integrate this tool across all of our online platforms, including mobile applications. The initial version includes

the basic functions but our aim is to continually and rapidly develop the product based on feedback from users. Our target is to roll out each new functionality within five days. We plan on having a "coming next" tab that keeps users updated on future developments. We would also like to develop a more light-hearted side to the service.

"For example, the user who receives the most 'likes' for his/her posts would receive a specific kind of badge."

The idea is to reward those users with the best profiles by giving badges which can then be used for free trades or to claim a gift. For example, the user who receives the most "likes" for his/her posts would receive a specific kind of badge. ▲



Mickey Mouse goes to China

Amusement parks are doing well - especially in Asia, a continent that has seen its population explode in the last few years. To better understand this phenomenon, *Swissquote Magazine* went to the new Disneyland in Shanghai.

BY JULIE ZAUGG

A thrilling experience for the riders of Tron roller coaster, one of the main attractions at the new Shanghai Disneyland Park.

Perched on her golden throne, the princess patiently waits for her makeup to be finished. Her hair has been swept up into an elaborate bun and covered with a crown adorned with sparkling gems. She's wearing a long blue dress with frills, just like Cinderella's. Her father is filming the whole scene on his mobile phone. This makeover workshop is located in the depths of a gigantic pink castle at the centre of the new Shanghai Disneyland Park, opened on 16 June of this year.

At a height of 60 m, this building is the tallest ever built by the California-based group. Among other attractions, it also houses a royal banquet hall, fitted out with chandeliers and red velvet armchairs, where visitors can feast on meals inspired by the 11 Disney princesses. At night, accompanied by fireworks, characters from the animated films *Aladdin*, *Mulan* and *Frozen* parade across the outside wall of the castle, which is transformed into a giant screen.

Shanghai Disneyland verges on outrageousness. To build the park, thousands of local residents had to be rehoused, 150 factories closed and a new metro line was built. The park covers an area of 4 km² and cost \$5.5 billion. Some 15 million visitors are expected annually. "Most visitors will come from the Yangtze River Delta, a population pool of



XU HEDE / AFP

330 million people, a maximum three-hour drive from Shanghai by car," says Stan Meyers, an analyst with Piper Jaffray.

This site is indicative of a new boom that is happening across the entire theme park industry: "The scale has tipped towards Asia, and on that continent, China is showing the strongest growth," says Chris Yoshii, Asia manager of the Themed Entertainment Association. The phenomenon is due to the emergence of

a large middle class that now has the means to pay for holidays, or at least for a day with Mickey and friends.

Last year, 21 new parks were built, and 20 others are currently under construction. A Universal Studios park will open in Beijing in 2020. And Six Flags, an American chain, will inaugurate its first site south of Shanghai in 2019. "Several local operators such as Songcheng, Chimelong, OCT and Dalian Wanda have emerged in the last few years," >

says Chris Yoshii. "They are developing smaller parks near tourist sites and shopping centres."

The rest of Asia is by no means lagging behind. Japan is home to two Disney parks and a Universal Studios park. South Korea has the Everland and Lotte World parks, which attract over 7 million visitors a year. Hong Kong has its own Disneyland as well as the unusual Ocean Park, a spectacular park clinging to the side of a mountain.

For the operators of western parks seeking to establish themselves in Asia, cultural adaptation is imperative. Shanghai Disneyland, for example, was specially designed for an Asian public that loves to pose for photos. A few steps from the castle, a small crowd has amassed in front of a wall decorated with 12 mosaics representing the signs of the Chinese zodiac. The year of the Rabbit is symbolised by Thumper, a character from *Bambi*, and the year of the Tiger by Tigger, a cohort of Winnie the Pooh. The delighted visitors take a plethora of group photos, selfies and family portraits.

"The park also puts on a lot of shows," says Meyers. "These are particularly appreciated by the Chinese, who love to travel with their extended family and therefore have to find activities that both children and grandparents will like." The musical *The Lion King* was translated into Mandarin especially for the park. Also on

the programme is a *Tarzan* stage show, directed by the Chinese choreographer Li Xining and performed by an acrobatic troupe from the city of Wuhan.

This is the first time Disney has made such an effort to understand its audience

Unsurprisingly, the food has also been adapted. At Shanghai Disneyland, you can find Peking duck pizzas, green tea bread rolls and mooncakes in the shape of Mickey Mouse. One of the restaurants, the Wandering Moon Teahouse, looks like a traditional Chinese teahouse. And the park's shops sell a plush Minnie Mouse dressed as a Shanghai woman from the 1920s.

This is the first time Disney has made such an effort to understand its audience. "It was important not to repeat the mistakes made at Euro Disney, a park where nothing had been designed for the French public and which was never as successful as they had hoped," says Martin Lewison, an amusement park expert at Farmingdale State College in New York. For example, the restaurants there refused to serve wine, which is sacrilege in France.

However, Europe remains a difficult market for theme parks. Few new projects are being planned except for a Paramount park under construction just outside London. And the market is dominated by national players which generally only own one park, such as Europa-Park in Germany, Tivoli Gardens in Denmark or Efteling in the Netherlands.

A large share of the industry is still concentrated in the United States, home to 622 parks which generated \$16 billion in revenue last year. Disney and Universal, who alone operate 11 parks in Florida and California, have the lion's share of market, at 52.4% and 22.1% respectively.

"In the United States, the market has two segments: the parks that serve as tourist destinations, attracting holidaymakers willing to stay there for several days, and the regional parks that attract a clientele of day-trippers that come for the day from the vicinity," explains Tyler Batory, an analyst at Janney. The main representatives of this second category are the Six Flags and Cedar Fair parks, which are located in medium-sized towns far from the coasts.

Sixty to eighty percent of the parks' revenue is generated by admission tickets, the rest coming from restaurants and merchandising. This last pillar is sometimes extremely lucrative: "A shop at Epcot Center

NUMBERS

+26.3%

The increase in attendance recorded by the world's 25 largest theme parks from 2006 to 2015. Last year, they attracted 420 million visitors.

789

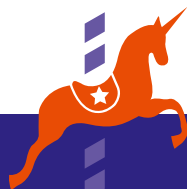
The number of amusement parks in China. Their revenue increased by an average of 10.2% a year from 2011 to 2016.

+7%

The increase in revenue for Disney in 2015, to a total of \$52.5 billion. This result was driven primarily by park admissions, which brought in \$16.2 billion.

138

In millions, the number of people who visited a Disney park in 2015, including 40 million to Disney World in Florida.



in Florida alone generates half a million dollars every year by selling plush toys of Figment, a purple dragon," notes Lewison.

The key to increasing this revenue is developing a universe inhabited by well-known characters. "Disney is unbeatable in this regard - it has not only its own characters, but also the Pixar, Marvel and Star Wars characters," says Meyers. Only Universal, which recently acquired DreamWorks, can compete in the same category. "When the new Harry Potter attraction opened in 2010 in Florida, it pushed park attendance up by 15% to 20%, and revenues by 40% to 50%," says Yoshii.

Last year, Disney's revenue increased to \$52.5 billion, up by 7%, a result driven primarily by park admissions, which brought in \$16.2 billion. This makes parks the most profitable division of the company after television. Disney parks also serve as a promotional platform for its films, books, clothes and toys. At Comcast, the media giant that owns Universal Studios, parks have generated more profits than the television network NBC or the film studio Universal Pictures during the last five years.

TECHNOLOGICAL GEMS

Back at Shanghai Disneyland, the small boats which visitors to the Pirates of the Caribbean attraction have boarded plunge into the dark, floating along an indoor river. Suddenly, on their right, a fluorescent skeleton appears which transforms before their eyes into Jack Sparrow, one of the characters from the film, and begins to speak to them. The boats then start to rock backwards and forwards while a huge screen emerges with images of wrecked pirate ships, giant squid and mermaids. The illusion is perfect, giving visitors the feeling of diving underwater. This attraction is a technological gem: the boats are driven by a magnetic propulsion system and the screens feature the latest innovations in immersive cinema. ▶



Costuming and hairdressing workshop in the Shanghai Disneyland Park castle.

Roller coasters too run-of-the-mill? The Superman attraction at Six Flags New England in Agawam, Massachusetts, ups the excitement by equipping its passengers with virtual reality helmets.

SIX FLAGS / SAMSUNG ELECTRONICS AMERICA



Amusement parks are constantly reinventing themselves. During the last five years, Disney has spent \$14 billion on the renovation of its five sites. In Paris, an attraction based on the animated film *Ratatouille* was introduced. In Florida, an entire area dedicated to *Star Wars*, another to *Avatar* and a *Frozen*-themed ride are all in the pipeline. In California, attractions inspired by *Toy Story* and *Cars* were built.

The other parks are making similar investments. "Several roller coasters have been fitted with ultra-fast rails developed by the company Rocky Mountain Construction," says Lewison. "This completely changed the experience." The roller coaster at the Ferrari park in the United Arab Emirates can reach 240 km/h thanks to this technology. For their part, Six Flags and Cedar Fair have introduced attractions inspired by

video games such as *Justice League* and *Iron Reef* which force the participants to take a more active role, for example by shooting crooks with laser pistols.

"This spring, Six Flags launched a roller coaster that you ride while wearing a Samsung virtual reality headset," adds Tyler Batory from Janney. "Visitors see images which are synchronised with the movements of the ride."

THE 10 LARGEST AMUSEMENT PARKS (IN NUMBER OF VISITORS IN 2015)

- | | | |
|---------------------------------------|--|---|
| 1. Disney World , Florida | 5. Universal Studios , Osaka | 8. Everland , Gyeonggi-Do, South Korea |
| 2. Tokyo Disneyland , Tokyo | 6. Disneyland Paris , Paris | 9. Ocean Park , Hong Kong |
| 3. Disneyland , California | 7. Chimelong Ocean Kingdom , Hengqin, China | 10. Lotte World , Seoul |
| 4. Universal Studios , Florida | | |

Despite their robust health, amusement parks have their share of challenges. At Shanghai Disneyland, two weeks after the opening, the wait in the queue for Soaring Over the Horizon, an attraction that allows visitors to fly over spectacular sites from all over the world while sitting in a sort of chairlift, had reached three hours. "Park visitors often spend 50% of their time in queues, or four to five hours in an eight- or nine-hour day," says Peter Rodbro, the CEO of Entertainment Booking Concepts, which provides

theme parks with technological solutions. “During that time, they get frustrated, and they certainly don’t consume anything.”

His firm has invented an app, currently being tested at Ocean Park in Hong Kong, that lets visitors plan their visit in advance on their smartphones. “They choose the attractions they want to go on, then they enter the time and number of people in their group,” he explains. “The app then gives them an itinerary. This prevents them having to wait and allows the parks to better anticipate the busy periods.” Disney has introduced a similar system, called Fastpass+, accompanied by a smart bracelet. Six Flags, for its part, offers a Flash Pass that gives visitors priority access to attractions at a cost of \$40.

Park visitors often spend 50% of their time in queues

In addition, parks are not immune to accidents. Alton Towers learned this from bitter experience in 2015 when a pile-up on a roller coaster injured 16 people, including two who had to have leg amputations. Attendance at the English park immediately dropped. In another vein, the film *Blackfish*, which documents the treatment of orcas in captivity at SeaWorld, was quite damaging to the park. “Its financial results have been plummeting since the documentary came out in 2013,” says Ian Corydon, an analyst with B. Riley.

And when an operator decides to take an interest in a market like China, it must deal with the caprices of the government. In order to establish its park in Shanghai, Disney had to formally apologise to Beijing for its film *Kundun* (about the Dalai Lama), give up its local streaming channel Disneylife and grant the government the right of scrutiny.

The government insisted that Disney give up some of its flagship attrac-

tions such as the Jungle Cruise, It’s a Small World and the emblematic Space Mountain. It wanted a unique park for the Chinese people - one without features deemed too American. Main Street, which duplicates an American shopping street from the early 20th century, was replaced by Mickey Street. Frontierland, a section of the park that imitates the Old West, became Adventure Isle, a lost tropical world.

Astride a futuristic motorcycle, their heads bent forward, visitors to Shanghai Disneyland who have chosen to face Tron, a ride inspired by the films of the same name, zoom at 100 km/h along a rail that goes up, down and sideways under a dome. Flashes of electric blue are all that pierce the darkness, to the sound of mildly unsettling electronic music. A concept that could be mistaken for Space Mountain... ▲ ▬ ▽ DIS



IAN TROWER / ROBERT HARDING PREMIUM / AFP

Cable car ride in Ocean Park, Hong Kong.

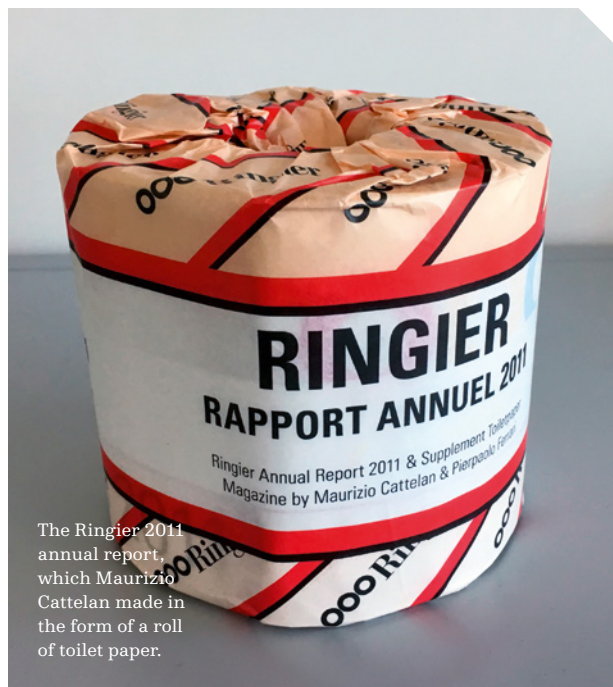
In each issue, *Swissquote Magazine* looks at the cultural capital of a company through an aspect of its communication or image. After last issue's look into the creative residence programme at Autodesk, we will now see how the Swiss publisher Ringier does annual reports with an artistic twist.

Ringier's creative accountancy

BY SYLVAIN MENÉTREY

In the chairman's message opening the 2015 annual report of his media group, Michael Ringier laments about how vicious his industry has become. Then on a more positive note, the Zurich-based publisher discusses the diversification strategy led by Ringier over the past few years into e-commerce and radio. The words are standard fare, but wrapped in a surprising package. For the 18th year running, Ringier has given free rein to a renowned artist to design its annual report. The image presented in the 2015 version appears rather unflattering. The young artist Helen Marten, whose work was seen at the 2015 Venice Biennale, presents a text and series of documentary photographs on sausage making, with two sausage casings. It's all encased in a luxury box, bringing to mind those lovely 20th-century illustrated art books.

The parallel drawn between an industry that grinds meat to mass-produce consumer goods and one that produces editorial content might seem inspired by



The Ringier 2011 annual report, which Maurizio Cattelan made in the form of a roll of toilet paper.

a biting sense of humour. But after publication, Helen Marten clearly stated her intentions in an interview. The artist compares the various recipes for pork meat, which are always stuffed into similar casings, with the production of a newspaper, whose content is constantly evolving but is presented in a package that never changes.

Ever since this unlikely union began between cold, hard business facts and artistic freedom, the guest artists selected by curator Beatrix Ruf have

consistently made use of provocation, criticism or humour. In 2006, Richard Phillips gave the group's earnings figures a sinister feel by presenting them in the German Gothic typeface used during the Nazi era. The following year, the Swiss duo Fischli & Weiss put together their report using images from ad campaigns collected over the year and categorised by theme: sports, family, lifestyle and fashion. The result was an encyclopaedic, fantasy-like take on daily life, while poking ironic fun at

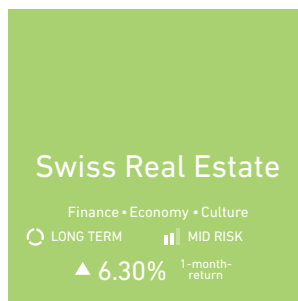
a group whose economic model functions based on advertising revenue.

"The annual reports are yzand despair. And finance experts prefer to receive the PDF version. Ringier shows its publishing savvy by producing a collector's book that gives value to these reports and turns them into a branding tool," says Nicolas Galley, director of the master's programme in Art Market Studies at the University of Zurich.

The series of reports, all available free of charge, makes for an interesting anthology of contemporary art over the past 20 years. Its selection of artists closely ties in with the programming at the Kunsthalle in Zurich, previously overseen by Beatrix Ruf, and the taste of Michael Ringier as an art collector. In any case, the approach offers a way for the group to spark debate. "The question of knowing what we can publish or not, and with what medium, is a key concern for publishing houses," wrote guest editor Richard Phillips in the introduction to his controversial report. ▀

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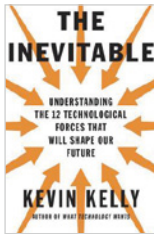
 **Swissquote**



TO READ

THE INEVITABLE: UNDERSTANDING THE 12 TECHNOLOGICAL FORCES THAT WILL SHAPE OUR FUTURE

By Kevin Kelly (Viking)

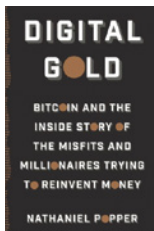


Whether we like it or not, new technologies (from virtual reality to artificial intelligence built into a growing number of household objects) have already brought on a number of changes that will revolutionise our lives over the next three decades. Kevin Kelly, co-founder of *Wired* magazine, gives advice on how to adapt to these changes and use them to your advantage so that you don't fall behind. This book offers a fascinating glimpse into what the future holds.

From 17 Swiss francs

DIGITAL GOLD: THE UNTOLD STORY OF BITCOIN

By Nathaniel Popper
(HarperCollins Publishers)



For the layman, the world of bitcoin often appears complicated and off-putting. But here we have a book that's as thorough as it is easy to read. The author takes a detailed and humorous look at the history of this virtual money, from its libertarian and experimental origins to the banking industry's growing use of blockchain technology. This is a highly informative book about an innovation that has the potential to revolutionise finance.

From 14 Swiss francs

TO DOWNLOAD

Walter Your Smart Travel Compass TRAVEL COMPANION



This travel app works like a radar. It detects any restaurants, shops, bars or other sights within a 20-minute walk. Just point your phone in any direction and a number of different coloured bars appear on your screen, arranged in a circle. Each colour represents a different type of hotspot, but no names are shown.

Free

Apple Store, Google Play

Indeed COMPREHENSIVE JOB SEARCH



Indeed gives you access to loads of job offers as soon as they're published, by

grouping together offers from different company websites and job boards in a single interface. You can save your favourite jobs and view them later. The app also allows you to upload your CV, so you can apply for a job immediately and receive alerts.

Free

Apple Store, Google Play

7 Min Workout EXERCISE ON THE GO



Too busy to go to the gym? Don't sweat it! This app features a series of 30-second

videos to guide you through twelve different exercises – all in just seven minutes! The intensive modules were designed by professionals to help you stay in shape and speed up your metabolism throughout the day. The app also features a logbook for keeping track of your progress and any changes in weight.

3 Swiss francs

Apple Store, Google Play

Swiftkey CUSTOMISABLE KEYBOARD



Swiftkey is a great alternative to the keyboards that come as standard with

today's smartphones and tablets. The app is widely seen as one of the best on the market, thanks to its array of options for customising autocorrect and predictive text input. It also recognises a number of different languages.

Free

Apple Store, Google Play

AUTO

A revamped compact SUV range

The next generation from Volkswagen, BMW and Peugeot

BY BLAISE DUVAL



ENGINE: FROM 1.4 TSI 125 HP

ENTRY-LEVEL PRICE: FROM CHF 28,200.-

VOLKSWAGEN TIGUAN, A CLASS ACT

Volkswagen Tiguan, a very popular choice among Swiss motorists, is moving upmarket. The new version is built on the same platform as the latest Golf and now flaunts a more striking and assertive angular design. The vehicle is longer (4.49 m) and wider (1.84 m) than its predecessor, meaning more space on-board. This all-new Tiguan is a real improvement and stands comparison with – and is in many ways better than – certain premium vehicles in the class, such

as the ageing Audi Q3. Even the Mercedes GLA and BMW X1, which got its own makeover recently (see below), need to watch their backs!

Whatever the terrain, the newcomer is comfortable yet energetic on the move, making good use of the four-wheel drive, 2-litre TSI 180 hp engine, seven-speed DSG gearbox and the optional adaptive dampers. It comes with a vast array of technology and a plethora of safety features

and driving aids, although many of them are options, like the cameras offering a 360-degree perspective of your surroundings. One pleasant surprise is the sliding rear seat, which means you can leave plenty of legroom for passengers in the back or boost your boot space, as required. Overall, this is a very good car, dulled only by the unimaginative dashboard design – but that is something that most VW devotees will be familiar with by now. ▲



PEUGEOT 3008, THE FUTURISTIC CHALLENGER

The next generation of 3008 will make its official debut at the Paris Auto Show in October. It sports bold, avant-garde styling and cockpit creativity to match any concept car. Manufacturing quality has made a major leap forward to put it on a par with the best in class. Price: Not yet known



BMW X1, THE PREMIUM BENCHMARK

The new X1 was released this spring and remains the benchmark in driving dynamics, even after the switch from rear to front-wheel drive. The all-new X1 comes with enhanced finish, spaciousness and on-board comfort – in fact, it is better in every way. One drawback however – the list of options can soon bump up the price tag. From CHF 36,900.-



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TRAVEL

Hitting the wine trail

Wine tourism is ageing well. Every year, more wineries are carving trails through their vineyards to offer visitors getaways that are good for mind, body and the taste buds.

BY SALOMÉ KINER



Off on a language and culinary programme?

A European city tour with a fitness coach? A yoga and surf retreat? In a world where everyone is pressed for time, multi-tasking is the way to go, even for travel. What makes wine trails so popular? Because of the treat awaiting hikers at their destination or because they make people feel less guilty about drinking wine? Whatever the reason, walking and wine – to be enjoyed in moderation – have been recommended since ancient times.

THE BEST OF BURGUNDY

87 kilometres, 24 grands crus, 29 wine villages and 1,247 parcels of vines. That's the moderate programme offered by the long-distance hiking (Grande Randonnée or GR) footpath through Burgundy's Grands Crus region, nicknamed the "Champs-Élysées of Burgundy". This trail offers an immersive walking experience as it meanders through some of the most beautiful landmarks of the Côte de Nuits, Hautes Côtes de Nuits and Côte de Beaune regions. These names are likely to sound more familiar from premium wines labels than the landscape they represent, but they offer a mosaic of spectacular natural and architectural sites that are attentively cared for by the local winemakers.

The first leg of the footpath, or GR, stretches from Dijon to Villers-la-Faye. The starting point is the Chenôve wine press, a 15th-century remnant from the Dukes of Burgundy and first architectural gem on a long list of historic monuments dotted along this path. The next part of the itinerary leads visitors towards Magny-lès-Villers, by way of Château de Gevrey-Chambertin. This castle once reigned over the vineyards belonging to the Abbey of Cluny. Soon afterwards is the Renaissance castle of Clos de Vougeot, which guarded the eponymous vineyard. The footpath continues through the vineyard of

Romanée-Conti (tasting stop) before reaching Nuits-Saint-Georges, where the Gothic church of Saint-Symphorien is an absolute must-see.

The second leg of the GR leaves from Villers-la-Faye and ends in Santenay. Vines are everywhere, stretching out to the horizon. An intoxicating feast for the eyes. In Beaune, the Hôtel-Dieu, with its multicoloured roof tiles and Gothic façades, offers a good example of the bold style of Flemish-Burgundian art. Visitors then march on to reach the legendary wine estate, Château de Meursault. A tasting here is imperative.

+++

This GR is for experienced hikers. It takes between three and five days to cover the entire footpath, but the way-marking and public transport make it possible to break the journey up into legs depending on time available and everyone's motivation.

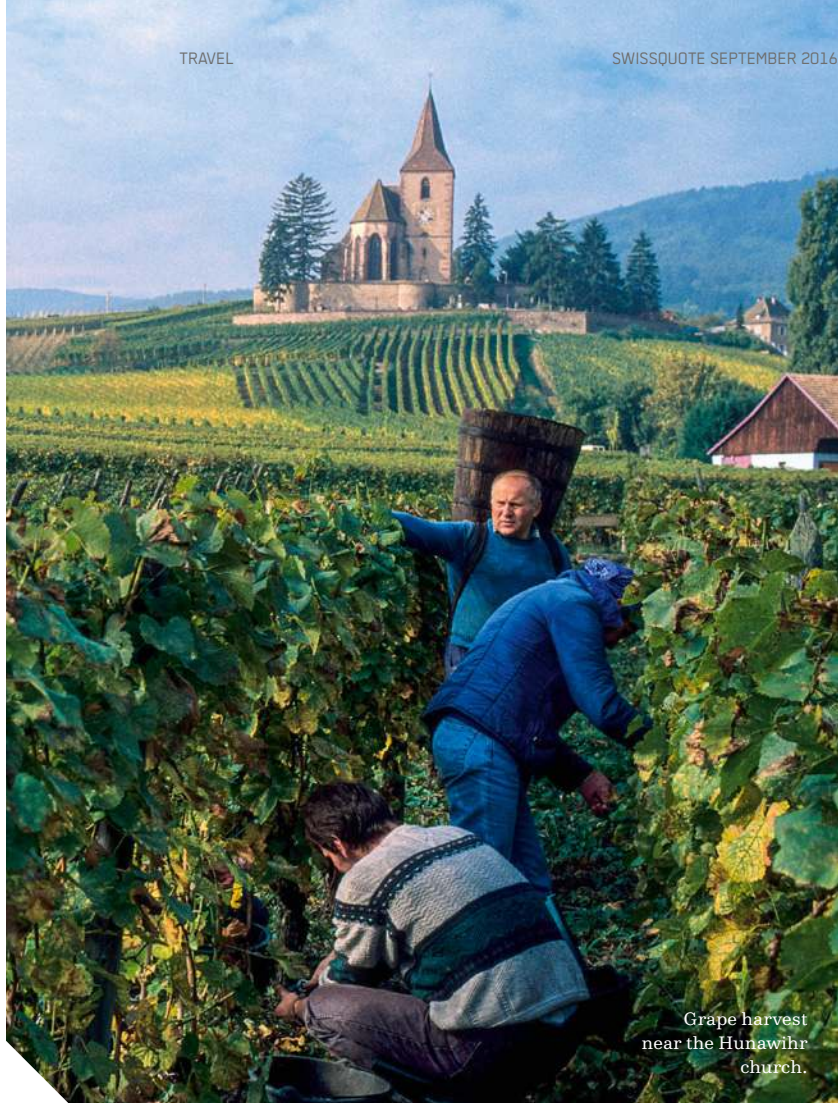
THE PEARLS OF ALSATIAN VINEYARDS

The Japanese chose it as the most beautiful village in France. With its flower-lined balconies, fountains adorned with greenery and stone houses, Riquewihr is, to say the least, picturesque. Before setting off on the “Perles du Vignoble” wine trail through seven premium vineyards (Froehn, Mandelberg, Marckrain, Schoenenbourg, Sonnenglanz, Sporen and Rosacker), visitors should stop off at L'Orignal, the restaurant owned by Cédric Laxenaire, a finalist in a popular televised cooking show. The next leg is a visit to Hunawihr's fortified church, with its cemetery overlooking the enticing flanks of a valley blanketed with vines. In Ribeauvillé, medievalists will love tours of Saint-Ulrich, Haut-Ribeauvillé and Girsberg castles, and the views over the Alsatian forest.

The wine trail is open year round on foot or bicycle without a guide, even during the harvest. But until mid-September, the region's winegrowers offer guided tours to present how they care for their vines. The walk is followed by a tasting and a tour of a cellar. The Perles du Vignoble trail can be done in small loops around

each village (Beblenheim, Bannwihr, Hunawihr, Mittelwihr, Riquewihr and Zellenberg) or over the route's entire 17 kilometres. Informational

markings about the vineyards on the trail are set out throughout the entire path. Tastings take place in the cellars of the villages visited.



Grape harvest
near the Hunawihr
church.

RIEGER BERTRAND / HEMIS.FR / AFP

EDUARDO FONSECA ARRAES



Typical house in the
village of Riquewihr.

+++

The Jean Becker winery is organising a guided tour of the Grand Cru Froehn vineyards on 23 September and 14 October 2016, from 6:00 to 9:00 p.m. The event includes an introduction to the winery's organic wines and a “pairing food and wine” lesson. Price: 24 Swiss francs per person. For more information: www.vinsbecker.com.

LIVING THE SWEET LIFE IN PIEDMONT

Bordering France, Switzerland and Italy, nestled at the foot of the Alps and stretching out to the edges of the Po, Piedmont is an easy-to-get-to getaway. Moving beyond the industrial plains of Torino, the landscape turns into rolling green hills. This unspoilt, fertile region located a short 50 kilometres or so from its capital is where Barolo – the most prestigious of Italian red wines, called the “the wine of kings, the king of wines” – is produced. The Nebbiolo grape is grown in the vineyards along the Langhe hills, a favourite hiking destination for wine lovers.

“With the harvest and the beginning of the white truffle hunting season, early autumn is the ideal time to come and explore the grapes of

Piedmont,” says Morgan Hubert from the agency Wine Passport. Hundreds of possible itineraries are available, but an immersion into the lands of the Piedmont star can kick off in the village of Barolo, with the Wine Museum and its regional Enoteca. The proper footpath, marked out with red arrows against a white background, begins in front of the town hall. The trail first zigzags through hazelnut tree fields and opens onto panoramic views of Nebbiolo vineyards. It then blazes through the medieval village of Monforte, where visitors should make a point of wandering aimlessly through the winding alleyways. The footpath then leads to the village of Novello and its cluster of houses hanging off the cliffside. The Elvio Cogno winery, majestically overlooking

the Langhe hills, is not to be missed, nor are the castle, the medieval tower and the Parish of St. Michael the Archangel. It’s then back to Barolo following the red and white markings. ▲

+++

The wine tourism agency Wine Passport offers an expert getaway “A Piedmontese Walk”. The package includes a tour of a winery with a tasting, one night in a charming guesthouse and dinner at a partner restaurant. Option of a hike with a sommelier guide. Price: €165 per person, not including travel expenses. For more information: www.winepassport.fr



View of Barolo Castle.

LUCA BOLDINI

BOUTIQUE

BLUE JERSEY

Here is a classy, vintage and high-tech clothing line designed for cycling fans. This is the concept behind the Louison Bobet brand, named after the French rider who won the Tour de France three times in the 1950s. Among other refinements, the Porticcio 69 jersey has slits in the sleeve hems for your thumbs so the jersey stays in place once you are on your bike. wMini holes in the arm-pit and neck areas ensure discreet ventilation.

www.louisonbobet.com

316 Swiss francs



JET LAG SOLUTION

It's not only the miles that start adding up on a long haul flight, but also the effects of fatigue. Different time zones, variations in temperature, air conditioning... Codage, a Parisian brand, has come up with a kit for globetrotters who are always running to catch the next flight. "On the Road Again" is a treatment that contains micellar water and a moisturising, energizing serum as well as day and night creams.

www.codageparis.com

75 Swiss francs



THE BRITISH TOUCH

Inspired by the streets of London, the Swiss designer Michèle Schneuwly proposes British style classics with a modern on-trend look. The Tobey jacket stands out. This bestseller has been revisited for winter with a tailored cut, hood and off-centre button, high collar and leather-lined pocket.

www.michelcouture.ch

449 Swiss francs

MINI WEATHER STATION

Want to check on your wine cellar? Planning a weekend away at your chalet? This little 35 mm cube, equipped with sensors and linked to a smartphone, will inform you of the temperature and the relative humidity wherever you place it and will notify you if the minimum or maximum thresholds you have set have been reached. A log function records variations over a period of 20 days.

www.misterhector.com

55 Swiss francs



THE RIGHT ACCENT

To make learning English a little easier, the Pronounce microphone-headset, as its name implies, can help you improve your pronunciation. The sound of your voice is transmitted naturally via special bone conduction headphones placed just in front of the ears. This tested technology helps assimilate sounds for a better accent.

www.pronounce.com
157 Swiss francs



VERTICAL TURNTABLE

The Gramovox label will go to great lengths when it comes to revisiting a vintage audio concept. After the gramophone, the Chicago start-up is focusing on turntables with Floating Record, a vertical turntable that plays 45 (single) and 33 1/3 (LP) records. Available in walnut or maple, the system has two full-range drivers.

www.gramovox.com
480 Swiss francs



STAND-UP DESK

And what if standing was the next revolution in the work place? This is the idea put forward by Will & Walt, designers and inventors of Flip Board, a modular desk with a simple and intuitive mechanical system that allows you to change your position at will. Made in beech, oak or walnut, this modular table can be customised and is made to order in France (Haute-Savoie).

www.willandwalt.com
2,490 Swiss francs



BOUTIQUE

WATCHLIST

THE DIE IS CAST

Corum has released a new collection of five gambling themed watches.

The Bubble Dice model prominently displays two dice on its green mat dial. No one loses here, as each side of the dice shows the number six. Only 88 copies were made of this 47-mm stainless steel case with a domed sapphire crystal. But the 88th piece is unique, featuring a red gold bezel.

www.corum.ch

3,775 Swiss francs



URBAN ICON

The latest creation from **Carl F. Bucherer** that everyone's talking about? **The Manero Peripheral**. This steel dress watch features a 40.6 mm case and manufacture calibre with a self-winding mechanism. With a classic, perfectly balanced design (central display of the hours and minutes, small seconds dial at 6:00 and the date at 3:00), the Manero Peripheral could very well become the house's next iconic model.

www.carl-f-bucherer.com

6,500 Swiss francs



TIME FOR A DRINK

Speake-Marin's new Rum Watch contains a drop of 1780 Harewood Rum, the oldest rum in the world. The first timepiece ever to encapsulate an ancient Caribbean spirit inside its watch face is enclosed in a titanium version of its famed Piccadilly case with a power reserve of 50 hours.

www.speake-marin.com

14,960 Swiss francs

ITALIAN STYLE

The Carbon Gold is a **Bulgari** classic. With a 42-hour power reserve, this wristwatch in steel and carbon resin offers a choice of a black, brown or blue dial enhanced with pink gold hour markers each ending in a SuperLuminova dot. The timepiece's stylish detailing includes the braided leather strap and its buckle in PEEK, a super-resistant alloy used in aeronautics.

www.bulgari.com

2,750 Swiss francs



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The Ronald McDonald Kinderstiftung is running seven parents' houses in Switzerland. These houses are close to children's hospitals: in Basel, Bern, Lucerne, St. Gallen, Bellinzona and Geneva. They provide a home away from home for parents so they can stay close to their seriously ill children, under the motto "Closeness helps healing". To date over 14,200 families have spent a total of 116,000 nights in the Swiss Ronald McDonald Houses.

Help us with your donation. Thank you.
www.ronaldmcdonald-house.ch



USD 2008.08.18 時系列データ		高値	安値	終値
日付	始値	110.86	109.60	110.51
2008/8/15	109.75	109.98	109.00	109.71
2008/8/14	109.45	109.23	108.35	109.47

1-May
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MAX RHEINER
 FOUNDER OF BIRDLY AND HEAD
 OF THE MASTER OF ARTS IN IN-
 TERACTION DESIGN PROGRAMME
 AT THE ZURICH UNIVERSITY OF
 THE ARTS (ZHdK)
 BORN 21 JUNE 1972 IN BARCELONA

Who hasn't dreamt of flying?
 Now anyone can, thanks to Max Rheiner, now based in Zurich. The head of the Master of Arts in Interaction Design programme at the Zurich University of the Arts (ZHdK) and independent artist developed Birdly, the first virtual reality bird flight simulator, in 2013 with Fabian Troxler and Thomas Tobler. Lying face down with arms stretched out, and wearing a virtual reality head-set, the user floats over San Francisco or Manhattan. Birdly's simulator has already been presented and tested at a number of events worldwide. Somniacs, a company also founded by Max Rheiner, has been producing the machine since late 2015.

DR

VIRTUAL REALITY, PROGRAMMING AND COOKING

A KEY EVENT FROM YOUR CHILDHOOD ?

Because of my father's profession, my family constantly travelled, including myself when I was a kid. With school enrolment, free travel was over, and I was finally grounded.

THE PROFESSION YOU WOULD HAVE LIKED TO DO ?

I do what I like, but as a kid my dream was to become a concert pianist. Less because of the music, more because of the pathos and the haircut.

YOUR SECRET HOBBY ?

Cooking. I'm quite picky with food, which leads to the joy of cooking for myself.

SOMETHING CRAZY YOU DID RECENTLY ?

I set up a company to develop a virtual reality bird flight simulator.

THE FILM THAT YOU WOULD HAVE LIKED TO EXPERIENCE ?

I guess I would like to choose *A Midsummer Night's Dream* by William Dieterle and Max Reinhardt from 1935. Some scenes are like being in a Henry Fuseli painting.

A BOOK THAT YOU RECOMMEND ?

Star Maker by Olaf Stapledon (1937). A hell of a ride through the universe and the human consciousness.

A PLACE THAT MADE AN IMPACT ON YOU – AND WHY ?

Tokyo around the millennium, where I spent my study abroad semester. I had the chance to work at night in a Virtual Reality Cave system and explore the city at dawn. I was deeply immersed in technology and foreign culture.

THE IDEAL WOMAN ?

Nerdier than me but still knows when to stop the nerdiness.

THE IDEAL MAN ?

100101110101101.

THE IDEAL ANIMAL ?

Maybe something like a cat, but less demanding?

YOU MAKE 5,000 SWISS FRANCS ON THE STOCK EXCHANGE.

WHAT DO YOU DO WITH THE MONEY ?

I will organise a party for friends and buy lottery tickets for them with all the money I made. I'd invest the winnings in the next party and hope for a snowball effect. If this works, we will end up in an infinite party loop.

YOUR FAVOURITE WORD AND YOUR FAVOURITE SWEAR WORD ?

"Epiphany" and "crap". ▲

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MECHANICAL
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HYT

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LuZ ERn: **Les Ambassadeurs** | inTERLAkEn: **Kirchhofer** |
ST MORITz: **Embassy - La Serlas** | zuRiCH: **Les Ambassadeurs** |

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FINANCES

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THE SWISS LEADER IN ONLINE BANKING