

SWISSQUOTE

FINANCE AND TECHNOLOGY UNPACKED

SWISSCOM
The blue giant
is evolving

ANALYSIS
The promises
of virtual
reality

OUTDOOR
E-biking
takes off

DOSSIER

CONSTRUCTION BUILDING ON INNOVATION

AN IN-DEPTH LOOK AT 12 INDUSTRY LEADERS
THE RISE OF ROBOT BUILDERS
SAND WARS

LAFARGEHOLCIM ► VINCI ► CATERPILLAR ► HOCHTIEF ► KOMATSU ► BOUYGUES

ISSN 2296-3278



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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 STAINLESS STEEL

AUDEMARS PIGUET
Le Brassus

AUDEMARS PIGUET BOUTIQUES:
GENEVA | ZÜRICH

Concrete here, there and everywhere



Marc Bürki,
CEO of Swissquote

Is the construction industry too big to change its ways that have made it so prosperous? This economic sector already represents more than 12% of global GDP and is expected to account for 15% by 2030. Three nations alone – led by India, and followed by China and the United States – will contribute more than half of that global growth. And it will take a mind-boggling amount of concrete to cover that non-stop development. Plenty of advances are being made to create innovative, high-tech materials, but, economically speaking, they do not hold the weight of cement.

One reassuring thought is that efforts are under way to develop more durable, more insulated and especially more eco-friendly forms of concrete. As the construction industry is responsible for 40% of the planet's CO₂ emissions, sector giants expect more restrictive standards in the future and are scrambling to engineer new products.

p. 46

p. 32 Construction leaders are generally long-established companies but are

now facing a whole new set of challenges. The first of their worries is the chronic, worldwide shortage of skilled workers, be it in Europe, the United States or Africa. Can they solve that problem by gradually introducing robots and drones at worksites? Although far from being deployed on a large scale, these technologies are already being tested by the most cutting-edge architects. One of them is Fabio Gramazio, the Swiss co-founder of Gramazio & Kohler and professor at ETH Zurich who granted us an interview for this issue.

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The latest innovations to rejuvenate the sector include 3D printing of parts and building models and, more generally, more powerful 3D software to improve worksite planning. This latest development, called Building Information Modeling (BIM), is a truly game-changing evolution for the industry. Companies would be wise to use it, or risk perishing, as we explain in our article on this digital revolution.

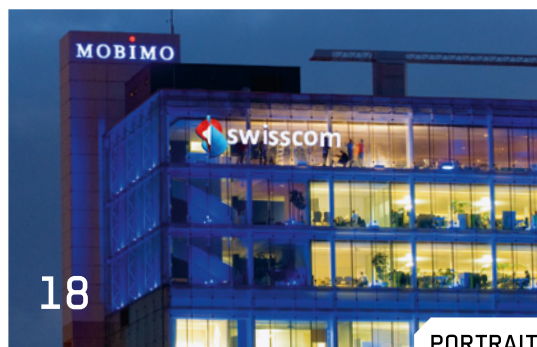
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Enjoy!

DOSSIER CONSTRUCTION BUILDING ON INNOVATION



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Abir Oreibi, CEO of
Lift conferences

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SCANS

health

INVESTING IN MARIJUANA

Will cannabis become a gold mine for stock markets? The market for legal cannabis is already worth several billion in the US.



CHARLÓN

The first marijuana-focused ETF is now trading on the Toronto Stock Exchange in Canada, a country that legalised medical marijuana in 2001. Like all ETFs, it tracks an index: the North American Medical Marijuana Index. But since marijuana is banned at the federal level in the United States, 11 of the 16 companies in the index are Canadian. The index also includes a Uruguayan company and a handful of US pharmaceutical groups. The results so far are promising: in the US alone, the marijuana market was worth \$6.7 billion at end-2016.

Check out : swissquote.com/themes-trading



“This app is only for rich people. I don’t want to expand into poor countries like India and Spain.”

Evan Spiegel, CEO of Snap Inc., according to a lawsuit filed by a former employee who was concerned that Snapchat, the photo- and video-sharing app, wasn’t expanding abroad.



management

SWISS CEOs ARE STAYING PUT

Joe Jimenez, CEO of Novartis since 2010.



NOVARTIS AG

Only 12.7% of people in the top spot at big Swiss companies changed positions in 2016, substantially less than the previous year (17.6%). This indicator was published in a study

by Strategy&, PwC’s strategy consultancy firm, covering the world’s 2,500 largest companies on the stock market. The authors attribute these findings to a brisk economy on the whole, which they believe has brought stability to management teams. Additionally, the analysis revealed that most Swiss companies (62%) choose bosses with international experience. The study also highlighted that women are deeply under-represented in executive management positions. Worldwide, only 3.8% of CEOs are women, and 5.1% in German-speaking countries.



14.6%

The percentage of global sales from e-commerce by 2020 according to the auditing firm KPMG, compared to 8.7% in 2016. E-commerce is set to double in that timeframe, reaching \$4.1 trillion.



A reporter tries a virtual reality shopping session developed by Alibaba and HTC during the Global shopping festival in Shenzhen, China. (November 2016).

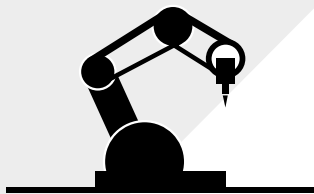
SHEN BOHAN / NEWS.COM

digital

CHINA AT THE FOREFRONT OF VIRTUAL REALITY

China will have absorbed one-third of all virtual-reality-headset sales worldwide by the end of this year, according to Morgan Stanley. By 2020, the VR market will be worth \$8.5 billion. The technology is hugely popular in China because of the many sophisticated ways it is used there.

For instance, the real-estate group Vanke uses VR to show apartments to potential clients. Alibaba plans to launch a service allowing users to virtually inspect goods before buying them on its e-commerce platform. And Tencent is working on producing VR films.



6

The number of US jobs, per 1,000 employees, lost for every robot brought into the workforce, according to a recent study by MIT and Boston University. Each robot also brings wages down 0.75%.

tourism

LOW-COST, LONG-HAUL FLIGHTS

The European airline group IAG recently launched Level, a low-cost airline offering long-haul flights. Based in Barcelona, Level operates two flights to Los Angeles and Oakland (California) on Airbus A330 aircraft. One-way tickets start at just \$149. Two other routes will be added mid-June: Punta Cana (Dominican Republic) and Buenos Aires (Argentina). With this new offer, IAG hopes to compete with other low-cost airlines operating long-haul flights, such as Norwegian and certain Gulf carriers. — IAG

RANKING

THE 10 MOST EXPENSIVE LUXURY BRANDS IN THE WORLD (in \$bn, 2016)

1. LOUIS VUITTON
28.5

2. HERMÈS
19.8

3. GUCCI
12.6

4. CHANEL
10.3

5. ROLEX
8.2

6. CARTIER
6.7

7. BURBERRY
4.6

8. PRADA
4.4

9. TIFFANY & CO.
2.5

10. DIOR
2.1

Source: Millward Brown

THE 10 MOST RESPECTABLE "MADE IN" LABELS (Made-In-Country-Index score, 2017)

1. GERMANY
100

2. SWITZERLAND
98

3. EUROPEAN UNION
92

4. UNITED KINGDOM
91

5. SWEDEN
90

6. CANADA
85

7. ITALY
84

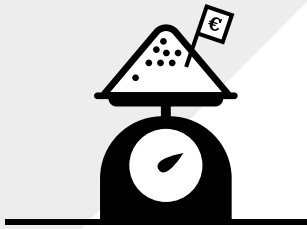
8. JAPAN
81

9. FRANCE
81

10. UNITED STATES
81

Source: Statista

SCANS



€500

The price of one tonne of European beetroot sugar, versus €700 in 2013. Prices have fallen ever since the EU deregulated its sugar market. And they could drop even further: production quotas and minimum guaranteed prices will be eliminated as of October.



DKSH GROUP

This Swiss firm's services involve helping other companies enter new markets, especially in Asia.

watchmaking

HARD TIMES FOR SWATCH

All Swiss watch brands are struggling at the moment – but none more so than Swatch. The Biel-based group saw its profits dive 47% last year, to 593 million Swiss francs. The disappointing performance was due to slowing business in China, its main market. The terrorist attacks in Europe also hurt tourism, which weighed on

sales. In addition to financial woes, the company has also run into legal hurdles. Apple filed a complaint against the Swiss watchmaker for copyright violation, stating that Swatch's new slogan, "Tick Different", is too similar to Apple's slogan, "Think Different", which launched in 1997. — UHRN



Swatch CEO Nick Hayek, less than impressed during the presentation of the group's annual results on 16 March.

FABRICE COFFRINI / AFP



“We did under-perform. We could have done a better job navigating the markets.”

Martin Chavez, CFO of Goldman Sachs, after a disappointing performance in the first quarter of 2017.

*distribution***DKSH BOOSTS ITS PRESENCE
IN CAMBODIA**

DKSH recently acquired Europ Continents, a Cambodian distributor of medical devices and diagnostic products. Europ Continents distributes the products of brands such as Philips, Braun, Horiba and Agilent in the fast-growing Cambodian market. The acquisition will help DKSH – a Swiss company that offers distribution services and helps brands penetrate new markets – boost its presence in southeast Asia. The company has been operating in Cambodia for over 60 years and employs some 1,400 people there.

— DKSH



**“I am always
confused
as to what
smartwatches
are for when
we have
smartphones”**

Eric Xu Zhijun,
CEO of Huawei.

*e-commerce***AMAZON EXPANDS (FURTHER)**

Amazon is looking to expand beyond its traditional markets in the United States and Europe. The US e-commerce giant recently bought Souq, the biggest e-commerce platform in the Middle East. Founded in 2005, the site generates about 50 million unique visits per month and delivers to six Gulf countries and Egypt. Amazon also announced at the end of 2016 that it would invest \$5 billion to expand into India, where several companies are engaged in fierce competition to dominate the country's e-commerce market. India's e-commerce sector could be worth as much as \$48 billion by 2020. — AMZN

**KICKSTARTER**

ZETIME

ZETIME*A smartwatch with hands*

ZeTime is a hybrid watch with mechanical hands and a round smartwatch touchscreen. Created by Geneva start-up MyKronoz, the watch has a classic Swiss design and features a high-res colour display for checking your email and social-media notifications, counting your steps and measuring your heart rate. In addition to its sleek design, ZeTime shows you the time – even when the screen is turned off. Plus, it has a super-long battery life: up to 30 days on a single charge! It'll cost \$199, or \$119 for those who supported it very early on the Kickstarter campaign.

FUNDS RAISED
\$5.3 MILLION

AVAILABLE
SEPTEMBER 2017

SCANS

technology

TOSHIBA WILL SPIN-OFF OPERATIONS TO AVOID BANKRUPTCY

CEO Satoshi
Tsunakawa under
pressure.



KOICHI NAKAMURA / AFP

Faced with serious financial problems, Toshiba has launched a comprehensive reorganisation project. The Japanese company plans to spin-off four of its least-profitable operations between July and October. These will include energy – with Westinghouse Electric, a US nuclear-power company that recently filed for bankruptcy – infrastructure systems, information technology and electronic devices. The reorganisation will affect between 24,000 and 30,000 employees. Toshiba is also desperately looking to sell its memory-chip business.

— 6502



“We have definitely got YouTube envy”

Reed Hastings, CEO of Netflix, comparing his company's 100 million users to YouTube's 1 billion.

transport

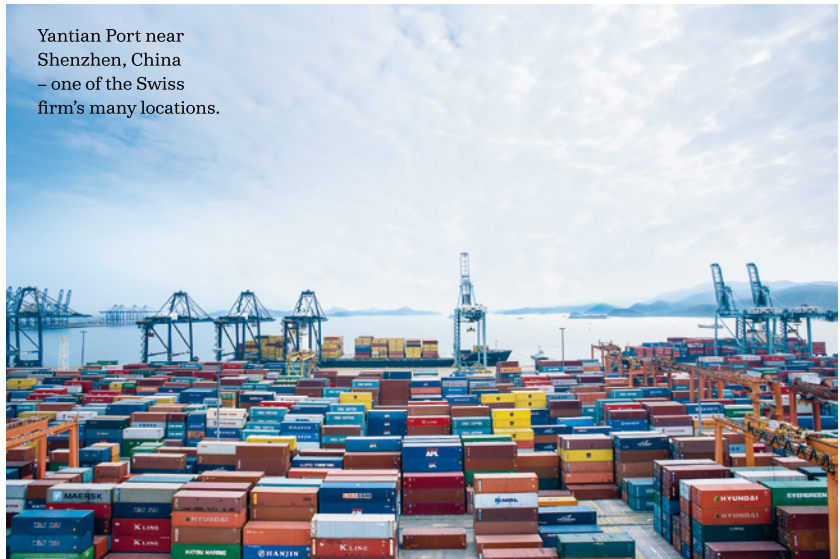
KÜHNE + NAGEL TEAMS UP WITH ALIBABA



2,740,000

The number of Switch consoles sold in March, the product's first month on the market. Nintendo is on track to sell over 7 million of its hybrid consoles – which can be played at home or on-the-go – for the year as a whole. Nintendo hopes Switch will be as successful as the Wii, which sold over 100 million consoles.

Yantian Port near
Shenzhen, China
– one of the Swiss
firm's many locations.



KHUNE+NAGEL

Kühne + Nagel have joined forces with the Chinese e-commerce giant Alibaba, becoming the preferred logistics-services supplier for wholesalers in the platform's B2B segment. Using an online tool called KN FreightNet, wholesalers can instantly organise and book the transport of their

goods – by air, sea, rail or road – and obtain a quote for how much it will cost. The Swiss company's offer also applies to small freight (less than one container). Kühne + Nagel currently operate in over 100 countries.

— KNIN

*food***BELL UPS SERRANO HAM PRODUCTION**

Everyone loves Serrano ham. To keep up with growing demand, Bell has started building a new production site in Fuensalida, near Madrid. The plant is scheduled to open in 2018 and will boost the Basel-based company's annual drying capacity to more than one million hams. Bell also took over Nobleza Ibérica's production sites in Azuaga, a town in Spain's Extremadura region, which is famous for its Ibérico ham. Nobleza Ibérica specialises in high-quality Ibérico ham and Spanish charcuterie. — BELL



SHUTTERSTOCK



351,000

The number of electric and hybrid cars sold in China in 2016. That's an 85% increase on the previous year, making China the world's biggest market for electric vehicles. Sales took off in 2014 and have quintupled since then.

*IPB***A UNICORN DEBUTS ON WALL STREET**

Cloudera is a start-up specialising in big-data solutions and services. The company floated on the New York Stock Exchange (NYSE) at the end of April. The stock debuted at \$17.9, valuing the California firm at \$2.3 billion. Cloudera has developed an ecosystem of big-data software centred around the Hadoop open-source platform. Its arti-

cial-intelligence tools help companies identify trends and anomalies in massive data sets. The NYSE uses the tools to identify illegal trading activity. Cloudera's revenue totalled \$261 million for the financial year ended January, up 57% on the previous year. Its main competitors are Hortonworks and MapR, two companies that also use Hadoop. — CLDR



ConocoPhillips
facility in northern
Alberta, Canada.

*oil***ENTHUSIASM FOR OIL SANDS IS WANING**

US oil giant ConocoPhillips recently sold its oil-sands assets in northern Canada to Canadian firm Cenovus Energy for 17.7 billion Canadian dollars (12.8 billion Swiss francs). That makes it the third major oil group – after Shell and Marathon Oil – to sell off assets in the region, where extraction is particularly costly and challenging from a technical standpoint. Low oil prices have eaten away at profitability. — COP



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THE LEADING HOUSE OF LEADING NAMES

TRENDS



the figure

MARCO GOBBETTI

Burberry takes on a new leader

Position
CEO of Burberry

Age
58

Nationality
Italian

From July, Marco Gobbetti will take the helm of the luxury British brand Burberry. The 58-year-old Italian is the former president and managing director of Céline, an LVMH group brand. After acquiring his Business Administration degree from the American University in Washington, D.C., he launched his career at the Italian brand Bottega Veneta. He then became CEO of Moschino from 1993

to 2004, and held the same role at Givenchy until 2008. Gobbetti will replace Christopher Bailey, the current CEO of Burberry, who will return to his former role as Chief Creative Officer. The brand, known for its signature plaid patterns and trench coats, is expected to get a substantial boost from its new CEO – a much needed push in the wake of the slowdown in the Chinese luxury market and the US retail crisis for department stores like Macy's and Bloomingdale's.



the country

KENYA

The African renaissance

Thanks to its fairly diverse economy, Kenya isn't as dependent on the price of raw materials as much as other African nations. Circumstances have enabled this East African coastal territory to soar, particularly due to the focus on the services sector as well as its technological expertise. Kenya's start-ups are some of the most innovative in the world, such as the money-transfer service M-Pesa,

the remote-learning platform Eneza and Magic Bus Ticketing – like Uber, but for public buses. The country's economy is also supported by a number of major infrastructure projects, such as the new railway connecting Nairobi and Mombasa and the Lake Turkana Wind Power Project. With 75% of its population under 30, the youth in Kenya help keep the country in good health. However, the 2017 outlook is less optimistic than last year due to the drought, which has put 2.7 million people in need of food aid.

Population
46.7 million

Per capita GDP
\$1,607

Growth (2016)
5.9%

Main economic sectors
Tourism, telecoms, transport, construction and agriculture



The system captures wind resources at higher altitudes to generate electricity.

AMPYX

UAV-BASED WIND TURBINE

A wind turbine carried by a drone

The Dutch start-up Ampyx is on the cutting edge of the wind-turbine revolution. It has developed wind technology that generates energy without the costly and heavy tower installations brandished with blades on top. Its Airborne Wind Energy System (AWES) uses a wind turbine mounted onto a drone, attached via cable to a land or sea-based generator. With this

system, wind resources at higher altitudes, which are stronger and more consistent, can be captured for more efficient electricity generation. It is also cost effective, eliminating the need to build towers and install wind farms. Ampyx has partnered up with the German energy group E.ON to develop its product. The first prototypes will be evaluated on a test site

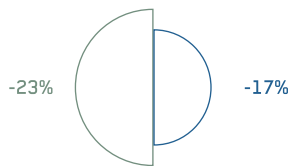
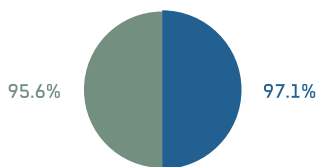
in Ireland. If the tests go well, a 2-MW version may be launched (capable of generating electricity for 2,000 homes). The long-term goal is to replace first-generation windfarms built in the early 2000s with this new technology when they reach the end of their service life.

Company
Ampyx and E.ON

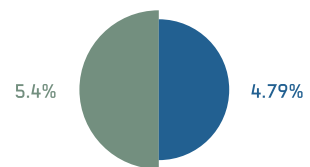
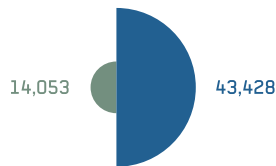
Launch date
2017

Estimated cost
€8.5 million

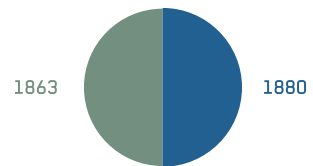
THE MATCH

PROFITS
(2016)CHANGE IN PROFITS
(VS 2015)PREMIUMS COLLECTED
(2016)COMBINED RATIO
(COSTS/PREMIUMS, Q1 2017)

SWISS RE VS MUNICH RE

GROSS
DIVIDEND YIELDMARKET
CAPITALISATIONNUMBER OF EMPLOYEES
(2016)

YEAR FOUNDED



CEO

CHRISTIAN MUMENTHALER
SINCE 1 JULY 2016



JOACHIM WENNING
SINCE 27 APRIL 2017



BY BENJAMIN KELLER

Having already taken a hit due to the natural disasters that occurred in 2016, Swiss Re has also been severely affected by climatic events in the first quarter of 2017. Net profits of the world's second-largest reinsurer – reinsurance involves insuring the insurers against the risks that they face – fell approximately 50% in just one year, to \$656 million. Cyclone Debbie,

which hit Australia at the end of March, weighed heavily on the results of the Zurich-based group, costing them in the region of \$350 million. Against a difficult backdrop over the last several years of falling premiums and interest rates, and subdued economic growth, Swiss Re nevertheless classifies its quarterly performance as “stable”. Munich Re, the sector

leader, posted profits of €557 million, equating to a 28% increase for Q1 2017. Based in Bavaria, the reinsurer was less exposed to Debbie (€100 million) and owes its positive results – albeit lower than expected – to its financial investments. Analysts advise holding on to positions in Munich Re and Swiss Re.

— SREN — MUV2

CHALLENGE EVERYTHING



H₀ BLACK

GENEVA MONTRES PRESTIGE INTERLAKEN KIRCHHOFFER HAUTE HORLOGERIE
LAUSANNE OURANOS LUGANO LES AMBASSADEURS LUZERN LES AMBASSADEURS
ZUG FINERY'S ZÜRICH LES AMBASSADEURS

THE HYDRO
MECHANICAL
HOROLOGISTS

HYT
HYTWATCHES.COM

Swisscom out to conquer the digital economy

The Swiss telecoms giant is looking to expand into new sectors, ranging from connected health to sensitive data storage for businesses. And it has little choice, with no end in sight to the nosedive in revenue from telephone services.

BY GENEVIÈVE RUIZ

“We’re witnessing the dawn of a vast market, and we plan to play a strategic role in it.”

Roger Wüthrich-Hasenböhler, chief digital officer of Swisscom, is not referring to the next generation of mobile phones but to new opportunities – data storage, connected health and the Internet of Things – created by the digital revolution.

It’s not easy to carve out one’s niche under the domination of the “Big Five” tech companies – Facebook, Google, Microsoft, Apple and Amazon

Why is Switzerland’s telecommunications leader talking about the digital revolution? Simply because its revenue has been on a downward spiral, falling 300 million to 400 million Swiss francs a year. It must find new growth drivers to survive. Innovations such as digital TV and new subscription packages won’t be enough. “Competition is tougher than ever in these markets, where revenue streams have gradually dried up over the past few years,” says Christian Neuhaus, spokesperson for Swisscom. “Like with WhatsApp, which has caused operators to lose 50 billion, we’re at the mercy of some guy tinkering around in his garage who comes out with a new app that, from one day to the next, provides a paid service for free.”

Swisscom faces no other choice but to diversify. The Swiss giant does have certain advantages enabling it to capture future markets driven

by the digital economy. These include a loyal customer base, advanced infrastructure and expertise in network and data management. The operator has invested millions over the past few years to forge the ideal position for itself in the innovation race. It also has offices in Silicon Valley and has recently opened one in Shanghai. Fresh from a trip to China, Mr Wüthrich-Hasenböhler explained that these entities were set up to analyse the business and technology trends that will shape these markets. “It’s very important for us to stay on top of these transformations. We need to figure out how technology and new services can be adapted to our country.”

It’s not easy to carve out one’s niche under the domination of the “Big Five” tech companies – Facebook, Google, Microsoft, Apple and Amazon. But Mr Wüthrich-Hasenböhler is optimistic. “Some services are all about local added value, and major tech firms are not always interested in a small market like Switzerland.” For example, Swisscom has invested in the Valais-based start-up KeyLemon, specialised in voice recognition (including Swiss German dialects). The group then integrated this service into its online television plan.

Swisscom has many other options to explore. Healthcare services, for one, is a fast-growing market where the company employs more than 200 people. Its customers include the six hospitals run by Bern-based Insel Gruppe and the Zurich healthcare network. The national telecoms operator has built a platform that centralises patient records (X-rays, MRIs, lab exams, medication, etc.). The information is kept in digital files that can be accessed by authorised staff anytime and anywhere. If a patient suffers from a leg fracture and concussion, the hospital treating him can check his medical records online to avoid any unsuitable medicines, such as in the case of an allergy. >

NUMBERS

11.64 bn

In Swiss francs, Swisscom's 2016 revenue, down 0.3% on 2015.

1.6 bn

In Swiss francs, 2016 net profits, up 17.8%.

21,127

Number of employees.

2.4 bn

In investment in infrastructure in 2016.

22

In Swiss francs, dividends per share in 2016.

+12%

Growth in Swisscom's bundle deals at end-March 2017. TV connections rose 8.7%.

Another growth area is data centralisation for city governments, which increasingly use this technology to better serve local citizens. Smart cities are booming, and Swisscom has initiated several of these projects in Switzerland.



“Most of our revenue comes from products that didn’t exist 10 years ago”

Christian Neuhaus, spokesperson for Swisscom

the United States. Swisscom already offers its services to multinationals, banks and even small businesses. It advises companies on their strategy, comes up with data management and security solutions, and designs file sharing platforms.

And finally, the latest sector that everyone wants a piece of: mobile payment services. Swisscom joined the Twint project, which brings together several Swiss banks and retailers to compete with the giants Apple Pay and Samsung Pay. Launched in April, Twint is expected to expand its base of 25,000 points of sale and develop new functionalities such as invoice payment. “Switzerland is not in the lead in this segment,” Grütter says. “We still have a way to go before we can offer a decent alternative to the

other applications available. For example, Denmark has an application that works with all the country’s banks and retailers. Practically all citizens use it.”

To become a leader in these future markets, Swisscom will have to invest massively in infrastructure and 5G network technology, which will bring greater speed and data transfer capacity. But it will not come cheap. The group thus finds itself in a predicament: its core market is winding down and it is unsure how much revenue its future growth drivers can generate. The national telecoms operator did not wish to disclose how much of its total revenue these new businesses represent, but it is probably still minimal. Nor was it willing to provide details about the revenue generated by its digital TV solutions. So the elusive

The operator provides Pully, in the Canton of Vaud, with aggregate data from smartphones to better understand how citizens move about. “These indicators will help us decide whether it’s worth it to invest in a certain bus line,” Alexandre Bossard, project manager at the City of Pully told *Le Temps*. Similar experiments are being run in Zurich, Geneva and Fribourg. “Swisscom has huge growth potential in this area,” says Peter Grütter, president of the Swiss Telecommunications Association. Additionally, all gas, electricity and water meters will eventually be connected with the development of the Internet of Things. That will produce vast amounts of data that can be collected to better manage supply and demand.”

Sensitive data storage is also a promising industry for the national telecoms operator. Switzerland offers considerable advantages for this market, such as political stability and a legal framework that protects privacy better than



statements from Christian Neuhaus are all we have to go on. "Most of our revenue comes from products that didn't exist 10 years ago," he says.

Could the same formula apply for the years to come? Swisscom enjoys recognised expertise and a critical mass of customers, but the long-standing operator will have to move quickly, while disseminating a risk-taking corporate culture. Swisscom's managers believe it can happen. "When we launched our digital TV services 10 years ago, we were looked down on," Roger Wüthrich-Hasenböhler says. "We had to prove our worth. But now the sector is a major source of revenue for Swisscom. We believe this will also be true with the digitisation of the economy." ▲

SCMN



SWISSCOM

Swisscom's Chief Digital Officer, Roger Wüthrich-Hasenböhler (left in the photo), spends a lot of time abroad on the lookout for the latest innovations. The national operator employs a small team in Silicon Valley. Its mission is to identify the most promising start-ups.

ANALYST'S OPINION



"INTELLIGENT STRATEGY"

Daniel Pellet specialises in the Telecommunications, Media and Technology markets at Bordier in Geneva. He reckons that Swisscom is on track to meet its objectives.

Sunrise brought in more mobile subscribers than Swisscom for the first time in 2016.

Will that trend continue?

I don't think so. Sunrise can most likely gain more subscribers in some segments, but rather over Salt. With 60% of the market, Swisscom remains ahead of the rest. But that means Switzerland has a vibrant telecommunications market, with real competition. Sunrise is now also moving into bundle deals and digital TV, products that have developed fast at Swisscom these past few years. Swiss customers remain loyal to the national operator, which provides quality network service and renews its plans and options regularly to keep up with the latest market trends. For example, its inOne package offers discounts for multiple subscriptions within the same household. It's a great idea.

But the fight will be tough because growth prospects are limited on the market...

Exactly, the traditional telecoms market is mature and will not grow much in the years to come. Monthly revenue per subscriber has fallen in recent years to about 50 Swiss francs today. Some sectors, such as landline phone service, are even upside down. In Switzerland, things are relatively stable with only three operators on the market – less than in most European countries – but their market share is unlikely to change much. The merger between Sunrise and Orange, rejected by the European Commission's Competition authority in 2010, is not going through. And licences won't be renewed until

2028. The Swiss Confederation has a 51.2% share. The dividends it collects are a welcome contribution to the federal coffers. What's more, it's increasingly important to have strategic control over communication infrastructure.

To offset the lack of growth in the telephone market, Swisscom is pushing ahead in the digital economy, investing in healthcare, finance and energy services. What do you think about that?

Given the current situation, Swisscom has to find growth drivers. It's only logical to look for them in the markets where its infrastructure will be used in the future. Entire swathes of the economy will be exchanging a growing amount of data, and Swisscom wants to capture that growth. It's an intelligent strategy, even though many unknowns remain as to where the digital economy will go. We don't yet know how much growth it can really bring Swisscom.

What do you recommend investors do with Swisscom shares?

Q1 2017 earnings were strong and the company met its targets. Although we don't recommend buying the share due to its high valuation, we recommend holding the stock for its healthy annual dividend of 22 Swiss francs. Not bad considering the current climate. This 4.85% return is not expected to change much over the coming year. It is worth noting that Sunrise produced slightly higher returns, at 5.3%, after a stronger stock market performance than Swisscom.





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ANALYSIS

THE VIEWPOINT OF SPECIALISTS

INVESTOR INTERVIEW

“Virtual reality will eventually go mainstream”

The first immersive VR headsets for consumer use hit retail shelves one year ago. But sales have been disappointing. The latest versions with more enhanced features are expected to give the market the boost it needs.

BY STANISLAS CAVALIER

Is virtual reality just a passing fad? A flash in the pan? Today, just one year after the big splash made when the first consumer headsets were released, their sales performance has been less than impressive. Facebook has supposedly only moved 500,000 Oculus Rift models since they came out in March 2016. Making matters worse, the lack of quality content available is turning the devices into little more than useless gadgets. But Gil Doukhan, an investor specialised in internet projects and social media at Iris Capital, is convinced that the technology will spread. “There’s no way virtual reality doesn’t have a future. And not just in consumer entertainment,” he says. “Businesses will also develop applications for it.”

After the big ceremonious launch of the first VR headsets in 2016, the excitement seems to have died down. Is that really the case?

First of all, virtual reality did not come out last year. People were already talking about it in the 1990s. But Facebook’s acquisition of Oculus Rift in 2014 for an astronomical amount [editor’s note: over \$2 billion] triggered renewed interest in the technology. After a deal like that, other tech companies couldn’t stand around without doing anything. So they took the plunge, namely HTC with its Vive headset and Sony with the PS VR for PlayStation 4. Sales of the Oculus and Vive are still relatively confidential, but it’s hardly been the tidal wave that was expected. These two systems are expensive – 600 Swiss

francs and 900 Swiss francs respectively – and require a powerful computer to run them. In fact, it’s the least technically advanced and least expensive model, the PS VR, that’s faring best [editor’s note: about 1 million copies sold]. And as it hooks up to a console, consumers are more readily buying them.

How would you explain the rather lacklustre sales?

We’re now discovering the first generation of virtual reality headsets. The products on the market are still sort of gadgety. It’s the kind of thing that you buy to try out but ends up in a cupboard because you have no use for it. With all the effervescence surrounding the takeover of Oculus Rift, some people have perhaps forgotten the mistakes they made in their youth and overestimated the short-term potential of the market.

VR generally faces two main obstacles. The first is the lack of content. VR headsets offer a whole new experience, so we’re starting from scratch. In the meantime, the content available is often more experimental, rather than a finished product. The second problem is more serious. Many users feel sick when they try VR [editor’s note: about 45% of the population according to a study led by Ubisoft]. Nausea caused by this “virtual reality sickness” or “cybersickness” can happen when what our body perceives is incoherent with what our senses perceive, as in when

Will Sony's PlayStation VR headset bring virtual reality to the masses? Around 1 million of them have been sold.

SHUTTERSTOCK



wearing one of these headsets. Users “see” movement but the body remains stationary. The brain is thrown off and sends alert signals in the form of nausea. It feels like motion sickness.

With all those obstacles, do you think VR can go mainstream?

It's an exciting industry with vast potential. I think there's no way virtual reality doesn't have a future. In fact, the many acquisitions taking place show that experts believe that too. Google has recently bought Owlchemy Labs, which designed the VR game Job Simulator, while the London start-up Improbable raised \$500 million. That kind of money leaves nothing to chance. But it will take time before VR goes mainstream.

Could the business world take advantage of the technology before consumers?

In business, VR could make sense for anything where teleportation is needed. For example, in the property sector, a building could be toured before it's built. Other applications are being developed, especially in telemedicine, education and remote museum experiences.

But for both industrial and consumer use, I think augmented reality, now called mixed reality, offers greater potential than VR. I think it might even have what it takes to be the next mobile phone.

Then how do you explain the flop with Google Glass?

Google Glass is just a prototype of what the future will bring. The experience is not seamless, not to mention the fact that people are not yet ready to wear something that is constantly recording. It feels too intrusive for now. The HoloLens headset by Microsoft is an improved version, but is still experimental. And with Magic Leap glasses, no one knows if they're seeing fiction or reality. But when the technology is fully developed, augmented reality will be used as much by businesses as by consumers. The popularity of Nintendo's Pokemon Go, which is actually a fairly basic game, shows how much people are after potential applications of augmented reality.

Which companies are good investments?

You should look at GAFAM (Google, Apple, Facebook, Amazon and Microsoft). For now, I'd advise waiting to see how these companies will shape their ecosystems to gauge their respective approaches. Today, virtual reality and augmented reality are not yet driving growth in the short term, as the cloud can. ▲



GIL DOUKHAN
INTERNET TECHNOLOGY EXPERT
IRIS CAPITAL

Dossier prepared by
Stanislas Cavalier,
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Geneviève Ruiz,
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DOSSIER

CONSTRUCTION

BUILDING ON INNOVATION

The gigantic, sprawling construction industry is worth more than \$10 trillion worldwide. The industry leaders – mostly huge, firmly planted and listed companies – are now coping with a number of challenges, such as the relentless digitisation of their working tools, the need for more sustainable and eco-friendly materials, and the worrying shortage of skilled workers currently plaguing many countries. These long-standing firms also have to deal with new competitors from China, reaching far beyond their borders. A behind-the-scenes look into the world of construction.



"India needs 170 million new houses"

The construction market, both global and ultra-local, is up against conflicting forces. In the west, the US and the UK are driving growth upwards.
Overview.

BY JULIE ZAUGG

The construction industry is booming. This is especially evident in Asia, but also in some western countries such as the US and the UK. Made up of big players that favour stability over adventure, this market must nevertheless adapt to some recent innovations, such as 3D printing and the emergence of robotics. Graham Robinson, director of the think tank Global Construction Perspectives, which is part of UK consulting firm Pinsent Masons, shares with us what he believes are the big trends shaping the industry.

Globally, what are the outlooks for the construction market ?

In 2017, expenditures in the sector are expected to exceed \$10.5 trillion, which is approximately 13% of the global GDP, and spending will only increase. By 2030, expenditures are expected to increase by close to 60%, reaching nearly \$17 trillion. Growth will be particularly strong in sectors such as offices, shops, en-

tertainment, health and education. Infrastructure, particularly transportation (constructing railways, ports, airports and roads) and private homes come in not far behind.

Which country will see this growth the most ?

India is without a doubt where the construction industry will see the most growth. Because of its rapid urbanisation, massive population growth and emergence of many middle-class families, the need for housing is incredible. India needs 170 million new houses over the next 15 years. That's 31,000 new buildings a day! Indonesia is another promising market for the construction industry. It lacks all types of infrastructure: roads, housing and airports. Other countries in South-east Asia, particularly Vietnam, the Philippines and Myanmar, are in a similar situation. Several industries could move their factories to the region to benefit from much lower

salaries than in China. Overall, the construction industry will be worth \$1 trillion in the ASEAN region (ed. note: Association of Southeast Asian Nations) by 2030.

What about China ? Many people say the Chinese economy is slowing down...

In fact, in 2017, the construction market is still growing in China, notably due to government investments. In the medium term, China will remain the most important prospect for the construction industry. By 2030, it will be home to a quarter of the world's construction projects. That being said, the growth rate of the construction sector in China that we've seen over the past few years is not sustainable. It will slow down, as it will in the majority of other industrialised countries. A good amount of roads, railways and airports that the country needs are already built. But there are intriguing opportunities for growth. The Chinese



PERSPECTIVES FROM AN EXPERT

Graham Robinson has more than 25 years of experience in the construction and engineering industry. He is the author of the very detailed *Global Construction 2030* report. Before joining Pinsent Masons in 2010, the 54-year-old Briton was in charge of the management consulting department at Gleeds, a UK-based consulting firm active in the construction and real estate industries. He was also in charge of the supply chain for Manchester airport and worked as a sales director at the Centre for Strategic Studies in Construction, which is part of the management and engineering school at the University of Reading.

population is ageing. The percentage of people over 65 will reach nearly 20% by 2030, which is similar to the older population in Europe.

This means that China will need significantly more hospitals and retirement homes. Additionally, the migration of rural populations to the cities will continue, which means that there will remain a demand for urban housing.

What's the situation in other developing markets ?

In Latin America, Mexico, Colombia, Chile and Peru will drive the construction market upwards. In Africa, Kenya, whose economy is relatively diversified and growing rapidly, is also fertile ground for the construction industry. It has begun to attract foreign capital, especially from China. South Africa, despite its sluggish growth, has significant infrastructure needs, particularly in the energy industry.

In the United States, what do you make of the Trump administration's infrastructure plan ? Will it boost the construction industry ?

Construction is doing very well in the US. It's expected to grow 4% annual-

ly until 2030. But its good health is less a result of public infrastructure projects and more due to a cyclical economic recovery and the need to catch up on the private housing market after the 2008 crisis. The regions that will see the most growth are those surrounding big cities such as New York, Los Angeles, Chicago and Houston. The Trump administration's plan will actually have a relatively limited effect on construction companies, particularly because financing these projects is not currently set in stone. Of the \$1 trillion planned, only a small amount is likely to actually happen. Those who will benefit the most will be companies that sell construction materials and who have the critical mass necessary to participate in a public-private partnership ▶

(PPP), such as Cemex, LafargeHolcim and HeidelbergCement. Steel and glass vendors are also expected to benefit from Trump's plan.

Is Europe doomed to lag behind in the construction market?

The majority of the big Western European countries already have good quality infrastructures. Their populations aren't increasing and nations have lots of debt. Opportunities for the construction industry are therefore limited in that region. There is one exception, however: the UK has a large deficit in terms of investments in housing and infrastructure.

It needs 3.3 million new houses over the next 15 years. Several big public projects are planned, such as the new high-speed railway connecting London and Birmingham and the extension of Heathrow airport. By 2030, the UK will become the most significant market in Europe for construction, followed by Germany. The latter will take advantage of domestic and European firms, as well as Chinese companies that are seeking to make more and more foreign investments. Chinese companies are expected to inject €105 billion into UK infrastructure and real estate projects over the next 10 years.

DANISH SIDDIQUI / REUTERS



Who are the main players in the construction industry?

The biggest companies are Chinese. China State Construction Engineering, a huge state conglomerate, is the largest construction firm in the world, followed closely by China Railway. In 2015, their profits reached \$115 and \$113 billion,

respectively. These companies owe their success to the incredible economic growth that China has experienced over the last 20 years. After these two companies, there is a series of European firms which do business all over the world. These include France's Vinci (€38.1 billion

in profits in 2016), Spain's ACS Group (€32 billion), France's Bouygues Construction (€31.8 billion), Germany's Hochtief (€20 billion) and Sweden's Skanska (€15 billion). It's also worth mentioning US companies Bechtel and Fluor, as well as Turkish companies, which have a strong



No, it is an extremely conservative market. When you do business in an industry where the goal is to construct buildings or bridges that are expected to last more than 100 years, taking risks is not a top priority. However, there is a sort of market consolidation of engineering companies and consultants affiliated with the construction industry.

What are the industry's biggest challenges?

First, there is a global shortage of qualified workers. In the US, Europe, Australia and Africa alike, companies are struggling to find specialised workers who can master construction trades. Companies must also adapt to certain new trends, which will change the way we think about building. Take self-driving cars, for example. When they become mainstream, it will completely revolution-

ise the way we build roads and organise signs and signals.

In your opinion, what are the most promising innovations?

Robotics and artificial intelligence are transforming the industry. Companies will delegate more and more construction tasks to robots. Similarly, 3D printing will facilitate the manufacturing of machine parts or certain parts used on construction sites. Manufacturing will become faster and cheaper. Japan, where the population is ageing and no longer progressing, is at the cutting edge of these new trends.

3D printing also opens up the possibility of reshoring (ed. note: returning to a local industrial production). It will have an impact on where companies decide to build new factories as well as the transportation used to ship the goods to the markets. ▲

Future workers learn the ropes at Larsen & Toubro's training centre in Panvel just outside of Mumbai. Like many of its global competitors, the India-based construction giant is experiencing a serious shortage of qualified workers.

presence in the Middle Eastern, Russian and Central Asian markets.

Would you consider the industry to be a dynamic market, favourable to new players, or is it more of a series of mergers and acquisitions?

SWISS MARKET REMAINS SOLID

What is the outlook for the Swiss construction market? The latest Swiss Construction Index – published quarterly by the Swiss Contractors' Association (SSE) and Credit Suisse – indicates that construction business should remain buoyant to the end of the year. Civil engineering dropped 4.2% in the second quarter, but SSE sees this as a temporary correction and not a long-term turnaround.

Overall revenue for the Swiss construction sector rose 5.4% in 2016. The UK consulting firm Turner & Townsend believes the sector will perform as it did last year, with slow but steady growth.

HEAVYWEIGHTS OF CONSTRUCTION

The construction and public works industry, old-fashioned and set in its ways, is hardly welcome territory for newcomers. A focus on the leading firms.

BY SOPHIE GAITZSCH

SKANSKA SCANDINAVIAN EDGE

The Swedish group won the contract to revamp LaGuardia Airport.

The long-standing company Skanska played an important role in the development of Swedish infrastructure before expanding beyond the country's borders. These days, the group is active in building and developing residential and commercial property and infrastructure, with extensive operations in the United States and Northern and Central Europe. Its big-name projects include the Swiss Re Building in London, the famous "Gherkin", which forever transformed the City's skyline in the early 2000s. In 2016, Skanska added to its orders the redesign of New York's LaGuardia Airport, a project estimated at \$2.8 billion, its biggest contract yet. Analysts recommend buying the share.

Founded
1887

Headquarters
Stockholm (SE)

Revenue
SEK 151 BN
(CHF 17 BN)

Employees
41,000

— SKA-B



The 8,700-m railway tunnel in Hallandsås, Sweden. The structure was built by Skanska and inaugurated in 2015, after 23 years of work!

AND...

CEMEX

The Mexican construction materials company (41,000 employees worldwide) is the world's leading ready-mix concrete supplier. — CX
REVENUE: \$13.4 BN

EIFFAGE

The third-largest construction group in France has a strong presence in West Africa, where it completed the region's first toll motorway operated under concession. — FGR
REVENUE: €14 BN

LAFARGEHOLCIM MAMMOTH UNDER PRESSURE

The merger between Lafarge and Holcim has yet to prove itself.

Founded
2015 (merger)

Headquarters
Jona (CH)

Revenue
CHF 26.9 BN

Employees
90,000

— LHN

The global leader in cement, formed by the mega-merger of the French group Lafarge and the Swiss company Holcim in 2015, has 2,300 factories worldwide. After a rocky wedding, it raised the bar in 2016

with net profits of 2.09 billion Swiss francs. But Sven Edelfelt, an analyst from Natixis, is not convinced. "Its Q1 2017 earnings are less than impressive. A substantial pick-up in Europe and the United States over the next few months could help, but industry trends in Europe have so far been highly disappointing." The analyst feels that targets set for 2018 are "unrealistic". Furthermore, the construction giant is caught up in turmoil over paying armed groups in Syria to keep one of its factories running. "They risk a heavy fine for financing terrorism," Edelfelt says, and recommends selling the share.

KOMATSU JAPANESE APPETITE

The Japanese group made the biggest acquisition in its history.

Like its major rival Caterpillar, the Japanese construction equipment builder has been dealt a blow by the slowdown in the mining industry and the yen's appreciation. But the world's second-largest industry manufacturer expects demand to pick up. It has just bought the American company Joy Global, specialising in mining, for \$3.7 billion – its biggest acquisition ever.

"The mining market is near the bottom. Now is the ideal moment (to make this acquisition)," CEO Tetsuji Ohashi announced then. Welcomed by industry experts as "logical", the deal brought Komatsu several new lines of machinery, especially underground and open pit equipment. Analysts have issued a HOLD recommendation on the share.

Founded
1921

Headquarters
Tokyo (JP)

Revenue
JPY 1.802 TRN
(CHF 15.9 BN)

Employees
47,000

— 6301



Diamond mining site near Barkly West, in the middle of South Africa.

KOOS VAN DER LENDE / NEWS.COM

ROYAL BAM GROUP

Founded in 1869, the Dutch company completed, in 2016, the huge student hall on the Hönggerberg campus of the Swiss Federal Institute of Technology in Zurich. — BAMNB
REVENUE: €7 BN

TECHNIPFMC

The group formed by the merger of Technip and FMC Technologies is active in engineering and the construction of oil and gas infrastructure. — FTI
REVENUE: €11.1 BN

FLUOR CORPORATION OIL AND DEPENDENCE

The US group is adversely affected by these bleak times for the raw materials market.

The Texas-based engineering and construction company made a name for itself building oil and gas refineries and pipelines, but has since diversified into industries such as large infrastructure projects. All the same, most of its business is generated by the area it refers to as Energy, Chemicals & Mining, which has a strong presence in the United States. In recent years, Fluor has been battered by the plunge in raw materials prices. In 2016, it managed to increase its revenue, after several consecutive years of decline. But its outlook remains murky, especially in terms of new contracts. "We continue to experience headwinds," CEO David Seaton said as he announced lower than expected earnings for Q1 2017. Analysts have issued a HOLD recommendation on the share.

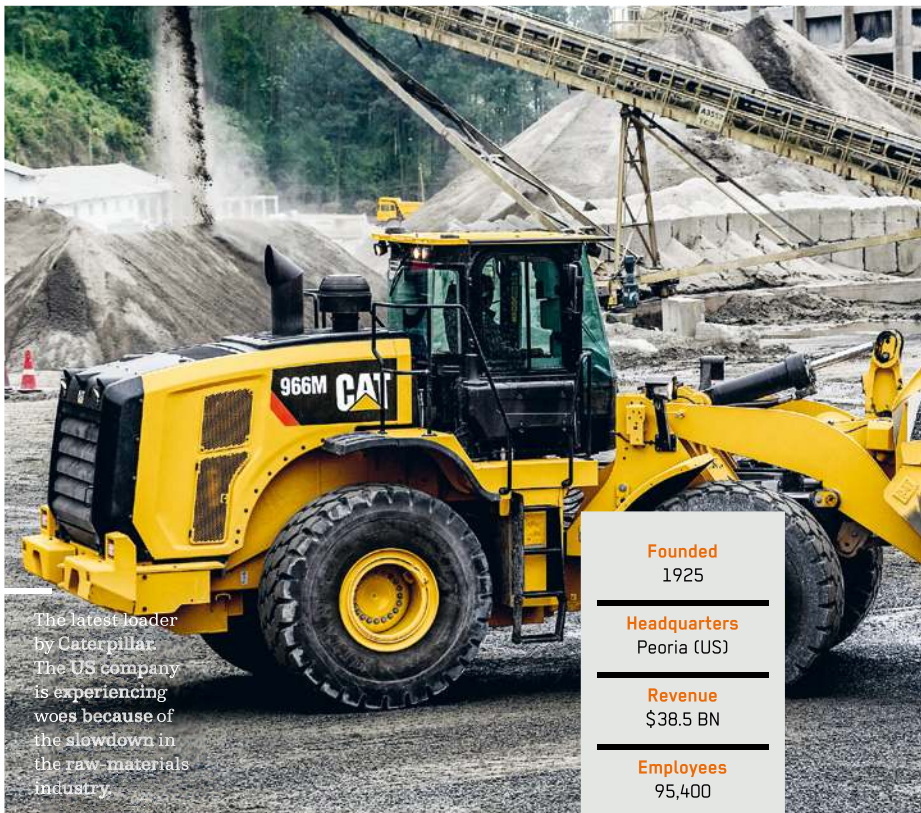
Founded
1912

Headquarters
Irving (US)

Revenue
\$19 BN

Employees
61,500

— FLR



The latest loader by Caterpillar. The US company is experiencing woes because of the slowdown in the raw materials industry.

Founded
1925

Headquarters
Peoria (US)

Revenue
\$38.5 BN

Employees
95,400

— CAT

CATERPILLAR MASSIVE RESTRUCTURING

The manufacturer has cut more than 10,000 jobs.

The world's leading construction and mining equipment manufacturer is suffering from the sluggish raw materials market and the slowdown in Chinese growth. Its sales dropped 18% in 2016, its fourth consecutive year of negative performance and the longest decline in its history. The US company has implemented an aggressive

cost-cutting policy, shedding more than 10,000 jobs over the past two years. The first quarter of 2017 showed some signs of recovery, but the outlook for the year remains uncertain. Making matters worse, Caterpillar is currently under investigation for tax fraud. If the accusations are true, the company could face heavy restrictions. Analysts have issued a HOLD recommendation on the share.

AND...

ODEBRECHT

The Brazilian construction giant is shaken by the epic corruption scandal affecting about 10 countries. Non listed

REVENUE: BRL 132.5 BN (CHF 40 BN)

ORASCOM CONSTRUCTION

This entity is part of the empire owned by Egypt's Sawiris family. The company employs 72,000 people and is specialised in large-scale infrastructure projects. — OC
REVENUE: \$4 BN



CATERPILLAR

VINCI

QUIET STRENGTH

The French group has developed a robust business model combining construction and concessions.

Founded
1899

Headquarters
Rueil-Malmaison (FR)

Revenue
€38.1 BN

Employees
183,000

— DG

The French behemoth sprawls across 2,100 companies in about 100 countries that fall into one of two complementary categories: construction (its core business) and concessions to operate transport infrastructure (airports, motorways, etc.). In 2016, the group completed 270,000 projects, with net annual

profits up 22.5% to €2.5 billion. “Vinci represents quiet strength,” says Grégoire Thibault from Natixis. “Its business model is also pertinent and robust. Vinci sets itself apart with its resilience and excellent management, along with its fire power for making strategic acquisitions, which have been driving its operational and stock market performance over the past few years. This development is expected to continue, with a focus on concessions and specialised civil engineering.” The analyst recommends buying the share.

STRABAG

LOOKING EASTWARD

The Austrian group is showing record-high orders.

The roots of Austria's construction leader go back to the first half of the 19th century, and it has since grown through acquisitions. The group began operating in Switzerland in 1995 and bought nine companies in the country. Strabag now stands out with its solid foothold in Eastern and South-eastern Europe, especially in Germany. In fact, its order book has never been so full, at

€14.8 billion (up 13%) in 2016, fuelled by major contracts chalked up on the German market, including headquarters of large companies, wind farms, a tunnel, railways, etc. The company has also pointed to strong development in Slovakia, Hungary and Austria. For 2017, the builder targets revenue growth of at least 4% and an operating margin of 3%. Analysts recommend buying the share.

Founded
1835

Headquarters
Vienne (AT)

Revenue
€12.4 BN

Employees
72,000

— STR

Strabag's order book has never been quite so full – increasing 13% in 2016.



STRABAG

DAIWA HOUSE

Japan's construction leader and largest homebuilder has forged its success selling prefabricated houses. — 1925
REVENUE: JPY 3513 BN (CHF 30.7 BN)

CIMIC GROUP

The Australian construction company, also active in mining, is owned by Hochtief and operates mostly in the Asia-Pacific region. — CIM
REVENUE: \$10.9 BN

ACS GROUP THE SPANISH OGRE

The group has developed through ambitious takeovers.

With revenue of €32 billion and 177,000 employees, the Spanish giant ACS is undeniably one of the industry's leaders. The outcome of the merger of OCP Construcciones and Ginés Navarro Construcciones in 1997, ACS has continued to grow through acquisitions. For example, it snatched up Dragados, a Spanish company specialised in large infrastructure projects and now one of its star brands. In 2011, ACS became the majority shareholder of Hochtief, and today owns over 70% of the German company. Analysts believe the company will outperform the market.

Founded
1997 (merger)

Headquarters
Madrid (ES)

Revenue
€32 BN

Employees
177,000

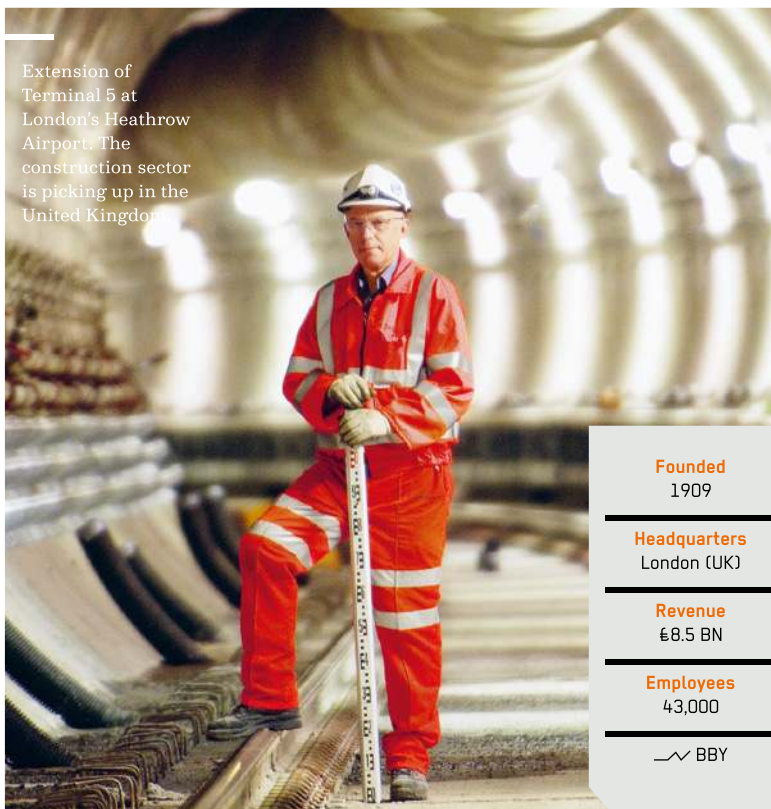
— ACS

The Hemisféric at the City of Arts and Sciences in Valencia, Spain. It is the largest planetarium and cinema in Spain.



ACS GROUP

Extension of Terminal 5 at London's Heathrow Airport. The construction sector is picking up in the United Kingdom.



Founded
1909

Headquarters
London (UK)

Revenue
£8.5 BN

Employees
43,000

— BBY

BALFOUR BEATTY

BALFOUR BEATTY BACK IN BLACK

The company finally raised its head back above the water in 2016.

Balfour Beatty became profitable again in 2016. That performance ended a period of considerable uncertainty for the United Kingdom's No. 1 construction group, after two consecutive years in the red, seven profit warnings and an attempted takeover by its competitor Carillion. The company gained its reputation for building the Channel Tunnel. Since then it has worked on simplify-

ing its processes and structure, which it openly acknowledged had become too complex over the course of its many acquisitions. The group has also withdrawn from several bids – in the Middle East, Indonesia and Australia – to focus on the United States and the United Kingdom, where the governments have pledged to invest heavily in infrastructure. Analysts recommend buying the share.

AND...

BILFINGER

The German construction company has diversified into services for industrial facilities, power plants and real estate. — GBF

REVENUE: €4.2 BN

HYUNDAI ENGINEERING AND CONSTRUCTION

The bridge opened last year over the Bosphorus in Istanbul was a technological feat and one of the Korean group's most recent headline achievements. — 000720

REVENUE: KRW 18.745 BN (CHF 16.3 BN)

HOCHTIEF

GERMAN CHAMPION OF INFRASTRUCTURE

The company has set its sights high for 2017.

Germany's construction leader, over 70%-owned by the Spanish group ACS, specialises in large-scale infrastructure, such as bridges, airports, tunnels and dams. In 2016, despite a drop in revenue, its operating profits defied expectations to climb 37% to €361 million. Hochtief makes no secret of its targets for 2017, forecasting further growth in

operating profits of between 13% and 25%, on top of a rise in sales of more than 10%. Its full order book (up 15% in 2016 to €25 billion) will move the company towards its goal. Hochtief's stock price has surged since the beginning of 2015. But analysts believe the share is overvalued and recommend selling.



Hochtief shows rapid growth – but its shares are believed to be overvalued.

Founded
1873

Headquarters
Essen (DE)

Revenue
€19.9 BN

Employees
51,500

— HOT

BOUYGUES

FAMILY-RUN CONGLOMERATE

Led by the founder's son, the group draws on its long-term heritage.

In 2016, Bouygues produced net profits up 29% to €632 million (excluding extraordinary items). The French group was set up in the 1950s amid post-war reconstruction in Europe and began diversifying into telecommunications and media in the 1980s. In 2006, it bought 28% of the train manufacturer Alstom. Bouygues has excelled in construction through its subsidiary Colas, the world's leading builder of roads. The conglomerate is run by Martin Bouygues, the son of the founder, and the family owns 19.9% of the share capital. "It's a strong, family-run company that draws on its long-term heritage. It has the financial capacity to make acquisitions, but its strategy, unlike Vinci's, is not as clear," Grégoire Thibault says. The Natixis analyst considers the share "well-valued" and has issued a neutral recommendation on the share.

Founded
1952

Headquarters
Paris (FR)

Revenue
€31.8 BN

Employees
118,000

— EN

AND THE SWISS LEADERS

IMPLENIA

Switzerland's construction leader, resulting from the merger of Zschokke and Batigroup, was part of the project to build the Gotthard Base Tunnel. — IMPN

REVENUE: CHF 3.3 BN

SIKA

After resisting a takeover by Saint-Gobain, the construction chemicals maker posted record performance in 2016. — SIK

REVENUE: CHF 5.8 BN

LARSEN & TOUBRO

THE GROUP BUILDING INDIA

The firm plans to double its revenue over the next five years.

Larsen & Toubro (L&T) was founded in 1938 by two Danish engineers based in India to import farming equipment. The trade restrictions during World War II rapidly put an end to that business, and the company moved into construction. Today, L&T is involved in most large building projects on the subcontinent, including airports, roads, power plants, etc. With operations in 30 countries, it has also become a sprawling conglomerate active in financial services, the property business and machine manufacturing. Holding a spot on *Forbes'* list of the world's

most innovative companies since 2011, the group has posted an average annual revenue growth of 14.5%, despite the slow economy. In 2016, L&T cut 14,000 jobs and unveiled its new "strategic plan" to double its revenue by 2021, focusing on defence and the African market. Over the first four months of 2017, its stock climbed 30%. Analysts recommend buying the share.

Founded
1938

Headquarters
Mumbai (IN)

Revenue
INR 1035 BN
(CHF 16.2 BN)

Employees
43,000

— LT

UNLISTED GIANTS

Some of the biggest companies in the construction industry are not listed on the stock market. For example, Bechtel, the largest construction and engineering group in the United States, founded in 1898, generated a revenue of \$32 billion in 2015. Two other prominent US companies are not listed either – Turner Construction Company and Kiewit Corporation, ranked third-largest and fifth-largest respectively in the country's construction industry. In Europe, Hilti, based in Liechtenstein, is a family-owned company specialised in construction tools. Operating in more than 120 countries with 24,600 employees, it generated sales of 4.6 billion Swiss francs in 2016.



AMIT KUMAR / EYE PRESS / NEWS.COM

The construction giant Larsen & Toubro is involved in most major projects on the subcontinent.

AND THE SWISS LEADERS...

SCHINDLER

The Lucerne-based lift manufacturer employs 58,271 people and does business on every continent. Its orders hit an all-time high in 2016. — SCHN
REVENUE: CHF 9.7 BN

ARBONIA

The building supplier based in the Canton of Thurgau – currently in the process of acquiring its competitor Looser – began making a profit again in 2016. — ARBN
REVENUE: CHF 995 M

HUMPTY TRUMPTY

Hundreds of companies have submitted bids to help build Trump's "anti-immigration" wall, which could cost as much as \$38 billion.

BY SOPHIE GAITZSCH



It was one of Donald Trump's signature campaign promises... and one of the most controversial: building a wall between Mexico and the United States to crack down on illegal immigration. The wall to seal the 3,200-km border between the two countries was initially estimated at \$10 billion, but the US Department of Homeland Security later revised that figure to \$21 billion. An article in *MIT Technology Review* estimates the cost at \$38 billion.

Construction companies of all sizes are rushing to get in on the action. In March, a call for bids to build a prototype for a wall received more than 700 bids. It stipulates that the wall must be at least 5.5 metres tall,

impossible to climb over or tunnel under and "visually appealing on its northern side".

Large construction and civil-engineering companies that have already worked for the US government – such as Kiewit, Fluor and KBR – have the best chance of being selected. Skanska, a Swedish company with a strong presence on the US market, said that it supports "openness and equality" and does not want to be associated with the project. The French group Vinci doesn't want to get involved either. The wall will have a "big impact on US (or Mexican) demand for cement and aggregates, and companies that supply those materials would benefit in a big way over the next several years," says New York-based research and brokerage firm Bernstein Research. Giants in the sector that were initially willing to help build the wall were cement producers Lafarge-Holcim and Cemex – before they decided against it, choosing not to taint their reputation.

But there are still many unknowns about Trump's "big, beautiful wall", despite his administration's eagerness to get the ball rolling. For starters, the border crosses private property, nature reserves and Native American lands, which could give rise to some nasty legal tussles. As for who will pay for the wall, Trump still insists that Mexico will be the one footing the bill. And the President suffered a setback in May, when Congress denied funding for the wall during negotiations for the 2017 budget. The battle will likely heat up this autumn during discussions for the 2018 budget. ▀

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A DIGITAL REVOLUTION ON CONSTRUCTION SITES

The emergence of digital tools in construction has revolutionised the industry. We take a closer look at the most promising advances.

BY STANISLAS CAVALIER

While a 3D printer finishes building the roof, a sanding robot tweaks the ceiling, watched by an android driving an excavator. This seems like something straight out of a science fiction film, but it will be a reality in the years to come. “We’re no longer an industry of people carrying wheelbarrows,” openly states Francis Carnoy, head of the Confédération Construction Wallonne in Belgium. “The emergence

of digital tools in the construction industry is significantly modernising all aspects of building, from architecture offices to construction sites.” (See also an interview with Swiss architect Fabio Gramazio on p. 43.)

Jeffrey Huang, director of the Media and Design laboratory at the Swiss Federal Institute of Technology in Lausanne (EPFL), agrees: “This is just the beginning, but robotics and

A view of the One World Trade Center, in Manhattan. This skyscraper, opened at the end of 2014, was built using a fully digital solution, bringing together all stakeholders in the construction process on a single platform. This proved a huge gain in terms of productivity.

expense in the industry. In Russia, start-up Apis Cor used a similar machine to build a 40 sq. metre house in December 2016. While these buildings seem abstract and far from Western standards, they do open the door to automating construction sites, especially in that 3D printing isn't the only option available to builders.

Christian Grellier,
head of innovation at Bouygues

French giant Bouygues, for example, has been using Roby, a robot, on its biggest construction sites since 2012. Developed in partnership with BA Systèmes, Roby can complete difficult work such as drilling or hammering walls. But there is a big problem with robots: the variety of tasks. "Machines are very effective for repetitive tasks in a predictable environment, but as soon as something changes, they have trouble adapting," said Philippe Souères, head of the Laboratory for Analysis and Architecture of Systems (LAAS) in Toulouse and co-designer of the humanoid worker robot Pyrène. In 2007, Japanese companies Kawada and Kawasaki Heavy Industries presented excavator operator HRP-3, the successor of HRP-1 and 2 that came out in the 1990s. This robot was expected to replace

workers on risky construction sites by 2010. But nothing came of it.

CONSTRUCTION 4.0

Additionally, all the data of a construction project needs to be digitised before moving on to automating the fabrication process. This isn't yet the case. Construction companies are just starting to enter the world of fabrication 4.0. What exactly is that? "Construction 4.0 is riding the wave of industry 4.0. The original term was invented by the German government in 2012 to encourage companies to integrate the internet into fabrication processes," explained Huang. "The concept of construction 4.0 is similar, and the aim is to digitise the entire value chain of a building, including the design, construction and final use. This allows for the various players, machines and smart parts to connect, interact and communicate with each other." In the next 10 years, the use of 4.0 technologies in the construction industry is expected to save between 15% to 20% per project, according to a study published by Boston Consulting Group in 2016.

The first step of digitisation is called the Building Information Model (BIM). It is a digital model that goes far beyond 2D or 3D views that are traditionally used in computer assisted design (CAD) software. The BIM is the exact virtual model of what the building will look like. Purely graphic representations are now replaced by virtual models that include the materials used (brick, glass, steel, tile, etc.), ▶

3D printers will definitively be part of the construction industry. It's inevitable. Experiments are already underway around the world, especially in the Middle East, to build entire houses using gigantic printers. NASA is also testing a machine to build a base on the Moon using lunar dust."

In China, the Winsun company, for example, is already able to print 10 basic houses in 24 hours, at \$5,000 each. The printer – a huge machine equipped with an articulated arm – builds these houses by adding layer upon layer of concrete paste made from cement, tailings and construction waste (cement, glass and sand). This could mean big savings in terms of labour, but also time and waste management – which is a significant

Software leading the industry

In only one year, the share price of Autodesk (ADSK), which developed the Revit software, increased 58% from \$60 in early May 2016 to \$94 in early May 2017. "Revit is now the most utilised programme in the construction world," said Jeffrey Huang, director of the Media and Design laboratory at EPFL. Its main competition is Archicad, developed by Graphisoft, a company that belongs to the Nemetschek group (NEM), which specialises in programmes for architecture, engineering and the building industry. Its share price fluctuated between €43–€64 over the past year.

costs and deadlines, as well as thermal, structural and acoustic data for the new building. "Everyone involved in the project can edit the data in real time, which results in significant productivity gains, with less paperwork and redundancies," said Huang.

For example, US architecture firm Skidmore, Owings & Merrill (SOM) used this type of software in their emblematic One World Trade Center project, the 541-metre tower that replaced the Twin Towers in the heart of Manhattan. According to figures from the firm, BIM technology reduced the documentation of "20,000 CAD files down to five architectural databases", which significantly simplified coordinating construction teams. It was a very convincing experience, according to SOM.

Francis Carnoy, director of the
Confédération Construction Wallonne

"BIM software was first used in the aeronautics industry. In the 1970s, the pioneering company Dassault Systèmes developed the system to finalise and build its fighter jet, the Mirage," said Huang. "The software, dubbed CATIA, improved efficiency and productivity in the aeronautics industry by 1,000%!" Understandably, this attracted companies from all other industries. CATIA was very quickly adapted for the auto industry, shipyards and now in construction. "The Fish building in Barcelona built in 1992 by the Frank Gehry firm was one of the first uses of CATIA in architecture industry," said Huang. "They used a tool that made it possible to build a creative, extremely complex design."

But ever since, it is mostly the increased productivity that entices various players to use the system. The expected benefits seem so significant that several countries even require companies to use BIM technology: Singapore (in 2013), the UK (2015), United Arab Emirates (2016), Spain (beginning in 2018), and Germany (beginning in 2020) have either required or will require all construction companies to use BIM if they want to participate in public tender offers.

This is a big help for software manufacturers in the industry, as governments have paved the way for them. Autodesk, the market leader, posted a turnover of \$2 billion in 2016 and is expecting 25% growth in the coming years, with a turnover of \$2.5 billion expected in 2018 (see inset on previous page). But there are still difficulties: "Purchasing the software, undergoing the necessary training and even BIM construction is a high cost for SMEs," said Huang. "Additionally, some architects don't like the rigid structure of the software, claiming that it doesn't allow for enough creativity."

As a result, some are against it. However, companies reticent to change must be aware: "Companies that aren't getting on the BIM train or aren't sufficiently aware of the importance of this evolution will be pushed out of the market in five to 10 years", predicts Carnoy. So as not to miss the digital revolution, all the major players in the construction industry keep an eye on innovations and start-ups. "We don't want to miss the Uber of real estate," said Christian Grellier, head of innovation at Bouygues, during an interview with *Les Echos* magazine. As a result, the French company identified 250 start-ups in 2016, approached and tested about 50, and then proceeded to acquire a stake in approximately 10 of them. ▲

A pioneer in digital technology



Fabio Gramazio

"Robots and architects are allies." In short, this could sum up the philosophy of Fabio Gramazio. Born in 1970, the architect received his degree from the Federal Institute of Technology in Zurich and is known around the world for being at the forefront of digital and robotised fabrication. In 2000, he founded Gramazio & Kohler with Matthias Kohler. Their firm has won many awards. They have created some remarkable buildings, such as the Gantenbein Winery building in Fläsch, whose façades were assembled by robots.

Gramazio & Kohler has notably received the Global Holcim Innovation Prize and the Acadia Award for Emerging Digital Practice. More recently, their Mesh Mould robotised construction project received the prestigious Swiss Technology Award (2016) and the Concrete Innovation Award (2017).

In 2005, Fabio Gramazio opened the world's first laboratory dedicated to robotised architecture at the Federal Institute of Technology in Zurich. His recent research is described in the book *The Robotic Touch: How Robots Change Architecture*, published in 2014.

"THE ERA OF ROBOT BUILDERS BEGINS"

Fabio Gramazio, professor of architecture and digital fabrication at the Swiss Federal Institute of Technology in Zurich, explains the technological changes in the industry.

BY STANISLAS CAVALIER

Many people believe that the construction industry is undergoing a true revolution, entering the 4.0 era. Is that really happening?

That is correct, we are in the middle of some very big changes in the construction industry. Just like other fields such as auto manufacturing, the building industry is going digital. Data is playing an increasingly important role in the whole process, from initial designs to constructing buildings.

But unlike other industries, such as telecoms or the auto industry, the digital transformation seems less apparent in construction. Construction sites are still construction sites...

In many ways, construction is still an archaic industry. The digital transformation is on its way, but slowly. It's a gradual revolution. There are two reasons for this: first, construction is a far more complex industry than the manufactured products industry. Cars, for example, are made by the millions, which means it is possible to test new technologies and make them profitable. In construction, how-

ever, each product is usually unique. In this context, it is much more difficult to implement and generalise a new tool. Second, the industry overall is still quite afraid of change, which slows down innovation.

What will digital technology bring to the construction industry?

It will help us build better buildings at a lower price. Take nature, for example. All its forms are extremely complex. They are complex for a reason: so that they can be as efficient as possible. That's exactly what we want to do in the construction industry. But there's a hiccup: the human brain struggles to solve difficult problems. Conversely, machines have no problem handling large amounts of data. So, using data will help us improve the efficiency of the industry, for example by using less materials, generating less waste, and building more complex structures. ▶



Gramazio & Kohler

A cross between an architectural object and a work of art, these rubber-covered structures designed by Gramazio & Kohler were constructed and assembled entirely by a robot.

Do you think that completely digital companies like Google can accelerate this revolution, similar to Tesla, which revolutionised a too-conservative automotive industry?

That is an excellent question. The construction industry is very static, so instead of traditional players, we could see new players on the scene that introduce necessary innovations. But I don't think that will be the case. The construction industry is far too complex for that, even more complicated than the auto industry. To break into the market, you need very good connections and experience. In my opinion, innovations are more likely to come from start-ups partnering with big companies rather than new players. But you never know... I can't rule out the possibility of a giant like Google investing in one of these start-ups, or even revolutionising the industry from the outside. Anything is possible.

After digitalisation, the next step is automating construction, with robots replacing workers on construction sites. Is that science fiction?

No. 3D printing, for example, is already used in small-scale productions to pre-fabricate parts of buildings. But robotisation is also up against the complexity of the industry. Robots are very efficient working in a predictable environment, such as a factory. But in construction, everything is always changing. Construction sites change every day, which makes it difficult to automate the work.

But since the 1990s, Japanese and Korean architects have used robots on their construction sites...

True, but that failed. In my opinion, they made two mistakes. First, they didn't think of the added value. Their machines turned out to be too big and too expensive to truly compete with workers. With no competitive advantage, there's no future. The second mistake, which isn't actually a mistake, is that it was just too early. The technology just wasn't ready yet. In terms of robots, the 1990s were prehistoric compared to today. Now, technologies are more advanced. We're starting to enter the era of robot builders.

Let's go back to 3D printing. It's usually used with plastic. Will we soon see houses made of plastic?

No, but it isn't anything to do with the material. In theory, 3D printers can print any type of material, especially metals, which makes it very promising for the construction industry.

"I can't rule out the possibility of a giant like Google revolutionising the industry from the outside"

But there are two limits: it's a slow, expensive process. Buildings are very large, so it would take an extremely long time to build a tower with a 3D printer. There's also an optics problem. At the moment, these machines print line by line, which produces a visual aspect that is rather lacking in aesthetics. For all these reasons, my partner, Matthias Kohler, and I decided to work on an alternative to 3D printing. We programmed a robot to build a façade brick by brick (read inset p. 42).

Instead of a robot limited to the ground, could you use drones for that ?

We also did test runs with drones and they were very promising. The technology is cutting-edge and inexpensive, and drones have the advantage of being able to place any type of object anywhere on a construction site. If we use multiple drones, similar to a swarm of insects, they could work together to build a structure extremely quickly, which solves the two main problems of 3D printing – speed and cost. But there are still hurdles: to carry heavy loads, we would have to build large drones, which are more difficult to control and have risks associated with that. Furthermore, drones geolocalise through a GPS when they're outside. This technology isn't precise enough yet to guarantee the quality of assembly that we need.

Compared to other countries such as Japan, which is known for its robots, where does Switzerland fall in this digital transformation of the construction industry ?

I think we're doing really well. The Swiss National Science Foundation (SNSF) opened a National Centre of Competence in Research (NCCR) dedicated to digital fabrication, which ETH, EPFL and other Swiss universities are part of.

For workers and small and medium-sized enterprises, the transformation in the industry could be difficult, though...

When you think in terms of "revolution", change is dramatic. But if you take into account that it's a "slow revolution", it's no longer dramatic. Workers and SMEs won't wake up one morning and find that everything is different. It will take a lot of time, maybe 50 years, before construction sites are

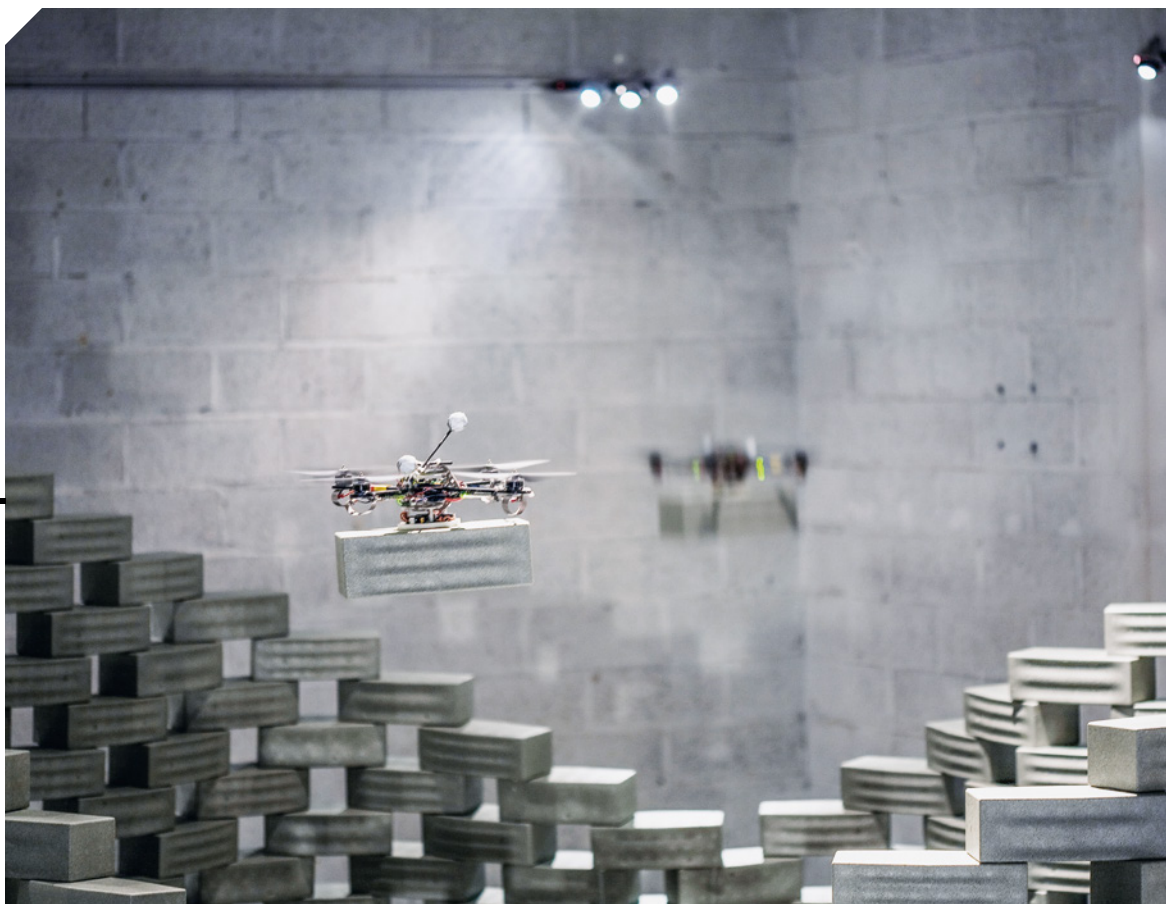
robotised. Switzerland has excellent schools and universities to invest in this future. But in my opinion, training in new digital tools needs to happen earlier in the school curriculum.

What are your upcoming research projects ?

We're focusing on digitalising processes using wood. As I already explained, construction is still an archaic sector overall. But that's not true for wood, which is on the cutting edge technologically speaking. Several years ago, no one really wanted wood buildings because they were poor quality and very expensive. The industry had to completely reinvent itself to avoid disappearing, and so it digitalised a large part of its processes. Now, wood has an excellent reputation. Also, it's always easier to introduce the next innovations in a sector that is at the forefront of technology, rather than behind. ▲

Gramazio & Kohler

A drone assembling an architectural structure. This installation, presented at the Fonds régional d'art contemporain in Orléans from 2011 to 2012, comprised 1,500 elements. It was designed by Gramazio & Kohler in collaboration with Raffaello d'Andrea, a professor at ETH Zürich.



MATERIALS

THE RELENTLESS REIGN OF CONCRETE

There are many innovations when it comes to materials, but the construction industry, conservative by design, struggles to welcome them. Environmental concerns play a big role, however, and regulatory constraints could increase, changing the market.

BY GENEVIÈVE RUIZ

When asked, “What is the construction material of the future?”, all industry experts have the same answer: concrete. Depressing? Maybe, especially for those who imagined that buildings, roadways, bridges and infrastructure of the future would be made of wood, fibre flax or soil, and insulators such as aerogel, cork or hemp would be used in all residential spaces. These materials have created a lot of buzz, but they will not revolutionise the materials market over the next few years. True, they reflect a large body of industry research conducted by universities and large companies. The innovations are sometimes marketed as part of a start-up or a company. But their real impact remains minimal for the time being. Concrete is currently the most consumed product in the world after water, and that is unlikely to change in the future. Here’s why. “The construction industry is very

conservative,” said Davide Zampini, director of the Global Center for Technology & Innovation at Mexico-based Cemex, one of the world leaders in the construction materials industry. “Sometimes it’s frustrating to try to change things. Take 3D cement printing, for example.

“More than 90% of our clients around the world only buy traditional cement from us.”

Davide Zampini – director at Cemex

It’s been marketed as the next big thing for over 10 years now. But how can we use it to produce concrete on

a large scale? And how can we ensure that the concrete that is produced is solid and durable? When I talk with architects and engineers in the field, they tell me that their job is to build a solid structure that people will live in! There’s not a lot of room for experimentation in this industry. More than 90% of our clients around the world only buy traditional cement from us.”

Indeed, there are several obstacles that get in the way of adopting innovations in the materials market: technical and local security standards; base ingredients such as sand or limestone that differ from one region to the next; and most importantly, costs. “Your home is probably the biggest investment you will make in your life,” said Peter Richner, deputy director of the Swiss Federal Laboratories for Materials Science and Technology (EMPA) in Dübendorf.

dorf in the canton of Zurich. "Would you trust a company that told you they're going to try a new material to build the walls of your home? Of course not. The difficulty with innovation in this industry is that the new products must be able to last in the long term. So these materials have to be tested for many years." This is why EMPA created a test building at its headquarters, which will be used under real conditions by real people over five years. The house is built with new materials, such as concrete structures that keep heat in, to study their longevity. "It is very difficult to predict which materials will actually make it onto the market," said Richner. Zampini agrees, adding "only the most profitable materials have even a chance of making it."

Despite these obstacles, big companies in the industry, including global leader LafargeHolcim, invest in innovation. "We have a global research and development centre in France that is working on the cement and concrete of the future," said Simon Wiedemann, head of the construction and affordable housing segment at LafargeHolcim. "At this centre we have more than 200 researchers from 20 different countries. We're constantly filing more and more patents. We also have eight laboratories around the world dedicated to handling local requirements."

The innovation strategy of large companies aims notably to reduce their environmental footprint and improve energy efficiency. "These companies fear that regulatory constraints or taxes could be put in place that would force them to reduce their environmental footprint and CO₂ emissions," said Richner. "Don't forget that the construction industry is responsible for 40% of the CO₂ emissions on the planet. For the past several years, the big companies are trying to stay ahead of the situation via innovation, creating less contaminating manufacturing processes and materials, as well as more sustainable types of con-

crete." At Cemex, for example, researchers are working on a concrete that has a very high thermal isolation capacity, as well as a special product that turns excess concrete into recyclable gravel. Other companies are working on cement that repairs itself using nanotechnology, as well as substitute combustibles that can reach the 1,450 degrees needed to make cement. "All the big companies already have solutions to make more environmentally-friendly materials," said Richner. "But for the most part, these solutions are never actually used. Why are companies investing massive amounts of money in innovation when CO₂ is still free for the time being? Because when the day comes when stricter regulations are put in place, they will be ready."

The other innovative approach is to optimise certain technical aspects, often to adapt to specific local requirements. "It's very important to know the working culture in the industry when developing new products," said Zampini. "The new product must be simple to implement, it must not waste any time, and it must not increase costs."

Peter Richner, deputy director of the Swiss Federal Laboratories for Materials Science and Technology (EMPA)

For example, we're working on reducing the weight and the drying time of concrete." LafargeHolcim is developing products specific to the African market: mud and cement bricks are more affordable and less harmful to the environment than traditional clay bricks. "For the

Indian market, we also designed a concrete that can be delivered in a bag by motorised tricycles," said Wiedemann. "In many neighbourhoods, the roads are too narrow for trucks." At EMPA, which collaborates with the industry, researchers are developing asphalt that can repair itself. "We added nanoparticles that can repair microfissures," said Richner. "The goal is to prevent big fissures, which cost millions of Swiss francs each year in maintenance and traffic disruption."

For the deputy director of EMPA, the biggest challenge of the future is yet another aspect: the durability of concrete. Currently, concrete structures can last approximately 100 years. Peter Richner: "In some cases, after a few decades, structures can begin to deteriorate as a result of a chemical reaction between the aggregate and the pH of the water."

This leads to volume adjustments and fissures. It is a huge problem, which is costly for society, as several infrastructures must then be renovated. But no one has come up with a solution to this problem.

Researchers don't exactly understand why the cement changes." As long as scientists are unable to master this material, further innovations will be limited. Therefore, a huge market is up for grabs for those who can solve this problem. ▀

MATERIALS

WOOD: OLD TURNED NEW

The bright lobby of the Tamedia headquarters at the Werdstrasse in Zurich. This building, built by the Japanese architect Shigeru Ban, rests entirely on a spruce wood structure.

Wood now incorporates a number of technical innovations, which architects believe offer real promise for moving ahead in the market.

BY GENEVIÈVE RUIZ

“Of all construction materials, timber offers the most growth potential,” says the Zurich-based architect Fabio Gramazio. He is convinced, not only judging by the growing interest from his clients but also because, as an eco-friendly material, industry professionals love it. “Timber produces no CO₂, and if managed properly, there will always be an adequate supply from forests,” the architect says, emphasising the myriad of technical advances made over the past 10 years. First, the industry has become highly digitised, making logistics easier to monitor and worksite design more efficient. Plus, improved chemical processes have made wood sturdier and more resistant to fire, water and UV rays. In a nutshell, wood is the new high-tech building material.

Buildings can now be made entirely out of wood, without so much as a nail or a hint of steel. A case in point: the laboratory for timber construction at the Swiss Federal Institute of Technology in Lausanne (EPFL)

designed an entirely wooden chapel in Saint-Loup and a 300-seat theatre in Vidy, both in the canton of Vaud. Structures made out of wood are also getting taller. For example, the 10-storey building currently under construction in Risch-Rotkreuz in the canton of Zug will be three floors higher than the office building designed in 2013 for the media group Tamedia, considered the world's tallest wooden edifice to date. Another surprising advantage of wood is its durability. Wood is believed to be less durable than concrete, but a look at the amazing condition of the mazots, or traditional wooden huts, in the canton of Valais built in the 17th century will convince sceptics otherwise.

With all this going for it, can wood really compete with concrete in the construction industry? Things are not so simple. The market share for timber in Switzerland is currently estimated at between 2% and 5%, but no experts have been so bold as to provide a precise figure. A survey conducted by industry professionals in France in 2014 points to 3% of revenue nationwide in the construction sector. So, what's holding it back? Unlike the market for concrete, the wood industry is made up of lots of small local businesses. Supplies are less readily available and delivery times are much longer. While concrete can be on the doorstep within 24 hours, wood can take between six weeks and six months to arrive.

The second major impediment for timber is its price volatility, which could jeopardise worksite budgets. The cost of concrete is relatively more stable, fluctuating within a tight band of plus or minus 5%. Wood also needs to rejuvenate its image, especially in emerging countries, where some people still consider it a poor man's material.

LITTLE IMPACT FOR MAJOR GROUPS

So, it is in our region that wood is expected to grow most over the next

few years. But that does not mean that listed companies will really gain from it, says Gabriel Micheli, a manager at Pictet Timber Fund. "Interest is definitely increasing for wooden buildings in Central Europe, and that is likely to add a few percentage points to market share. But that growth will hardly be felt by timber industry leaders, such as the Finnish group Stora Enso or US firm Weyerhaeuser," Micheli says. "These companies focus on the Scandinavian and North American markets, where the vast majority of individual homes are traditionally built with wood.

Their stock market performance is primarily contingent on the property market in these regions."

But the analyst agrees that healthy niche markets could emerge: "Stora Enso mainly produces laminated wood panels, and sales could rise if wood continues to boom in Central Europe. But the wood construction market is essentially local, due to the cost of transporting the material. An increased use of wood in construction in Switzerland would not have a huge impact on the major Scandinavian and American timber groups. ▀

The Tamedia building during construction. The seven-storey-high building was inaugurated in 2013.





SAND WARS

Sand is a component in every large structure built by humans – and demand for it is growing 5.5% per year. Dive into this burning market.

BY JULIE ZAUGG

Without sand, there would be no roads, homes, airports or shopping centres. Produced from centuries of wind and water erosion, sand is the foundation of the entire construction industry. Sand alone makes up 85% of ore extracted worldwide each year, according to the United Nations Environment Programme. In total, the sand industry is worth \$70 billion.

Two companies dominate the market: Swiss-French LafargeHolcim and German HeidelbergCement. Not far behind is Sibelco (Belgium), Cemex (Mexico), CRH (Ireland) and Fairmount Santrol, US Silica, Martin Marietta and Summit Materials (all

four from the US), plus many local players.

“It’s an extremely fragmented market,” says Zoe Biller, an analyst from Freedonia Group who specialises in the sector. “Anyone with a small quarry and a truck can start selling sand. In emerging countries, sometimes people even go to the beach with a shovel.” The barriers to entry are extremely low for this market. “Sand can be found almost anywhere and can be extracted without any complex machinery. It also doesn’t need any complicated processing before being sold to a cement manufacturer.”

The majority of sand used in construction is extracted from quarries,



Sand quarry in Poland. The sand industry is worth \$70 billion worldwide.

CRH

but some also comes from rivers and lakes, and even the bottom of the ocean. In the UK, one-fifth of sand comes from marine sources. The American Midwest was once covered by oceans. As a result, it is one of the richest sources of sand in the world, according to Samir Nangia, a specialist from economic intelligence firm IHS Markit. "In the Midwest, which includes states such as Wisconsin and Illinois, there is very high-quality white sand less than three meters underground." Fairmount Santrol and US Silica have mines in the region.

Brazil, China, India, Indonesia, Australia, Kenya and South Africa have significant silica reserves, which is the main component of

sand. Desert sand, however, is too round and too fine, which is not ideal for the construction industry because it is difficult to combine in concrete.

On construction sites, sand is used to produce three different materials: concrete (a material composed of sand, cement and water), asphalt and gravel used as a base layer under roadways. Brent Thielman, analyst at Davidson & Co, estimates that half the sand that is extracted in the world is then used in big public projects such as building roads and bridges. The other half is used in the private construction industry.

DESERT SAND, HOWEVER, IS TOO ROUND AND TOO FINE, WHICH IS NOT IDEAL FOR THE CONSTRUCTION INDUSTRY

To give an example, 200 tonnes of sand is needed to build an average-sized (200 sq. m) family home in the US. Sand is also used on golf courses and to make glass. There are even new ways to use the material: "A growing percentage of sand is used by the fracking industry to split the rock and extract oil," says Nangia.

Demand mostly comes from developing countries. The emergence of supercities – such as Lagos, Chongqing and Delhi – has required a lot of sand. This phenomenon is particularly apparent in China and India, two countries where hundreds of roadways, airports and residential buildings have been built over the past 20 years. Of the 13.7 billion tonnes of sand extracted globally in 2016, 70% was used in Asian countries and close to half was used in China alone. Between 2011 and ▶

COMPANIES TO WATCH

FAIRMOUNT SANTROL Fracking supplier

Fairmount Santrol operates eight sand mines in the US. The largest, in Wedron, Illinois, is close to railways, which makes it easy to transport sand across the country. The company offers low prices due to low extraction costs. Last summer, the spot price for FOB (freight on board) sand from one of its Wisconsin mines was double the price of the rest of the industry, owing to high demand in the region. Fairmount Santrol also benefits from increased demand from the fracking industry, which now makes up 72% of the company's profits. Analysts believe Fairmount Santrol will outperform the market.

HEADQUARTERS: CHESTERLAND (US)

EMPLOYEES: 744

REVENUE (2016): \$535 M

~ FMSA

CRH Asia in its sights

The Irish company posted strong growth last year (+15%), particularly in the US. The US division responsible for heavy materials sales saw profits increase 26%. In the middle term, CRH will set its sights on Asia, where margins reached 21.5% last year. Analysts believe CRH shares will outperform the market.

HEADQUARTERS: DUBLIN (IRELAND)

EMPLOYEES: 87,000

REVENUE (2016): €27.1 BN

~ CRH

2013, China used more cement than the United States did in the entire 20th century. To give an idea of such magnitude, China built 32.3 million houses and 4.5 million kilometres of roadways between 2011 and 2015.

Smaller countries are also participating in this sand frenzy. Singapore gained 130 sq. kilometres in land reclamation since 1965, making it the biggest importer of sand in the world. Dubai embarked on a giant project to construct artificial islands – the Palm Islands – as well as the Burj Khalifa, an 828-metre skyscraper, using sand imported from Australia. Some islands such as the Maldives and Kiribati have begun backfilling with sand mountains to counteract rising sea levels due to climate change.

In the West, a series of large infrastructure projects announced in Europe and the US could increase demand for sand. Félix Brunotte, analyst at Alphavalue, brings up the Fixing America's Surface Transportation Act (FAST), which was adopted by Congress at the end of 2015 and which sets aside \$305 billion for

roadway repairs in the US. There are also the new construction investments announced by the Trump administration: "A firm such as Heidelberg-Cement, the world's top asphalt company, would benefit immensely," says Brunotte.

In Europe, the Juncker Plan (named after the current president of the European Commission), an infrastructure investment programme worth €315 billion over three years, launched in 2014, also supports sand consumption. "The recovery of the US real estate market, which began picking up a few years ago, will also have an effect on the demand for sand," says Thielman. Overall, Freedonia Group calculates its growth at an annual average of 5.5%.

The sand market is not without constraints, however. First, the low price of sand – at \$7.50 per tonne – makes transportation over long distances economically unsound. "We calculated that travelling anything beyond 160 kilometres is no longer worth it," says Biller. As a result, companies are forced to set up their quar-

ries close to the corresponding big construction sites. This is sometimes an inconvenient task, especially in developed countries, says Thielman of Davidson & Co: "No one wants a sand mine in their backyard. There are many forces against it, and it takes a long time to get a permit."

BETWEEN 2011 AND 2013, CHINA USED MORE CEMENT THAN THE UNITED STATES DID IN THE ENTIRE 20TH CENTURY

Faced with the low price of sand, vendors are seeking alternate routes. In the US, more and more vendors are turning to the fracking industry, which is ready to pay double the price to buy sand that is specially designed to split rock. This could also have a negative effect for construction companies, according to Nangia: "During the fracking boom in



Sand quarry in Buchan, southern Australia.



Thompson-Arthur plant in North Carolina. Countless local companies are active in the sand market.

CRH

2014, some companies couldn't buy any sand because their suppliers had sold it all to oil companies." Another thing to note is that sand reserves are starting to dwindle in some parts in the world, especially China and India. Beijing has even started using gigantic ships to dredge seabeds in the South China Sea to get more sand. Other countries such as Cambodia, Indonesia and Vietnam are experiencing land erosion, as too much sand has been extracted from riverbanks or gathered from beaches. In India, some bridges are on the brink of collapsing, as they cross over-exploited rivers. The shortage of sand has led to a black market, run by criminal organisa-

tions. In India, the black market for sand is worth \$2.3 billion a year.

But this isn't always the case. In the West, sand providers have begun looking at alternatives. "To mitigate the shortage, an increasing number of companies are replacing natural sand with ground rock," said Biller. Japan relies almost entirely on this artificial sand. However, this material is about 30% more expensive to produce than real sand due to its costly production process. As a result, it will never entirely replace natural sand. "In Europe and the US, suppliers have also begun making sand from recycled concrete," says Biller. In the UK, close to one-third of construction materials are made this way. ▀

HEIDELBERGCEMENT An undervalued giant

This colossal German company has seen its sales of aggregates (sand, gravel, etc.) grow 9.1% in 2016, reaching 272 million tonnes. In total, it has 20.1 billion tonnes of reserves throughout the world. "The value of its assets is under-estimated," says Alpha-value analyst Félix Brunotte. He estimates that HeidelbergCement shares should be valued at more than €120 instead of the current €88. The group is also well diversified, as 43% of its revenue comes from Europe, 25% from North America, 18% from Asia and 10% from Africa and the Middle East. But Brunotte believes the company suffers from overcapacity: "Its usage ratio is only 70%, which means that close to one-third of its assets are not used."

HEADQUARTERS: HEIDELBERG (GERMANY)

EMPLOYEES: 60,424

REVENUE (2016): €15.2 BN



MARTIN MARIETTA MATERIALS

King of American asphalt

This asphalt specialist is present in 26 US states, Canada and the Caribbean. It was able to avoid focusing too heavily on one region, while also holding an advantageous position in certain local markets, especially Texas, where it has both quarries and cement factories. Analysts believe its shares will outperform the market.

HEADQUARTERS: RALEIGH (US)

EMPLOYEES: 8,100

REVENUE (2016): \$3.6 BN



CHINA, ON EVERY FRONT

Chinese companies dominate the construction industry in emerging countries. Their attractive prices and ability to handle a project from A to Z make them valuable allies for the governments of these nations.

BY JULIE ZAUGG

Already with a reputation as the factory of the world, China has revealed another facet as an industrial powerhouse, by investing wherever it can in construction. Chinese firms handled infrastructure projects worth a total of 1.6 billion yuan (230 million Swiss francs) in 2016, up 18% from the previous year as reported by the Chinese Ministry of Commerce.

This frenzy of international expansion is mainly the result of the country's economic slowdown, says Rana Mitter, professor of Chinese studies at the University of Oxford. "In recent decades, China has built an incredible number of new airports, roads, railways and homes, but when growth slowed in the country, the construction industry ended up with idle capacity. That's when construction companies began looking outside their borders." Four companies currently dominate the industry: China State Construction Engineering (CSCE), China Railway Group (CREC), China Railway Construction Corporation (CRCC) and China Communications Construction (CCC).

"China Railway Group invested more than 100 billion yuan [14 billion Swiss francs] outside China last year," says Rachel Miu, an analyst at DBS Vickers Securities. "That comes out to a 50% rise on 2015." CCC and CRCC announced that they would increase the share of their revenue generated abroad to 50% and 30%, respectively.

These days, Chinese firms increasingly operate the structures once they are built

Alongside these giants are a number of private companies, such as the Shanghai-based Wison Group or the telecommunications equipment makers ZTE and Huawei. Another handful of firms sell construction equipment, including Sany, Zoomlion and XCMG.

Chinese investments are primarily funnelled into developing countries, especially in Asia, Africa and the Middle East. But also further afield. "The real source of pride for Chinese firms is to work on projects in the West, as they are perceived as more prestigious," says Joshua Yau, an expert on China at the PricewaterhouseCoopers Hong Kong office. CSCE acquired the US group Plaza Construction in 2014 to expand its presence in the country. One year later, CCC snapped up the Australian engineering and contracting company John Holland, with plans to gain a foothold in the region.

Comparative advantages

Chinese construction companies have managed to move into so many markets because they offer a number of competitive advantages. "With the economies of scale gained because of their sheer size, and cheap labour exports, their prices are considerably more appealing than those of their competitors," Yau says.

Chinese firms can also count on Beijing's \$40 billion development fund ▶



RAILWAYS

1. Railway tracks connecting Nairobi to Mombasa in Kenya, estimated at \$4 billion. Inaugurated last May, the structure was built by China Road and Bridge Corporation and China Communications Construction.
2. Railway between Addis Ababa, Ethiopia, and Djibouti, on the eastern coast of Africa. Opened in 2017, the project cost \$4.2 billion. The line was built by China Railway Group and China Civil Engineering Construction Corporation.
3. Railway linking Laos to China. Its construction began at the end of 2016, overseen by China Railway Group. The line will eventually be extended to Bangkok, Thailand.
4. High-speed rail line between Jakarta and Bandung, Indonesia. The work of China Railway Construction Corporation, it will start running in 2019 at a cost of \$5 billion.
5. Railway stretching 1,385 km along the entire coast of Nigeria. The \$13.1 billion contract was awarded to China Railway Construction Corporation.



ROADS AND BRIDGES

6. Reconstruction of the Karakoram Highway, which links Punjab province in Pakistan and western China, by China Communications Construction. The 1,300 km road passes through mountains at an elevation of almost 4,700 m.
7. Construction of a road between Libreville and Port-Gentil, Gabon, by China Road and Bridge Corporation.
8. Upgrade of a section of the San Francisco–Oakland Bay Bridge in California, by Shanghai Zhenhua Heavy Industries. The structure was completed in 2013.



PORTS

9. Shanghai Port Group is set to build and manage the largest port in Algeria, in the city of Cherchell. Project cost: \$3.3 billion.
10. Cosco, a shipping company, bought a 67% stake in the port of Piraeus in Greece for €369 million.
11. Construction and management of a port in Hambantota, Sri Lanka, a project estimated at \$1.4 billion. Built by China Communications Construction, the structure is set to be operated by China Merchants Port Holdings.
12. Extension of Gwadar Port in Pakistan, at a cost of \$1.6 billion. A natural gas facility will also be built on the site, along with a special economic zone. China Overseas Port Holding will operate the port until 2059.
13. Construction and operation of a port and free trade zone in Djibouti by China Merchants Group and Dalian Port Corporation. The port, which cost \$590 million to build, is set to open in July.



ENERGY PROJECTS

14. China General Nuclear Power teamed up with France's EDF to build the Hinkley Point nuclear power station in the United Kingdom. Project cost: £18 billion.
15. Construction of a hydropower station on Jhelum River in Pakistan by Three Gorges Corporation. The project is worth \$1.65 billion.
16. China National Machinery Import and Export Corporation will build a coal-fired power station in Payra, Bangladesh. The cost of the project is estimated at \$1.6 billion.

allocated to the One Belt, One Road project, a plan to revive the old Silk Road involving a series of large-scale infrastructure projects. They also have access to funding provided by the Asian Infrastructure Investment Bank, freshly created in 2015.

These days, Chinese firms increasingly operate the structures once they are built. "Their strategy is to take out a loan in their name, build and maintain the concession over the first 30 or 40 years, collecting all the revenue generated, before handing it back to the local government," Yau says. This new Build-Operate-Transfer (BOT) model began developing about five years ago.

"CCC was one of the first construction companies capable of offering this one-stop shop format," says John Hu, an analyst at Morningstar. "The approach earned it numerous contracts, especially in Africa, where the governments often lack the funds required to launch major infrastructure projects."

"Riots have also broken out on several occasions in Africa to protest the use of Chinese workers"

But investing abroad does not always go so smoothly for Chinese construction companies. "The consultation process or relocation

of the local population is not carried out properly in some countries, and that fuels resentment," Yau points out. The massive Myitsone Dam project, which was scheduled to be built by a Chinese group in Myanmar, was cancelled due to opposition from locals. Similarly, the terms initially agreed on for a Chinese company to operate the new Hambantota port in Sri Lanka were scaled back due to anger from locals.

"Riots have also broken out on several occasions in Africa to protest the use of Chinese workers on major infrastructure projects, as jobs were not created for people in the region," Professor Mitter says. Sometimes, the foreign government suddenly changes its mind. In the Philippines, a project to build a rail line linking Manila to the north of Luzon Island, originally planned to be built by the Chinese company Sinomach, was suspended in 2012 because of diplomatic tensions that erupted over Beijing's territorial claims to disputed areas in the South China Sea.

The West also takes precautions when dealing with the Chinese. "Europe and the United States are very reluctant to accept Chinese investment in areas they believe to be sensitive," says Mitter. They view it as a security risk. "The investment from China General Nuclear Power in the Hinkley Point nuclear power station in the United Kingdom nearly derailed the whole project." Meanwhile, in 2012 the US government banned Huawei from any infrastructure contract related to telecommunications. Washington feared that the Chinese group would use it as a front to spy for Beijing. ▲

COMPANIES TO WATCH

CHINA COMMUNICATIONS CONSTRUCTION (CCC)

The construction behemoth

China Communications Construction (CCC) was one of the first Chinese groups to venture abroad. "Its exposure to international markets is much higher than that of its peers," says John Hu, an analyst at Morningstar. "The company has extensive operations in Africa, the Middle East and Southeast Asia." It is active in 130 countries. In 2016, its profits rose 16.4% to reach 57.9 billion yuan (8.3 billion Swiss francs). The group boasts nearly unparalleled expertise in building ports, roads and bridges. "It is expected to be one of the main beneficiaries of the One Belt, One Road project [ed. note: initiative launched by the Chinese government to revive the old Silk Road]," says the bank UOB Kay Hian.

HEADQUARTERS: BEIJING (CN)

EMPLOYEES: 118,770

REVENUE (2016): ¥430 BN (CHF 61.9 BN)

— 1800

CHINA RAILWAY GROUP

The king of rail

"The outlook for China Railway Group is positive," says Rachel Miu, an analyst at DBS Vickers Securities. "At the end of the first quarter of 2017, its order book totalled 2 billion yuan (288 million Swiss francs), which should promise two to three years of growth." The company, active in 68 countries, has been involved in some of the world's biggest rail projects in Africa, Asia and Russia. "Its debt ratio improved from 63% to 40% in 2016," Rachel Miu says. The only drawback is that its margins have been squeezed because of the fierce competition on the railway market and cost overruns.

HEADQUARTERS: BEIJING (CN)

EMPLOYEES: 283,511

REVENUE (2016): ¥639.4 BN (CHF 92 BN)

— 390

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SWISS DOTS : AN INCREASINGLY RICH CHOICE

The Swissquote platform dedicated to derivative products is celebrating its fifth birthday. Jürg Schwab, Head of Trading, presents the latest developments.

What is the concept behind Swiss DOTS and how did the platform come about ?

The platform is dedicated to trading derivative products, such as warrants, and provides access to a multitude of leveraged products. The platform was launched five years ago, with the idea being to offer our customers a much broader range of products than was available in Switzerland at the time. In those days, it was not possible to trade warrants anywhere other than on the SIX Swiss Exchange (the Swiss Stock Exchange).

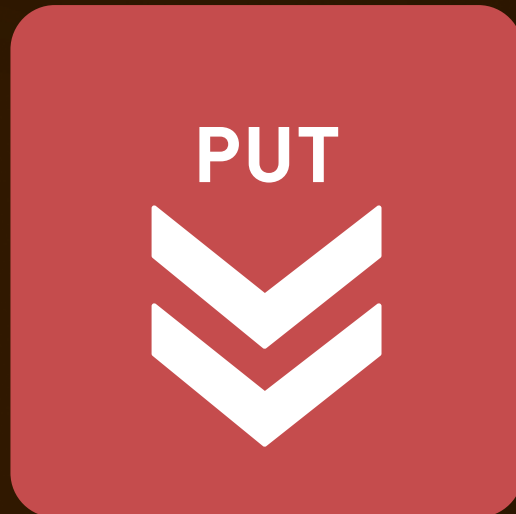
How has the platform evolved since it was launched ?

In addition to UBS and Goldman Sachs, our two long-term partners, the choice of issuers that we can offer our customers has expanded considerably, with products available from Commerzbank, Deutsche

Bank and Vontobel. We now offer approximately 80,000 products (traded OTC), compared to the 25,000 leveraged products available on the SIX Swiss Exchange. Our Swiss market share has continued to rise over the years and we now handle 40% of transactions on the Stock Exchange, which equates to more than 15,000 transactions per month

Can you remind us what a warrant is ?

A warrant is an option that gives its holder the right to buy or sell a security – known as an underlying – at a price and expiry date fixed in advance. Potential gains are high as a warrant can take advantage of a leverage effect. On the expiry of the warrant, if the product posts gains, the customer's account is credited. The customer is also free to resell the product at any moment



or pocket the profit, if applicable. Warrants are issued on a wide range of underlyings, such as equities, indices, interest rates, commodities or exchange rates. There are two types of warrants, known as Call and Put. Call warrants confer the right to buy and Put warrants the right to sell.

Why do Swiss DOTS users purchase warrants?

The vast majority of customers are looking to speculate on rising markets and so they buy Calls. However, and even if this seems counterintuitive, it is also helpful to use warrants to protect yourself against potential future falls in the market and, therefore to buy Puts. You could buy a Put, for example, on a security or an index such as the SMI if a drop in the market is anticipated.

Why are warrants so popular with customers?

The products that prove the most successful are generally linked to current affairs. We should recognise that our partner issuers stand

out from the crowd thanks to their reactivity. For example, during periods of extreme and fast-paced movement on the markets, they immediately offer new products, with adapted base prices. Customers really appreciate this. The same applies to highly anticipated IPOs, such as Twitter or Snapchat most recently. The same day that the IPOs occurred, issuers immediately offered warrants on these shares. This is a real advantage for our customers, as they can immediately take advantage of these new opportunities.

How can people get started with Swiss DOTS?

The platform is accessible to all Swissquote customers, from 8am to 10pm. Our search engine makes it extremely easy to select and choose the product of your choice. What's more, our customers can make the most of this service at a very low price. Commission fees charged on each transaction are limited to 9 Swiss francs and no stock market tax is charged.

Is it risky to invest in these types of products?

Buying a warrant is a risk as you could lose the amount of the premium invested initially. The maximum loss is, however, limited to the premium. Given that warrants are a leveraged product, gains could be significant, when the market follows the direction anticipated.

What new developments are planned?

Working with our issuer partners, we are going to extend the range of financial products that we offer. Moreover, we are also ready to open up our platform to other banks, who can also offer their products to their customers. We have initiated a partnership with Postfinance, for example, whose customers can already access Swiss DOTS. ▲



JÜRIG SCHWAB
HEAD OF TRADING
SWISSQUOTE BANK

“INVESTOR CONFIDENCE IS BACK”

While the stock market continues its upward trajectory, a Lombard loan is a useful tool to get the most out of your portfolio. As Lombard Loan Manager in the Trading department, Sébastien Schneider sheds some insight on the subject.

SPECIAL OFFER: LOMBARD LOANS AT 0%

From the beginning of June to the end of September, Swissquote is offering 0% interest on all new Lombard loans*.

What is a Lombard loan and how can it benefit investors?

A Lombard loan is a securities-backed loan (stocks, bonds, investment funds, etc.). This financing tool enables investors to take advantage of new market opportunities without depleting their portfolios. In other words, you don't have to sell your securities to be able to invest in others. When the stock market shows high growth potential as it does currently, a Lombard loan can expand your portfolio's range by enabling you to invest in new opportunities.

What kind of growth potential are we looking at presently?

The potential is substantial and multifaceted. Firstly, the vast majority of global stock exchanges have been on a steep upward trend for several months now. In Europe and in the US, a number of indices have reached historic highs. Investor confidence is finally back after years of struggle – and it's higher than it's been in a decade. As such, the

markets are set to keep climbing, and a Lombard loan is a great way to take advantage of these favourable circumstances.

Secondly, fixed income yields are still scraping the bottom of the barrel, especially in Swiss francs, while dividends are currently high for a myriad of equities. Shareholders are regularly seeing 2%-4% in pay outs, making equities much more appealing than other asset classes.

Finally, the continued influx of liquidity from central banks suggests that the upward trend will continue.

With stock indices at their current highs, is market correction on the horizon?

Market correction is likely, but a Lombard loan can increase the overall value of your portfolio so that you come out on top. In the event of such a correction, we suggest that you buy quality securities from undervalued sectors.

How can I take out a Lombard loan with Swissquote?

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Any other suggestions?

Standard advice: it is better to limit your risk by diversifying your equity portfolio, investing in different industries, countries and even currencies. ▲

*Applicable for all new Lombard loans taken out as of 31 July.



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The cruise market sets sail for innovation

Conflicts in the Middle East, falling prices and an ageing clientele... Faced with these obstacles, cruise companies have had to progress by focusing on new business models – and the forecasts are excellent.

BY MARIE MAURISSE

On 19 April the “Empress of the Seas” left Miami for an historic voyage: it was the first time that a Royal Caribbean International cruise liner was heading to Cuba. Up until last year, trade embargoes prevented the US cruise company from putting into port at the island. Cuba was a luxury destination and only European cruise ships travelled there. However, Havana is now ready for mass tourism. At 211-m long, the “Empress of the Seas” can accommodate 1,800 passengers.

Royal Caribbean International is not the only company to offer a cruise to the island once presided over by Fidel Castro. The other leading cruise company, Carnival, also offers Cuba as a destination, as does MSC Croisières. In addition to the symbolism of having Cuba as a port of call, these companies are constantly searching for new destinations, explains Marie-France Rüedi, Marketing Director of Cruise Center, a Swiss travel agency specialising in cruises. “Companies traditionally offer Mediterranean cruises to North Africa, Turkey or the Black Sea but

recent geopolitical problems have forced cruise companies to remove these destinations and provide new options for holiday-makers seeking to enjoy the sun and hot temperatures, even in the winter.” This is why Cuba’s accessibility is so timely.

The cruise market developed in the 1970s by attracting clientele from amongst the US baby-boomer generation, who had the time to travel and sufficient purchasing power to be able to do so. Since then, the number of passengers has grown continuously, according to data provided by Cruise Market Watch, which cites 6.5% average growth each year since 1990, with this growth forecast to continue until 2019.

Alongside this strong growth, the sector simultaneously experienced significant concentration. Today, there are three main companies – all American – that are listed on the stock market and which carry 80% of cruise passengers: the market leader, Carnival (which also owns Costa), its rival Royal Caribbean Cruises (Royal Caribbean International), and Norwegian Cruise ▶

Line Holdings, which, unlike its name would suggest, is based in Miami (see inserts on p. 65). American travellers still represent the majority of the market for these companies. MSC Croisières, owned by the Geneva-based Mediterranean Shipping Company Group, has a market share of approximately 7%. The company is not listed on the stock market and primarily targets the European market.

There are three main companies – all American – that are listed on the stock market and which carry 80% of cruise passengers

In a detailed report on the sector, Jaime Katz, financial analyst at Morningstar, lays bare the many challenges facing the cruise industry, including the volatility in fuel prices and global geopolitical tensions. Despite these uncertainties, Katz predicts a bright future for the industry. She estimates that “over the next five years, cruise passenger numbers will hit 27 million, with

14 million passengers from North America, 7 million from Europe and 2 million from Asia”. This figure stood at 20.6 million in 2015.

Despite the slowdown in its growth, China is shaping up to be the El Dorado of the future, as the middle class is expanding and is ripe for leisure

opportunities. Katz believes that this market is the “most promising for the three main cruise companies”. She also expects that over the next few years the number of Chinese passengers will increase by an average of 33% year-on-year. These opportunities will require significant investments. Moreover, Carnival’s brand new ship, the “Majestic Princess”, which cost more than €600 million, will set sail this summer from its homeport of Shanghai to Japan and South Korea. The ship targets Chinese clients, first and foremost, explains Marie-France Rüedi, from the Swiss company Cruise Center, as holiday-makers get a taste for cruising by first taking trips closer to home, on local waters. “Ocean liners targeted at the Chinese market are somewhat different from other ships as they include more casinos. Passengers aren’t allowed to gamble at home and they are rather partial to a flutter on-board.”

Whilst Asia is a promising market, Europe is proving to be less so. It is true that French and German passengers appreciate the Mediterranean

ROYAL CARIBBEAN CRUISES



Evening festivities on the “Harmony of the Seas”, currently the largest cruise ship in the world at 362-metres long.

ANALYSTS' ADVICE

US COMPANIES RULE THE WAVES

“Of the three cruise companies listed on the stock market, Norwegian Cruise Line Holdings (NCLH) appears to be the most undervalued,” explains Jaime Katz, analyst at Morningstar. According to Katz, the US cruise company has the highest growth potential because 70% of its clients come from the US, which is at the heart of the cruise market. And this is even against a backdrop of 2016 and 2017 terror attacks, which have led to a decline in the number of Americans travelling abroad. In addition, the group is particularly focused on the luxury end of the market,

with its Regent Seven Seas and Oceania brands offering more stable destinations such as the Caribbean and having less trips cancelled due to the local political situation. In the long term, investing in Norwegian therefore seems to be a profitable choice. This opinion is shared by Jared Shojaian, expert at Wolfe Research, who appears positive about the outlook for the three giants of the sector. “I have a slight preference for Royal Caribbean (RCL),” he explains, “because the price is attractive and the company has a good credit rating with its investors.”

cruises, but the higher unemployment rate in the eurozone is weighing on cruise companies' turnover. The market is being kept afloat more than ever by US consumers. Analysts hope that the "Millennials", who are more city-based and connected, will appreciate the cruises that their parents and grandparents are so enamoured by... For Jared Shojaian, analyst at Wolfe Research in New York, "the younger generation doesn't want to buy a holiday like they would a t-shirt or a watch. These consumers want a real experience, which is exactly what cruise companies are now striving to offer. This is why I think that the sector has a real future." Carnival is promoting itself via its own TV show, airing every Saturday night in the US. Themed cruises are also very much in vogue: carnival nights near Brazil, philosophical debates in Greece, etc. Costa Cruises (Carnival) even offers a trip retracing the footsteps of the Swiss immigrants in Argentina, which proved a hit with the Cruise Center travel agency.

"The younger generation doesn't want to buy a holiday like they would a t-shirt or a watch"

Jared Shojaian, analyst at Wolfe Research

Cruise companies could, however, improve their profit margins by continuing to cut costs, notably thanks to technological developments which reduce fuel consumption, says Jaime Katz. Constructing bigger and bigger ships also enables companies to make considerable economies of scale. "Harmony of the Seas" is currently the largest cruise ship in the world. Owned by Royal Caribbean Cruises, she is 362-m long, has a capacity of 6,360 passengers and boasts 25 restau-

rants, 4 swimming pools, a nature park, 3 water slides and even a 24-m zip wire.

These facilities were provided with families in mind, who are increasingly opting for a cruise for their holidays. Cruising allows travellers to visit multiple exotic destinations in total comfort. Whilst basic rates are very attractive, à la carte services, such as drinks and excursions, which are evidently more expensive, provide the cruise companies with an attractive source of income. At Carnival, these services make up more than 25% of their turnover. Norwegian Cruise Line Holdings stands out from the competition by recently launching an extremely enticing family-focused package with drinks and tips included. Jared Shojaian believes that this offer is unsurprising, as the leaders are currently engaged in a ferocious price war.

On-board security has improved considerably since the "Costa Concordia" sunk off Italy in January 2012. The accident, which is still a recent memory, forced all ships to be connected via GPS with their company's headquarters, which avoids dangerous course changes. Growing safety and environmental regulations are also requiring the groups to take new measures. Moreover, cases of children drowning on-board, which often hit the headlines, have pushed Royal Caribbean and Norwegian to hire life-guards several weeks ago. Carnival has not yet taken the plunge.

Even if the company is not listed on the stock market, MSC Croisières is not being left behind. The Swiss company is offering, for the very first time, a world cruise aboard the "MSC Magnifica". The itinerary is to die for: the trip lasts 119 days with 49 ports of call in 32 countries (including Colombia, Hawaii and New Zealand). Departure is scheduled from Genoa for 5 January 2019 and there are still some cabins available. ▀

COMPANIES TO KEEP YOUR EYE ON

CARNIVAL CORPORATION THE LEADER

With a fleet of 102 ships, and more than 19 currently being built, this US group has more than 50% market share of the global cruise market. The group owns some of the most popular cruise lines, including Costa.

HEADQUARTERS: MIAMI (US) AND SOUTHAMPTON (UK)

EMPLOYEES: 120,000

REVENUE (2016): \$16.4 BN



ROYAL CARIBBEAN CRUISES THE CHALLENGER

Founded in 1968, the Florida-based group has a fleet of 49 ships operated by six cruise lines. Royal Caribbean has invested heavily to help accelerate its expansion and takes pride in owning the largest ship in the world, "Harmony of the Seas", which is 362-m long.

HEADQUARTERS: MIAMI (US)

EMPLOYEES: 66,000

REVENUE (2016): \$8.5 BN



NORWEGIAN CRUISE LINE HOLDINGS THE MOST INNOVATIVE OF THE TRIO

The US group is about to take on the Chinese market with its brand new, 19-deck ship, the "Norwegian Joy". The ship has been especially designed for Chinese clients, with separate bunks in the cabins, menus featuring primarily Asian food and more whirlpools than swimming pools.

HEADQUARTERS: MIAMI (US)

EMPLOYEES: 30,000

REVENUE (2016): \$4.9 BN



Electric mountain bikes can climb slopes too steep for traditional bikes. Case in point, this Specialized Levo FSR Expert on the surrounding hills of Spa, Belgium (2016).

THE JOYS OF E-BIKING

Sales of electric-assist mountain bikes are exploding, and new models are coming out constantly. Is it time to try out an electric mountain bike? Read about what the experts have to say and the test rides performed out on the open trail.

BY BLAISE DUVAL

Will electric-assist mountain bikes make the traditional sport obsolete? That would have come across as a preposterous question just five years ago, but with each new season, we wonder a bit more. The first indicator is the impressive sales statistics. Velosuisse, the Swiss bicycle trade association, reports that 20,761 electric mountain bikes were sold in 2016 (13,697 in 2014), representing 6.4% of the total bicycle market. "Sales are exploding," says Mathieu Gresy, store director at Veloland in Conthey. "The phenom-

enon began about three years ago and has kept on growing. Now, nearly 20% of people buying a mountain bike opt for an electric model."

What is more surprising than its huge commercial success is that electric mountain bikes are also popular with purists. "I admit that I was sceptical at first," says Nils Peters, 38, an experienced mountain biker and owner of the store Dr Bike & Mr Ride, in Gland. "Until I tried it out." Like most long-time mountain biking enthusiasts, especially those who enjoy technical uphill and downhill rides, he says he is

impressed with everything a rider can do with these bikes. "You can do things that are impossible with a traditional mountain bike, such as climb super steep, rough trails for unbeatable sensations." Another advantage highlighted by Peters is the social aspect of electric mountain bikes. "Electric-assist bikes make it possible for people with smaller builds to ride with more athletic friends, whether they have a traditional or electric mountain bike." That is also key for pleasant rides as a couple, for example.

Electric mountain bikes largely owe their success to their ability to attract users from across the spectrum. "A wide variety of customers buy these bikes," says Gresy from Veloland. "From beginners to advanced mountain bikers who often no longer have the time to dedicate to long rides. The electric-assist feature means they can go significantly faster and still get a good workout."

GOING UP LA BARILLETTE

On-trail testing: Our ride for the day is a Specialized Turbo Levo S-Works (read inset p. 68), a bike released in 2015 that is still regarded as a benchmark. Equipped with 140 mm travel in front and back, the machine was made for aggressive trails.

The first thing one notices is that it is beautiful. Specialized set the bar high by coming out with this machine that perfectly integrates the motor into the frame, a design much copied by other big-name bike makers. The second thing one notices is much less to cheer about but common to all electric mountain bikes: the weight. It comes in at a whopping 22 kg, almost twice as heavy as a traditional mountain bike designed for similar use. That big-boned frame makes a noticeable difference when it comes time to loading it up in the car.

But once on our test circuit, at the foot of the no-fun-and-games uphill

path leading to La Barillette from the village of Gingins in the Canton of Vaud, the settings on this bike are easy enough for even a child to adjust. A button to start and stop the electric assist, and another to select the power mode – Eco, Trail or Turbo. Specialized made the choice of doing away with a dashboard but instead provides a comprehensive, easy-to-use smartphone app. Connecting your smartphone with the bike via Bluetooth makes for an onboard system offering a plethora of settings to customise your ride (motor power and mode) and providing all sorts of metrics including speed, power use, watts developed and the distance covered.



In "normal" mode, the first gram of pressure on the pedal immediately brings that exhilarating push of momentum typical of electric bikes

In normal mode, the first gram of pressure on the pedal immediately brings that exhilarating push of momentum typical of electric bikes. The steep grade (topping over 11% in some sections), generally tackled with a heavy dose of grit, is glided over without any special effort. Electric assist in the middle of a forest definitely adds a surreal quality, even if the path we are using as a test trail does not adequately capture all the incredible performance capabilities of this bike. By venturing onto a huge mound, too intimidatingly steep for a regular mountain bike, we realise that the limits are no longer measured in available strength but in the rider's ability to keep the front wheel on the ground. As for the rest, the technical features say it all. The motor delivers up to 90 newton metres

of force, nearly half of the power of a compact car. The machine makes a slight growling noise, which did not bother us but will not always be appreciated by hikers in the vicinity. The 10 km and 1,000 m of uphill riding took just under 45 minutes at an average speed of 13 km/h. It can obviously climb much faster, but that would mean sweating a bit. Yes, even e-mountain bikes do require some push on the pedals to achieve a high cadence. It is, after all, a bike. With one downside – it is so heavy that it cannot be taken on trails where it would need to be carried.

One look at the battery, and it is clear that battery life is another drawback with this type of machine. The smartphone shows 36%, way down from the 85% displayed at the beginning of the climb. "Using Turbo mode too much on slopes can use up the battery in 15 km," Peters had warned us. "But it can last up to 80 km on a more natural, moderate ride."

Good news though – the rest of the path is downhill, which will save power. Passing by Saint-Cergue and Gingins on trails dotted with a few slightly technical spots makes us realise that, surprisingly, we practically forget the weight of the bike going downhill as well. Based on the famed Stumpjumper FSR geometry, Specialized's flagship bike, the Levo, behaves almost exactly like its motorless cousin. The very low centre of gravity keeps the bike on the ground and is reassuring, as are the high volume 27.5+ tyres (another popular trend currently found in mountain biking). With that kind of equipment, the rocky stretches are smoothed out with unsettling ease. The bike is agile, handles well – better than expected – and adapts easily to its environment. The large 200 mm front disc brakes can hold their own against those on downhill models, on top of being incredibly efficient. *Back to the plain:* After riding along >

5 km of paved road to get to the car, the battery shows 25%. That proves that by going easy on the power supply during uphill sections, a three-hour ride is indeed feasible.

What conclusion can we draw about electric mountain bikes? The list of criticisms, apart from the gripes about its weight and battery life, includes the use of electricity in a sport long considered to be at one

with nature. This issue is clearly avoided by the mountain biking industry, having created a lucrative business, but some potential customers will not let their conscience get away with it. That controversial aspect aside, these bikes are primarily designed for fun. The fundamental mountain biking experience remains intact, with an extra (heavy) dose of supernatural sensation. For someone used to traditional moun-

tain biking, the feeling of accomplishment is generally downshifted somewhat. (It is simply too tempting to let oneself go with the electric assist.) But riders can always push themselves if that is what they are looking for. More than anything, these bikes offer the possibility of experimenting and veering off the beaten path. And they provide novices with a royal entrance to mountain biking with the promise of beautiful rides awaiting. ▲



TEST BIKE

SPECIALIZED TURBO LEVO FSR

When Specialized came out with the Turbo Levo FSR 6Fattie in the summer of 2015, the Californian brand shook things up in the e-mountain bike industry. The bike modelled after the Stumpjumper FSR was one of the rare specimens to so seamlessly integrate the electric motor into the frame. This exclusive motor by Brose is also

highly appreciated for its torque and its quiet purr. Specialized has also outdone itself in terms of software, with a mobile app that can be used to adjust bike settings and monitor rides. The choice not to build a console into the handlebars is a clear one. The S-Works version of our test model tops the range, featuring multiple parts in carbon, such as

the wheels. The lack of electric assist when walking the bike along is one of the only quibbles with this bike, which is currently one of the best on the market.

Travel: 135 mm back, 140 mm front
Wheel size: 27.5+ or 29 inches
Power: 460 or 504 Wh
Starting at CHF 4,599
(model tested: CHF 9,999)



Scott e-Spark Plus Tuned

Fresh on the market, the 2017 version of the Scott e-Spark is hailed as an all-new model, designed from A to Z around the integration of an electric motor rather than simply tweaking an existing mountain bike. Like Specialized, the Swiss brand has thought out every detail of fitting the motor into the frame. This multi-purpose machine features a new Steps E8000 motor by Shimano, praised for its performance and compact size, with a control screen built into the handlebars offering the utmost practicality.

Travel: 120 mm back, 130 mm front
Wheel size: 27.5+
Power: 500 Wh
 7,899.-

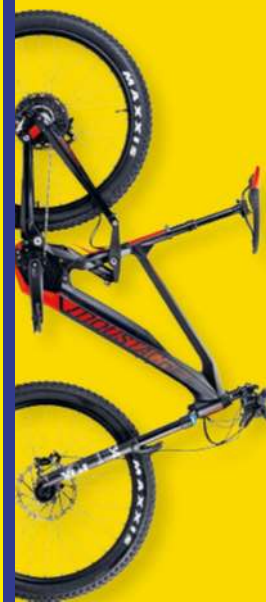
THREE NEW BIKES TO GO ALL OUT

Dozens of new electric mountain bikes are flooding the market every season. A selection.

Moustache Samedi 27 Trail 9 Carbon

The French brand Moustache is one of the leaders and pioneers in electric mountain bikes and well-known for the quality of its models, the detail and seamless integration of the different parts (motor, battery, cables, tyres, etc.). The new Samedi 27 Trail is no exception. Fun to ride both uphill and down, this bike, fitted with a Bosch motor, ranks as one of the best models on the market. The carbon frame version is not only 890 g lighter but also sturdier.

Travel: 140 mm back, 140 mm front
Wheel size: 27.5+
Power: 500 Wh
 7,299.- (Carbon 70 version)



Rocky Mountain Altitude Powerplay

Mountain biking buffs all know Rocky Mountain, a brand synonymous with dirt bikes and exclusive models. The Canadian bicycle maker is off to a strong start on its first foray into e-bikes. The Altitude Powerplay, which came out at the end of May, features a unique propulsion system, with a real crankset and a chainring fitted with sensors to trigger the motor. The idea is for a quieter, more natural electric assist function. This gorgeous bike was lauded by industry press, also for its downhill ride. With one drawback: the battery cannot be removed to charge it.

Travel: 150 mm back, 160 mm front
Wheel size: 27.5
Power: 632 Wh
 € 6,999 (Carbon 70 version)



The Samos Islands (left) and Fourni (right), viewed from Icaria.

TRAVEL

Go to Icaria and live a long life

It's one of the places in the world where people live the longest. What's the secret of this verdant mountainous island in the northeast Aegean Sea?

BY BENJAMIN KELLER
PHOTOS: MAËLLE GROSS

On Icaria, it's not uncommon to see goats or sheep ambling freely on the side of the road. Neither is it rare to find elderly people walking alone, with a youthful spring in their step. This mountainous Greek island, a mere 255 sq. kilometres is located in the eastern Aegean Sea close to Turkey. Here, time has a little less of an effect on people than elsewhere. Icarians are

known for their exceptional longevity. Studies have shown that they are two and a half times more likely to reach 90 years old than Americans. They are also significantly less afflicted by cancers, cardiovascular diseases, depression and dementia.

"It could be due to our diets or the climate, or maybe because we only worry about the present," said Zacharias, 89 years old, sitting as he

does every day on the terrace of a café in the main square in Karavostamo, a village of 400 residents on the island's north coast. Houses with bucolic gardens and balconies covered in flowers lead down to the sea. Blue and white "platia" cobblestones complete the scene. Immaculate walls with depictions of Greek gods are decorated with sailboats, painted by a nostalgic sea captain. ▸



Mind the goats! It is common for people to find them roadside as they frolic freely on the island.

THE RED ISLAND

Zacharias returned to Karavostamo last autumn, after living in the United States for 50 years. A carpenter by trade, he is helping his daughter, who stayed in the village, to renovate her home. Watching him say hello to everyone or tell stories about the magic of his island would make one think he had never left. He recalls that as a child, he would go and feed the goats, because on the island self-sufficiency was primordial and each family usually owned a few animals. He described the exodus of young people and how the mills closed because there weren't enough workers. He also explained that Icaria was once called the "red island" because there was a strong communist presence.

During the civil war that destroyed Greece between 1945 and 1949, 13,000 communists were deported to Icaria. This was more than the number of actual residents, which today is 10,000. "There was a time where three-quarters of the people here were communists, but that's no longer the case now," explains Zacharias, who is almost 90 years old. His American accent is a relic

of his long exile away from his homeland. "We didn't know what communism was. When we understood, we stopped believing in it," he said, laughing. The red graffiti spotted here and there, however, suggests that some still subscribe to the ideology.

"WE LIVE SLOWLY"

Let yourself be surprised by Icaria and live by the rhythm of the island and its residents. Icaria is far from the intense tourism of Mykonos or Santorini. "We live more slowly here than in other places," said Gabriella, a German-Italian who has lived on Icaria for the past 30 years. With six other women, Gabriella runs a co-operative of local products from Christos Raches, a village in the west-central part of the island, 500 metres above sea level. The road to get there cuts through a thick forest of pine and oak trees and is worth the drive alone. Much loved by visitors, the pedestrian-only centre is filled with cafés,



**"There was a time
where three-
quarters of Icaria
was communist, but
that's no longer
the case"**

Zacharias, 89



The lively centre of Agios Kyrkos, the "capital" of Icaria.

bars, restaurants and shops that surround the large church and its marble steeple.

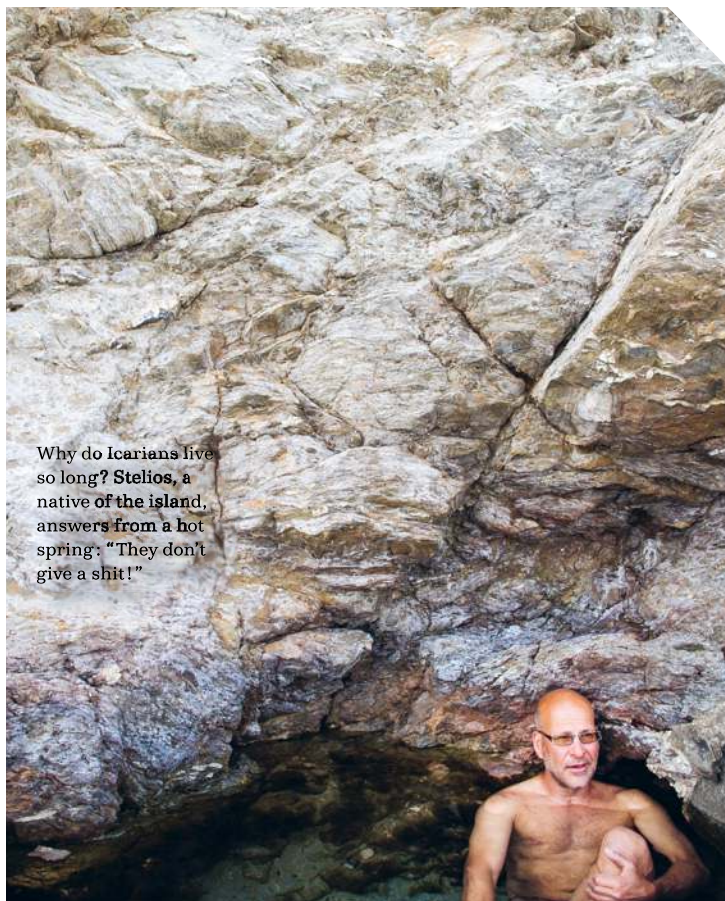
Icaria is far from the intense tourism of Mykonos or Santorini

The best way to discover Icaria is to rent a car (preferably a 4x4, as some roads can be rough) and climb its hills or wander along the sea. Admire the view of Samos and other surrounding islands, hike between olive trees, smell the wild thyme and rosemary, swim in the waterfalls and hot springs, or sunbathe on the beaches. Stop in at the pretty cafés where villagers gather and eat “soufiko” along with “tsipouro” in a “taverna”. Appreciate the white churches and slate roofs. Celebrate

at a “panagiria”, parties in honour of a saint that last until dawn, and dance the traditional “ikariotikos” to the beat of the “tsabouna” and the “pidavli”. And, of course, drink the local wine.



The women's co-op in the picturesque village of Christos Raches.



Why do Icarians live so long? Stelios, a native of the island, answers from a hot spring: “They don’t give a shit!”



“Greek doctor Hippocrates used Icarian wine to treat infections and mental issues”

Konstantinos Afianes,
local winemaker

MAGIC WINE

Some people even believe that Icarians owe their longevity to this drink. The island has worshipped Dionysus, the god of wine, since ancient times. In the Iliad, soldiers drank “Pramnian”, the oldest wine of Icaria. It is amber in colour and is supposed to have magic powers. Greek doctor Hippocrates prescribed the drink to heal infections and treat mental issues. Above the village of Christos Raches, in Profitis Ilias, Konstantinos Afianes and his father make “Pramnian” – >

renamed “Tama” – and other red and white wines from local grape varieties. The wine is made as it was long ago and is completely organic.

The grapes are pressed in a vat made of granite, and then the wine is left to age in clay amphoras that are buried outside. “The granite is rich in minerals and oxides, such

as iron and calcium, that people would buy in a pharmacy,” said the 28-year-old winemaker, who studied in Bordeaux. Additionally, Icarian grapes have a strong concentration of phenol, which has anti-oxidants. “It’s because the grapes are picked by hand and not with a knife,” says Konstantinos. “The phenol is produced by the vine to protect itself

when the grapes are picked.”

Konstantinos seems to be at home on the hill, in the middle of his vineyard. He doesn’t seem affected by the busy city and stress of modern life. He leads a peaceful life, along with “a lot” of wine, which he offers to visitors for tastings. He will no doubt live a very long life. ▲

Theoktistis Monastery on the north side of Ikaria. One of the many and one of the oldest churches on the island.



GETTING THERE

BY PLANE

All routes go through Athens. Daily flights between the Greek capital and Icaria (40 minutes).

BY FERRY

Connections to Athens (7 to 8 hours of travel) and surrounding islands.

LEMY

The agency is next to the baggage claim area at the airport.
+30 69 83 41 88 78

BLUE HOUSE

A charming blue and white house next to the magnificent Maganitis church and a picturesque café-grocery. 33 Swiss francs per night on Airbnb.

RAKOSTROTO

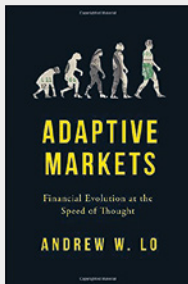
Delicious “mezze” and copious fish dishes in the heart of pretty seaside village Evdilos.

AFIANES WINERY

Taste real wine from Icaria and discover the secrets to how it’s made from the passionate Konstantinos.

WWW.AFIANESWINES.GR

TO READ, TO DOWNLOAD



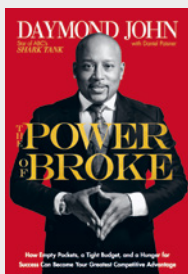
From 40 Swiss francs

ADAPTIVE MARKETS

By Andrew Lo
(Princeton University Press, 2017)

FINANCIAL EVOLUTION

One in two Americans invests in the stock market. But economists don't know whether investors and markets are rational and efficient (as modern financial theory assumes) or irrational and inefficient (as behavioural theory assumes, and as evidenced by crises and bubbles). For Andrew Lo, it's a bit of both. The MIT professor presents his hypothesis of adaptive markets, in which he sees things from an evolutionary perspective. If an investor's strategy fails, he'll try a different one. If his strategy is successful, he'll repeat it until it fails... To succeed, you must be innovative.



From 27 Swiss francs

THE POWER OF BROKE

By Daymond John
(Crown Business, 2016)

POVERTY: THE KEY TO SUCCESS

Daymond John started his entrepreneurial career selling T-shirts in his Queens neighbourhood, with a budget of \$40. Thanks to an innovative promotional campaign, he was able to turn his small business into the Fubu brand, now worth \$6 billion. He learned through his experience that when it comes to starting a company, having very little money can actually be a big advantage. You have no choice but to be creative, optimise your resources and use your imagination to think up an effective marketing strategy. This is a must-read for anyone with a small budget but a big desire to succeed.



Free
Apple Store,
Google Play

HOPPER

FIND THE CHEAPEST AIRFARES

Nobody knows how airlines calculate ticket prices, or when the best time to buy is. But Hopper does. The app uses big data to predict movements in price. Users receive a notification letting them know when it's a good time to buy. Hopper isn't perfect, but it's probably the best app of its kind.



2 Swiss francs
Apple Store
Free
Google Play

FOREST

SOUNDS OF SILENCE

Do you feel like you're constantly distracted by your phone when you should be focusing on other things? Forest helps you resist the urge to reach for your phone. The app works like a game. The goal is to grow a forest by planting trees, one by one. Each time you plant a tree, you have to wait a certain amount of time (set in advance by the user) before you can leave the app – or else the tree dies. It's fun...and it works!



Free
Apple Store,
Google Play

INVOICE2GO

INVOICING MADE EASY

For freelancers, there's nothing more tedious than sending out invoices. And when you're first starting out, it can be really overwhelming... Luckily, there are a number of apps out there that take the stress out of invoicing. Invoice2go is our favourite. The app offers a wide range of stylish and customisable invoice templates, plus an array of other features.



Free
Apple Store,
Google Play

ASANA REBEL

AT-HOME YOGA TEACHER

More and more people are enjoying yoga and going to the gym nowadays. But not everyone enjoys bending over backwards or being sweaty around strangers... With Asana Rebel, you can work out in the comfort of your own home. The app features well-produced yoga and workout videos and offers personalised programmes based on your own goals.



CARS

Searching for the essential

SPORTS CARS ON A STRICT DIET

BY PHILIPP MÜLLER

LOTUS ELISE SPRINT: THE WEIGHT OF EXPERIENCE

In England more than any other country, certain cars enjoy unparalleled longevity. Following in the tyre tracks of the Morgan, Reliant and other Bristol cars, the sleek lines of the Lotus Elise appear to be timeless. Launched in 2001, the second generation – or Mark 2 for the aficionados – is continuing along the right track with successive developments and remains the car of choice for driving enthusiasts who hanker after authentic sensations.

The name Elise Sprint is more evocative of a car built for acceleration than pure speed. To gain a few more tenths against the clock, the disciples of lightweight design – which was dear to the heart of Lotus' founder Colin Chapman –

have succeeded in slimming down the Lotus Elise Sprint in areas where this was still possible.

The Elise Sprint is 41 kg lighter than the standard Sport version

This was a challenge given the ultra-slender physique of the Elise, built on an extruded aluminium bonded chassis. And it wasn't easy to pare down the interior either, as interior comforts were almost inexistent and bare metal was already in evidence in the Spartan styling.



ENGINE: 1.8 L 4-CYLINDER SUPERCHARGED
POWER: 220 HP
0 TO 100 KM/H: 4.5 seconds
STARTING PRICE: 60,400 Swiss francs



ALPINE A110, RENAISSANCE

A new take on the first WRC Rally-winning car (1973). A lightweight 2-seater sport coupé (1,080 kg), 4.18 m long, with a 1.8 litre supercharged 252 hp rear-mounted engine. 2,000–3,000 cars are to be manufactured every year.

Prices start at 64,000 Swiss francs



CATERHAM SEVEN 485, POCKET DRAG RACER

Forever linked to the immortal Lotus Seven, launched in 1957, the British outfit Caterham offers various versions of this radical and minimalist sports car. The 2.0-litre Ford Duratec naturally aspirated 240 hp engine only has to power 585 kg of car!

Prices start at 67,500 Swiss francs

Weighing in at 798 kg – i.e. roughly 0.5 tons lighter than the Audi TT – the Elise Sprint is 41 kg lighter than the standard Sport version and within the critical 800 kg threshold. The trick to achieving this was by replacing the lead battery with a lithium-ion unit, choosing forged wheels (black), using linkage for the 6-speed gearbox and manufacturing numerous parts from carbon fibre (bonnet, roll hoop, seats). Aesthetically, we noticed the re-designed lighter-weight front grill, silver flashes on the sides and a pared-down rear design featuring two round lights instead of four.

To justify the extra 6,600 Swiss francs compared to the Sport model, there are some additional renowned features, namely brake calipers

provided by AP Racing and Brembo (at the front and rear respectively), Bilstein shock absorbers and Eibach springs. Lastly, the magicians at Hethel have fitted an exhaust system that gives a particularly expressive sound, which addresses the criticisms that the Elise sounded too much like a 4-cylinder Toyota. Like the Elise Sport, the Sprint comes with either the naturally aspirated 1.6-litre engine, offering 136 hp and 160 Nm of torque, or the 1.8-litre supercharged engine, offering 220 hp and 250 Nm of torque. The honed power-to-weight ratio ensures that the compact mid-mounted engine provides acceleration of 0–100 km/h in 6.3 seconds, dropping to 4.5 seconds for the supercharged version.

These specifications are enough to keep Lotus' few competitors – Porsche Cayman, Alfa Romeo 4C – at bay and help the manufacturer feel more confident that the Elise can hold its own against the Renault Alpine A110, the star of this year's Geneva International Motor Show. This French car justifies the slightly higher price tag thanks to the appeal of brand new features: a more powerful 1.8-litre turbo engine and dual-clutch transmission. However, seeing as Renault has adopted a sales strategy based on a limited production run for its sports car – all the cars have already been sold – the Lotus Elise could still be looking at a bright future, especially in the summer as its soft-top is a real plus in making the driving experience all the more authentic. ▲

BOUTIQUE



SMART CLUB

Loved by golf fans, the TruSwing sensor from US supplier Garmin easily attaches onto golf clubs. With the sensor, golfers can analyse and visualise each swing in order to improve their efficiency. Small, light and compact (weighing only 28 grams), the sensor has a battery life of 12 hours.

www.garmin.com

169 Swiss francs



CUSTOM SURFBOARD

This is one of the summer highlights at Lausanne concept store Chic Cham. At Les Ateliers Baume, surfers can design the custom surfboard of their dreams which will be shaped by hand by artisans from the Lausanne shop. The decorative graphics are inspired by the ocean and the neo-vintage California wave from designer Naomi Gally.

www.lesateliersbaume.ch

From 1,000 Swiss francs



SMART FLOATING SENSOR

Designed by Brittany-based start-up Asamgo, Ofi is a floating sensor that aims to simplify pool maintenance. Chlorine levels, pH, temperature, conductivity, hardness and alkalinity are all monitored continuously and transmitted to a smartphone via a dedicated app. The plus: Ofi has three coloured LED lights, making it easy to see how the pool is doing with just a glance.

www.oficoncept.com

426 Swiss francs





SOUND ON THE WATER

With 360-degree sound, the WonderBoom speaker is the latest from Logitech's Ultimate Ears brand. Particularly compact, with 10 hours of battery life and a 30 metre Bluetooth range, this portable speaker floats and is shock resistant. It can withstand being up to one metre underwater for 30 minutes. Available in six colours, it is also sand and dust resistant. Ideal for days at the beach.

www.ultimateears.com
119 Swiss francs

STYLISH MUSIC

For the Salone del Mobile event in Milan, luxury menswear brand Ermenegildo Zegna unveiled Zegna's Toyz, a line of high-tech design items elegantly covered in Pelle Tessuta, a house fabric woven of thin strips of nappa leather. We particularly like the very chic record player, a collaboration with New York label Master & Dynamic.

www.zegna.fr

Available from autumn



2 SHORTS IN 1

Swiss running shoes brand ON is launching a line of technical apparel. Its new product is two shorts in one, made of two pieces that can be worn together or separately. The trunks can be worn swimming, and once they're dry, then layered beneath the running shorts. Crafted from a light, non-rip and quick-dry fabric, the shorts have a pocket to securely carry keys, cards and a smartphone, even while running.

www.on-running.com
120 Swiss francs



MODULAR SMARTWATCH

Dubbed the Connected Modular 45, the new Swiss-made smartwatch from Tag Heuer is equipped with an AMOLED touchscreen under sapphire crystal. It is waterproof up to 50 metres and can be customised in innovative ways. Notably, wearers can choose between several screen colours and various types of material (titanium, ceramic or gold-plated). Several interchangeable straps are also available.

www.tagheuer.com
From 1,450 Swiss francs



ABIR OREIBI
CEO OF LIFT
CONFERENCES
BORN 16 JUNE 1989 IN
BENGHAZI (LIBYA)

FOOTBALL, FELLINI AND SANDBERG



DR

Oreibi is the CEO of Lift conferences, one of the biggest technology and innovation events in Europe. She is one of those people who just can't stay put. The Swiss-Lybian mother of five (including two stepchildren) came to Geneva when she was a child. At the age of 22, with a political science degree, she travelled to Hong Kong to work at a research institute. After spending some time in Bangkok and a stint in Shanghai, where she learned Chinese and co-founded Bizart (an organisation promoting artistic exchanges between China and Europe), she settled in London to open the UK office of Chinese e-commerce giant Alibaba.com. She returned to Geneva and began managing Lift in 2011. Oreibi is also a member of the Commission for Technology and Innovation (CTI) and an ex-member of the jury for the Swiss ICT Award, a competition that recognises the most innovative technology start-ups each year.

A KEY EVENT FROM YOUR CHILDHOOD ?

Football parties with my uncles, aunts and cousins.

THE PROFESSION YOU WOULD HAVE LIKED TO DO ?

I like what I do now.

YOUR SECRET HOBBY ?

Biographies and autobiographies of famous women.

SOMETHING THAT INSPIRED YOU RECENTLY ?

The generosity and sincerity of the human interactions at our last event, Lift:Lab, in Geneva.

A SONG THAT SUMS YOU UP ?

Hit the Road Jack, by Ray Charles.

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

Lamu, in Kenya, for its magical encounters.

THE FILM THAT YOU WOULD'VE LIKED TO EXPERIENCE ?

La Dolce Vita, by Fellini.

THE IDEAL WOMAN ?

A mix of my mother, the singer Jane Birkin and Sheryl Sandberg, COO at Facebook.

THE IDEAL MAN ?

He will know himself.

THE IDEAL ANIMAL ?

One in its natural habitat.

SOMETHING CRAZY YOU DID RECENTLY ?

I haven't done it yet.

YOU WIN 5,000 SWISS FRANCS ON THE STOCK EXCHANGE. WHAT WOULD YOU DO WITH THE MONEY ?

I would take my mother on a trip.

A BOOK THAT YOU RECOMMEND ?

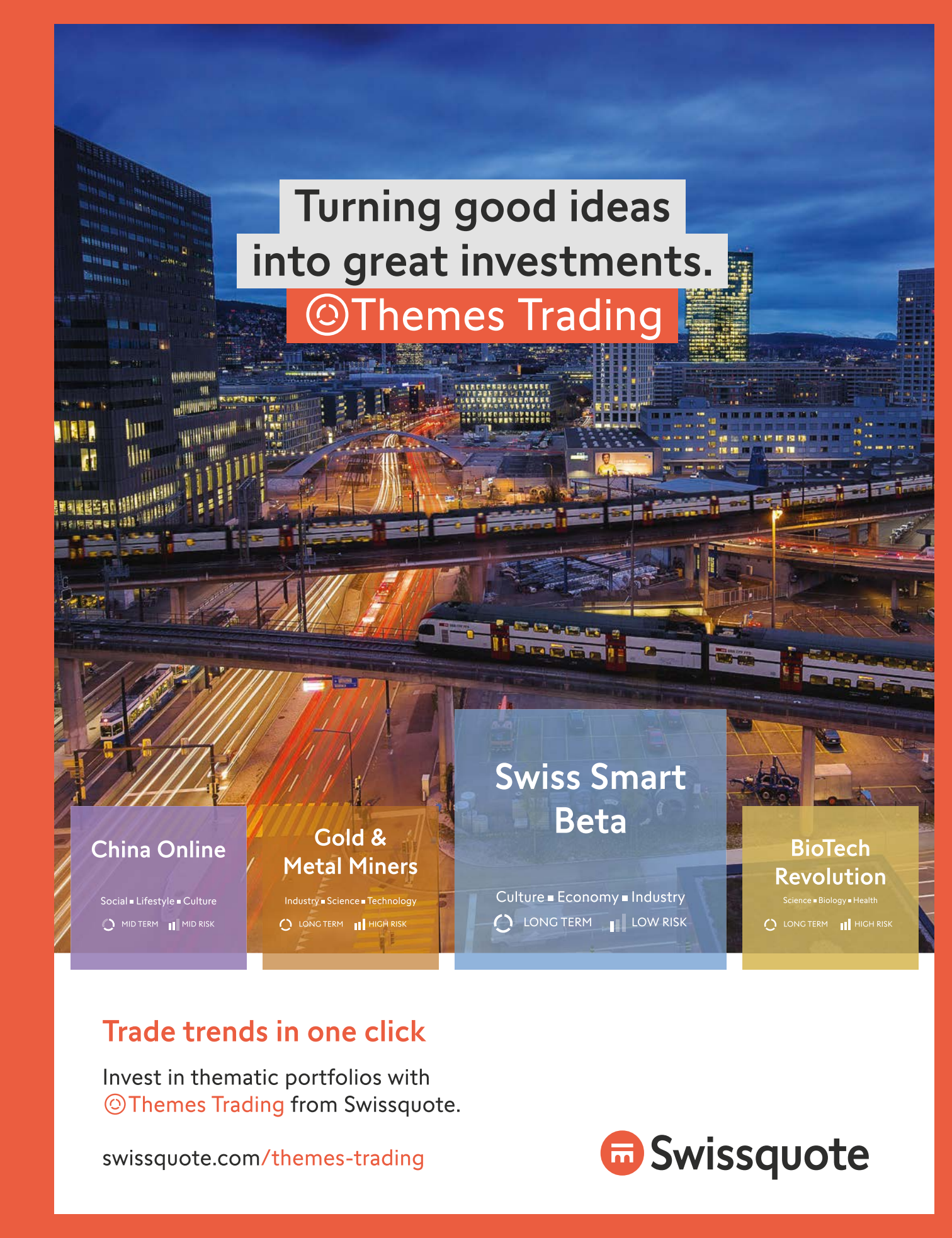
Power, Privilege and the Post: The Katharine Graham Story, by Carol Felsenthal.

YOUR FAVOURITE WORD ?

Apparently I use the word "cool" often. ▲



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