

SWISSQUOTE

FINANCE AND TECHNOLOGY UNPACKED

GOLD
Yellow metal
makes a
comeback

IDORSIA
A Swiss pharma
in start-up mode

BIG BROTHER
China racing
ahead



AUTOMOBILE DOSSIER

THE INEVITABLE ELECTRIC TRANSITION

Manufacturer strategies
Successful companies
The Tesla paradox

ISSN 2296-3278

58



▶ CATL ▶ TESLA ▶ PANASONIC ▶ KOMAX ▶ FAURECIA ▶ VOLKSWAGEN ▶ ABB ▶

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COLLECTION
Fifty Fathoms



©Photograph: Laurent Ballesta/Gombessa Project



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The electric shift



By Marc Bürki,
CEO of Swissquote

29 April 1899. The Jamais-Contente, a car shaped like a torpedo on wheels built by Belgian manufacturer Jenatzy, was the first road vehicle to go faster than 100 km/h. All without a single drop of petrol... Nestled between the back wheels, two single electric engines made the impossible possible.

It would take more than a century for this mode of propulsion to slowly gain credibility. Spurred on by American company Tesla, at the forefront of this revolution, traditional car brands are gradually rethinking their convictions. How about starting from scratch?

Atmosphere and noise pollution, global warming, and various government incentives and limitations are all reasons for companies to **go** electric. It's a question of converting consumers, of course. But also manufacturers. Manufacturers no longer have a choice: to comply with the environmental objectives set by the European Union and China, they must significantly increase the percentage of zero-emission vehicles in their fleets.

The Frankfurt Motor Show, which opens on 12 September, will usher

in a new era in this complete overhaul for major car brands. Notably, Volkswagen and Porsche will present their new 100% electric models for the first time. Audi, Mercedes and Jaguar unveiled theirs earlier this year. Battery manufacturers and certain specialised **companies** are gearing up for this electric revolution. We've featured some of the best in this issue.

In Switzerland, the market share for electric vehicles is still small – under 4%. It's quite the opposite scene in Norway, where 60% of new registered vehicles are either electric or hybrid, thanks to government subsidies. For the same reasons, electric car sales have been on the rise in Sweden in recent months.

Switzerland, although lagging behind, does have one particular claim to fame, with one of the highest concentrations of Tesla vehicles per capita in Europe. The California brand's new saloon Model 3, which we **assess** in this issue, is ranked fourth in the top registered car types in Switzerland over the past six months.

Happy reading!

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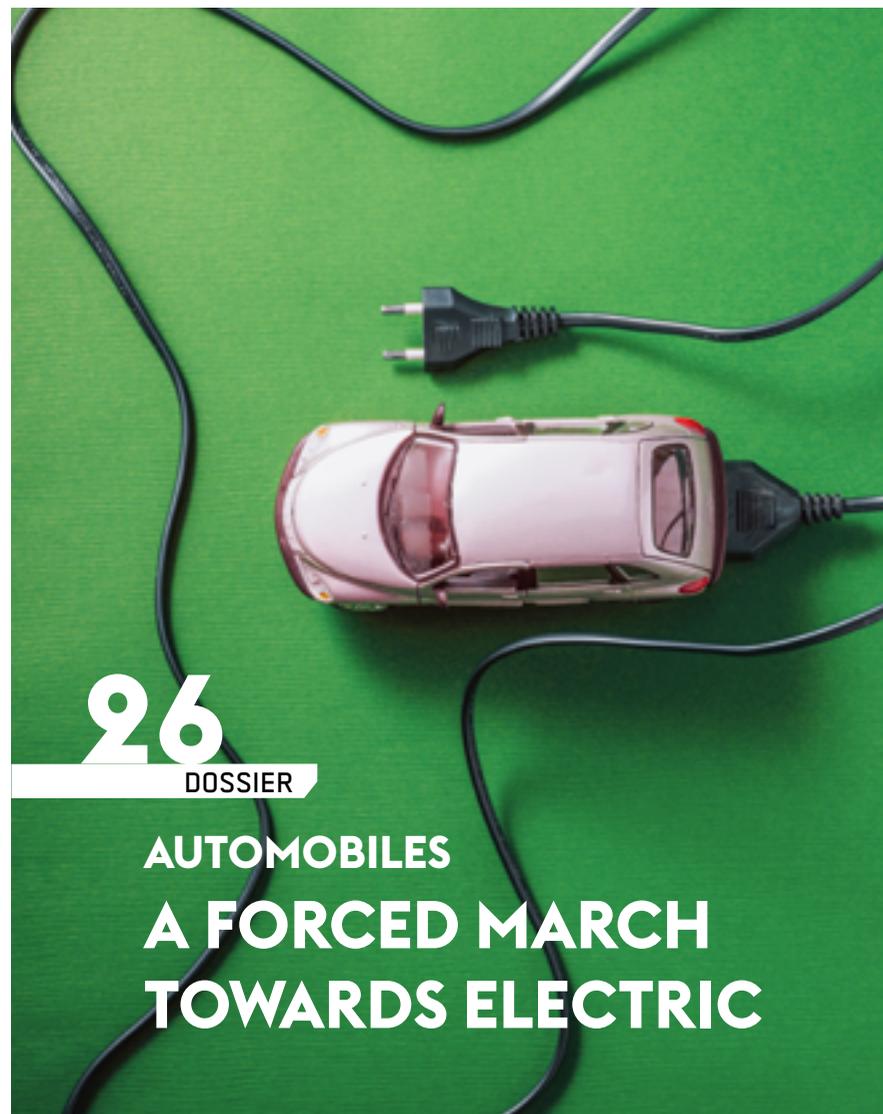
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IDORSIA



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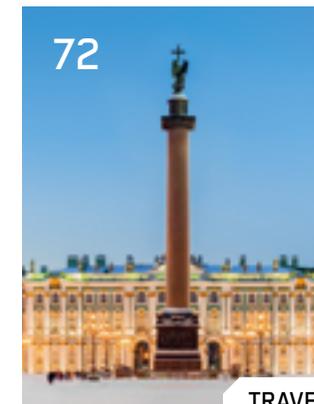
DOSSIER

**AUTOMOBILES
A FORCED MARCH
TOWARDS ELECTRIC**



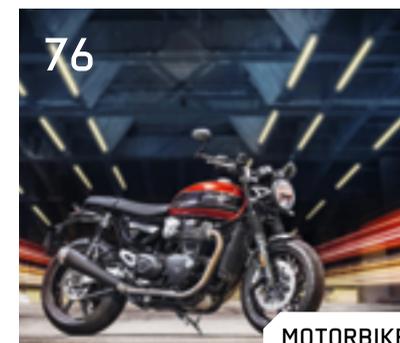
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BIG BROTHER



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PUBLISHER
Swissquote
Chemin de la Crétaux 33
1196 Gland - Switzerland
T. +41 44 825 88 88
www.swissquote.com
magazine@swissquote.ch

Manager
Brigitta Cooper

EDITORIAL

Editor-in-chief
Ludovic Chappex

Associate editor
Bertrand Beauté

Design director
Natalie Bindelli and Caroline Fischer
CANA atelier graphique
Route de Jussy 29 - 1226 Thônex
www.ateliercana.ch

Editorial staff
Bertrand Beauté, Ludovic Chappex, Benjamin Keller, Salomé Kiner, Martin Longet, Angélique Mounier-Kuhn, Philipp Müller, Gaëlle Sinnassamy, Julie Zaugg

Layout
Natalie Bindelli, Caroline Fischer, Coralie Meder, Romain Guerini (CANA atelier graphique)

Cover
CANA atelier graphique sarl

Photography
Nicolas Righetti, AFP, Keystone, Getty images, iStockphoto, Newscom, Reuters

Editing (English version)
Ose Ayewoh, Marco Simon

Translation
Technicis Finance

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hans.otto@i-plus.ch

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SCANS

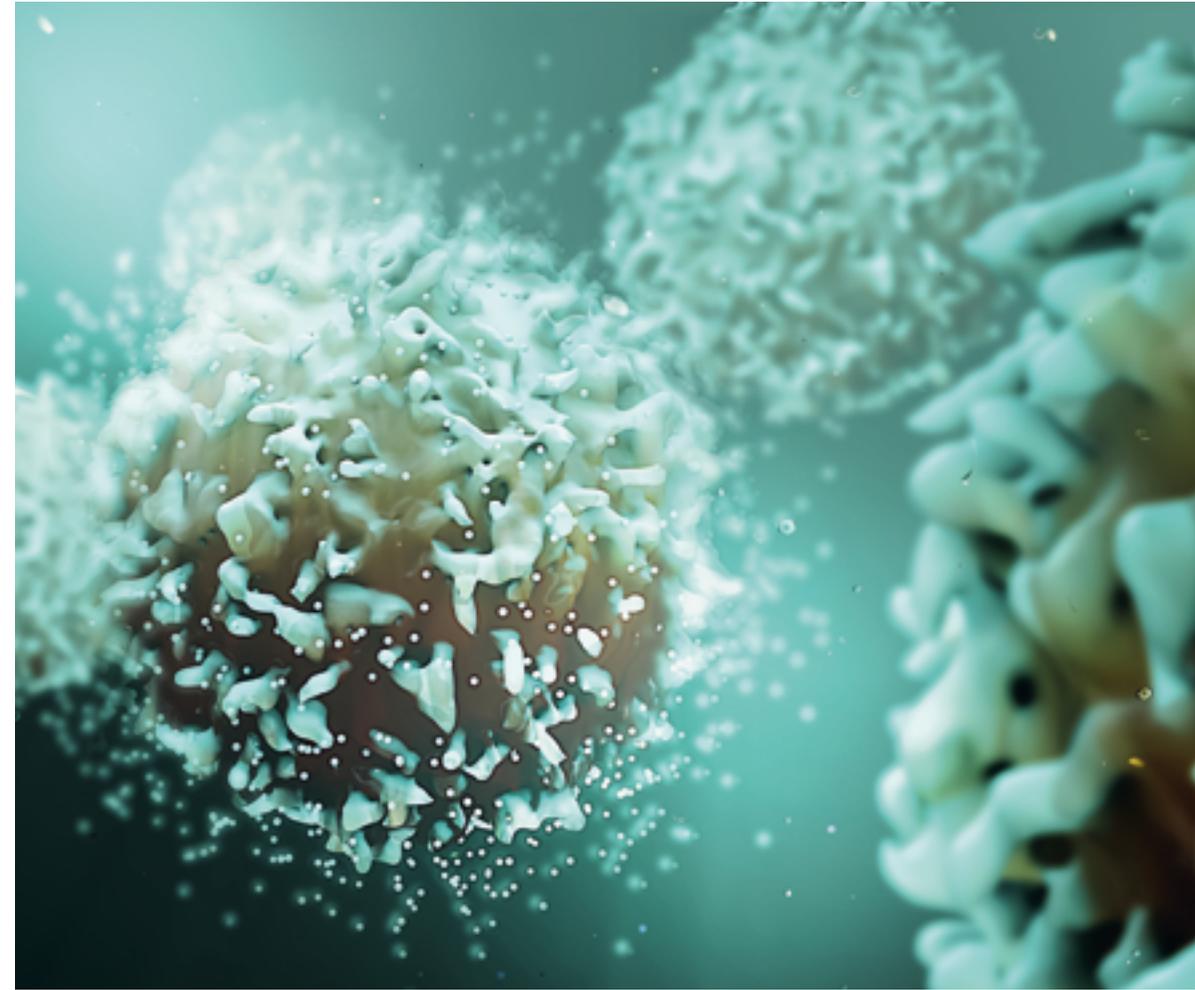
food

VEGGIE BURGER WARS



NESTLÉ

Nestlé has invested heavily in the veggie meat market, launching its “Incredible Burger” this spring, under the Garden Gourmet brand. This autumn, the “Awesome Burger” will hit shops, marketed by Sweet Earth, which Nestlé acquired in 2017. The Awesome Burger, made of green peas, is more dense in fibres and proteins than other plant-based burgers. But the Vevey-based giant has stiff competition in the form of Beyond Meat, which has just gone public, and Impossible Foods, whose veggie burgers are sold by Burger King. — NESN



ISTOCK

health

CHINESE IMMUNOTHERAPY

The future of the fight against cancer is treatments that use the patient’s immune system to attack the tumour. This segment is now overrun by Chinese pharmaceutical firms such as BeiGene, Innovent Technologies and Shanghai Junshi Biosciences. These three companies recently launched or are preparing to launch cancer treatments that target the PD-1 molecule, a protein on the surface of cells that stops the body from attacking cancerous cells. The treatments cost a fraction of the price of treatments from Western competitors Merck and Bristol-Myers Squibb.

— BGNE — 1877



“The software world is a winner-take-all market. So the greatest mistake I ever made was that which caused Microsoft not to be what Android is”

Bill Gates,
co-founder of Microsoft

RANKING

TOP FIVE COMPANIES THAT CREATED THE MOST VALUE FOR SHAREHOLDERS (in percentage, over the last five years)

1. NVIDIA 54.4%
2. KWEICHOW MOUTAI 43.5%
3. BROADCOM 39.5%
4. NETFLIX 38.5%
5. ADOBE 30.5%

Source: Boston Consulting Group

TOP FIVE MOST CONNECTED CEOs (based on 100,000 data points, and their presence and reactivity on social networks)

1. DOUG MCMILLON
WALMART
GLOBAL SCORE: 828.7
2. BRENT SAUNDERS
ALLERGAN
GLOBAL SCORE: 815.3
3. RAMON LAGUARTA
PEPSICO
GLOBAL SCORE: 802
4. ADENA FRIEDMAN
NASDAQ
GLOBAL SCORE: 799
5. DAN SCHULMAN
PAYPAL
GLOBAL SCORE: 795.3

Source: Brunswick Group

TOP FIVE COUNTRIES MOST FAVOURABLE TO FAMILIES (based on a set of criteria determined by UNICEF)

1. SWEDEN
2. NORWAY
3. ICELAND
4. ESTONIA
5. PORTUGAL

Source: UNICEF



4.5%

The real average growth of India during the 2011–12 to 2016–17 financial years, according to economist Arvind Subramanian, who just published a paper through Harvard University. Official figures from the government recorded an annual growth of 7% during this period.

certification

SGS MIXING WITH K-BEAUTY

Geneva certification giant SGS has been authorised to test cosmetic products for the South Korean market, becoming one of the rare Western groups to obtain this privilege. The tests will be conducted in its laboratory in Uiwang, in southern Seoul, to confirm that the creams and lotions do not contain any prohibited substances, such as nitromethane or certain types of formaldehydes. Valued at \$13 billion, the South Korean cosmetics market is booming. Its products are particularly popular in the rest of Asia, especially in China. — SGSN



Frankie Ng,
CEO of SGS.

KEYSTONE / MARTIAL TREZZINI

payments

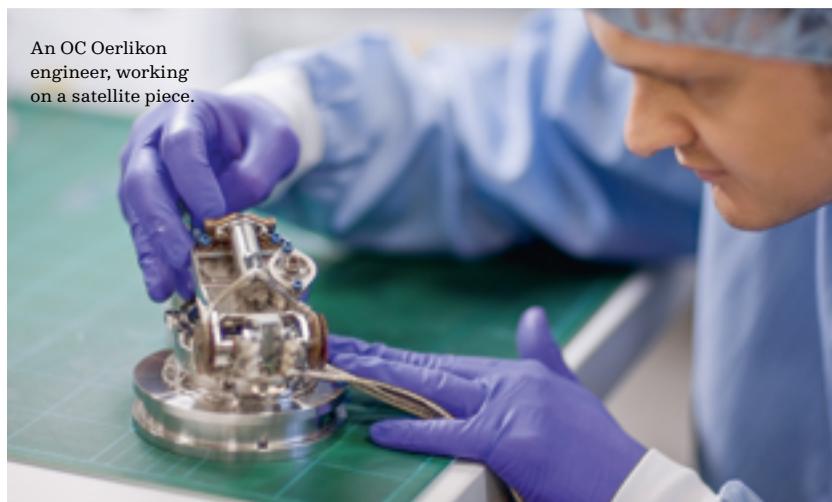
TARGETING ASIAN WALLETS

US games giant Razer has entered into a partnership with Visa to allow users of their pre-paid virtual wallet to make purchases at 54 brands affiliated with the US credit card company. It is targeting South-East Asia in particular, where only 27% of people have a bank account. The offer will first be launched in Malaysia and Singapore, then the Philippines. But local firms Grab and Go-Jek, as well as Chinese giants Alibaba and Tencent, already operate mobile payment systems in the region. — RAZFF — V

SCANS

aerospace

OC OERLIKON HAS ITS HEAD IN THE STARS



An OC Oerlikon engineer, working on a satellite piece.

KEYSTONE / GAETAN BALLY

Schwyz-based OC Oerlikon and Germany's MT Aerospace, which belong to the OHB SE group, joined together to produce 3D printed parts for the space and aeronautics industry. Their cumulative expertise will allow them to produce ultra-light, sturdy parts at a competitive

price. Thanks to this collaboration, the Swiss group will benefit from access to MT Aerospace's portfolio of prestigious clients, which includes Airbus and French rocket launcher Ariane, as well as manufacturers of satellites and space vehicles. — OERL



“We don't believe tariffs are an effective way to drive global trade”

Bob Swan,
CEO of Intel

nutrition

ANOTHER LOOK AT QUINOA



GARRO / PHANIE

Quinoa, a pseudo-cereal grain primarily grown in the Andes, enjoyed its moment of glory at the turn of the millennium, when its price tripled to \$4,800 per tonne. Following this though, the market stagnated, as the quality of quinoa batches was too uneven to include it in industrially-produced foods. To remedy the situation, several farms in the United States, France and Spain began growing quinoa, primarily through flour manufacturer Ardent Mills. Kellogg's also began including quinoa in its frozen foods and cereal bars. — K



\$70 BN

The value of the parts that Huawei purchased last year from its suppliers. Suppliers include several US-based groups, such as Intel, Qualcomm and Broadcom. Donald Trump is threatening these sales as part of his trade war with China.

mountain

CROWDS AT THE JUNGFRAU SUMMIT



ISTOCK

The Jungfrau summit had a record 1.07 million visitors last year. The majority were tourists from Asia. This increased revenue for the trains that go to Jungfrau, up 10% to reach 212.8 million Swiss francs. Profits soared 15%. The mythical mountain is expected to attract an increasing number of visitors: an aerial tramway is currently under construction leaving from Grindelwald, which would reduce travel times by 47 minutes and allow more people to reach the summit. The tramway will be operational in late 2019. — JFN



+2.9%

The increase in global energy consumption in 2018, according to a report from petrol company BP. This is the most significant increase in nine years. It is due to high consumption in China, India and the United States, as well as an exceptionally high number of very hot and cold days.



“The shale gas revolution has frankly been an unmitigated disaster for any buy-and-hold investor”

Steve Schlotterbeck,
former CEO
of fracking firm EQT

KICKSTARTER



WINSTON

A SMALL BOX TO PROTECT PRIVATE INFORMATION

Winston is a small, square device that connects to a home internet network to filter information delivered by various electronic devices on the network. Claiming to be more effective than a VPN or ad blocker, which must be installed on each smartphone, tablet or computer, Winston encrypts all online transactions. This blocks malware installation attempts, stops personalised adverts, and prevents tech giants such as Facebook and Google from obtaining information on users' online behaviour. Winston can also be configured to block certain content, for example on devices used by children. Winston also protects cameras, smart TVs and other connected objects throughout the house against hacking attempts.

FUNDS RAISED
\$514,669

AVAILABLE
OCTOBER 2019



210

The number of supermarkets that French company Carrefour will close in China. Carrefour, which arrived in China in 1995, is struggling to make its supermarkets profitable due to competition from online shopping. It will sell 80% of its Chinese operations to local group Suning for 4.8 billion yuan (690 million Swiss francs).

insurance PROTECTING YOUR SMARTPHONE

Saint Gallen insurer Helvetia has acquired Helvetic Warranty, which specialises in insurance for electronic devices. Insurance is sold directly at points of sale, which avoids the costly operations of canvassing customers. The Zurich firm handles approximately 20,000 claims per year. The insurance market for electronic devices is booming: it reached \$12.5 billion in 2017 and is expected to grow 13% per year by 2025. The most purchased types of insurance include protection against theft, breakage, wear and tear, and viruses. — HELN

transport

EUROWINGS IS TIGHTENING THE PURSE STRINGS



DUSTIN HACKERT

Lufthansa's low-cost company isn't doing well. In 2018, Eurowings lost €231 million. As a result, the German operator is hoping to reduce costs by 25% by 2022. To do so, it will no longer operate long-haul flights that currently fly to destinations such as Thailand and the United States. The cuts will

also have an impact on employees, who will work approximately one hour more each day. To grow revenue, the airline also hopes to capitalise on selling additional services to passengers, a business model invented by its competitors easyJet and Ryanair.

— LHA

THE FLOP

Taco Bell opens a hotel in California

Blow-up floats shaped like spicy sauce packets float in the pool. The walls of the rooms are decorated with the Taco Bell logo and the beds are covered in pillows shaped like chilli sauce packets. Welcome to the first hotel dedicated completely to a fast food chain. Taco Bell has taken over the V Palm Springs, a 70-room hotel in the California desert.

In addition to decor evocative of this industrial taco and burrito chain's cuisine, the hotel also has a "freeze room" inspired by the Baja Blast flavour of the Mountain Dew fizzy drink, as well as a beauty salon offering manicures featuring the brand's bell. The hotel restaurant will serve Taco Bell food, of course. The result is far from appetising. — YUM

digital

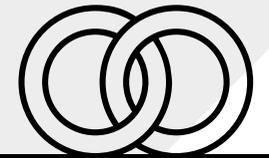
KING OF FLAT SCREENS



SONG BAI / IMAGINECHINA

Chinese company BOE Technology has become the global leader in flat screens, with a 21% market share according to IHS Markit. This new development comes at the expense of its two biggest Korean competitors: LG and Samsung. BOE became the leader by putting a series of innovative products on the market, such as screens for foldable smartphones and ultra-wide liquid crystal screens. It also created gigantic production lines, capable of producing hundreds of thousands of pieces per month, which resulted in significant economies of scale.

— 000725



\$74 BN

The combined revenue of US groups Raytheon and United Technologies once their merger is complete. The aim of this transaction, which will take place in mid-2020, is to create a global aeronautics and defence giant that can compete with Boeing and Lockheed Martin.

cosmetics

AMAZON TARGETS BEAUTY PROFESSIONALS



We don't look at your messages, we don't listen in on your microphone, doing so would be super problematic. But I recognise you're not gonna really believe me"

Adam Mosseri,
CEO of Instagram



Jeff Bezos, founder and CEO of Amazon.

SAUL LOEB / AFP

Whenever Amazon decides to break into a new industry, it usually has a devastating effect on players that are already there. This has already happened in the book and clothing industries. The e-commerce giant is now interested in the cosmetics market. It just launched an online store designed for beauty pro-

fessionals. Amazon will sell brands used by hair stylists and beauticians, such as Wella Color Charm, RUSK and OPI Professional. The announcement made share prices drop for Revlon, Ulta Beauty and Sally Beauty, which are all present in this segment.

— AMZN

SCANS



“Facing harassment online, based on your identity or your sexual orientation, is just extraordinarily wrong. So, we feel a responsibility as a platform”

Sundar Pichai,
CEO of Google,
which owns YouTube

labelling
ZERO ALLERGY RISK



A Pret a Manger shop in London.

RETURNS / NEIL HALL

The United Kingdom is preparing to adopt a law that would force all companies selling takeaway food prepared on site (for example, chains such as Pret a Manger, Gregg's and Marks & Spencer) to publish a complete list of the ingredients in these foods on the packaging.

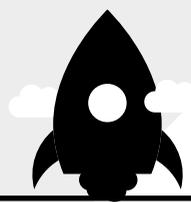
This regulation is already in place for supermarkets and local shops. The new legislation, which will come into effect in 2021, is the result of the death of a teenager in 2016 who ate a sandwich without knowing it contained sesame, to which she was severely allergic.



BREITLING
1884

#SQUADONAMMISSION

BREITLING BOUTIQUE
GENEVA • LAUSANNE • LUCERNE
ST. MORITZ • ZERMATT • ZURICH



€ 3.1 BN

The amount of cash flow held by German start-up incubator Rocket Internet. It accumulated this amount because it struggled to find promising start-ups in which to invest.

THE IPO

SLACK TAKES OFF LIKE A SHOT ON WALL STREET

Corporate messaging system Slack was listed directly on the New York exchange in June. Its share price immediately went up 50%, valuing the company at \$19.5 billion. While the start-up, created in 2009 in Canada, isn't yet in the black, it has seen spectacular growth. In 2018, Slack generated \$400 million in revenue, for a loss of \$138 million.

It benefits from a solid business model, based on selling paid subscriptions that result in significant profit margins. The system already has 95,000 paying clients. But it's not alone in the market: Microsoft and Facebook have launched their own products, called Microsoft Teams and Workplace, respectively, to compete with Slack. — WORK

TRENDS



the figure
ANN SARNOFF

Title
CEO of Warner Bros

Age
57

Nationality
American

A woman at the helm of Warner Brothers

Warner Bros, whose former CEO Kevin Tsujihara resigned after being implicated in the #MeToo scandal, has chosen its first female CEO: Ann Sarnoff. The 57-year-old, who studied economics at the universities of Harvard and Georgetown, joined the BBC in 2010, becoming

the president of its US studios and growing the number of its US subscribers to 80 million.

She has also held management roles at Nickelodeon, the US Women's National Basketball Association and Dow Jones. Sarnoff's primary

focus will be to supervise the launch of a streaming service, which will be based on the Warner Bros and HBO catalogues, to compete with Netflix and Disney's platforms. She is also expected to develop the studio's franchises, such as *Batman* and *Superman*.



A Prada backpack, made with Econyl, a synthetic fabric.

the innovation
ECONYL

Company
Prada

Launch
June 2019

Projected cost
Not communicated

Green nylon

Prada has launched a new line of bags made of environmentally-friendly nylon. Created with Econyl, a synthetic fabric made from plastic waste found in oceans, such as fishing nets, and leftovers from fibres generated by the textile industry, the bags are available in six models, including a backpack, tote bag and duffel bag. They were designed in partnership with Italian firm Aqua-

fil, which invented Econyl. This is a pilot project for the Italian luxury brand, which plans to replace all of its nylon products with this new green fibre by 2021. Just as strong as the plastic-based synthetic fabric invented by DuPont in 1935, Econyl can be recycled dozens of times without losing its quality. To promote the launch of these bags, Prada commissioned National

Geographic to produce a series of mini-documentaries describing how Econyl is made. The first episode describes how Aquafil gathered leftovers from rugs and transformed them into nylon in Phoenix, Arizona. A percentage of each sale will go towards a project designed to raise awareness about environmental concerns.

LEASING
1.9%

SUR TOUS LES MODÈLES
PORSCHE E-HYBRID.



PORSCHE

Convertir l'électricité en adrénaline. Les modèles Porsche E-Hybrid.

Écouter son cœur et profiter du leasing 1,9 %.
En savoir plus: porsche-e-performance.ch

Exemple de prix Cayenne E-Hybrid avec leasing 1,9% pour une durée de 24: prix CHF 121'200.-; premier loyer CHF 24'240.-; durée 36 mois; kilométrage 15'000 km p.a.; taux d'intérêt effectif 1,92%; loyer mensuel CHF 1'336.-; les prix s'entendent TVA incluse; assurance tous risques non incluse. Une offre de Porsche Financial Services en coopération avec BANK-now SA. L'octroi d'un crédit est interdit s'il entraîne un surendettement du consommateur (art. 3 LCD). Action valable sur tous les véhicules neufs du 13 août au 30 septembre 2019. Le taux de leasing nominal est de 1,9% pour une durée de 24 et 36 mois, et de 2,4% pour une durée de 48 mois.

ANALYSIS

SPECIALISTS' VIEWPOINT

INTERVIEW

“Gold companies shine once again”

The surge in gold prices is whetting investors' appetite. An analysis of this unique market.

BY ANGÉLIQUE MOUNIER-KUHN

Gold prices have been on the rise in recent months. Many observers are hailing a comeback of the yellow metal, after years of ups and downs. In Emmanuel Painchault's view, this renewed interest is justified, but the trend is more about firming up than taking off. The head of commodity stocks at Edmond de Rothschild Asset Management reviews the various options available to investors who want to increase their exposure to gold.

After the plunge in prices between 2012 and 2013 and the years of erratic movements that followed, is it time to go back to gold?

With the trade war between the United States and China, and tensions in the Middle East, we should be cautious in the current geopolitical context. In addition, central banks – in particular the US Federal Reserve and the European Central Bank – have changed their tone and seem more inclined to accept quantitative easing due to growing economic risks. All that is making gold attractive again. As a protective asset, its price tends to rise when threats intensify. However, if no major crisis emerges, a massive shift is unlikely. Since the end of 2015, gold has been trading at between \$1,200 and \$1,300 per ounce. The Fed's about-face edged this range up to \$1,300–\$1,400, but a rate cut or two will not be enough to push it much higher. That said, any sustained monetary easing policy could give the price per ounce a more significant lift.

In addition to buying physical gold, what options do investors have for increasing their exposure to the yellow metal?

Buying ingots and coins involves dealing with storage and a tax on resale. You can also invest in gold companies, but they are much more volatile. Their high beta accentuates the increase or decrease in gold prices. Basically, it all depends on the scenario and the investor's risk aversion. Investing in physical gold means choosing protection. When looking for performance, gold companies are attractive, but they require a tactical approach and a deep understanding of timing. Not everyone can do that. The emergence of physical gold ETFs about 15 years ago created an additional opportunity. These investment instruments can be used to replicate the performance of gold without having to store it. The ETF provider is required to store the equivalent amount of gold, which has a very real impact on demand. From the investor's point of view, ETFs can be used to benefit from the advantages of using gold as a protective asset, but simplify things. It is worth noting that some of these ETFs offer holders a physical gold withdrawal service for an additional fee. Investors can also increase their exposure to gold prices through structured products or derivatives such as tracker certificates and CFDs.

How does supply and demand influence gold prices?

Unlike most commodities that react to both supply and demand and to inventory levels, gold prices are mainly affected by the main macroeconomic variables, including inflation, interest rates and US dollar exchange rates. However, demand is regaining its influence on gold prices. In the early 2000s, central banks – primarily those in emerging countries, including Russia, India and China – gradually began snapping up gold and were eventually buying over 400 tonnes per year as of 2011. Last year, demand from these countries reached a record 652 tonnes. That's significant on a market totalling about 4,400 tonnes. Central bank buying aims to diversify their countries' reserves as well as improve their credibility with the IMF, as gold reputedly reflects financial stability. Additionally, in times of crisis, gold can be used as a guarantee when a country issues debt, providing access to more attractive financing rates.

“The ‘de-dollarisation’ of the world economy indirectly supports the gold market”

In the short term, demand for gold from the jewellery industry, which accounts for 50% to 60% of total demand, will also have a positive impact. India and China are by far the two largest markets. And in India, 2019 has had the most wedding dates since 2011.

Finally, the “de-dollarisation” of the world economy, although a long-term process, also indirectly supports the gold market. Given the huge amounts at stake, central banks that want to sell their US Treasury bonds to buy gold must do so gradually. In the long run, if the global economy runs on fewer and fewer dollars, the US currency will eventually weaken. However, experience shows that the green-

back and the yellow metal are almost always inversely correlated.

Gold companies have turned in disappointing performances in recent years. Does the current market concentration make the sector more attractive?

First, we should note that gold companies regain their appeal with the increase in the range of gold prices, as this boosts their operating income. Given their strong beta, a 5% to 10% increase in the price of gold can lead to a 20% to 30% increase, or even more, in the share price of gold companies.

The current trend towards market concentration is different from your garden-variety deals in which large companies buy up small companies to replace their reserves and diversify their risks. The large-scale deals that have taken place recently – such as the takeover of Randgold by Barrick Gold and of Goldcorp by Newmont – are much rarer. Four of the top five industry players are now reduced to two. These acquisitions have to do with financial discipline. They aim to create larger and better managed companies, i.e. companies that provide shareholders with better visibility and can even pay dividends, which is not the sector norm. In addition, with market capitalisations of \$25 billion to \$30 billion, they are now “investable” for generalist funds, which makes them even more attractive.

Smaller companies, which suffered tremendously due to their over-investment when gold collapsed in 2013–2014, have also regained their appeal. Stronger gold prices enable them to generate higher operating income and improve their capital allocation. ▽



EMMANUEL PAINCHAULT
HEAD OF COMMODITY STOCKS
EDMOND DE ROTHSCHILD ASSET MANAGEMENT

Idorsia, a small newcomer already ahead of the game

The young Basel-based pharmaceutical company is working on a number of novel medicines. We take a look at Idorsia's flagship projects with its CEO Jean-Paul Clozel.

BY JULIE ZAUGG

The headquarters of Idorsia in Allschwil, near Basel.

IN FIGURES

2017

Year Idorsia was founded

28%

Percentage of the company held by the Clozels, founders of Idorsia. US giant Johnson & Johnson has an 9.9% share

750+

Number of employees

3 billion

The company's capitalisation in Swiss francs as of late August

I dorsia is a UFO in the Swiss biotech world. The company was founded in 2017, when Actelion owners Jean-Paul Clozel and his wife Martine Clozel decided to sell the pharmaceutical group they founded in 1997 to US giant Johnson & Johnson for \$30 billion. They held onto a portfolio of molecules still under development and founded Idorsia to work on the drugs.

"This history gives the company a unique profile," said Michael Altdorfer, who leads the organisation Swiss Biotech. "Most Swiss biotech companies are spin-offs that grow organically over a long period and have less than 300 employees on average." Conversely, Idorsia began with a startup capital of \$1 billion provided by Johnson & Johnson, and already has 750 employees. The Basel-based company has also been publicly listed since it was created.

"Idorsia will market its first product soon, whereas its competitors usually take 10 to 15 years to reach that stage," said Altdorfer. That's because the company isn't starting from scratch. "We were able to benefit from research and development abilities that we created over the span of 20 years at Actelion," said Jean-Paul Clozel, who is also a cardiologist.

At Idorsia, the development of new drugs is an empirical process. The company has a library of 600,000 molecules. Each time medical research discovers the role of a receptor or an enzyme in triggering a disease, Idorsia reviews every one of its molecules to determine if one of them is able to block the action mechanism. "Since we don't have a commercial division with a pre-established list of diseases that we need to find treatments for, we are free to go where innovation takes us," Clozel said.

To assist in this gargantuan effort, the company uses artificial intelligence tools based on machine learning. "These tools make it possible for us to identify patterns within the gigantic quantities of data we generate, in order to establish correlations and causalities," he said. Idorsia now has 10 molecules under development. The project that has garnered the most interest is a treatment for insomnia, currently in phase III of clinical trials (see inset on p. 22), and set to be on the market in 2020.



"We are free to go where innovation takes us"

Jean-Paul Clozel, CEO of Idorsia

Three other drugs are also in phase III and could be launched on the market by 2021. One is for patients with Fabry disease, a rare genetic disease where the body isn't able to break down a type of lipid. "Our treatment would penetrate tissues deeper than current drugs, which minimises the neuropathic pain that these patients suffer from," said Clozel.

Another molecule being tested can treat ultra-resistant cases of hypertension. "Patients who would benefit from this drug are people who have already exhausted all treatment options but their blood pressure is still too high," said Idorsia's CEO. In the United States alone, between five and 10 million people are affected by this type of hypertension. >

The third molecule is expected to allow people who have suffered a cerebral aneurysm to “return to their regular activities more quickly,” said Clozel. It works by keeping arteries open during the two months after the incident, which reduces the risk of a vasospasm. One-third of people who have had an aneurysm are at risk of this complication.

Idorsia is also working on less advanced drugs to treat lupus, acute coronary syndrome, nasal polyps and epilepsy.

Financially, Idorsia has a liquidity pool of 1.1 billion Swiss francs as of March 2019. Its stock valuation is currently about 3 billion Swiss francs. A series of partnerships with other pharma groups – such as Janssen Biotech, a subsidiary of Johnson & Johnson, and Roche – also guarantee revenue for Idorsia.

According to various analysts, however, the Basel-based firm could still burn through its funds too quickly.

SEBASTIEN BOZON / AFP

The founders of Idorsia, Martine and Jean-Paul Clozel, a wife-and-husband team – respectively Chief Scientific Officer (CSO) and Executive Vice President, and CEO of the company.

“The amount of financing required to test a diversified pipeline could be challenging for a young company”

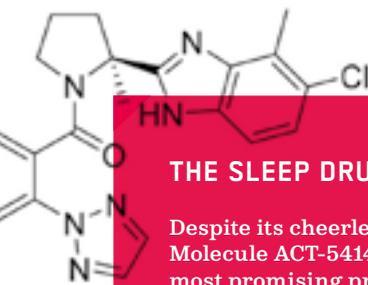
Jean-Paul Clozel, CEO of Idorsia

ANALYSTS' ADVICE

“A SOLID PORTFOLIO”

While Idorsia isn't close to being in the black, it's still an attractive investment. “The company has a management team and employees with many years of experience, and maintains close relations with two large pharma groups: Johnson & Johnson and Roche,” said Stefan Schneider, analyst at Vontobel Bank. It also has a solid portfolio of drugs, several of which are already in phase III clinical trials, as well as an advantageous financial situation, particularly as a result of its successful fundraising round in 2018.

But a word of caution: like Michael Altdorfer, Stefan Schneider worries about the speed at which Idorsia is burning through its financial reserves. “Its pipeline is too diversified and none of its drugs seem to have a true competitive advantage over market rivals at this time,” said the analyst. In other words, Idorsia's financial resources could be used up before the company reaches its profitability threshold. This should be considered a warning for investors, despite the advances that the Basel-based firm has already made.



THE SLEEP DRUG IN TESTING PHASE

Despite its cheerless name, Molecule ACT-541468 is the most promising product in Idorsia's pipeline. This insomnia treatment works by blocking orexin receptors. “Orexin, generated by neurons in the posterolateral hypothalamus, keeps us awake,” says José Haba-Rubio of the Center for Investigation and Research on Sleep at Lausanne University Hospital (CHUV). “So blocking its action facilitates falling asleep.”

This method has a significant advantage over traditional sleeping pills, according to

Idorsia CEO Jean-Paul Clozel. “Sleeping pills work by reducing the speed at which the brain functions, so there's more of a loss of consciousness than just sleep alone.” This new treatment would generate a drowsiness whose structure is closer to natural sleep, with different phases such as deep sleep and Rapid Eye Movement sleep. Another advantage: by blocking the action of orexins, there is less of a risk of addiction than with traditional sleeping pills.

Idorsia began recruiting 1,800 patients in June to con-

duct phase III clinical trials and hopes to publish the first results in late 2019 for a market launch in 2020. Phase II clinical trials, conducted on 360 adult insomniacs, showed that the drug makes patients fall asleep quickly and stay asleep for a normal amount of time, with few instances of waking up in the middle of the night. It also doesn't cause sleepiness the next day. These trials were also conducted on 58 seniors, a demographic that often suffers from insomnia but doesn't tolerate sleeping pills very well.

“While it's true that Idorsia raised 505 million Swiss francs over a few days in July 2018, which is a sign that investors trust the company,” said Altdorfer, “phase III clinical trials are much more expensive than pre-clinical trials.” The expert believes that Idorsia could run out of cash relatively soon. This year, the company is expected to spend 570 million Swiss francs to carry out its projects. Last year, it recorded a loss of 386 million francs. “The amount of financing required to test a diversified pipeline could be challenging for a young company,” Clozel said in February this year.

But Idorsia has some advantages on its side. Deutsche Bank estimates that the revenue generated by the four molecules in phase III clinical trials could exceed 4 billion Swiss francs. Vontobel Bank gave a more conservative estimate, estimating the potential revenue at 2.6 billion Swiss francs. Vontobel fears that Idorsia's flagship drug – to treat insomnia – will suffer from competitors that make generic sleep aids. Vontobel Bank also points out that there is already a similar treatment: Belsomra, developed by Merck.

Marketed in Japan, the United States and Australia, it has not yet

been approved in Europe. And the market is immense: “More than 30% of the adult population suffers from insomnia, and 10% uses a product to help them sleep,” said José-Haba-Rubio of the Center for Investigation and Research on Sleep at Lausanne University Hospital (CHUV).

Idorsia will also establish its own sales force, which should help to maximise the benefits of its scientific discoveries. To launch its insomnia drug, the company is planning a widespread promotion strategy. The campaign will target doctors, patient discussion forums and people who wear smart watches. IDIA

Social responsibility: A NORWEGIAN SUPERPOWER SETS THE TONE

Norway's sovereign fund is worth more than \$1,000 billion, making it the most influential in the world. It has begun to disengage from fossil fuels. Here is its story.

BY ANGÉLIQUE MOUNIER-KUHN

It's no coincidence. On 8 March, Norway announced that its sovereign fund would progressively divest its portfolio of all shares in companies active in producing and exploiting oil and gas. The same day, on Wall Street, energy sector stock on the S&P 500 dropped 2.4%, while the global index fell 0.8%.

The Government Pension Fund Global (GPF), its official name, had already made a similar announcement in 2015, when it divested from coal producers. It's far from the only entity to move away from the fossil fuel industry. According to 350.org – an organisation leading a global NGO campaign to encourage entities to divert their financial capital towards renewable energies – 1,070 institutions collectively worth nearly \$9,000 billion in assets have already announced their divestment. These include local governments, foundations, churches, universities and pension funds.

But none is as powerful as GPF, the largest sovereign fund in the

world, with 9,250 billion Norwegian kroner under management, equivalent to \$1,080 billion. So as not to overwhelm the national economy, the funds are invested completely internationally, with 66% in stocks, 30% in bonds and the rest in real estate. With such power, the GPF holds 1.4% of the global capitalisation and even 2.7% of the Swiss exchange, where it holds 130 positions, including a 4.73% share in Credit Suisse, 2.51% in Nestlé, 3.45% in Valora and 1.43% in Swatch Group.

“When churches and universities move away from coal and oil, that's great; they set the tone morally. But when a player such as GPF announces its divestment, the entire world pays attention and the shock wave spreads to the entire financial community,” said Yossi Cadan, Global Finance Campaign Manager at 350.org. As proof, during a speech at Harvard in late May, Nobel Peace Prize recipient and environmental activist Al Gore used the example of GPF to convince the university's endowment fund (\$39.2 billion) to divest from fossil fuels.

Created in 1990 and operational in 1996, the GPF has a rather misleading name. It's not a proper pension fund, but rather a very long-term savings fund. It is fuelled by oil revenue, with the goal of buffering the impact of oil price fluctuations on Norway's economy and serving as a war chest for future post-oil generations. The central bank of Norway manages the fund on behalf of the Ministry of Finance, which owns the fund on behalf of the Norwegian people.

TV SERIES

There is a real sense of collective ownership among the 5.3 million Norwegians for their “Oil Fund”, as it is commonly known. It's such a part of their lives that last year its name – Oljefondet – was used in a 10-episode TV series. Full of internal sources, the series follows the struggles of a brilliant, successful manager and the bane of his existence – the fund's Council on Ethics.

“The GPF has long supported social responsibility and human rights. It's not a pioneer in socially responsible investing; there were others before it.

But it's the first very large fund to systematically invest in this way, which allowed the fund to grow. Its criteria are the benchmark for other entities,” said Fabio Bertoni, a finance professor at emlyon business school.

The 9,158 companies in which GPF invests are under constant surveillance from the Council on Ethics, created in 2004, which focuses particularly on child labour, environmental concerns and water usage, as well as fiscal transparency. It doesn't matter if the company is a heavyweight. If it doesn't comply with regulations from the Council, the company can be put under review or even excluded from the investment universe. As an example of this intransigence, the eviction of Walmart for “serious human rights violations” in 2006 led to protests from the US government. But the protests were in vain. The retailer is still in purgatory. Tobacco manufacturers were banned in 2010, and in 2018 companies that produced nuclear weapons, such as UK-based BAE Systems, were also banned. In late May, the cannabis industry was ousted from the index.

In total, more than 150 companies are blacklisted, and the entire list can be found on the GPF website.

“When a player such as GPF announces its divestment, the shock wave spreads to the entire financial community”

Yossi Cadan, Global Finance Campaign Manager at 350.org

“The fund is perfectly transparent, which sets it apart from most sovereign funds. It's one of the rare funds that publishes very precise information on its allocations and yields. And as it posts excellent results, it is very popular with investors,” said Jeanne Amar, lecturer at the University of Nice Sophia Antipolis in France. Since 1998, the GPF has generated a gross annual yield of 5.8% (3.9% net of fees after inflation). It was up 9% in the first quarter after losing 6% the year before.

It remains a paradox from which GPF is struggling to escape. In the era of climate change, it is difficult to be seen as a paragon of virtue when its fortune is based on oil. As the 14th largest crude oil producer in the world, Norway is also the third largest exporter of natural gas – resources that make up 21% of the government's revenue. Incidentally, the GPF has justified turning away from fossil fuel producers not to fight climate change, but to reduce the fund's vulnerability to the expected drop in oil prices. “From a financial standpoint, it's perfectly logical to move away from oil in order to diversify risk,” said Bertoni.

But environmental NGOs were very much aware that the divestment was merely incomplete. The fund is keeping integrated oil groups in its portfolio, including giants such as BP and Chevron, on the grounds that they allocate part – even if only a small part – of their investments to renewable energies. “GPF will end up excluding those companies as well,” said Cadan. “It won't have a choice with the climate emergency.”



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DOSSIER

AUTOMOBILES

A FORCED MARCH TOWARDS ELECTRIC

Manufacturers no longer have a choice: if they want to comply with European and Asian standards, they must now market (and sell) electric vehicles. This is an incredible challenge for an industry forced to go green very quickly.

BY BERTRAND BEAUTÉ

The star of the Frankfurt motor show, which opens on 12 September, should have been the Golf 8, the seventh iteration of a success story which began in 1974. But the iconic compact car from the German company was pulled from the red carpet in order to not steal the spotlight from a newcomer – the Volkswagen ID.3. The first in the line of ID electric vehicles, the ID.3 is emblematic of the green revolution happening at Volkswagen. It is the start of a new era. While the German brand already offers electric vehicles such as the e-Golf, this is the first time VW is marketing a vehicle that is entirely designed to be electric. This strategic and marketing challenge is worth delaying the presentation of the new Golf, which will now only run on petrol.

VW won't be the only brand at the Frankfurt motor show to unveil its ▶



A Tesla charging station in Mosjøen, Norway, champion of green mobility. Electric or hybrid cars now account for nearly 60% of registrations.

ISTOCK

electric transition. Porsche will officially present its Taycan, Seat will show off its Mii and Opel will introduce the electric version of its city car Corsa. And there will be others, such as the Honda e, the Japanese giant's first 100% electric vehicle. Audi, Mercedes and Jaguar, which have already rolled out their electric models, will also be present. "Every manufacturer is going electric," said Flavien Neuvy, head of L'Observatoire Cetelem for the auto market. "But not because they believe in the technology necessarily. They are being forced."

Nevine Pollini, analyst at Union Bancaire Privée (UBP), agrees: "The car industry is currently experiencing a major turning point in its history. Go to a motor show and you'll see: all the big names, such as Volkswagen with its ID and Audi's e-tron, are offering complete lines of electric vehicles that will be on the market in late 2019 or throughout 2020. After years of denial, manufacturers finally understood that they no longer had a choice." The reason? Environmental requirements from the European Union and draconian quotas for electric vehicles imposed by the Chinese government.

ASTRONOMICAL FINES

As the leading car market in the world with 28 million new vehicles sold in 2018, China implemented generous tax rebates several years ago for consumers buying a clean car. As a result, sales exploded, reaching 1.3 million cars in 2018, up 62% over one year. Thus far, the market is monopolised by local brands such as BYD (number two in the industry with 230,000 electric vehicles sold last year), SAIC, BAIC and Geely.

"China is ahead of the game in terms of clean cars," said geo-energy economist Laurent Horvath, founder of 2000Watts.org. "In other words, Europe missed the first turn towards electric." What's more, the Chinese government is so sure of its advance and the maturity of the market that in March 2019 it decided to cut rebates for electric vehicles by 50%, before getting rid of them entirely in 2020. "With this regulatory shift, Beijing expects to kill off the lesser manufacturers," explains Pollini. "The fewer incentives will lead to weaknesses among the most fragile players on the market, as well as a wave of concentration." Indeed, the generous tax breaks created a pull

factor where nearly 500 Chinese companies involved in various capacities in this emerging industry went all out in order to benefit from the government incentives.

But even with no tax breaks, western manufacturers will have no choice but to go electric in China. Since early 2019, Beijing requires that at least 10% of vehicles sold by all players operating in China be hybrid or electric, compared to 4% in 2018. This will go up to 12% starting in 2020. If the quota is not met, manufacturers must purchase credits from their Chinese competitors or pay fines. "China is the most dynamic market in the world. It sets the tone for the rest of the industry," said Horvath. "Foreign groups simply cannot escape: they must sell zero-emission vehicles."

"Every manufacturer is going electric, but not because they believe in the technology necessarily. They are being forced"

Flavien Neuvy, head of L'Observatoire Cetelem for the auto market

Renault, which arrived late to the Chinese market in 2016, decided to focus primarily on electric. Starting this autumn, the group will market its Renault City K-ZE, a low-cost 100% electric mini city car that is expected to rival Chinese competitors in terms of price. It's an incredible challenge in an ultra-saturated market where, in addition to local players, western companies are all on the offensive. Ford, for example, launched its zero-emission Territory SUV in the second half of 2019 and expects to unveil 10 electric models in China over the next three years. BMW, Volkswagen and Daimler are also perfecting their plans of attack so as to not get left behind.

AN ENORMOUS CHALLENGE

"Establishing quotas on 'clean' vehicles, similar to what is being done in China, is something that Brussels had envisaged doing before caving in to the pressures of the car lobby," said Bernard Jullien, founder of a ▶



The new Renault Zoe was unveiled in June. The iconic electric city car from the French manufacturer claims a range of 390 km.

VARIOUS TYPES OF ELECTRIC VEHICLES

HYBRID

Made popular by the Toyota Prius, launched in 1997, the "classic" hybrid car, also called a "full hybrid", is a petrol vehicle with a small electric engine and battery. When the car brakes, kinetic energy is collected and stored in the battery. It is then reused when the car starts moving again, so drivers can travel a few hundred meters without using any petrol.

RECHARGEABLE HYBRID

The next evolution of the hybrid is the rechargeable, with a larger electric engine and battery. The battery must be recharged by plugging into the electrical grid. For models such as the Audi A3 e-Tron, the 100% electric mode can achieve a range of around 50 kilometres.

ALL ELECTRIC

100% electric, these vehicles no longer have a combustion engine, which means they emit 0 grams of CO₂. Depending on the model, the battery, which must be recharged on the electrical grid, has a range of 200 to 600 kilometres.

HYDROGEN

While a battery-powered car draws its energy from an accumulator, hydrogen-powered electric vehicles such as the Toyota Mirai use a fuel-cell battery that directly produces electricity onboard using hydrogen. These vehicles, which only emit water, therefore have zero emissions. Their range is also comparable to combustion-powered cars.



THE AMERICAN PARADOX

The old world is digging in its heels. After restarting carbon production, Donald Trump decided to remove incentives to purchase electric vehicles from the 2020 federal budget. The rebates could be up to \$7,500 in the form of a tax credit. The decision will mainly affect Tesla, which sold 145,000 Model 3's in the United States in 2018, as well as General Motors. Nevertheless, Bernard Jullien, found-

er of a car industry research firm, puts the power of the US president into perspective: "The United States isn't just Donald Trump. It's also California." Currently, about 10 US states including California are forcing car manufacturers to reach a sales quota of zero-emission vehicles in their state if they want to sell their vehicles. And Trump can't force these companies to go backwards.

◀ The elegant Volvo XC40 will be available in a 100% electric version next year. The Swedish manufacturer already offers an extensive range of hybrid models.



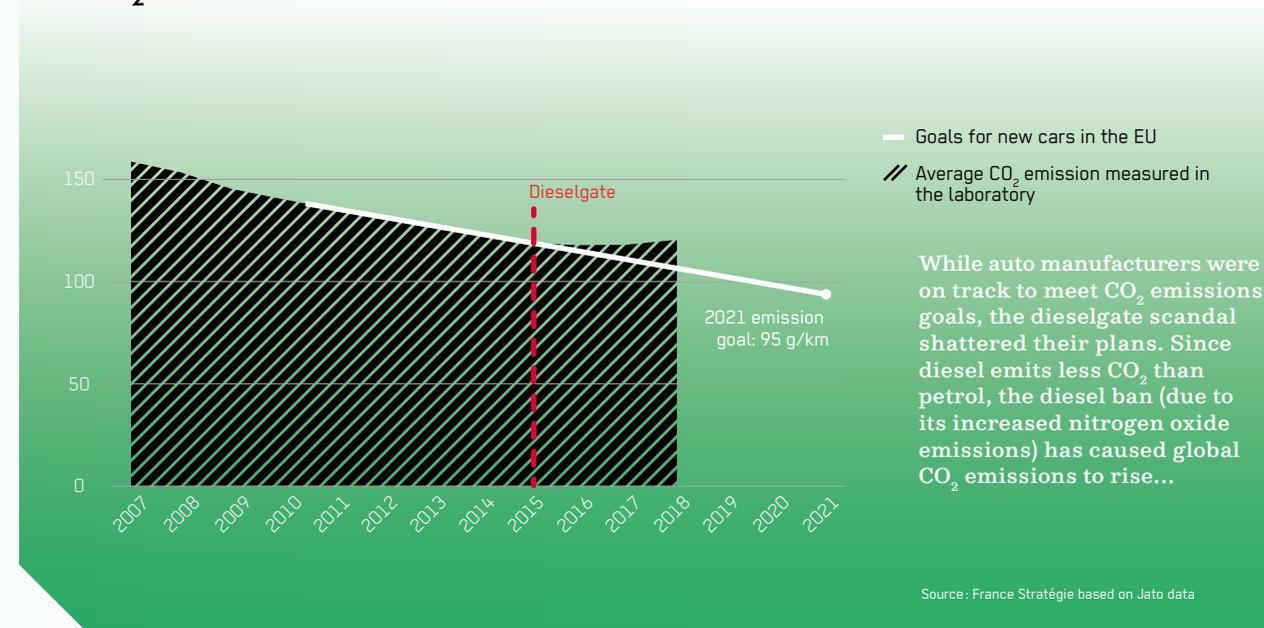
consulting firm studying the car industry. Instead, the European union opted for CO₂ emissions goals. Starting in 2021, manufacturers must indicate average CO₂ emissions of less than 95 grams per kilometre for their fleet of new cars sold in Europe. In 2018, new vehicles emitted 120.5 grams. "It's an enormous challenge," according to the firm Euler Hermes in a study published in May. "It will force manufacturers to reduce their CO₂ emissions by 20% between 2019 and 2020, whereas it took 10 years to reduce emissions by 25% previously."

"If they fail to meet the goal, they could be faced with astronomical fines, as per the 'polluter pays' principle," warned Nevine Pollini, analyst at UBP. "Each gram of excess CO₂ will cost €95, multiplied by the number of cars sold in the EU." According to figures from research group Jato, if nothing changes from 2018 to 2021, penalties could be as high as €3.24 billion for Fiat Chrysler, €3.6 billion for Renault and €9 billion for European leader Volkswagen. In total, fines could exceed €34 billion! As a result: "The main threat weighing on the car industry isn't Brexit or any potential US customs duty, but rather EU regulations limiting CO₂ emissions," wrote Euler Hermes in its study published in May.

How did the car industry reach this tax impasse without predicting such a situation? "When the 95-gram limit was imposed on manufacturers in 2013, it didn't seem like an impossible target given the incremental improvements in combustion engines," said Nicolas Meilhan, scientific advisor and transport specialist for France Stratégie, a department reporting to the French Prime Minister. "And in fact, up until 2015, all the groups seemed off to a good start and set to reach the target by 2021." And then dieselgate happened...which was a major step backwards.

In the 2000s, most manufacturers were counting on diesel to reduce

CO₂ EMISSIONS: THE DIESELGATE EFFECT



their greenhouse gas emissions – since diesel emits an average of 20% less CO₂ per kilometre than petrol. At the time, even Porsche – which typically steered clear of diesel – gave in, launching the Cayenne TDI in 2009. But everything changed in 2015, when the fraudulent engine scandal orchestrated by Volkswagen broke (see article on p. 35).

Many European cities announced they would limit the number of diesel cars

Following the scandal, many European cities such as Paris, Berlin, Madrid and Rome announced they would limit the number of diesel cars that generated the most pollution in the cities. As a result, the market for new diesel cars slumped. Correlated with the increased interest in SUVs, which shows no signs of stopping, the disavowal for diesel motors caused CO₂ emissions to rise. Now, the 2021

target of 95 grams of CO₂ seems difficult to attain. It could even be impossible for the companies that generate the most pollution. "It's our goal, but we can't guarantee we'll be there in 2021," said Dieter Zetsche in 2018. The former CEO of Daimler Mercedes resigned in May this year.

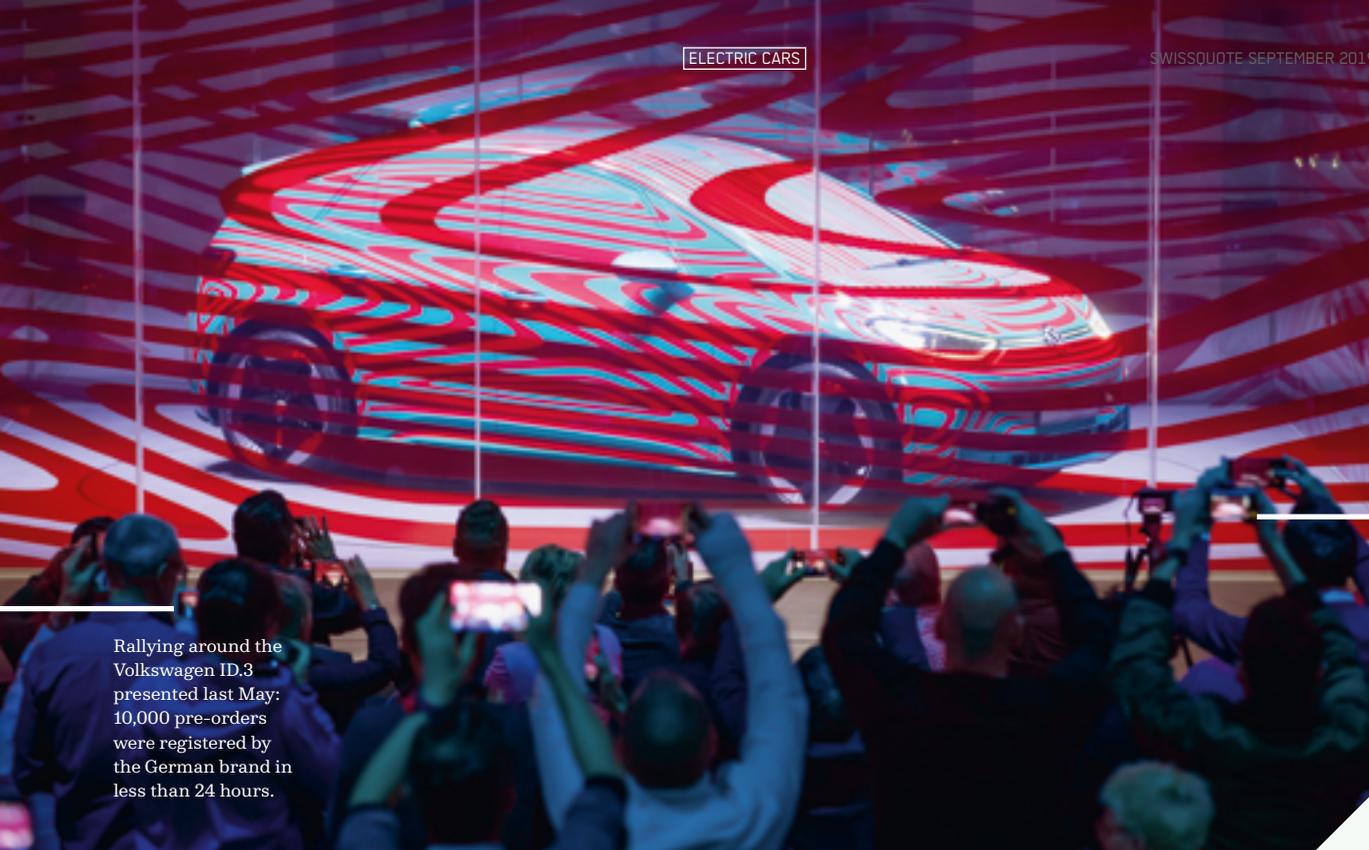
220 NEW MODELS

To tackle the challenge, manufacturers have admittedly limited options. "Some companies will have to retire models from their range that generate too much pollution," said Pollini. "Others could simply leave Europe to escape the fines. This is the approach taken by US group General Motors, which sold its European brand Opel/Vauxhall to Peugeot in 2017. But most have decided to commit to the electric revolution at top speed, before the 2021 deadline.

"By 2021, 220 new low-emission models (electric and hybrid) will be available in Europe, compared to 70 in 2018," said Rémi Cornubert, senior partner specialising in mobility at the firm Advancy. "There's no doubt about it, the stage is set for an

inevitable electric boom." Among the new models are the second-generation Renault Zoe, the Peugeot e-208, the DS3 Crossback e-Tense, the Volkswagen ID.3, the Porsche Taycan and the upcoming BMW iX3 and Volvo electric XC40. The Audi e-Tron and Mercedes EQC are already on the market. Even Toyota, which has only designed hybrids thus far, has drafted an aggressive plan. On 7 June, the Japanese manufacturer announced that it has moved up its target date from 2030 to 2025 to sell 50% electrified models around the world and unveiled a large range of battery-powered vehicles.

This forced march, both in Europe and China, is a real electric shock to major industry players, forcing them to overcome technical and economic challenges in a limited amount of time. "Manufacturers are up against what I call the 'CO₂ wall'," said Flavien Neuvy. "They must invest giant sums of money to develop their fleet of electric vehicles, while the market share of these vehicles is still minimal (ed. note: approximately 2% of registrations in Europe in 2018)." ▶



Rallying around the Volkswagen ID.3 presented last May: 10,000 pre-orders were registered by the German brand in less than 24 hours.

In November 2018, for example, Volkswagen announced it would invest nearly €44 billion in electric vehicles and new mobility services by 2023. Ford promised to put \$11 billion on the table to launch 16 completely electric models and 24 hybrids by 2022. In total, the major manufacturers will invest \$300 billion to develop electric vehicles over the next five to 10 years. Nearly half of these investments will go to China, according to figures from Reuters in January 2019. Volkswagen will assume one-third of this amount (\$91 billion).

MERGERS ON THE HORIZON

For the car industry, these expenses are coming at the worst time. According to a study from firm Alix Partners published in June, global production will only reach 90 million vehicles in 2019, compared to 93 million in 2018, representing a 3.2% drop. This slump will be followed by a period of sluggishness and production levels aren't expected to exceed 2018 figures until 2022.

"For some companies, it will be difficult to reach those levels," said Pollini. "Volkswagen is in good standing and can take on the necessary R&D expenses. But other companies will have to merge or create joint ventures in order to reduce development costs. For investors, this uncertainty results in some difficult choices. No one knows who will win and who will lose in the electric revolution."

"For some companies, it will be difficult to reach those levels"

Nevine Pollini, analyst at UBP

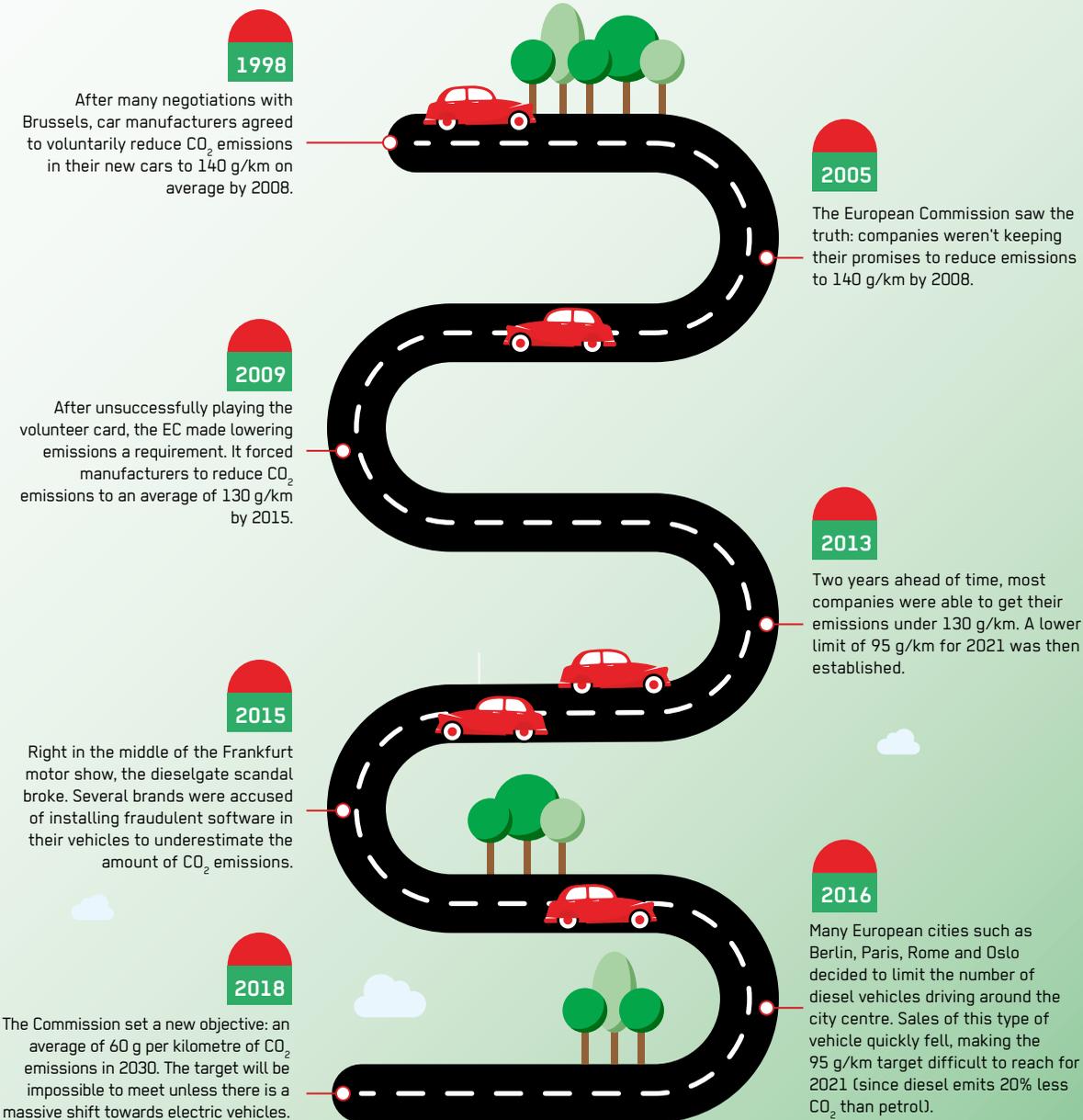
For example, after years of underinvestment, Italian-American group Fiat Chrysler (FCA) is urgently seeking a partner to tackle the EU CO₂ standards. The failed merger in June 2019 with Renault, Europe's electric

leader, was the start of a wave of alignments or at least an increased number of partnerships to share the burden of innovation.

In the meantime, companies are advancing based on what they can afford. PSA Group (Peugeot Citroën), whose investments in electric are below \$1 billion, is continuing to adapt combustion engines. Announced with great fanfare, the e-208 is no more than a petrol-powered Peugeot 208 in which batteries and an electric engine replace the petrol turbine. "The electric revolution has taken PSA a bit by surprise," said Bernard Jullien, a fine connoisseur of the industry.

In contrast, VW has grand ambitions. The Wolfsburg giant hopes to sell 22 million "clean" vehicles by 2028, with 70 completely electric models and 30 hybrid models, for its brands Volkswagen, Seat and Skoda. To do so, the German company inaugurated the MEB (Modularer Elektrobauplasten) electric modular platform in 2019 in its Dresden "glass factory", also known as the "anti-Tesla

HOW EUROPE TOOK A TOUGHER STAND



The Mission E, unveiled by Porsche in 2015, gave birth to the Taycan series model. This highly anticipated 100% electric sedan will be officially presented at the Frankfurt Motor Show in September.





With the new Peugeot e-208, announced at the beginning of the year, the French brand joins the ranks of general-purpose manufacturers in the offensive on the electric market.

er demand for electric vehicles. None. European consumers aren't ready to take the risk and go 100% electric because the infrastructure isn't ready yet and resales are unknown."

Electric and hybrid vehicles make up nearly 60% of new vehicle registrations in Norway, but that is because the government heavily penalises other forms of propulsion. Owners of an Audi Q7 are taxed €20,000, whereas buyers of electric vehicles can receive rebates. Everywhere else, there are fewer incentives, and the market share for "clean" vehicles is stuck below 5%.

"2020 will be the breakthrough year," said Rémi Cornubert from consulting firm Advancy. "Either the increased offer will lead to real change in the market, or all manufacturers will need to go back to hybrids and push to reduce emissions of combustion engines. In my opinion, electric vehicles are a pipe dream. In 2020, there will be far too many models and not enough consumers." Nevine Pollini of UBP has a different opinion: "Thus far, the adoption of electric vehicles has been faster than analysts have anticipated. Barriers to purchase, such as price, autonomy and lack of infrastructure, are starting to fall." ▲

factory". This is where vehicles from the ID range will be made, such as the ID.3.

Volvo, owned by Chinese group Geely, even went one step further, announcing in July 2017 that it would no longer produce vehicles with only combustion engines as of 2019: all new cars will now be either hybrid or 100% electric. "This is the historic end of vehicles equipped with only a combustion engine," confirmed Håkan Samuelsson, CEO of Volvo.

Now the hope is that car buyers will convert en masse to zero-emission

vehicles. Thus far, rechargeable electric and hybrid vehicles only made up 2% of global sales, for a total of 2 million cars sold in 2018, according to Jato. The numbers don't justify the massive investments. "This is the major issue that the entire car industry is concerned about," said Neuvy. "Authorities are forcing manufacturers to produce electric vehicles, but for the time being, consumers don't want to go to electric. They prefer combustion engine SUVs. Will that change in the years to come? I have no idea." During a round table organised in June 2019, BMW's director of R&D Klaus Fröhlich made waves by saying: "There is no consum-



FIAT CHRYSLER'S LITTLE TRICKS

With an average of 125 grams of CO₂ emissions per new vehicle in 2018, Fiat Chrysler (FCA) is far from the European target, set at 95 grams by 2021. The Italian-American brand knows it won't make the cut. But rather than resign itself to a gigantic fine, currently estimated at more than €3 billion, FCA found a loophole in the Brussels legislation. The group signed an agreement

with Californian brand Tesla, which makes 100% electric vehicles, that will take care of FCA's excess CO₂. Mike Manley, CEO of Fiat, expects to pay approximately €1.8 billion over the next three years to Elon Musk's company, so that FCA can include Tesla's zero-emission vehicles in its CO₂ averages. This will systematically lower FCA's own average emissions. Credits from Tesla are

expected to help FCA achieve its 15% reduction target for 2021. Truth be told, Fiat-Chrysler and Tesla aren't the only companies doing this sort of business. Non-virtuous Mazda, whose fleet emitted more than 135 grams of CO₂ per kilometre in 2018, announced it would partner with Toyota to also create a "pool", as it is known in Brussels. Legal? Yes. But it goes against the spirit of the law.

DIESELGATE THE COST OF LIES

Dieselgate has tarnished the automotive industry's image. Its lobby, once so powerful, has lost a great deal of its former influence in Brussels in a political reversal that has hit the industry hard.

BY BERTRAND BEAUTÉ

“Operation US 07”. This could well be mistaken for the title of a James Bond film – but in fact, it's the name of a 2006 Volkswagen project. Then, the company was working on a new diesel engine that would meet US emissions standards, which were stricter than Europe's. The aim? Conquer the west, armed with TDI engines. The operation was a success. In November 2008, the Jetta TDI was named “Green Car of the Year” at the Los Angeles Auto Show. The immense honour also represented the first time a diesel engine had received this distinction. Volkswagen, seizing the opportunity, immediately launched its “TDI Clean Diesel” campaign.

Thus the myth of clean diesel was born. It would last until 2014, when American engineers decided to test the emissions of a selection of cars. In the labs, the vehicles passed the tests exceptionally. Yet, on the roads and in real conditions, the results were alarming. The engines emitted between five and 35 times as much nitrogen oxide (NOx) as standards permitted. In September 2015, VW admitted to installing software on 11 million vehicles, across the Volkswagen, Audi, Seat, Skoda and Porsche brands, with the aim of cheating the pollution tests conducted in labs.

Several developments have since come to light. In January 2018, the *New York Times* revealed that VW had forced monkeys to inhale exhaust fumes, to prove the safety of

its diesel engines – yet the results were so dire that the firm hid them. Months later, the European Commission opened an inquiry against BMW, Daimler and VW. It accused the three of reaching an agreement (2006 to 2014) to delay the rollout of emission-reducing technologies.

CORPORATE BLACKMAIL

Aside from the financial aspect – VW paid a fine of \$4.3 billion in the US – the manufacturers found themselves obliged to manage the indirect, but lasting, consequences of these scandals, the most noteworthy being a profound crisis of trust. Angela Merkel, for example, nicknamed the “Chancellor of Cars”, had been comfortable welcoming the sector's leading figures to her office, conversing with them on a first-name basis. Such displays of closeness now draw considerable criticism – and Merkel's door is no longer open. “European emissions policies were once created in collaboration with manufacturers,” recalls Bernard Jullien, founder of a consultancy and research firm focusing on the automotive industry. “Not any more. Dieselgate was a tsunami that brought back with it the old patterns of influence.”

When manufacturers later fought for the reductions in CO₂ emissions to be limited to 15% by 2030, Brussels paid no attention. In December, the European Parliament opted for a more ambitious objective: a 37.5% reduction in CO₂ emissions by 2030, or

60 grams per kilometre. “Manufacturers don't have the same influence they once had,” adds Jullien. “They're no longer being listened to – after all, they lied.”

To restore their image, key players have turned to the electric market. “Were it not for dieselgate, Volkswagen would never have turned to electromobility so quickly,” says Philippe Vangeel, secretary general of the European Association for Electromobility. Still, the automotive lobby hasn't abandoned the idea of saving diesel and petrol. “Even while launching zero-emission vehicles, manufacturers continue to fight to curb the tightening of environmental regulations,” says Laurent Castaignède, author of *Airvare ou la face obscure des transports* [*Airvare, or the Dark Side of Transport*]. In an interview with *Le Figaro* last March, Carlos Tavares, chairman of the European Automobile Manufacturers Association, denounced the “diktat” from Brussels: “The European Parliament's vote is a vote against European industry [that] puts the 13 million people who work in our sector at risk.”

“The automotive lobby has continued to engage in corporate blackmail to try and save diesel fuel,” says Jullien. “But Europe won't go back on its decisions.” Especially as Volkswagen isn't the only one to have engaged in such fraud – PSA, Fiat Chrysler and Renault are all suspected of rigging their engines and are subjects of a judicial inquiry. ▲

BATTERIES: THE NEW CORE OF VEHICLES

While combustion engines have been the primary added value of vehicles for several centuries, electric models are changing the game. Performance in these cars comes from the battery.

BY BERTRAND BEAUTÉ

“The next generation of batteries, likely launching next year, will be developed to have a life expectancy of 1.6 million kilometres.” In April, Elon Musk confirmed that all future Teslas will achieve unprecedented performance. Of course, the CEO of the Californian company often makes dramatic announcements. But make no mistake: since the very start, batteries have been at the core of Tesla’s revolution. And for good reason. “In an electric car, the majority of the performance comes from the battery,” said Rémi Cornubert, mobility specialist at Advancy. “The battery determines the price, range, lifespan and recharging speed of an electric vehicle.”

So going electric requires a paradigm shift. “Traditionally, car manufacturers focused first and foremost on engines. Engines were ranked based on their power, consumption and turbine performance,” said Nevine Pollini of UBP. “But in electric cars, the engine is a very simple element that doesn’t

stand out.” The battery is what really matters. The vital components of cars are now the business of electrochemists. But manufacturers don’t have these skill sets in their internal teams.

While manufacturers do have to purchase their battery cells from other companies, they still want to control the assembly in battery packs

To obtain this expertise, electric pioneers have forged alliances with battery manufacturers. Tesla and Toyota have partnered with Japanese group Panasonic, while Nissan has joined forces with fellow Japanese compa-

ny NEC, and Renault is supplied by South Korean firm LG. While manufacturers do have to purchase their battery cells from other companies, they still want to control the assembly in battery packs. “Even if it’s a restricted area, packaging is a major challenge,” said Cornubert. “So manufacturers are fighting on this front to increase battery performance and offer added value.” Tesla is particularly cutting-edge in terms of assembling battery cells (integration, electrical connectors, cooling systems, battery management electronics, etc.), which explains its advance in terms of autonomy and life cycle.

A CHINESE RISING STAR

In the industrial battle to build the best battery, China has worked incredibly hard to catch up to giants from South Korea and Japan. And it saw results rather quickly. Driven by its domestic market, CATL became the world’s top battery manufacturer for cars in 2017, ousting

Japanese brand Panasonic, and is expanding to international markets. A contract signed in 2018 between BMW and CATL is proof that Chinese technology is now very close, if not equivalent, to Korean and Japanese products. And it is definitely less expensive. “Chinese players control the entire battery supply chain, particularly cobalt mines and access to rare metals, which allows Chinese companies to maintain low prices,” said Cornubert. Nearly 80% of the cobalt used in batteries is refined in China and seven Chinese firms are now among the top 10 companies in the industry worldwide (see infographic below).

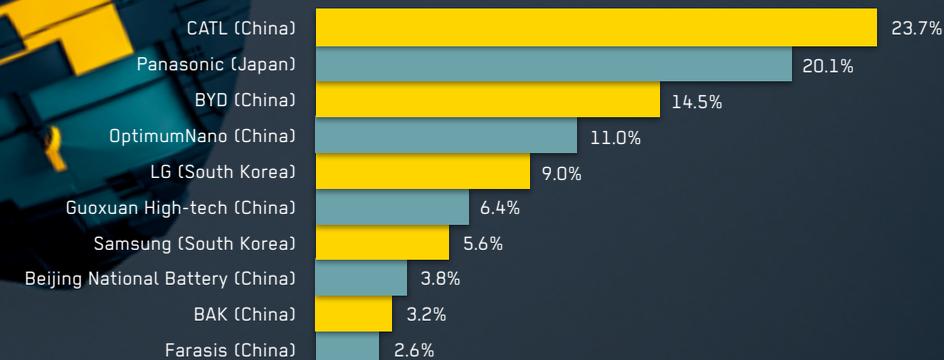
For car manufacturers, this dependence on Asian suppliers is problematic. In 2018, for example, battery shortages burdened sales of Renault’s Zoe and Tesla’s Model 3. But the loss of earnings is the true concern. According to various estimates, batteries make up 20% to 30% of the price of an electric vehicle. So most of the revenue generated by increased electric vehicle sales could fall into the hands of Asian electrochemists. “If car manufacturers abandon batteries, the body and

aura will be all that’s left of these cars,” said Pollini.

Indeed, after playing a waiting game for many years, car manufacturers are now fighting back. In May, Volkswagen, whose current supplier is CATL, announced it would invest nearly €1 billion to manufacture its own battery cells at its factory in Salzgitter, Germany. “We cannot become dependent on a few Asian manufacturers over the long term,” said Herbert Diess, CEO of the Wolfsburg-based group. The German company also purchased a stake in Swedish start-up Northvolt, which in August began construction on a production plant in Skellefteå to produce 16 GWh lithium-ion batteries. Large-scale production is expected to begin in early 2021.

Tesla, which has a tense relationship with its supplier Panasonic, also decided to manufacture its own battery cells, according to information from news channel CNBC. PSA and Opel are expected to participate in the “Airbus for batteries” project, officially launched in May by Paris and Berlin, in order to reduce European dependence on Asian suppliers. ▽

TOP 10 BATTERY MANUFACTURERS FOR VEHICLES (market shares)



Source: RealLi Research



INTERVIEW

“THE WEIGHT OF COMPONENTS IS AN IMPORTANT FACTOR”

Autoneum is the global market leader in acoustic and thermal management for vehicles. As the head of the R&D department, Maurizio Mantovani explains the transformations currently under way across the industry.

BY LUDOVIC CHAPPEX, PHOTOS: NICOLAS RIGHETTI

From the outside, the site features a stark-looking hangar and a few buildings that resemble more of a barracks or a school. Despite its appearance, this is where Autoneum invents the high-tech future of the automobile. At these unassuming headquarters located in Winterthur, the Swiss company – the global leader in acoustic and thermal management solutions for vehicles – develops new materials and products for nearly all car manufacturers around the globe. While industrial-scale production takes place at the group’s many factories, the Zurich-based lab acts as a life-size testing ground, packed with the latest technology. The Italian-born Maurizio Mantovani, who leads the unit, received us for an interview.

In terms of sound and thermal insulation, what new challenges do you face with electric cars?

Electric vehicles are different in several ways. First of all, contrary to popular belief, they are not always silent. After a certain speed, aerodynamic and tyre noise – not engine noise – is most noticeable in a modern premium car. Drivers of electric vehicles like the silence at low speeds, and are often surprised by the noise created at higher speeds. They’re also more sensitive to noise caused by braking or air conditioning, for example.

What solutions have you developed for electric cars?

For example, we use new materials to encapsulate the electric powertrains, which generate less vibration and heat than internal combustion engines. The materials can therefore be lighter and tuned to the unpleasant high sound frequencies typical of this type of propulsion that need to be filtered.

The weight of components is an important factor, more so than for internal combustion engine vehicles. High weight reduces the car’s range, which is already limited in an electric car. These innovations actually also benefit x-cars powered by internal combustion engines. For instance, to reduce tyre noise, we’ve recently launched an ultra-light-weight textile wheelhouse outer liner called Alpha-Liner.

“We’ve already started exploring very futuristic solutions based on biomaterials”

Do you work with tyre manufacturers?

Absolutely. The challenge is difficult for them because reducing noise and optimising the tyre’s adherence to the road and its durability are contradictory objectives. Tyre makers have to find the best compromise between safety, road handling, durability and acoustic comfort. That’s why you can’t sell a tyre that doesn’t make any noise. Tyre manufacturers are working to reduce this noise at the source, and we’re working to contain it as best we can. So it’s in our interest to work with them on these issues, as well as with carmakers.

What areas of innovation are you currently working on?

In addition to continuing to reduce

noise from the road with absorbing and insulating components in the interior and under the floor of the car, we are developing solutions to encapsulate the powertrain even more effectively. Both areas are key to reducing exterior noise, which is regulated by laws that are becoming stricter and stricter.

Environmental sustainability of our materials is another key area. We offer a number of fully recyclable parts and plan to replicate this approach for different product ranges. In fact, we’ve already started exploring very futuristic solutions based on biomaterials. Already today, we are renowned for our multifunctional components that combine sound and thermal insulation. Our most lightweight sound-absorbing textile parts are also effective thermal insulators. Working on this type of solution kills two birds with one stone and significantly reduces weight, thereby lowering fuel consumption and CO₂ emissions as well as improving driving range. This is crucial particularly for e-cars, because in situations of extreme temperatures, up to 25% of the energy from the battery in an electric car goes to heating or cooling.

What progress is being made in the automotive industry to develop new acoustic and thermal insulation technologies?

Enormous progress has been made over the past few decades, and in every area. Advances are made constantly. Acoustic comfort in cars continues to improve.

Isn’t there a point where gains become only marginal?

The curve tends to flatten out slightly, but that’s the case for many areas of technology. In the 1970s and 1980s, the leaps forward were ▶

huge, because we were starting almost from scratch. When Autoneum came out with ultra-light components in 1998, it revolutionised everything. Before that, sound insulation was always achieved with heavy materials similar to rubber. The idea was to design a “wall” protection that was as airtight as possible to keep noise outside the vehicle. But the engineers realised that this wasn’t always the most efficient approach because there were always gaps, needed for assembly. So we allowed some reduction in insulation to focus more on the best way to absorb sound. That’s what we’re working on constantly improving since then.

Are improvements due more to materials used or to manufacturing processes?

Materials are only one part of the equation. Upstream, we use specialized simulation tools we have developed to better understand and control the physics of wave and heat propagation and vehicle acoustics and vibrations. Moving forward, we can develop innovative production technologies and increasingly effective materials. What we call “design methodology” is also a very important aspect in our work. It’s not just about having the best technology, but also using it in the most relevant way possible in each vehicle.

How do you work with carmakers? And at which step in the process of designing a new model do you come in?

We have long-term partnerships with our customers. Usually, vehicle manufacturers approach us before the development of a new car, to jointly evaluate acoustic components in the pre-development phase. This dialogue is crucial for achieving breakthrough innovations and revolutionary new approaches.

How do you deal with the uncertainty of developing electric



Holder of a doctorate in acoustical and vibratory phenomena, the Italian Maurizio Mantovani joined Autoneum in 1998, after a 9-year stint at the FIAT Research Center. He has been leading the R&D department of the Swiss group since 2013.

cars? This market transformation requires huge efforts in R&D, even though only 2% of the global vehicle fleet are electric vehicles.

That’s why we don’t focus our attention only on electric vehicles (EVs). Although it’s growing, the EV market is not going to suddenly take over the market for internal combustion cars. The transition will be gradual, and it will take time. That’s also good for car manufacturers. Some choose to develop platforms that can be used to make different types of engine – from internal combustion

to hybrid, plug-in hybrid, to electric, where common components can be adopted.

We don’t think that internal combustion engines will disappear within the next 10 or even 20 years. Hybrid vehicles still have a good many years to go.

You announced that you considerably upgraded your R&D centre last year. What type of improvements have you made?

Among others, we have modernized the material-testing laboratory.

There, new technologies and components are being examined and validated – including substances that absorb unpleasant odours inside the vehicle and thus improve air quality. This is key for shared and also private mobility, particularly in China. Chinese customers especially are very sensitive to the smell of plastic, which they associate with chemicals. This area of research didn’t exist 10 years ago, and we’ve invested a lot in it, in terms of both skills and equipment.

What sets Autoneum apart from its competitors?

We’re different in many ways. One very important aspect is that we’re clearly the global market and innovation leader in our product segment. Our customer base covers practically every car maker in the world. One car out of three worldwide is equipped with an Autoneum component. That means collecting a huge amount of feedback from our customers, synthesising it and constantly staying on the cutting edge of innovation. We also offer a broader product range for all types of drives than some

of our competitors, which typically focus on only one or two products. Furthermore, we develop measurement systems which are industry benchmark and used by carmakers and competitors alike. For example, we recently launched a measurement system called “Carpet Cleanability Analyzer”, which manufacturers use to test their carpet texture to make cleaning as easy and effective as possible.

In 2017, you opened a new R&D hub in Sunnyvale, in Silicon Valley. What is the purpose of that centre?

The “Competence Center New Mobility” facilitates contact with companies based in Silicon Valley. Particular focus lies on projects that examine the use of new technologies and innovative materials – for example bio-degradable materials – for noise and heat protection. Companies there are more inclined to explore unprecedented solutions, e.g. in areas such as biotechnology or specific solutions for robo-taxis. They’re more willing to accept the risk that comes with innovation.

In exchange, we benefit from their input.

Your list of customers is impressive. Nearly all carmakers are on it. But not Tesla, even though they’re based in Silicon Valley...

Tesla produces in California where we do not operate a manufacturing site. But this does not mean that Tesla will never benefit from our products, let’s see. However, today we already equip most of the electric vehicle models globally available for EV carmakers such as Renault, Nissan, Audi and the new Chinese manufacturers Nio and Aiyaws.

What are the advantages of keeping your R&D department in Switzerland?

We can attract talents from many countries around the world. The research environment is very stimulating in the Zurich region, especially with ETH. Furthermore, having our R&D centre based at the company’s headquarters also helps us stay in close contact with the top management. ◀

LACKLUSTRE MARKET

FOUNDED
2011 (SPIN-OFF OF
RIETER GROUP)

HEADQUARTERS
WINTERTHUR

EMPLOYEES
12,946

2018 REVENUE
CHF 2.28 BN

CAPITALISATION
CHF 470 M

— AUTN

With its undisputed global leadership, abundant R&D budget, lightweight and recyclable products geared up for the electric revolution, and 55 production sites worldwide delivering to all markets, Autoneum has a lot of advantages on its side. Nearly all car makers feature among its customers. But the Winterthur-based firm is grappling with a sluggish economy, amid declining global car production. On top of the overall market slowdown, production problems at two of the group’s US plants – in South Carolina and Indiana – have affected performance over the past few months. Although these

issues are seemingly on their way to being resolved (revenue in local currencies for the first half of the year rose 1.9%), the company aims to substantially improve its earnings in 2020 and return to sound profitability levels by 2021. Meanwhile, analysts are taking a wait-and-see attitude. “Autoneum has invested heavily in new sites (ed. note: especially in China), at a time when the global market downturn is hitting home,” notes Torsten Sauter from Kepler Cheuvreux. “In this kind of environment, the group will have to demonstrate that it can maintain its margins and cash flow.”

THESE COMPANIES HAVE GONE ELECTRIC

In 2030, one out of every two registered cars will be electric, according to estimates – quite the incentive for industry companies. We feature some of the best.

BY BERTRAND BEAUTÉ

"Semi", the electric lorry unveiled by Tesla in 2017, is expected to be marketed next year.

TESLA

Tesla: the blaster

There are few companies as divisive as Tesla for analysts. For some, Tesla is just a bubble on the verge of bursting. For others, Elon Musk is developing products that will change the world, like Apple with its iPhone. It's therefore difficult for investors to form an informed opinion. On the one hand, the Palo Alto manufacturer sold more than 245,000 vehicles in 2018, including nearly 150,000 Model 3s, which is double the amount sold the previous year. "To put our growth into perspective, we sold almost as many cars in 2018 as we did in all other previous years combined," said Tesla in a press release. "I never had a lot of faith in Tesla, but it seems like the company has crossed the valley of death," said Nicolas Meilhan, car specialist at France Stratégie. "With production reaching 90,000 vehicles per quarter, the company could become profitable."

On the other hand, Tesla's profits are not so appealing. After recording a loss of \$702 million in Q1 2019, and \$408 million in Q2, Tesla, which has almost never had a profitable quarter, still has \$5 billion in the bank. The group still plans to spend \$2.5 billion this year to develop new models – starting with a lorry and the Model Y, an SUV. To boost its capital, Tesla raised \$2.7 billion in early May. This is because the troublemaker of the car industry can't halt its R&D efforts: as a long-time pioneer of

high-end electric vehicles, Tesla is now faced with competition, particularly German companies, which are preparing for war. The company will soon be up against prestigious rivals such as Porsche, Jaguar and BMW (see also p. 61). This could be concerning for investors. Traded at around 350 Swiss francs in January 2019, Tesla's share price is now worth about 240 francs. "Tesla is losing its advantage as a first mover," said Nevine Pollini, analyst at UBP. "Faced with competition from industry heavyweights, like Volkswagen, the brand could suffer."

FOUNDED
2003

HEADQUARTERS
PALO ALTO (US)

EMPLOYEES
45,000

2018 REVENUE
\$21.5 BN

CAPITALISATION
\$40.7 BN

— TSLA

AND LET'S NOT FORGET...

ABB:

HEAD OF THE CHARGE

One of the Swiss group's many activities is producing charging infrastructure for electric vehicles. With more than 6,500 rapid charging stations installed in 60 countries, ABB is the global leader in this segment.

FOUNDED: 1891

HEADQUARTERS: ZÜRICH (CH)

EMPLOYEES: 147,000

2018 REVENUE: CHF 27.7 BN

CAPITALISATION: CHF 39.5 BN

— ABBN

ALBEMARLE:

KING OF LITHIUM

The demand for lithium, the metal used to make Li-ion batteries, could quadruple by 2025. This is great news for US-based Albemarle, top global producer with a 30% market share.

FOUNDED: 1994

HEADQUARTERS: CHARLOTTE (US)

EMPLOYEES: 5,400

2018 REVENUE: \$3.4 BN

CAPITALISATION: \$7.9 BN

— ALB

BORGWARNER CONVERTS TO ELECTRIC

Known for its transmission systems, gearboxes and turbochargers, BorgWarner is now going electric. The US car supplier is now developing propulsion systems and engines for hybrid and electric vehicles.

FOUNDED: 1880

HEADQUARTERS: AUBURN HILLS (US)

EMPLOYEES: 29,000

2018 REVENUE: \$10.5 BN

CAPITALISATION: \$8.4 BN

— BWA

French President Emmanuel Macron visits the Faurecia booth at the last Paris Motor Show (3 October, 2018).

Faurecia: perfectly positioned

The French group posted solid results in 2018, with a profit of €701 million, up 17% compared to 2017. Faurecia owes its financial good health to its booming “Clean Mobility” business. The company sells a range of battery packs and battery housing solutions for rechargeable electric and hybrid vehicles. It is also expanding its offer to include battery combustion management, and as a result becoming a competitor of Swiss company Autoneum. In March 2019, Faurecia also created a joint venture with Michelin to invest in the fuel cell industry. Its other business lines (seats and cabin interiors) aren't expected to slump with the decline of combustion vehicles. Currently, one out of every three cars sold includes Faurecia products. Most analysts recommend purchasing shares.

FOUNDED
1997

HEADQUARTERS
NANTERRE (FR)

EMPLOYEES
122,000

2018 REVENUE
€17.5 BN

CAPITALISATION
€6.1 BN

— SU

CATL: the king of batteries

It's a hidden champion, well hidden under the bonnet of vehicles. In 2018, Chinese company Contemporary Amperex Technology Ltd (CATL) became the global leader in car batteries, ahead of rivals from Korea (LG Chem), Japan (Panasonic) and China (BYD). It was a dazzling ascent. Founded only eight years ago, CATL has specialised in electric vehicles from the very beginning, at a time when the market had only a few hundred models sold per year in China. The bet paid off. In 2015, Beijing launched the “Made in China 2025” plan, making electric vehicles a national priority. Buoyed by incentives, sales took off and so did CATL.

In 2018, the company very successfully went public on the Shenzhen exchange: shares immediately shot up 44%, the maximum increase authorised during the first day a company is listed. And CATL isn't planning to stop there. Thanks to the funds raised during its IPO, the group expects to triple production between 2018 and 2020. To do so, construction is underway on a giant battery factory in Erfurt, Germany, close to major European car manufacturers. After successfully conquering its domestic market with batteries that were cheaper than the competition, CATL is now making waves internationally as a result of its quality products. Volkswagen, PSA, Nissan, Daimler and BMW all purchase their batteries from this new giant. Compared to the competition, CATL also benefits from its position as a battery pure-player, whereas China's number two, BYD, which also makes vehicles, has generated distrust among other western manufacturers.

FOUNDED
2011

HEADQUARTERS
NINGDE (CN)

EMPLOYEES
25,000

2018 REVENUE
CN¥ 29.6 BN

CAPITALISATION
CN¥ 166.4 BN

— SU

SCHNEIDER: RECHARGING AT HOME

The French specialist in energy management products is creating charging stations for homes, which can be installed in garages or outside the house. This is a small business line for the group, but it has high potential.

FOUNDED: 1871
HEADQUARTERS: RUEIL-MALMAISON (FR)
EMPLOYEES: 142,000
2018 REVENUE: €25.7 BN
CAPITALISATION: €43.3 BN

— SU

BYD: THE DIVERSIFIED GIANT

Little known in Europe, BYD is an electric pioneer. In 2018, the company sold 225,000 low-emissions vehicles (electric and rechargeable hybrids). It also produces a significant number of batteries. BYD has attracted the interest of Warren Buffett himself.

FOUNDED: 1995
HEADQUARTERS: SHENZHEN (CN)
EMPLOYEES: 220,000
2018 REVENUE: CN¥ 130 BN
CAPITALISATION: CN¥ 129.5 BN

— 002594

BP: THE END OF THE OIL KING

In 2018, the oil giant acquired Chargemaster, the largest network of charging stations in the United Kingdom, and invested \$20 million in StoreDot, the Israeli manufacturer of ultra-fast battery chargers. BP is making strategic moves at a time when its main competitors, like Total and Shell, are taking the same approach.

FOUNDED: 1909
HEADQUARTERS: LONDON (UK)
EMPLOYEES: 73,000
2018 REVENUE: \$303.73 BN
CAPITALISATION: \$132 BN

— BP

STMicro running on electric

"Electric vehicles contain more electric parts, notably to manage power to the battery," said Julien Leegenhoek, tech stock analyst at UBP. "Companies active in this field will likely profit from increased electric vehicle sales." These include French-Italian group (based in Switzerland) STMicroelectronics, which produces silicon carbide chips. Compared to traditional silicon which is used for most electronic chips, silicon carbide is used to make chips that allow the battery to last longer. As a result, the chips prolong the range of electric and hybrid vehicles.

Currently, STMicro only generates \$100 million in revenue with its silicon carbide chips, and 70% of that comes from the car industry.

But the company plans to multiply its revenue from the car industry tenfold by 2025, aiming for \$1 billion. To do so, the company can count on a key client: Tesla – it supplies chips for the Model 3. STMicro, which in total generated one-quarter of its revenue from the car industry via other technologies, also works with other manufacturers, such as South Korean brand Hyundai and the Renault-Nissan-Mitsubishi alliance. In the promising silicon carbide segment, the company is facing competition from US-based Cree, Japanese firm Rohm and German company Infineon. Most analysts recommend purchasing shares.

FOUNDED	1987
HEADQUARTERS	PLAN-LES-OUATES (CH)
EMPLOYEES	45,000
2018 REVENUE	\$9.66 BN
CAPITALISATION	\$17.1 BN
	STM

The chips developed by STMicro include those for the new Tesla Model 3.

DBT: recharging specialist

In early July, when the French government announced a plan to accelerate the deployment of charging stations for electric vehicles, DBT's share price jumped 10%. The company is indeed particularly well-positioned to benefit from the rise of this infrastructure. DBT installed its first charging stations in 1995. At that time, the business was just a niche market no one believed in. Everything changed in 2012, when Nissan chose DBT to deploy charging stations for its "Leaf" model.

With the planned explosion of electric vehicle sales, the infrastructure market now seems to have a very promising future. DBT currently sells its stations to electricity producers, such as EDF in France, as well as to retailers such as Auchan, Carrefour, and Ikea for their car parks. The company has installed more than 2,200 rapid charging stations in 37 countries in the past four years. As of early June, DBT had orders for 170 rapid chargers and 440 under negotiation, of which 10% are 150 kW chargers. While Tesla charging stations are reserved for Tesla vehicles, DBT chargers have the advantage of being compatible with all electric vehicles. But the company must compete with ABB, the industry leader, and Ionity (not publicly listed), a joint venture of car manufacturers BMW, Mercedes-Benz, Ford, Audi, Porsche and Volkswagen, which has already installed more than 100 electric charging stations in Europe, 25% of its goal set for 2020.

FOUNDED	1990
HEADQUARTERS	BREBIÈRES (FR)
EMPLOYEES	65
2018 REVENUE	€9.5 M
CAPITALISATION	€5.37 M
	ALDBT

PANASONIC: PARTNERS WITH TESLA

Since its sensational arrival on the automotive market in 2003, Tesla has equipped all its vehicles with Panasonic battery cells. But recently, the current seems to be changing between the Japanese firm and Elon Musk's company. According to Japanese daily *Nikkei*, Panasonic froze its investments in Tesla's Gigafactory 1 in Nevada this April. And rumour has it that Elon Musk is planning to stop receiving shipments from its partner. In the event of a divorce, Panasonic could turn to its compatriot Toyota – the two created a joint venture for batteries in January 2019.

FOUNDED:	1918
HEADQUARTERS:	OSAKA (JP)
EMPLOYEES:	272,000
2018 REVENUE:	¥ 7,982 BN
CAPITALISATION:	¥ 2,132 BN
TYO:	6752

SQM: SECOND IN LINE FOR LITHIUM

Sociedad Química y Minera de Chile (SQM), the second-largest lithium producer in the world, is expected to benefit from the spike in demand for the metal. In 2018, Chinese company Tianqi Lithium spent €3.5 billion to acquire a 25% share of SQM.

FOUNDED:	1968
HEADQUARTERS:	SANTIAGO (CL)
EMPLOYEES:	10,000
2018 REVENUE:	\$2.3 BN
CAPITALISATION:	\$7.92 BN
	SQM

VALEO SLASHES PRICES

In 2018, the supplier unveiled the e-City, a small electric car priced far below the competition: €7,000. Valeo is also active in autonomous vehicles. It has already raked in over 500 million orders for its Lidar autonomous vehicle sensors.

FOUNDED:	1923
HEADQUARTERS:	PARIS (FR)
EMPLOYEES:	114,000
2018 REVENUE:	€19.1 BN
CAPITALISATION:	€6.8 BN
	FR

LEM Holding: the current leader

Global leader in electric measuring for industrial applications, Swiss company LEM Holding had a solid 2018 financial year (from 1 April 2018 to 31 March 2019), with revenue up 6.8% over one year, reaching 321.6 million Swiss francs. These good results come primarily from the car industry, which made up 61% of the revenue growth, boosted by the transition to low-emissions vehicles. Battery-powered vehicle manufacturers are fond of the current and voltage transducers developed by LEM. Most analysts recommend keeping shares, as they are already well valued.

FOUNDED
1972

HEADQUARTERS
PLAN-LES-OUATES
(CH)

EMPLOYEES
1,480

2018 REVENUE
CHF 321.6 M

CAPITALISATION
CHF 1.56 BN

LEHN

A Komax employee working on one of the machines designed by the Swiss company.



KOMAX

Komax: a well-wired Swiss company

The boom in the number of “clean” vehicles sold will increase demand for cables and wires. Lucerne-based Komax, whose primary business is producing cable assembly systems, hopes to take full advantage of this phenomenon. To do so, it has created a skills hub dedicated to e-mobility at its location in Budakeszi, Hungary.

FOUNDED
1975

HEADQUARTERS
DIERIKON (CH)

EMPLOYEES
2,000

2018 REVENUE
CHF 480 M

CAPITALISATION
CHF 736 M

KOMN

SOLVAY: THE SMALL CHEMIST

Essential to the performance of electric vehicles, batteries require keen electrochemical knowledge. Belgian chemist Solvay understands the challenge quite well. The group provides battery manufacturers with many of the ingredients present in battery electrolytes – the liquid between the anode and cathode – such as conductor salts, additives and fluorinated solvents. Solvay also joined Saft, Umicore, Manz and Siemens in a European alliance aiming to create an “Airbus for batteries”.

FOUNDED: 1863
HEADQUARTERS: BRUSSELS (BE)
EMPLOYEES: 24,500
2018 REVENUE: €10.3 BN
CAPITALISATION: €9.6 BN

SOLB

INFINEON: FOCUSED ON CHINA

German semi-conductor manufacturer Infineon announced in 2018 that it was creating a joint venture with SAIC, China’s top automotive group, to produce power modules for electric vehicles. This will certainly ensure its growth in the number one global automotive market.

FOUNDED: 1999
HEADQUARTERS: NEUBIBERG (DE)
EMPLOYEES: 40,000
2018 REVENUE: €7.6 BN
CAPITALISATION: €20 BN

IFX

CREE: VW'S PARTNER

Cree is doing quite well. The US semi-conductor expert was chosen in May 2019 to be Volkswagen’s exclusive supplier of silicon carbide chips for all of the group’s future electric vehicles, particularly the ID.3. The American supplier came out ahead of its European competitors, Infineon Technologies from Germany and French-Italian group STMicroelectronics.

FOUNDED: 1987
HEADQUARTERS: DURHAM (US)
EMPLOYEES: 6,800
2018 REVENUE: \$1.49 BN
CAPITALISATION: \$6.5 BN

CREE



INTERVIEW

“WE WANT TO MAINTAIN OUR POSITION AS LEADER”

Eric Feunteun, director of Renault's Electric Vehicle Programme, gives us a sneak peek at the brand's ambitions.

BY BERTRAND BEAUTÉ

In 2009, Renault presented the Zoe concept car, a 100% electric vehicle, at the Frankfurt motor show. At the time, the French group was a pioneer among major western manufacturers. Ten years later, with 49,600 electric vehicles sold globally in 2018,

Renault is the European leader in the industry. But other brands are rushing to close the electric gap. The competition doesn't scare Eric Feunteun, “Mr Electricity” of the Renault Group, who said that eight electric models will be on the market by 2022.

Renault launched its first electric vehicle, Zoe, in 2012. In hindsight, was it too early?

We had a tough time in the beginning. But I believe that our 10 years of experience now gives us an incredible advantage. Building electric vehicles is more than just replacing a combustion engine with a battery. The entire company has to fundamentally change, including its factories and R&D. It has to develop an entire electric ecosystem. For example, if you live in the Swiss mountains, snow builds up under your car in the winter. With a combustion engine, this is no problem. The engine is hot and will melt the snow. But with an electric vehicle, that doesn't happen. So the snow will accumulate, which leads to new issues with corrosion. Furthermore, switching to electric means that every level of the company needs to be trained. When we started, for example, many journalists made fun of us a little bit because they went to a dealership to ask for information about the Zoe and left with materials for the Clio. So, we also had to give our salespeople particular training, since for electric vehicles they needed to know more about what consumers were looking for, especially in terms of distance travelled and the ability to recharge at home.

Now all manufacturers are making electric vehicles. Are you afraid of the competition?

Not at all. The more competition we have, the more supply will go up, which means there will be more people looking to buy electric vehicles. We know that, when purchasing a car, consumers like to stand out and have a range of options. The limited offer on the market kept people from buying electric models for a long time. We're planning to fight in order to maintain our place as the European industry leader. Our line of

electric vehicles will go from four to eight in 2022. By that time, we hope that this segment will make up 10% of our global sales, compared to 2% or 3% currently. We're particularly targeting the Chinese and European markets, which are the most buoyant for electric vehicles.

“The more competition we have, the more supply will go up, meaning there'll be more people looking to buy electric vehicles”

Will your efforts be enough for Renault to comply with the European standards for new vehicles: average CO₂ emissions of less than 95 grams per kilometre by 2021?

Given the sizeable fines imposed by the European Commission, we will meet this target. We don't have a choice. We can count on strong growth in the electric sector to get us there. In 2018, our sales in this segment increased 36.6% compared to 2017, whereas over the same period, the group's total sales were up only 3.2%.

What roadblocks still need to be overcome for this growth to continue?

Without incentives, electric vehicles are still more expensive to buy than combustion-powered cars. Given that government subsidies will gradually decrease, we are working to make the costs equivalent by 2022-2025. Already, you'll be surprised at the price of the Renault K-ZE, which will be sold globally. We're announcing the price at the end of 2019. It will

be a real game changer (ed. note: experts believe the price will be around €10,000). Additionally, don't forget that the usage cost of an electric vehicle is a lot lower than the costs for a combustion vehicle.

The second challenge is the lack of recharging stations. But many private companies, particularly service stations such as Shell, BP and Total, are investing more and more into building these stations. Finally, the last roadblock is range. But the current Zoe, with a range of more than 300 km with real usage, solves that problem. The majority of daily trips fall well below the 100 km mark.

Other manufacturers are offering ranges of more than 500 km...

And that's great! But that's only for very large, very expensive models. We have nothing against such vehicles, but it's not in our Renault DNA to make cars like that. We want to make electric vehicles accessible to all. And to do so, they need to be affordable.

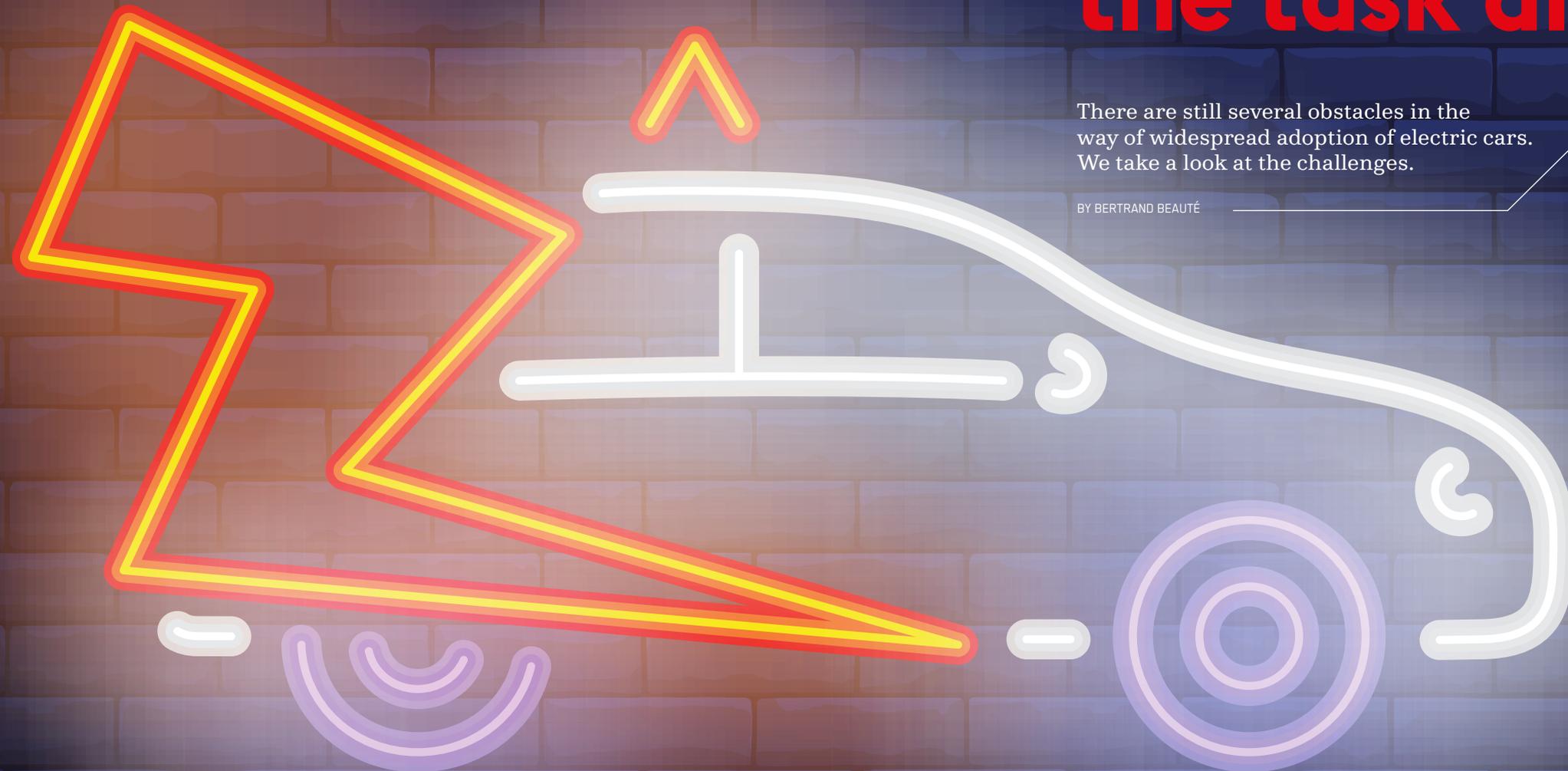
Child labour, pollution, and extracting minerals needed for the batteries is not ethically responsible. In fact, Renault was heavily criticised for this two years ago. What are you doing now to guarantee responsible production?

We're very concerned with ethics. But we can't be naive. Between the mines and Renault, there are a dozen subcontractors and it is difficult to know exactly how the minerals are extracted. With LG Chem, our battery cell provider, we're working hand-in-hand to find out. We have also hired NGOs to conduct audits on our entire supply chain. Regarding the environment, our partner LG Chem has opened a production factory in Poland. As a result, we no longer have to ship heavy batteries from one side of the world to the other. ▀

Electric cars: are they up to the task ahead?

There are still several obstacles in the way of widespread adoption of electric cars. We take a look at the challenges.

BY BERTRAND BEAUTÉ



“ In the darkness, we found the light.” In its new web advertising campaign, which began in June, Volkswagen suggests that from the scandal came its desire to enter “a new era”: the era of electromobility. “By 2025, one out of every four new Volkswagens sold will be electric,” says the Wolfsburg group. But beyond marketing, these promises could have to face up to the limits of battery-powered vehicles. Indeed, both from an environmental perspective and for manufacturers and consumers, electromobility poses challenges that have yet to be resolved. ▶

1



A LUXURY RESERVED FOR THE RICH

While the Volkswagen ID.3 hasn't yet arrived on the market, pre-orders of the ID.3 1st limited edition began in June 2019. Equipped with a 58 kWh battery (with a range of 420 km), this version – which boasts a wide range of options – comes in at just under €40,000. Comparatively, the identically-sized Golf 7 starts at less than €20,000 for the base model. The main difference between the two is the battery. While the price of batteries has dropped by 50% in recent years – from €400 per kWh in 2015 to approximately €200 today – they are still the main reason why electric vehicles cost as much as they do. The battery in the ID.3 costs more than €10,000. “While they're

more expensive to buy, electric cars are less expensive to run,” says Philippe Van-geel, secretary general of the European Association for Electromobility. During intensive use, battery-powered vehicles can be up to 4 times more economical to drive than combustion engines, due to the cost of electricity, which is cheaper than petrol, and the fact that they require almost no maintenance.

But the purchase price is a significant hurdle. According to experts, it won't be until around 2025 or 2030 that electric vehicles will be sold for a similar price to combustion vehicles. In the meantime, the industry is faced with a dilemma: either manufacturers add the battery costs to the vehicle purchase price, running the risk that sale volumes will remain small, or they reduce their margins. For the time being, companies seem to have chosen the latter. In 2020, after the ID.3 1st, Volkswagen will market an entry-level version of the same model at a lower price: less than €30,000, but with a range of only 300 km. At that price, rumour has it that VW will lose money. Energy specialist Laurent Horvath confirms these suspicions: “With increased volumes, prices will go down. But for the time being, manufacturers are selling at a loss in order to boost sales.”

2



SUBSIDIES SET TO DECREASE

To make up for the costly purchase price, many countries have implemented tax breaks. In Norway, where 60% of new vehicles are electric or rechargeable hybrids, electric vehicles are heavily subsidised. In Switzerland, where there is no comparable incentive,

low-emissions vehicles made up only 3.2% of sales in 2018. But the tax breaks won't last forever. “As long as volumes are low, there's no issue providing tax benefits,” says Laurent Castaignède, auto engineer and author of *Airvore ou la face obscure des transports* [*Airvore, or the Dark Side of Transport*]. “But when you're talking about millions of vehicles, the cost becomes exorbitant.” Indeed, Norway decided to reduce subsidies in 2017, and China followed suit in 2019. Without subsidies, low-emissions vehicles could indirectly benefit from complementary measures, such as bans on diesel cars in city centres or an additional tax on combustion-powered vehicles. In Norway, buying a diesel Audi Q7 means paying €20,000 in tax.

3



LIMITED RANGE

According to an international study from the auto division of the L'Observatoire Cetelem published in late 2018, only 30% of people would be prepared to buy an “electric car with a range of less than 300 km”. To overcome this purchasing barrier, manufacturers have begun a race for the furthest range. The first Renault Zoe, for example, which went on the market in 2013, could only be driven 210 km before it needed to be recharged. Its younger sister, the Zoe 2, which comes out this autumn, has a range of 400 km. It's enough for most

trips, but still far less than the best combustion vehicles – especially since battery range greatly depends on usage conditions. “On the motorway, Tesla owners often drive at a moderate speed,” says Rémi Cornubert, senior partner in charge of mobility at consulting firm Advancy. “On average, the driving range takes a hit when you go from 90 to 130 km/h.”

A study by the American Automobile Association (AAA) published in March 2019 also showed that at an outside temperature of 35 degrees with the air con switched on, electric vehicles' driving range drops by an average of 17%. Cold temperatures seem to have an even more negative effect: if the heating is switched on, increasing inside temperatures by less than 6 degrees, the models tested (the BMWi3, Chevrolet Bolt, Tesla S, e-Golf and Nissan Leaf) lost an average of 41% of their range. But Tesla is contesting these statistics, saying that its models' range changes by only a few per cent.

4



EXCESSIVE WEIGHT

The race for greater range leads to excessive weight that verges on obesity. The Mercedes EQC weighs more than 2.4 tonnes with a 650 kg

battery, whereas the average weight of vehicles sold in Switzerland in 2018 was 1.6 tonnes – already very heavy. “From an environmental perspective, driving a 2.5 tonne electric SUV makes no sense,” says Laurent Castaignède.

Nicolas Meilhan, transport specialist for France Stratégie, shares this opinion: “The bigger the battery, the more limited the environmental benefits of electric power, as the weight that needs to travel is increased. A vehicle needs to be light before it becomes electric – especially as daily trips are generally no more than 50 km. A small 15 kWh

battery is enough for most cases.” This is the crux of the paradox of battery-powered vehicles: in order for consumers to buy them, they need a high range, but to be as eco-friendly as possible, they can’t be any heavier than absolutely necessary – especially as high-capacity batteries will more quickly compromise the availability of certain rare metals such as cobalt.

“In my opinion, the best compromise is a mixed fleet of cars,” says Flavien Neuvy. “Light-battery cars are ideal for short distances, while hydrogen, rechargeable hybrid and/or combustion vehicles are better for longer ones.”

5



BOTTLENECKS AT THE PUMP

In order to accelerate the roll-out of low-emissions vehicles, public authorities are taking it upon themselves to build recharging stations in great numbers. So many, in fact, that “in a few years, infrastructure will almost no longer be an issue,” says Vangeel. But this optimism is

confronted with two problems. Firstly, studies show that users mainly recharge their vehicles at home. It’s easy to install a charging station if you own your home, but more difficult or even impossible for people renting city-centre apartments. Originally designed for urban areas, the Renault Zoe is now mainly sold in the countryside.

Secondly, recharging times are long. Even when using the Ionity super charging stations, the most powerful stations with a 350 kW charge, it takes seven minutes to charge a 100 kWh battery to 50%, giving a range of approximately 150 km. When everyone is heading off on their summer holidays, service stations could turn into giant bottlenecks.

6



A NETWORK UNDER STRESS

Is the electricity grid capable of handling the demand if millions of vehicles are charging at the same time? A May 2019 report from RTE, a subsidiary of EDF, says yes.

According to France’s electricity distribution company, the drop in consumption from other uses by 2030 will allow the grid to supply enough energy to recharge “several million” vehicles with no major problems. “The only potential situations to look out for would be during the Christmas holidays if there is a cold snap,” say the authors.

“In France and Switzerland, the electricity grids are capable of handling the increased power requirements of electromobility,” says Joseph Beretta, chairman of Avere-France, an association for the development of electric mobility. “But I can’t guarantee that every country’s grid will be able to do so.”

7



THE NEED FOR AN ETHICAL MANUFACTURING SECTOR

Because battery manufacturing uses an extraordinary amount of energy, batteries need to be made in regions where electricity is clean. But the main producer of batteries is China, where 80% of energy comes from coal. “It’s quite possible that in the next five to 10 years, we could be faced with

a global ‘electricgate’, where we realise that global greenhouse gas emissions from cars haven’t decreased, despite a significant proportion of vehicles being electric-powered,” says Castaignède. Carlos Tavares, CEO of PSA, agrees: “If we’re being told to make electric vehicles, then governments and authorities need to assume the scientific responsibility,” he said at the 2018 Frankfurt auto show. “I don’t want us to find out in 30 years that they’re not as good as they seemed.” The head of the French group highlights the potential problems linked to generating electricity, recycling batteries and managing rare raw materials.

In addition to the environmental aspect, in March 2019, Amnesty International sounded the alarm over the conditions in which batteries are manufactured, calling on auto industry leaders to produce batteries in a completely ethical way in the next five years. The manufacturing of electric

vehicles gobbles up rare earths, lithium and cobalt (see our November 2018 issue on rare metals). The problem is that these raw materials are primarily mined in China, where the extraction of rare earths leads to environmental disasters, and in the Democratic Republic of Congo, where children work in cobalt mines. “Without radical changes, the batteries that power these green vehicles will continue to be tarnished by human rights violations,” said Kumi Naidoo, secretary general of Amnesty International.

So what’s the verdict? Should you trade in your combustion engine for an electric vehicle? Over their lifetime, electric vehicles in Europe have a better environmental impact than a diesel or petrol car, especially if the electric vehicle is light and used intensively. But while the exhaust pipe is a thing of the past with electric vehicles, they still aren’t “clean” and don’t solve mobility problems, such as traffic congestion in cities. ▲

WE DROVE TESLA'S CAR FOR THE PEOPLE

The Model 3, the California brand's new saloon aimed at the general public, is now available in Switzerland. We share our impressions after a week behind the wheel.

BY LUDDOVIC CHAPPEX

Ah, the much-vaunted Tesla Model 3 – we'd been itching to give it a try. After reading the generally very positive reviews about it in the specialist media, we were certainly curious to say the least. This review is intended to share the experience of the average driver who is new to electric vehicles.

Why Tesla, and why this model in particular? Because the California manufacturer is still, for the time being, the biggest brand in the ongoing electric revolution, and because this new model aims to increase access to a market that until now has been limited to a high-end fringe population. Indeed, among the brand's imposing limousines and SUVs, the Model 3, which we had free use of for a week, significantly expands Tesla's target clientèle.

Our test model, the long-range "Dual Motor", starts at a base price of 54,990 Swiss francs (the "Standard" model starts at 44,990 francs). Almost everything is standard, except for some select exterior colours and wheels, as well as the pricey "fully autonomous driving" option, which comes in at a steep 6,300 Swiss francs. To sugar-coat the price point,

Tesla argues that its models will be able to drive themselves in cities (at least from a technical perspective) in just a few months. This is one of the brand's distinctive traits: offering its customers regular software updates that will continuously improve the features of their vehicles.

These leanings towards the geeky also mean that there's an app available for drivers to download onto their smartphone, allowing them to use their device as a portable dashboard. Via the customisable interface, drivers can unlock the car, find its location, monitor charging, set the interior temperature and more, in just a few taps. In Deep Blue Metallic, the Model 3 is eye-catching. But the overall style is rather understated. On the interior, a single 15-inch touchscreen has replaced the usual dashboard buttons.

The tasteful white seats of our test model further highlight the feeling of spaciousness on board. The roof – one big anti-UV window – brings a final touch of modernity. Depending on your mood or personality, you might find this environment to be either an oasis of calm or austere empty. We enjoyed the zen feeling it encouraged. Once on the road, with the Meyrin

Tesla Service Center in the rearview, the unique features of the electric motor didn't hesitate to make themselves known. It's impossible not to listen to the range of sounds it produces. In the background, the quiet rolling of the tyres on the roadway kept us company. A feeling of calm set in.

After a while, we found a clear stretch of road that would give us a chance to confirm that the car journalists weren't lying in terms of the engine's

power. At 40 km/h, I hit the accelerator. As promised, the Tesla was off like a rocket, pinning me to my seat. Alas, I quickly had to take my foot off the pedal to avoid smashing the speed limit. This model is advertised as being capable of going from 0-100 km/h in 4.6 seconds (the "Performance" model, which costs 5,000 Swiss francs more, can do so in 3.4 seconds). These figures will certainly attract the attention of car enthusiasts. It's worth noting that

it's in the first few metres that the Performance version really makes a difference. At a moderate speed, the difference in acceleration between the two models isn't quite as significant, as can be seen in YouTube videos.

But what's really impressive is the way in which the Model 3 delivers that acceleration that sets it apart from combustion engines. All of the torque is constantly available, without delay, and the constant

thrust forward seems to never waver – at least at legal speeds. But Tesla didn't just turn its saloon car into a dragster. The fact that the batteries are stored in the floor, under the axle, makes for excellent handling and dynamic performance, setting the Model 3 apart from the rest of its class. The winding roads to Saint-Cergue, among others, were an excellent chance to put it to the test, including in the rain – where the all-wheel-drive really came in handy. ▶



In Deep Blue Metallic, the Model 3 is eye-catching

Nighttime escapade in Geneva, at the wheel of Tesla's Model 3 "Dual Motor" long-range version.

In fact, the grip went well beyond the testing opportunities offered by the open road. And for anyone who still has doubts, the well-known car show *Top Gear* recently pitted the Tesla Performance model against a BMW M3 on a racetrack (video available on YouTube). It was a bitter loss for the German brand, which finished nearly two seconds behind on a one-and-a-half minute lap.

If we seem to be focusing heavily on the Model 3's sportiness, it's because Tesla is also highlighting its sporting genes. And it's true that in terms of pure performance, there's probably nothing like it on the market today at this price. That said, the available power and quiet running make for an easy, peaceful drive. The comfortable suspension doesn't hurt, either. Simply tap the accelerator to easily pass another car or merge onto the motorway.

And when it comes to passive safety, there's good news: the same level of mastery applies here, too. The Model 3 received five stars on the Euro NCAP tests, with a distinction of excellence. A key advantage is the position of the batteries, which weigh several hundred kilos, giving highly effective protection in the event of a lateral crash.

EIGHT CAMERAS

Let's talk autonomous driving, Tesla's signature feature. The Model 3 has no fewer than eight cameras and 12 ultrasound sensors installed at 360 degrees, as well as a radar system in the front of the vehicle. These devices work together to make the car one of the most advanced on the market in terms of autonomous driving. Tesla has gone so far as to offer autonomous navigation from point A to point B. The system is already capable of efficiently follow-

ing an itinerary in auto-pilot mode on the motorway by suggesting lane changes. While this option is quite handy in traffic jams, we didn't find it nearly as relaxing when driving at a faster speed. This feature isn't unique to Tesla: premium German brands and Sweden's Volvo, in particular, are striving to automate driving. The catch is that drivers have to touch the steering wheel at regular intervals to let the system know that they're still awake – so we're still quite a way off from being able to relax as you could on a train or plane.

All of the torque is constantly available, without delay, and the constant thrust forward seems to never waver

ELECTRIC VEHICLES IN EVERYDAY LIFE

The central question still remains: how practical is it to drive an electric car for everyday trips? Let's be honest: for drivers who can't charge their vehicles at their private home or workplace, electric cars are restrictive. To get a quick recharge, drivers have to go to a Tesla Supercharger, which are located near shopping centres or four-star hotels. But the process is very simple. Park, plug in the connector, and you're done. With the Tesla app, drivers can monitor the charging progress while sipping their coffee. The corresponding amount is automatically debited from the driver's Tesla account. For the Model 3, one complete recharge costs just over 20 Swiss francs.

But there are two disadvantages: one, the charging speed drops significantly as the battery regains power, >



Highly minimalistic, the Tesla Model 3's cockpit features seats upholstered in synthetic leather.

TESLA

GERMANY STRIKES BACK

As a "first mover" on the premium electric vehicle market, Tesla is ahead of the competition when it comes to certain key aspects. It already has a dense network of charging stations, but that's not all. Range, battery management and limited weight are also some of the brand's strong points. Its flagship models also boast meteoric performance and are the undisputed champions of 0-100 km/h. Tesla has set the bar high, and as a result, newcomers to the scene are capitalising on their own strengths, starting with their brand image.

After Jaguar, which has been selling its I-Pace SUV since last year, Audi and Mercedes enter the ring this year with the e-Tron and EQC respectively. These new SUVs from Audi and Mercedes don't weigh any less or have a longer range, but instead put pressure where it hurts by offering extremely high-quality

workmanship, comfort and soundproofing – all of which exceed the Tesla models.

These new SUVs from Audi and Mercedes put pressure where it hurts

And that's just the beginning. In September, Porsche will officially present its electric saloon car, Taycan. It will be interesting to see how the Zuffenhausen-based group has managed to combine sportiness with an electric motor. The first test results from the pre-series models seem very positive. More than 30,000 customers have already pre-ordered what is expected to be a fearsome

competitor for the Tesla Model S. And the pressure will continue to be taken up a notch with the arrival of Volvo's new entirely electric XC40. BMW's iX3 SUV will then enter the market in 2020. Audi and Mercedes will continue to rapidly expand their electric range with Audi's more compact e-Tron SUV, based on the Q4 presented this year at the Geneva Motor Show, and Mercedes unveiling the EQB, an electric version of the new GLB.

How will the market react? Do its fanbase and unique features give Tesla a brand identity strong enough to remain a leader in the long term? Or is the hype simply due to the fact that the California group was the only one on the market? What happens now when faced with competition from traditional premium brands? We'll see in 2020. It will be quite a decisive year for Tesla.



Jaguar – SUV I-Pace



Audi – e-Tron



Mercedes – EQC



Porsche – Taycan (concept image)



Volvo – XC40 (electric version from 2020)



BMW – iX3 (concept image)

becoming very slow once it passes 90%. Two: this speed depends on the number of cars connected to the same charging station, as the power is split among the vehicles. During our drive, we visited two Supercharger stations, one in Bussigny (VD) and the other in Archamps in neighbouring France. Neither was busy when we stopped. In both cases, around 30 minutes of charging increased battery power from around 20% to 80%.

Clearly, a combustion engine offers vastly greater ease of use in this regard. But we have to admit that this comparison isn't exactly fair. Compared to other electric vehicles, the Model 3 is already setting the bar very high. Tesla deserves praise for its ecosystem, which is well ahead of its competitors. Its network of superchargers already offers good European coverage. What's more, the California brand has announced that its infrastructure will be updated by late 2019. At that time, each station will provide up to 250 kW of power, compared to the current 120 kW. The upgraded stations will be able to charge a battery to approximately 80% in 15 minutes. In addition, the excellent integrated GPS navigation interface, which calculates the consumption and exact range to the next charging station, makes the Model 3 a viable option, including for long trips.

The official total range of the "Long-Range" model is 560 km. But when driving exclusively on motorways, which are more demanding for electric vehicles, the range is closer to 450 km. That's already quite far compared to the competition, which is struggling to keep up with Tesla on this front. Additionally, in an uncommon feature for an electric car, the range of the Model 3 is almost unaffected by driving style, as confirmed by various tests conducted by specialist magazines. Even at motorway-illegal speeds,

20 to 30 km/h above the legal limits, electricity consumption varies by less than 20%.

The California brand has announced that its infrastructure will be updated by late 2019. At that time, each station will provide up to 250 kW of power, compared to the current 120 kW

AN ACCOMPLISHED VEHICLE

At the end of the day, the Model 3 left us with the impression that it is a truly accomplished vehicle. While not the main focus of this article, we also appreciated the stylish interface and responsiveness of the large touchscreen every time we used it, and the premium hi-fi sound system was so impressive it left a few passengers speechless. One for the cons column is that the car isn't completely soundproof on the motorway. While it isn't exactly annoying, drivers can still hear air rushing past the wing mirrors. This kind of noise is better managed in some comparable saloon cars. A "double-glazed" front windscreen option, such as those offered by Audi and BMW, would likely improve the exterior noises. Also, the quality of workmanship isn't quite up to par with the German premium brand, which is untouchable in this regard. Finally, the long-term dependability is still unknown.

However, these criticisms should be set against the price, which is truly competitive given the overall package. At 4.69 m long, the Tesla Model 3 is competing against the BMW Series 3, Alfa Giulia and other Mercedes C Class models, to name just a few non-electric rivals, all of which have a list of optional extras that quickly raise the price.

So you might think that Tesla has tapped into the winning formula. But that may not be good enough... The competition is catching up, actively preparing its electric comeback (see p. 61). The coming months will be crucial for the American manufacturer, which continues to lose money with each car sold. Next year, it will unveil its new Model Y SUV, which is based on the Model 3 platform and will largely copy its interior cabin design. Tesla hopes to achieve economies of scale and reach significantly higher production volumes than its current numbers in order to finally turn a profit. But given the difficulties encountered in the past with production of the Model 3, this is anything but certain. In the meantime, Tesla is offering a clear demonstration of its auto expertise, and we were sad to leave its latest model at the Meyrin Service Center. ▲

TECHNICAL SPECS

Tesla Model 3 Long-Range Dual Motor

Range

560 km (according to the WLTP standard)

Acceleration

0 to 100 km/h: 4.6 seconds
(Performance version: 3.4 seconds)

Transmission

Dual motor all-wheel drive

Power

352 hp and 510 Nm of torque
(according to informal sources, as Tesla doesn't share either value)

Weight

1,847 kg

Dimensions

length: 4.69 m, width: 1.93 m,
height: 1.44 m

Price

CHF 54,990.-
(Standard version: CHF 44,990.-)

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TRANSFER YOUR CRYPTOCURRENCIES TO A SWISS BANK

It is now possible to deposit Bitcoins and Ethers into a Swissquote account from an external wallet. There are quite a few advantages. Swissquote explains further.

[swissquote.com/cryptos](https://www.swissquote.com/cryptos)

Swissquote clients can now transfer Bitcoins (XBT) and Ethers (ETH) between their external private wallets and their Swissquote trading accounts. This solution keeps cryptocurrencies in a safe place, without requiring clients to monitor the security themselves. Clients can also withdraw funds at any time to use as they wish. Yann Isola, project manager at Swissquote, explains.

Why should clients deposit their cryptocurrencies with Swissquote rather than keep them in a personal wallet?

In terms of security and maintenance, it is often better to leave it to the experts. There is always the risk that clients could lose their private key, and thus access to their wallet. They also need to stay up to date with any protocol updates for the cryptocurrencies they hold, which can involve sensitive handling. The same goes for forks (editor's note: creating a new cryptocurrency from an old one). These examples show that it is worth trusting your currencies to a well-regarded platform. Another advantage: once the cryptocurrencies

are transferred to Swissquote, they can be exchanged at any time for fiat money in order to realise capital gains. It is also possible to transfer cryptocurrencies from a Swissquote account to a personal wallet.

How can clients take advantage of this offer?

Clients who are interested just need to have a trading account with Swissquote. In the "Cryptocurrency" section, there is a "Deposit/Withdraw" button to access this option. Note that deposits of \$500 or more have no associated fees.

Besides Bitcoin and Ethereum, does Swissquote plan to open the transfers up to other cryptocurrencies?

Yes, and soon. To do so, we will need to analyse precisely where the transferred funds are coming from, in compliance with regulations from FINMA (Swiss Financial Market Supervisory Authority). Currently, our tools can trace funds in Bitcoin and Ether. We are currently working on a similar tool for XRP and some ERC-20 type tokens.

What are the most common cryptocurrencies traded by Swissquote clients?

Bitcoin, XRP and Ethereum, in that order.

With Bitcoin's sudden surge, the cryptocurrency market has been brought back to life in recent months. Libra, Facebook's controversial cryptocurrency project, has also revived public interest. Has the hype returned?

We are seeing large numbers of people starting to invest again, and we are receiving many requests to open accounts... We have also noticed increased interest from institutional fund managers, particularly for ETF/ETP products which can trade cryptocurrencies. This is what is to come. These managers are more inclined to use a trusted banking institution, whose business model is not exclusively tied to cryptocurrencies. It is a guarantee of security for them. ▽



YANN ISOLA
PROJECT MANAGER
SWISSQUOTE BANK



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“Sharp Eyes”, Beijing’s inescapable surveillance system

China is very quickly implementing global surveillance on its citizens. This programme relies on national tech companies that are taking over the global market.

BY JULIE ZAUGG, HONG KONG

“Please face the camera.” The female robotic voice comes from a screen at the border between Hong Kong and Shenzhen. Travellers’ faces are scanned, then compared against a database of every person who has already crossed this border. Installed in summer 2018, this facial recognition system aims to catch petty traffickers going through customs with untaxed goods purchased in Hong Kong to resell in China.

Not far away, a crowd begins to form on both sides of the road, one of the busiest in the Futian neighbourhood in Shenzhen. People are waiting for the light to turn green. Suddenly, an old man pushing a cart full of emp-

ty bottles loses his patience and steps forward, zigzagging between vehicles. Soon after, he is followed by a woman with two pink suitcases. Within just a few minutes, their faces will appear on a giant screen, along with their names and half of their national identity number. They were caught by a surveillance camera equipped with facial recognition software.

The country has 176 million surveillance cameras and hopes to have 626 million by 2020

These two examples demonstrate the system China has implemented to monitor its citizens, a sort of 21st century panopticon. In 2017, China spent 1.24 billion yuan (172 billion Swiss francs) on domestic security, according to figures from German researcher Adrian Zenz. This amount has tripled since 2007. A handful of companies are reaping the benefits, particularly video surveillance camera manufacturers Hikvision and Dahua Technology.

“These companies are the top two in the world,” said John Honovich, founder of IPVM, a video surveillance intelligence firm. “Their combined revenue is approximately \$10 billion, compared to \$1 billion for their primary western competitor, Swedish company Axis Communications; and \$600 million for Uniview Technologies, the third-biggest player in China.”

These two groups can count on a booming Chinese video surveillance market. In 2018, the market reached \$8.1 billion, up 14.7% according to IHS Markit. The growth in this indus-

try is largely due to the implementation of the government programme “Sharp Eyes”. Launched in 2015, the goal is to create an immense database containing images filmed by every surveillance camera in the country.

The country already has 176 million of these cameras, the most in the world, and hopes to have 626 million by 2020. The objective is to cover all public spaces (streets, squares, train stations, schools), as well as certain private spaces, such as residential complexes and shopping centres.

Hikvision and Dahua Technology generate approximately one-third of their revenue from the public sector. “This context gives them an enormous advantage: contracts with the government are generally quite profitable and last several years,” said Jeffrey Towson, a specialist in China’s tech industry. “Moreover, the government is a privileged partner that provides easy access to loans provided by state banks, as well as subsidies and tax rebates.”

The two companies also sell cameras outside of China. “Their foreign clients are primarily small grocery stores and neighbourhood restaurants looking for a cheap surveillance solution and end up purchasing their low-end products,” said Honovich. Dahua products are used in the London underground, while Hikvision cameras are used in Jordan’s parliament building.

ARTIFICIAL INTELLIGENCE

But what makes the Chinese panopticon truly frightening is the use of artificial intelligence, especially facial and voice recognition. “The use of these technologies really took off two years ago,” said Zhong Zhenhan, vice president of emerging technology research at IDC. “China is now the global leader for these applications, both in terms of their sophistication and their widespread use.” ▶

COMPANIES TO WATCH

HIKVISION

GLOBAL LEADER IN VIDEO SURVEILLANCE

This firm came from a research lab run by the Chinese army, which still holds a 42% share. “It enjoys robust growth and low debt,” said Ying Wang, analyst at Moody’s. In 2018, the group made 72% of its profits in China alone. “But it’s still the global leader in video surveillance, with more than 20% of the market share,” said Wang. Hikvision is likely to maintain this share, as 8% of its profits go to research and development. But fears of espionage due to its close relationship with the Chinese government could hurt business. In 2018, the United States banned government agencies from using Hikvision’s products, which made share prices drop.

HEADQUARTERS: HANGZHOU

EMPLOYEES: 26,000

REVENUE (2018): \$7.4 BN

002415

DAHUA TECHNOLOGY

A WELL-POSITIONED SUCCESSOR

Number two worldwide, this video surveillance company was founded in 2001 by Fu Liquan, a former military engineer who holds a 37% share. The firm saw its revenue grow 26% last year. Less exposed than Hikvision to international markets, it is not expected to suffer too much from the US campaign against Chinese tech. “The main risk for Dahua Technology is competition from giants such as Huawei and Alibaba, which have planned to invest in the Chinese video surveillance market,” said John Honovich, founder of intelligence firm IPVM.

HEADQUARTERS: HANGZHOU

EMPLOYEES: 16,000

REVENUE (2018): \$3.45 BN

002236



GILLES SABRIE

The country absorbs 29% of facial recognition devices produced worldwide. This number is expected to grow to 45% by 2023 according to Gen Market Insights. Four start-ups, founded between 2011 and 2015, dominate the industry: SenseTime, Megvii, Yitu and CloudWalk. The first two plan to go public on the Hong Kong exchange shortly.

SenseTime is the global leader. "Its technology is cutting-edge," said Jeffrey Ding, an expert in Chinese artificial intelligence at the Univer-

sity of Oxford. "Its algorithms are based on 240 points of recognition to identify a face, which makes them extremely precise." In 2018, the Hong Kong-based firm saw profits explode by 400% to reach \$100 million, according to an estimate from *Forbes*.

Voice recognition, on the other hand, is dominated by iFlytek, a company based in Anhui in eastern China. It developed a system that can recognise a person based on the pitch of their voice, even if they're speaking a dialect like Cantonese

or Shanghaiese, or if they have a strong regional accent.

The government is an important client for iFlytek as well. SenseTime has provided its technology to approximately 40 municipalities and makes 40% of its revenue from the public sector. "The government uses iFlytek software to detect suspicious behaviour or criminals in a crowd," said Towson.

In January, a woman who had been wanted by police for 17 years for

murdering her boyfriend was filmed and identified by facial recognition software when she entered a police station to ask for directions. Similarly, cameras were installed at the entrance to a beer festival at Qingdao, at a Jackie Cheung concert in Jiaxing and at an investor forum in Kunming in order to find people who were at large.

In January, a woman who had been wanted by police for 17 years for murdering her boyfriend was filmed and identified by facial recognition software

iFlytek has entered into a contract with government authorities in the Anhui province for a pilot project to gather vocal prints of as many citizens as possible. Approximately 70,000 samples have been collected. In 2017, the company began using the software to automatically detect the identities of people whose telephones were tapped. The technology was able to solve several cases of drug trafficking, kidnapping and fraud.

For these companies, public contracts are crucial. "Such projects allow companies to acquire astronomical amounts of data, which is essential to improving the precision of their algorithms," said Towson, Chinese tech industry specialist. iFlytek partnered with the three big mobile operators in China, "which potentially gives the company access to every telephone conversation in the country". Similarly, SenseTime draws on the national

database containing ID photos and documents for all 1.4 billion Chinese residents.

PRIVACY BREACHES

More and more people are speaking up to denounce the serious breaches of privacy for Chinese citizens, who are subject to this mass surveillance. Nowhere are effects more apparent than in Xinjiang, a province in western China that is home to a significant Muslim community with Uyghur heritage. "In cities, there are police roadblocks with facial recognition cameras every 200 metres," said Maya Wang of Human Rights Watch. "Bazaars, mosques and petrol stations also have these cameras."

This surveillance – officially designed to prevent terrorist acts – can detect all behaviour defined by authorities as extremist: being further than 300 metres from home, going to the mosque too frequently or even going to the petrol station several times a week. "People caught by the cameras could be sent to a re-education camp," said Wang. One million Uyghurs have already been interned.

Breaches of privacy are also rampant in the rest of the country. "The goal of facial recognition is to identify deviants, but the definition of deviants is elastic: it includes dissidents, drug users and the mentally ill," said Wang. "It could potentially include any citizen whose behaviour is out of the ordinary." Such as a man who walks alone at night or receives many foreign visitors.

"The ultimate objective is to align all this information with the social credit system that is currently being deployed," warned Matthew Warren, professor of cybersecurity at Deakin University in Australia. The social credit system will give a grade to each citizen, which will fluctuate based on their good or bad actions. People with a low score can no longer take the train, enrol in a good university or find a job. ▽

COMPANIES TO WATCH

IFLYTEK

LEADER IN VOICE RECOGNITION

Founded in 1999, this firm, which began at a tech university, is practically the only player in the Chinese voice recognition market, with a 70% market share. In addition to contracts with the government, iFlytek has other clients such as telephony operators and smartphone manufacturers that use its voicemail app. Insurers and e-commerce platforms also use iFlytek's technology in their call centres. It is now seeking to expand internationally with automatic translation software.

HEADQUARTERS: HEFEI

EMPLOYEES: 3,000

REVENUE (2018): \$1.1 BN

002230

SENSETIME

CUTTING-EDGE FACIAL RECOGNITION

Founded in 2014 by a team of IT engineers at the Chinese University of Hong Kong, this company – currently unlisted – put its first product on the market in 2016: an algorithm called DeepID. But the real turning point was in 2018, when the start-up raised \$1.2 billion, valuing it at \$4.5 billion. Revenue reached \$100 million last year, up 400% according to a *Forbes* estimate. SenseTime is now planning its IPO on the Hong Kong exchange.

HEADQUARTERS: HONG KONG

EMPLOYEES: 2,200

VALUATION (2018): \$4.5 BN

NOT LISTED



TO READ, TO DOWNLOAD



University of
Pennsylvania, 2019
CHF 30.–

A BRIEF HISTORY OF DOOM

TWO HUNDRED YEARS
OF FINANCIAL CRISES

By Richard Vague

By focusing on major financial crises over the last two centuries, Richard Vague, former banker and economist, finds a common theme: economic crises are systematically preceded by the over-accumulation of private debt. Supported by many examples demonstrating this cyclical pattern, the book offers tools for legislators and bankers, as well as regular people, to recognise warning signs before a collapse and ways to adapt if a crisis actually occurs.



PublicAffairs, 2019
CHF 20.–

THE LEVELLING

WHAT'S NEXT AFTER
GLOBALIZATION

By Michael O'Sullivan

Nearly 30 years after the fall of communism, an open world emerged with ideals such as the free movement of capital, people and ideas, but also an explosion of wage inequality and a growing divide between rich and poor regions around the world. Irish author Michael O'Sullivan, the current Chief Investment Officer at Credit Suisse, uses facts and figures to argue that the world today is entering a new phase: the levelling. O'Sullivan predicts a geographic reshuffling and a redistribution of resources, as well as a gradual elimination of traditional centres of power such as the WTO and IMF.



Free
Google Play

NIGHT VIDEO PLAYER

FILMS IN BED

Much more than just a simple video player, Night Video Player intelligently manages the volume of sounds and voices in real time. As a result, contrasts are much better, voices are more understandable, and the viewing experience is significantly improved. The app, which is completely free with no ads, supports all types of codecs and formats imaginable.

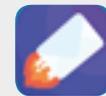


Free, premium
version available
Google Play

SKIT

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Designed for geeks and anyone who wants more details about the apps they install, Skit is the ultimate app manager for Android. It knows every detail, including exact permissions, install dates, updates and memory usage. More advanced users will appreciate the ability to delete and export any app directly in APK format.



Free, in-app
purchases
App Store
Google Play

TEXTBLAST BULK SMS

SMS SPAMMER

The concept of TextBlast? Send the same message to dozens of different recipients, and the app automatically changes personal details such as first name and family name. While somewhat designed for marketers and advertisers, this app is also very useful for certain events, such as sending the same message to many people during New Year festivities.



Free, in-app
purchases
Google Play

ACTIONDASH

GUARDIAN OF YOUR DIGITAL
WELLBEING

Taking a digital break is trending nowadays. But being aware of our inability to manage smartphone use isn't enough: we need tools to help. Well aware of this very modern problem, ActionDash is an app that tracks all of a user's activity and displays it in simple, stylish infographics with all sorts of statistics for users to follow the progress of their digital detox. Unless the app itself becomes addictive...



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Palace Square, the central city square of St Petersburg.

TRAVEL

A fresh look at Saint Petersburg

Romanesque, Saint Petersburg is full of gilding and excess. Often compared to Venice for its network of canals and to Paris for its museums, the city enchants lovers of fine arts. But behind its stately institutions, Saint Petersburg is a fun, laid-back city.

BY SALOMÉ KINER

Saint Petersburg seems like it was designed to be wandered around. In 1703, Tsar Peter the Great, eager to assert his power after dethroning the Kingdom of Sweden, laid the foundation for the first port of his empire. He was envisioning European capitals: Amsterdam, Italy and France. Ticino architect Domenico Trezzini designed this aesthetic project with palaces lined up along straight arteries, producing a never-ending perspective. Still today, the harmonious urban geometry makes visitors stop in their tracks. Tourist groups spill out of churches, monarchs' residences and memorial sites honouring Russian history. To complement the classical culture, here are a few tips to explore the city beyond its extravagant institutions.



A bit of culture

In Saint Petersburg, you'll find your fair share of industrial wasteland, but also excellent ideas. A gigantic bakery used to occupy the buildings where the Loft Project Etagi now stands. Opened in 2007, this cultural centre is five storeys tall and home to many art forms: cinema, art gallery, designers' showrooms, festivals, concerts, and a restaurant-bar that revisits Russian classics.

At the Hermitage museum, you can admire paintings from Matisse, Picasso, the *Madonna Litta* by Leonardo da Vinci and *Young Girl with a Hat* by Titian. >



Russia



SHUTTERSTOCK

At the Museum of Soviet Arcade Machines, opened in 2007 by three passionate gamers, you'll find Dendy consoles, an unlicensed clone of Nintendo, the famous *Battleship* kiosk and *Morskoy Boy*, which allowed young USSR geeks to launch fake torpedoes at NATO warships. Unlike the paintings from the masters, these works

can be played with: at the entrance to the museum, visitors receive 15 kopeks to try their luck at the machines. Not far from the Church of the Saviour on Spilled Blood, tucked away in a stunning courtyard, this museum even has a vintage sparkling water fountain that still works. Visitors who love antique gadgets will be amazed.

GETTING THERE

Direct flights from Zurich starting at 300 Swiss francs per person

WHERE TO STAY

In the ambassador's quarters at Helvetia Hotel, formerly home to the Swiss consulate. Starting at 150 Swiss francs per night for 2 people helvetiahotel.ru

Overlooking the Moika in a 19th century manor at the Pushka Inn Hotel. Starting at 120 Swiss francs per night for 2 people pushkainn.ru

FEDOR POGORELOV'S ALTERNATIVE ITINERARIES

Summer 2018: football fans from all over the world were in Russia to follow the World Cup. Fedor Pogorelov, a sports journalist, was eager to share his secrets. His first guided tour of the city, "Saint Petersburg: capital of Russian football" visits historical stadiums and tells the story of local clubs with archives to prove it. Today, a collaboration with FC Zenith even allows these tour groups to walk on the club's turf.

A remarkable storyteller, Pogorelov has added tours to his line-up: "Rogues of Saint Petersburg" describes the city's crim-

inal history from 1926 to 2007, when the last active gangs in the city fell, aggressively hunted down by the Putin government. An authentic Petersburgian, Fedor Pogorelov grew up in a communal apartment on Repin street, the city's narrowest street at only 5.6 metres wide. Using interviews with painters, artists and musicians, he recreated the historic past of this classic 18th-century neighbourhood.

For more information and to make reservations: fedor.pogorelov@gmail.com
instagram: fpogo



A bit of wellbeing



Thermal tourism makes perfect sense in Saint Petersburg, where winter humidity can sometimes be bone-chilling. Tsar Peter the Great, fond of steam, encouraged "banya" culture by not taxing the construction of these baths. Legend has it that Lenin and Dostoyevsky often visited the Yamskie baths and then would go to the Shaika-laika bar for a steaming kvass.

Also historic, the Degtyarnie public baths were very popular before being restored to their current more elegant state, with a variety of massages and beauty options.



A bit to eat

A few metres from the Hermitage, is the "Snyt": a flower-filled courtyard, mismatched sofas, delicious drinks and a variety of pastries – it is an ideal place to end a visit to the museum.

Russian gastronomy has some gems. At Mamalyga, discover delicious Georgian cuisine. We particularly enjoyed the honey cake, khinkalis (raviolis), kharcho (meat stew) and the range of khachapuri (turnovers stuffed with cheese).

Ask locals for a place to enjoy a drink with a panoramic view of the city, and they'll send you to Mansarda. On the sixth floor of the former Gazprom offices, patrons will enjoy the view of

the dome of Saint Isaac cathedral a bit more than the sushi and pizza on the menu. If you're hungry, your best bet is the cosy EM. With 22 places to sit and an open kitchen home to a collectible cast-iron gas cooker, EM has walls that would make entomologists envious and dishes that make us forget the Cold War. Reservations are required.

Is vodka not your drink of choice? Head to Beer Geek instead and sip your way through the many Russian craft beers available. On the same street you'll find Bekitzer, an Israeli street food bar that will welcome you when you need something to soak up the hops at the end of the night.



A bit of vintage shopping



STEFAN WEGER

A radical alternative to the luxurious shops of Saint Petersburg, the Udelnaya market is worth a visit. In the northern part of the city towards the Finnish border, Russia's largest antiques market hasn't

changed since it opened 20 years ago. You will feel like you went back in time as you peruse Soviet trinkets, discover lost crafts and admire the patience of vendors wrapped up in their shapka hats and woollen boots. ▽

ADDRESSES



+++
Cultural centre
Loft Project Etagi
Ligovskiy Av
loftprojectetagi.ru

Museum of Soviet Arcade Machines
Nevsky Prospekt,
Konyushennaya Square, 2B
15kop.ru



+++
Thermal bath
Yamskie Bani
Dostoevskogo Ul. 9

Thermal bath
Degtyarnie Bani,
Degtyarnaya Ul. 1A



+++
Art-Café Snyt
Moshkov Ln., 4

Mansarda
Business Centre Quattro Corti,
Pochtamtorskaya Ul. 3
ginza-mansarda.ru

EM, Moika River Emb. 84
emrestaurant.ru/en

Mamalyga, Kazanskaya Ul. 2
ginza.ru

Beer Geek, Rubinstein Ul. 2/45

Bekitzer, Rubinstein Ul. 40/11
bekitzer.ru



+++
Udelnaya Market
Monday to Sunday, from 11.00 to 19.00
Accessible by metro (Udelnaya Station) or taxi



MOTORBIKES

A retro feeling

UK brand Triumph is launching a line of vintage-looking motorbikes with modern features. Our reviewer tested the new Speed Twin, which gets its name from a well-known older model.

BY PHILIPP MÜLLER

This bike doesn't lose any oil while riding, vibrations don't make the rear-view mirrors fall off, and there's no tap to turn for reserve mode when there is dangerously low petrol in the tank. The experience at the helm of the new Triumph Speed Twin is similar to what you'd expect from any other modern motorbike. Only the look is retro. And it's only one of several models (15 in all!) that the UK brand is offering for this booming neo-retro segment. Triumph is not the only company investing in this segment of the motorbike market:

other big names (BMW, Ducati, Yamaha, Kawasaki, Honda) have also re-designed or re-interpreted older models in recent years.

The Speed Twin also gets its name from the practically legendary Triumph model from years ago. The first Speed Twin was the UK manufacturer's first motorbike to use a two-cylinder motor. That was in 1938, and this design would serve as a model for almost all motorbikes produced in Britain until the 1960s.



TRIUMPH SPEED TWIN

ENGINE:

INLINE TWO-CYLINDER, 1,200 CC

HORSEPOWER:

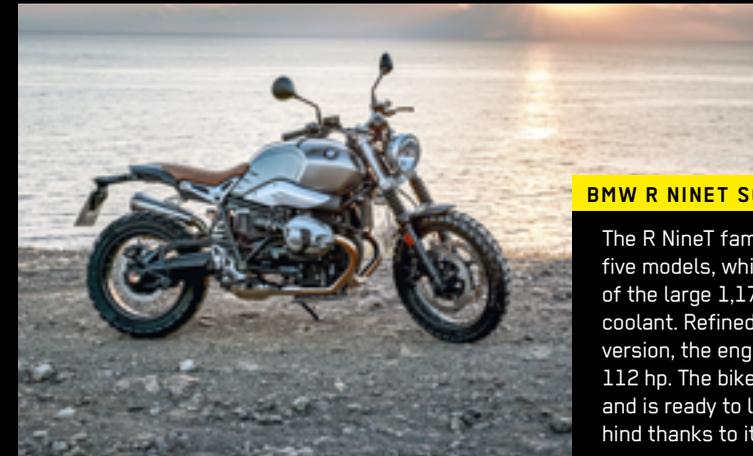
97 HP AT 6,750 RPM, MAXIMUM TORQUE OF 112 NM TO 4,950 RPM

WEIGHT:

196 KG WITH AN EMPTY TANK (14.5 L PETROL TANK)

PRICE:

STARTING AT CHF 13,600.-



BMW R NINET SCRAMBLER

The R NineT family has no less than five models, which are all variations of the large 1,170 cc engine without coolant. Refined further with each new version, the engine currently reaches 112 hp. The bike has a charming sound and is ready to leave the asphalt behind thanks to its special tyres.



HONDA CB 650 R

The design is a skilful mix of tradition and the future. It is also part of a range with various cylinders; the 650 (649 cc) is the latest model. It is equipped with very effective suspension, brakes and anti-skid technology, all with a maximum of 95 horsepower at the very top end of the tachometer.

THE COMPETITION

Today, the Speed Twin still has a parallel twin engine and the design is similar to its ancestor. But everything else has changed. When you sit on the bike, you realise there's a large engine of 1,200 cubic centimetres. There's also an electric starter and sophisticated suspensions that guarantee excellent comfort while riding.

Due to current anti-pollution regulations, the British twin is now cooled with liquid, rather than air. A discreet coolant radiator is vertical, almost hidden behind the front wheel between the two steel tubes of the frame. The catalytic converter, which cleans the exhaust gases from the engine that travel through the chrome tubes, is also hidden under the motorbike. The quality of the manufacturing is impressive.

Despite the concessions made for the modern world, the strong retro pulsations of the twin take riders right back in time, provoking visceral emotions. The English engine is designed to accelerate cleanly as soon as you turn the throttle, rather than immediately jump to the edge of the tachometer like a Japanese sport bike. The 220 kg Speed Twin is catapulted forward with gentle strength and an enjoyable rumbling. You can easily enjoy the ride without pushing the speed limit.

There's also no need to curb all motorbiking instincts in tight turns. The suspension and brakes of the Speed Twin are top when you want to slow down. While not quite as firm as a sport bike, and the mass is still sensitive to quick cornering, this

bike is nevertheless much more agile than its retro look would lead you to believe. And if you're too enthusiastic during tight turns, the (configurable) anti-skid brakes will save the day.

More good news: no need to destroy your back for a dash of sportiness – the riding position is active but not tiring on the body. Furthermore, the seat is low enough and the clutch is easy to operate – a big advantage when riding at slow speeds.

This new model seems designed to satisfy the needs of many motorbike riders, offering a stellar mix of sportiness, comfort and style. So it's not surprising that Triumph's Swiss subsidiary quickly sold all of its annual stock... Riders will have to be patient if they want this bike. ▲

BOUTIQUE

GPS ON GLASS

Say goodbye to the GPS stuck to the windscreen, blocking the driver's visibility. The Hudway Glass reflects smartphone instructions on glass surfaces via a dedicated app. Not only does the system keep the field of vision clear for drivers, it also projects a 20% larger image, thanks to an incorporated lens.

hudwayglass.com
CHF 50.-



PREMIUM BARBECUE

Feuerring, a company based in Küssnacht, has gained a respectable reputation for its stylish, bowl-shaped barbecues, designed as works of art. Made out of a combination of different types of steel, these sculptures have won several design awards and are impressive in all ways. The "small" 50-cm high Tulip 50 model weighs in at 150 kg. Several shapes and sizes are available.

feuerring.ch
CHF 6,500.-



COFFEE WHILE YOU WAKE

Tired of your annoying alarm clock? The Barisieur from British designer Joshua Renouf brews a cup of hot coffee and doubles as an alarm clock when it's time to get up. Powered by a ball bearing system, the machine's digital display gently wakes you from your slumber with soft percolation noises and steaming coffee.

barisieur.com
CHF 435.-



POCKET TRANSLATOR

Pocketalk is small enough to fit in your pocket and can simultaneously translate 74 different languages, including Chinese, Swahili and Hebrew. Equipped with two noise-cancelling microphones, the touchscreen device is operational in even the noisiest environments (railway stations, airports, bars) and has a battery life of 7 hours of conversation.

pocketalk.net
335.-

ELECTRIC GLIDE

With a 500 w motor and weighing only 4.9 kg, the New Nimbus electric skateboard from Bordeaux brand Elwing reaches a top speed of 32 km/h and has a maximum range of 15 km. The large, flexible wheels support riders comfortably and the Canadian maple deck is equipped with a handle, making the board easy to carry.

elwingboards.com
CHF 599.-



RESPONSIBLE POLO SHIRT

Ralph Lauren has launched the "Earth Polo", a new version of its iconic polo shirt that is sewn entirely with fabric made from recycled plastic bottles. Available in four colours, the shirts are dyed using an innovative process that doesn't use water. This initiative is part of the brand's commitment to extract 170 million plastic bottles from landfills and oceans by 2025.

ralphlauren.fr
CHF 139.-



RACING FOR WATTS

Eco-friendly company SportsArt has developed a high-tech treadmill that transforms part of the energy produced by a runner's physical effort into electricity, and then puts it back into the network. Up to 200 watts can be generated per hour by the Verde G690 Treadmill depending on the chosen setting: running, walking, sprinting, or even pushing a sledge. This makes jogging worth the price.

gosportsart.com
CHF 10,015.-



TRIED AND TESTED

“DUMBPHONE”, THE ANTI-SMARTPHONE

BY BENJAMIN KELLER

Dumbphones – minimalist phones – are a hit among people looking to free themselves from their smartphones. Seeking some peace, our columnist tested the updated Nokia 3310.

“I’ll quit tomorrow.” I’ve said this for months before actually doing anything about it. Not cigarettes, I’ve already quit. Something more addictive: my smartphone. When I see people glued to their screen at the bus stop, on the train, while walking, I get the feeling that these “smart” phones are making people dumber. They take up mental space, cause stress and kill your attention span. I wanted to free myself.

But I couldn’t go back to the stone age, either. Between the smartphone and not having a phone at all, there’s the “dumbphone”: a “stupid” phone that can only be used to make calls and send messages. I first fell for the new Punkt model, from a small Ticino-based company that designs clean, elegant products. But the device’s youthful shortcomings made me choose the update of the famous Nokia 3310, the telephone of my teenage years.

I saved my contacts to my SIM card before transferring it to the new device (an opportunity for some spring cleaning) and I was good to go! The first thing I noticed with the Nokia was that it was very small

and lightweight: 88 g. A far cry from the brick of the early 2000s. Since then, the parts have become smaller and smaller. I almost forgot

Living with a dumbphone is fantastic at first. I feel lighter

it was in my pocket. It’s a big change from my Galaxy S8 that I have to put in my bag when I cycle so it doesn’t bother me while I pedal. Other welcome evolutions: messages are displayed by discussion (and no longer in separate sent and received inboxes) and the menu is presented as a series of icons, which makes it easy to find what you want. In addition to calls and messages, the phone also has basic applications such as a calendar, alarm clock, voice recorder, camera (if you want to call it that) and the famous “Snake” game updated (for the worse, sadly). You can even personalise the phone: screen saver, colour, etc., all for the low price of 59 Swiss francs.

Living with a dumbphone is fantastic at first. I feel lighter. I wasn’t constantly bombarded by notifications or tempted to pull out my mobile every time I had to wait 10 seconds. And you don’t need to charge it all the time, as the battery life easily lasts a week.

But I soon encountered difficulties. Like the day I was stuck in the Fribourg countryside because I missed a connection and had an urgent meeting. With no Wi-Fi, I resigned myself to putting my SIM card back in my Samsung for Google Maps to save me. To handle these types of unpredictable situations, but also to not become dependent on nearby smartphone users, I grew accustomed to carrying around two devices with me.

But as I write this, I must admit that I haven’t used the Nokia 3310 for several days. I don’t have internet access in my current apartment, so I’m forced to switch out my SIM card when I get home to access the internet. As the days went on, I rarely put it back in the Nokia... Without that problem, I think I would have been able to stay strong. I’ll quit tomorrow, I promise... ▾

JOSEF LAGO / AFP

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