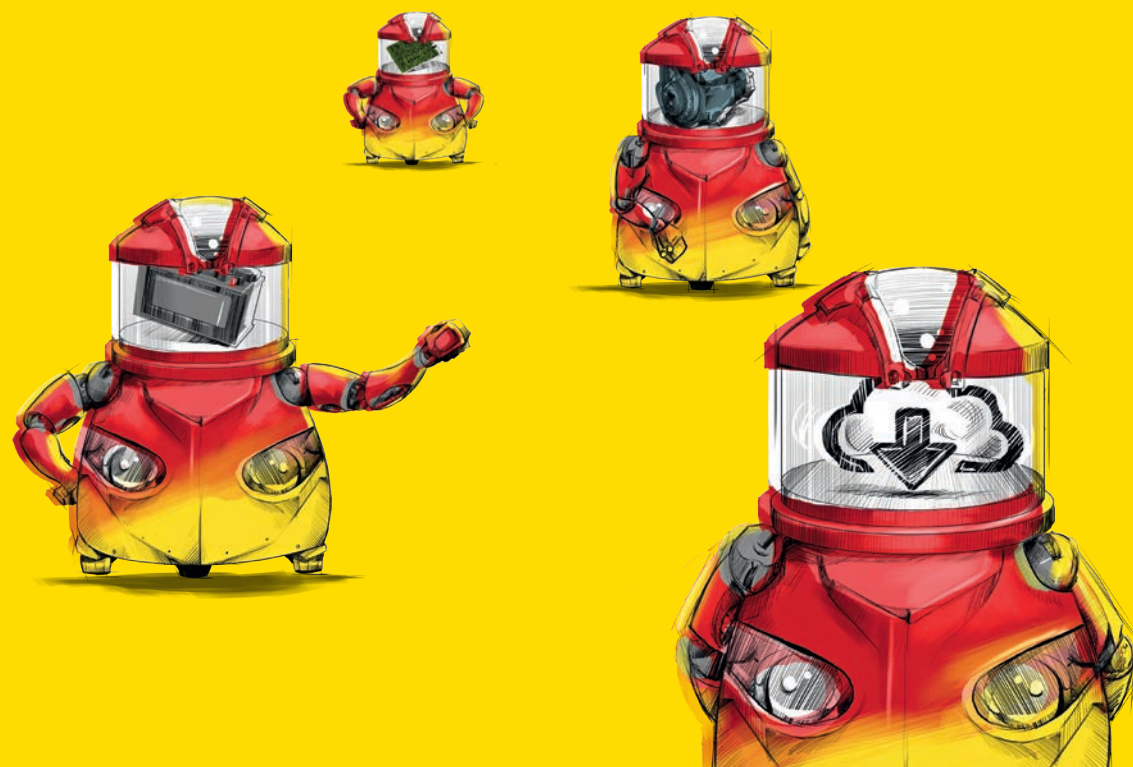


# THINK ACT

## AUTOMOTIVE INSIGHTS

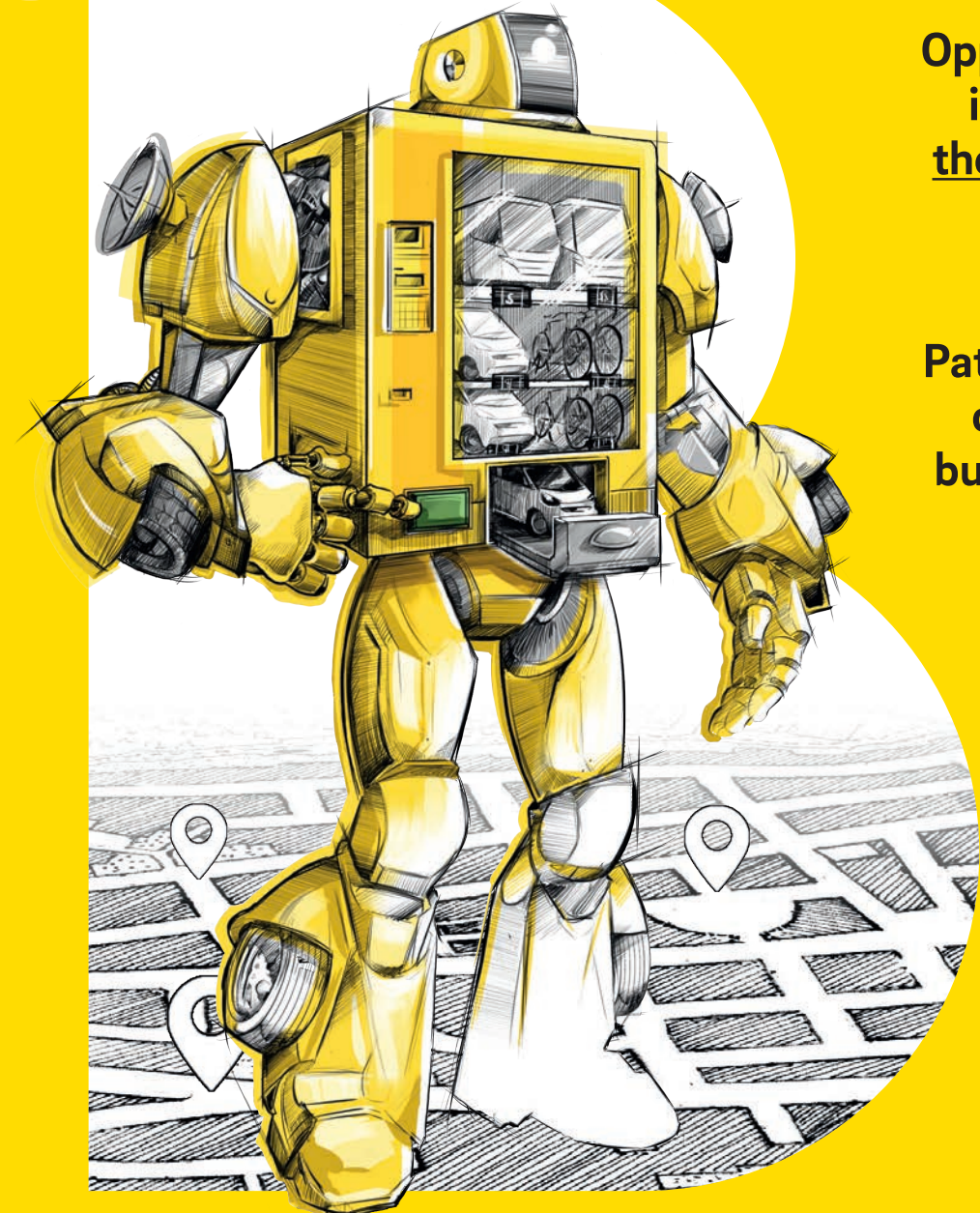
Many of the OEMs we know today will end up as mere Device Manufacturers.

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THINK ACT AUTOMOTIVE INSIGHTS | 1 | 2016 FUTURE PROFITS IN CAR INDUSTRY



TRANSFORMATION OF THE CAR INDUSTRY

# Who will capture most of the future profit pools?

MARKETS

**Opportunities in Iran after the sanctions**

INTERVIEW

**Faurecia's Patrick Koller on supplier business and leadership in the digital age**

**How will  
traditional  
automotive  
companies  
earn money in  
the future?**

# The automotive world in 2030

Let's be honest: over the past 100 years, the automotive industry saw very linear development. Maybe that's why we all like to hype new trends like the first "telematics wave" 15 years ago. We had high expectations, which quickly lapsed into many years of silence. With all the buzz about electric cars and automated driving, are we now in a similar situation?

**FOUR STRONG TRENDS** are "meeting" at the same point in time. Therefore at Roland Berger we are convinced that this time, it's different. Firstly, there is strong global and regulatory pressure to reduce CO<sub>2</sub> emissions, while at the same time achieving a world with virtually zero road-traffic fatalities. Secondly, consumer behavior is changing dramatically (e.g. sharing economy). Thirdly, we observe a strong strategic motivation and financial means of non-traditional players to invest in disruptive technology and business models. And fourthly, new enabling technologies are available at relatively low cost. The implication is clear: the traditional automotive value chain will see more disruption in the next decade than it has since the automobile was invented.

**AUTOMOTIVE INSIGHTS** offers helpful guidance as automotive industry players seek out the right path to succeed in this new world. For the first time since the dawn of this new era, we have conducted a thorough survey of the landscape: our Global Automotive Ecosys-

**Marcus Berret** is Head of the Global Automotive Competence Center at Roland Berger and Head of the company's supervisory board.

**Contact:**

Marcus.Berret@rolandberger.com  
Phone: +49 711 3275-7419



tem Revenue Stream and Profit Pool Models enable us to map out scenarios that visualize the big shifts in revenue and profit performance. Knowing the likely changes in advance will provide stakeholders with a better sense of strategic investments they should make in the automotive ecosystem.

**HOW TRADITIONAL PROVIDERS** can prepare themselves for this brave new world is another key topic, which we touch upon in our interview with Faurecia's CEO-designate Patrick Koller. He talks to us about the challenges that digitization holds for suppliers and outlines some of the ways Faurecia has found to deal with them.

**AND YOU MIGHT LIKE TO KNOW** that our work in supporting numerous players as they realign their business model has led us to team up with another world market leader. Our new partner Wind River, a U.S.-based software and IoT solutions provider, will make us more agile and round out our range of consulting services.

Enjoy your read!

**Marcus Berret**

## Next-generation automotive consulting – how does it work?

In this partnership, Roland Berger weds its extensive industry expertise across the global markets with Wind River's decades of embedded software leadership, rich technology expertise and its long history in automotive software. The joint offer will help customers intelligently navigate the software revolution happening in the automotive industry.

Wind River, a wholly owned subsidiary of Intel Corporation, will provide software management capability, architectural expertise, and engineering support that ranges from strategy exploration to the proof-of-concept and production phases.

Roland Berger will deliver key market insights, including trend and business analysis for assessing strategy value and expected benefits, and help design new innovative business models. As a leading global consultancy, Roland Berger's service portfolio spans the entire range of management consulting from strategic advice to implementation.



Captive finance buyers purchase more cars. They buy a new one

**1.5**  
years

earlier than cash customers.

Turning wheels into gold

**30**

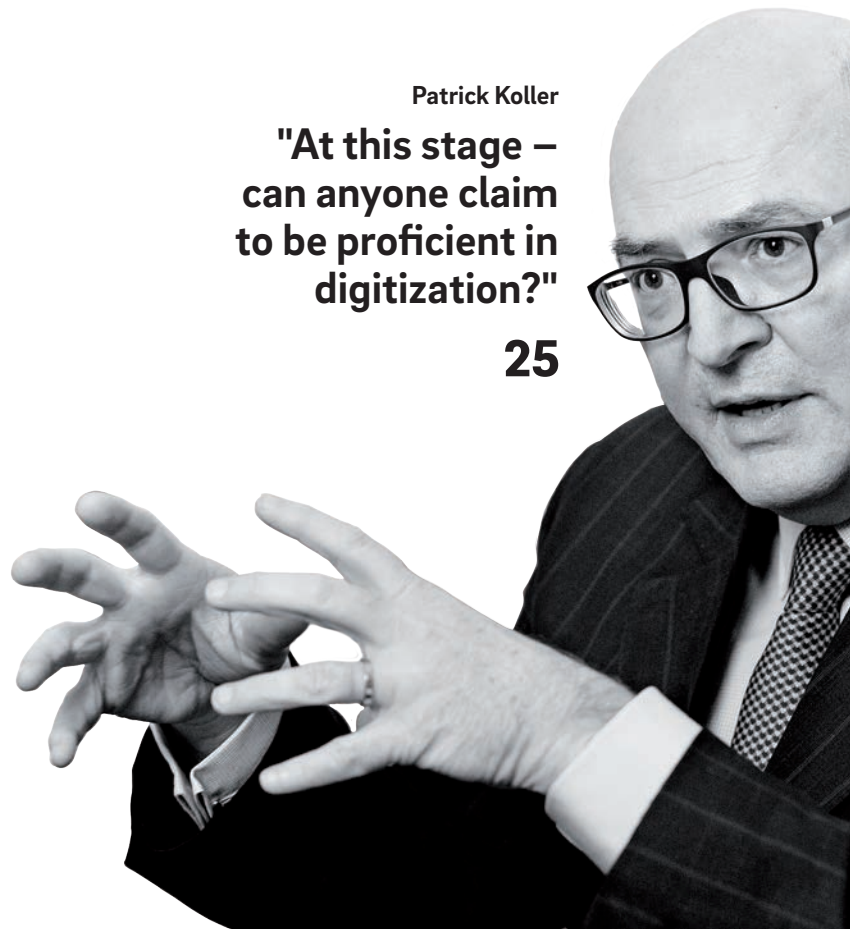


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A new perspective on Chinese customers



**32** Join the road train: Platooning is key for a market breakthrough of automated driving technologies



Patrick Koller

"At this stage – can anyone claim to be proficient in digitization?"

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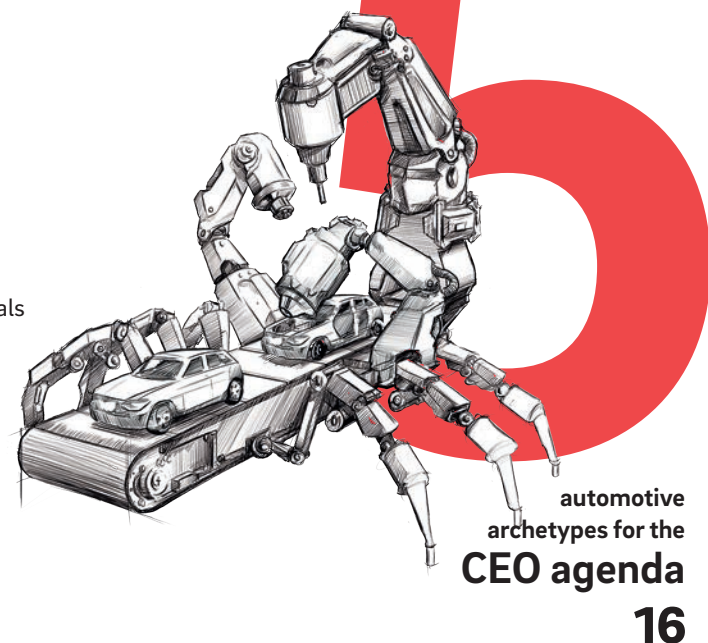
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**Back to business: The Azadi Tower in Tehran City is a symbol of modern Iran**

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# Back to business

Tehran City western entrance:  
Azadi Tower is an award-winning  
monument built in 1971  
by Hossein Amanat.



## Iran has reopened its markets to the automotive industry. The environment is attractive, but players need to keep an eye on customer preferences and new legislative initiatives

by Philipp Grosse Kleimann, Alexander Brenner and Santiago Castillo

In a world beset with structural economic problems, automotive investment locations with high-growth potential resting on sound economic fundamentals seem few. On January 16, 2016, it was announced that Iran is in compliance with the UN nuclear agreement, resulting in almost all international economic sanctions against it being lifted. The critical question is how the overall market has changed since those sanctions were imposed. Automotive players looking for lucrative opportunities will need a thorough understanding of recent developments and the particulars of the Iranian market: the competitive environment, the specific regulatory and taxation conditions, and current customer preferences.

### A HURRIED RETURN TO THE MARKET

Although most sanctions preventing European firms trading with Iran were already lifted at the beginning of 2014, the automotive industry has been hit significantly. After reaching a peak of 1.5 million units sold in 2011, it crashed in 2013 with sales of only 670,000 units. By 2014, the figures had significantly recovered to 930,000.

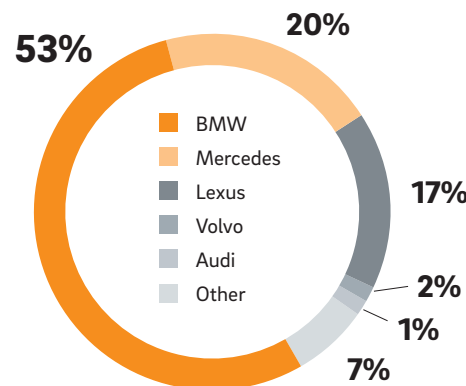
Now the storm has passed and former trading partners are scrambling to get back into Iran. Peugeot is back with a new Iran Khodro joint venture that includes EUR 427 million in debt waivers and discounts for the Iranian manufacturer. The companies plan to produce Peugeot's 2008 SUV and the Peugeot 208, with the first vehicles rolling off production lines in 2017. Daimler, which gave up its 30% stake in Khodro Diesel in 2010, has already announced plans to

### THE ONLY WAY IS UP

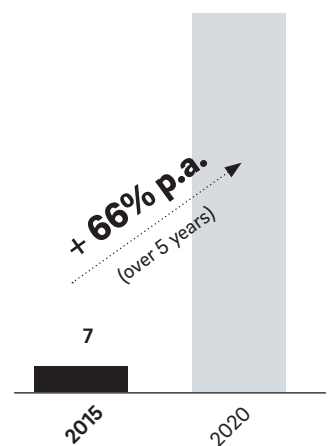
Twofold opportunities in Iran: The future is bright for premium manufacturers, but volume manufacturers can also count on annual growth in the double digits

Car sales 2015 and projected car sales 2020 [per '000 units, optimistic scenario]

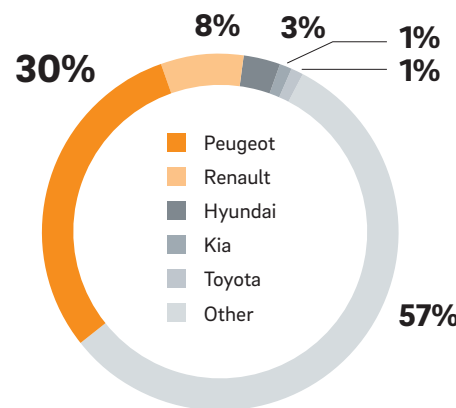
#### Premium car sales 2015



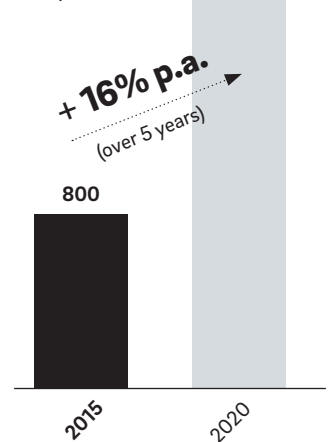
#### Projection



#### Volume car sales 2015



#### Projection



Source: Roland Berger

restart sales and local production. Daimler predicts intense demand for commercial vehicles, trucks in particular.

Players such as Audi, Volkswagen, BMW, and Hyundai who, until now, have not had a manufacturing presence in the country, started exploring the market and holding discussions with Iranian automakers in mid-2015. Some players are still cautious: BMW has said it will hold back and see how political and economic developments unfold. Fiat Chrysler has described the Iranian market as very promising but too early to judge. Skeptics note that if Iran does not stick to the agreement, sanctions may be reintroduced at any point. At the end of February 2016, however, Iranians returned and overwhelmingly reelected Rouhani's moderate forces, a positive sign that Iran will abide by the terms of the nuclear agreement.

### SOLID FUNDAMENTALS

The ongoing sensitivity of the political situation notwithstanding, the fundamentals of the Iranian market are highly promising. Iran has a population of 80 million – roughly the same size as Germany – half of which is under the age of thirty and highly educated, in particular in science, engineering and technology. The IMF has predicted economic growth of 4.4% in Iran from 2016 onwards if sanctions remain lifted. Although the country continues to be dependent on oil revenues, it has managed to gradually reduce the share of government revenues based on oil exports. As of December 2015, the share of oil in Iran's budget was 26.1% – a year-on-year decrease of 13.8%. Iran's car industry is its second largest after oil, and prior to the sanctions, Iran was the 20th largest car manufacturer in the world. The automotive industry employs 700,000 people directly and 2.4 million people indirectly in related industries, equivalent to 10% of the country's workforce. Iran exports vehicles only to some countries in the Middle East (mainly Iraq and Egypt), as well as to Belarus, Algeria, Senegal and Venezuela. Its central geographic location means it has significant growth potential



## How the Iranian government supports a more modern car parc

**Emission standards.** Since March 2012, compliance with Euro IV is mandatory for all locally produced gasoline and diesel vehicles – Euro V for import vehicles. It is expected that from 2016 onward imported vehicles will have to comply with Euro VI. Moreover, authorities introduced restricted low-emission traffic zones.

**Alternative powertrains.** Iran has the world's second largest fleet of compressed natural gas vehicles. By law, 60% of vehicles sold in the country must run on natural gas or dual fuel – so far, this regulation has not been enforced.

**Scrappage program.** Authorities want to take some 200,000 vehicles per year off the roads, to be replaced by newer, more efficient cars. The program started in 2005. It reduced the average age of vehicles in use from 17 years to 10.6 years within 8 years. It is expected that within 10-15 years about 2.2 million vehicles will be replaced.

as an export hub. Peugeot has announced plans to export 30% of Iranian-produced cars, taking advantage of a government scheme to give generous tax breaks and other incentives to foreign investors who construct factories in Iran and export more than 30% of their production. The market potential for new cars is huge (see graphic on previous page). Premium car sales are expected to outperform the overall market with an annual growth rate of 66% up to 2020, while the rest of the market will grow by 16% within the same period. Iran's young population will reach their peak purchasing power by 2040. Currently, there are 147 cars for every 1,000 people (by comparison, the UK has 519 cars per 1,000 people, the U.S. 809). The Iranian government has introduced various initiatives to modernize the country's fleet (see box on the left), which on average is about 11 years old. These include new emission standards and a vehicle scrappage scheme, which was introduced in 2005 with the aim of taking old and inefficient cars off the roads. In 2015, over 320,000 vehicles were scrapped as part of the scheme and the government





predicts that 200,000 vehicles will be traded in every year for the next 10 to 15 years. Foreign brands continue to enjoy a positive reputation among the public, despite attracting the ire of Iranian officials as a result. According to an August 2015 study, Iranians perceive imported goods as being of superior quality (see graphic on the right). 49% of those interviewed said they would be interested in purchasing an imported car. But importing complete cars to Iran has never been a big business due to high import tariffs. Completely Built Unit (CBU) imports dropped to between 35,000 and 40,000 during the sanctions. However, they recovered rapidly in 2014 to 106,000 units and this upward trend is expected to continue as historically high tariffs are slowly being reduced. A 100% import tariff for new cars was reduced to 90% in 2006 and lowered again to 70% in 2010. Hybrid vehicles, however, are an exception – an import tax of 4% was set in order to promote their purchase, resulting in a 112% increase in hybrid vehicles sales in 2014. Although Iran is the world's seventh largest oil producer, it has limited refining capacity and is seeking to promote

hybrid vehicles and cars that run on natural gas. The Iranian government disagrees whether to continue to reduce import tariffs. In 2015, a group of Iranian parliamentarians, as well as the head of Iran's customs administration, called for an increase in car tariffs in order to boost government revenue and reduce imports to protect local manufacturing. It is likely, however, that the Iranian government will continue to relax import tariffs considering its long-term goal of joining the WTO, among whose members car import tariffs are 3.5% on average. Even very high tariffs and a ban on engines with capacities higher than 2.5 liters have not dented wealthy Iranians' enthusiasm for luxury models in recent years. From March 2011 to 2012, during the height of the sanctions, 563 Porsche models were imported to Iran at a total cost of USD 50 million dollars. On top of that, customers had to pay the 90% import tariff.

duced its ownership in Iran Khodro and Saipa, the two largest Iranian automakers, down from around 50% in 2008 to 20% in 2010. Smaller Iranian players, however, continue to complain of an effective duopoly and preferential treatment for those two companies.

It is clear that the government's priority is to build up the domestic industry's expertise while continuing to shield it from foreign competition. That's why CBU strategies will remain efficient only for low volume-model retailing, and in the medium term. Iran Khodro announced in 2014 that it can manufacture the TU3 engines for type 2 Peugeot 206 cars "completely on its own" and "without assistance from Peugeot".

Greenfield approaches in Iran are untested terrain for foreign investors, but given the country's current policy priorities, joint ventures remain the best entry to the Iranian market.

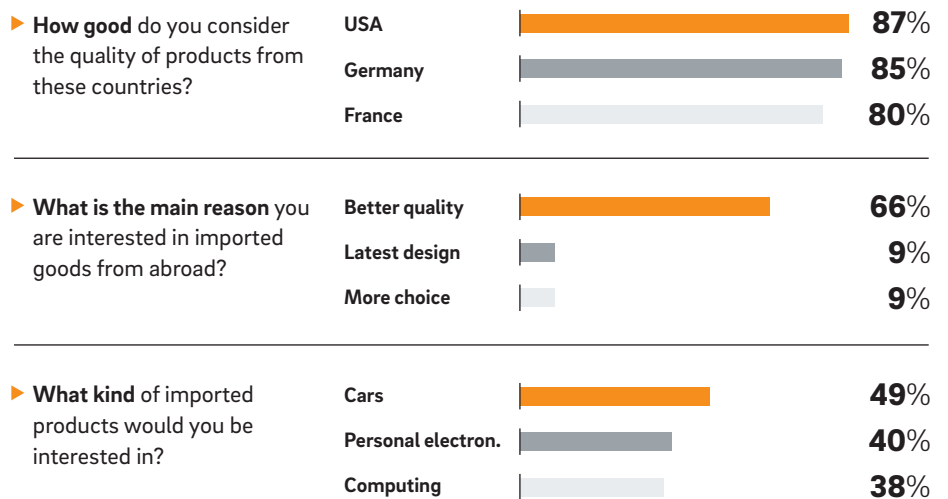
Foreign investors who are prepared to navigate Iran's intersection of regulatory requirements, market conditions and its unique political and cultural landscape, will be well-positioned in what is promising to be a highly lucrative market.

**NEW BEGINNING, NEW RULES?**

Iran has traditionally maintained government monopolies in the oil sector and major manufacturing industries. In recent years, the government has gradually re-

**A SOFT SPOT FOR FOREIGN BRANDS**

A recent survey indicated that Iranian customers appreciate cars and good quality



Source: OnDevice Research

A weakness for big cars: The needs of well-educated women should be taken into account when addressing next-generation car buyers.







# The car generation

Rapid change can translate into considerable opportunity – if you know what to look out for. Staying on top of the Chinese automotive market means understanding shifting consumer demographics and learning to speak to a new generation of drivers.

by Junyi Zhang

**F**or the first time in ten years – luxury or mass market, foreign or domestic, sales figures or manufacturing – the Chinese automotive market is stagnating. For those operating in the automotive sector, it's time to recognize that a coming period of fierce competition is inevitable and that seizing the initiative will mean reacting to changing Chinese consumer demands.

In an exclusive study conducted with Bitauto, we analyzed auto consumption data on browsing, searches and orders from Bitauto's website and over 500 other media partners to provide carmakers, dealers and other auto industry operators with an informed overview of China's increasingly complex automotive marketplace. This study represents an objective and comprehensive analysis throughout 2015 of consumer preferences at the point of purchase, major consumer groups, and other significant trends in auto consumption. A deep understanding of three emerging target markets and six consumer profiles will be essential for effectively marketing to the newly matured Chinese automotive market.

By the 2012-2014 period, sales had expanded to fourth- and fifth-tier cities as well as rural areas, reaching nationwide consumption. This uneven consumption across urban and rural lines, and in a climate of quick development, has led to overlapping increases in consumption growth and complicated divisions in market sub-segments. It is important to remember, however, that China's automotive market can only now be considered mature after years of considerable growth. Increasing market saturation is pushing the auto industry towards greater integration, opening up new opportunities in the process as the market adjusts.

Consumer price preferences now favor entry-level economy models and enhanced mid- to high-end models, a growing trend that has also seen the market share of status symbol vehicles decline in recent years. Vehicle type preferences have responded accordingly. While compact cars have retained a significant market share of just over one third, sales show a small decline of 4% over the 2014-2015 period, approximately the same level of increase seen in Sports Utility

Vehicles' (SUV) share of the market. Factor in the fact that Multi Purpose Vehicle (MPV) are holding steady at just under 10% of sales, and a trend towards more economically priced, practical vehicles is clearly visible. In low-end markets, domestic SUVs and MPVs are showing significant growth, a trend matched by foreign invested SUV brands in high-end markets.

## **CHANGING DEMOGRAPHICS**

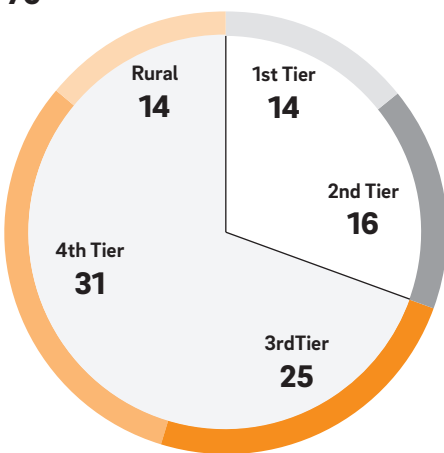
This shift reflects the steady growth of the auto sales market in fourth- and fifth-tier cities, the result of increased purchasing power and better distribution channels in the midwest. In contrast to the eastern regions, the northwestern and southwestern regions are growing and place a premium on value and practicality. Sales in these markets are frequently to first-time buyers, consumers who tend to be more rational, economical, practical and cautious at the point of sale. Nonetheless, these buyers – those in third- and fourth-tier cities as well as rural areas – currently represent 70% of the market composition, and the number is expected to rise to 77% in the coming year.

## THE SHIFT IN AUTO SALES VOLUME TO LOWER-TIER CITIES IS INEVITABLE

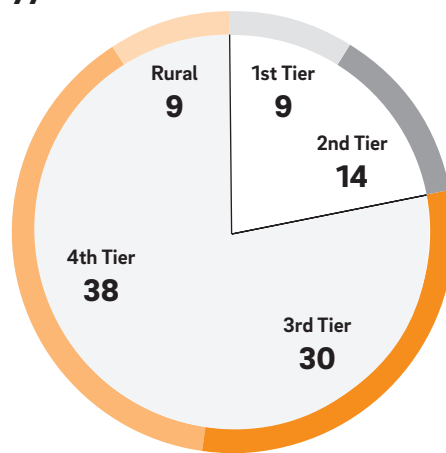
Compared to the current composition of the car-owner market, the expectation shows a shift away from developed 1st- and 2nd-tier cities towards the lower-tier cities. The mature 1st-tier cities in particular are becoming less significant, while the 4th-tier cities are on the rise.

Annual sales volume in China [%]

**Current:**  
Market share of lower-tier cities  
**70**



**Expectation:**  
Market share of lower-tier cities  
**77**



- Beijing, Shanghai, Guangzhou and Shenzhen are classified as 1st-tier cities; provincial capitals and economic hubs are classified as 2nd-tier cities; prefecture-level cities as 3rd-tier cities, and county-level cities as 4th-tier cities.

Source: Roland Berger

Increased purchasing power can also be seen among women, a demographic that currently makes up nearly one third of the market. Female buyers place a premium on vehicle class, appearance, and comfort and are more likely than male buyers to purchase a higher class of vehicle for the better design and security that these brands offer. Style and aesthetics as well as electronic entertainment features are also key to marketing to this growing demographic, one that is very willing to spend more for sense of youthfulness that higher class vehicles offer. Additionally, market players must be aware of the rising importance of buyers under 30 and the values specific to this demographic – one that represents

36% of consumers and is critical to the future of the Chinese automotive sector. Rather than seeing vehicles as either a status symbol or a utilitarian "major asset", these younger consumers think of cars as ordinary commodities – and as expressions of their identity at that. They want variety and prefer relaxed, fun methods of shopping. They shop online easily and want to share their experiences with those they perceive as sharing their sensibilities and tastes. Individualization, convenience, community, and customer relationship maintenance – and the economical compact cars they feel embody these desires – will be the key to successfully reaching this substantial market group.

These three major target markets will indeed determine the future of the Chinese automotive marketplace, but it is imperative to look a little deeper. Overlap and market sub-segments must be taken into account. Based on data collected by Bitauto, various characteristics and purchasing preferences were extrapolated to define six consumer types, or customer profiles, that offer the kind of understanding that can open up new opportunities during this period of market adjustment.

### CONSUMER TYPES

#### 1. The Metropolitan High Flyers:

What is interesting to note in this market sub-segment is that while purchasing preferences remain in higher and status symbol level classes of vehicles, the SUV is now the favored vehicle type with a significant share of 91%. Luxury cars, including sports cars, came in at only 3% of purchases. Although favoring classic models, the range of brands shows a good level of purchasing flexibility.

#### 2. The Down-to-Earth Pragmatics:

Younger than the aforementioned group, these men show a distinct tendency to be loyal to German brands, followed by Korean and French brands, although these two brand groups come in at considerably smaller percentages of market share. The VW aesthetic particularly appeals to this sub-segment, and three-box sedans are favored, coming in at 87% of sales.

#### 3. The More-for-less Penny Savers:

Practical, economical, and popular compact cars are the top choice of this value-seeking sub-segment. The Toyota Carola, Chevrolet Malibu, and BYD Surui are this group's benchmarks for the ideal compact sedan, their favorite vehicle type, a selection of models indicative of the substantial presence of Chinese, Japanese, and American makers amongst their top brands.

#### 4. The Young Guns on a Budget:

This sub-segment seeks to maximize their individuality despite a limited budget. Their purchasing preferences fall almost entirely into the category of classic domestic brands, and their favored vehicle type, at 72% of the market share in this sub-seg-



ment, is overwhelmingly the SUV. The MPV is the only other significant purchasing trend in this group, and like their choices of SUVs, the majority of purchases will fall into the two most economy vehicle classes.

**5. The Successful Style Mavens:**

Purchasing power meets refined taste, creating a sub-segment that shows an affinity for German brands, especially in mid-level sedans and SUVs. Volkswagen, Audi, and BMW feature prominently among their brands of choice, part of a 52% market share for German brands in this particular market group. Korean, Japanese, French and American brands

are also favored, although all at substantially lower percentage shares.

**6. The Economical Trendsetters:**

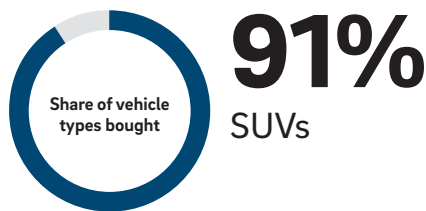
This sub-segment puts economy first and individuality second. They have a strong affinity for Chinese makers, which constitute 57% of their purchases, with Japanese and American makers showing up in substantial – although far smaller – shares of this market. Economical sedans and SUVs are their vehicle types of choice, but price remains the strongest determining factor at the point of purchase. Eighty-seven percent of sales fall into the two most economy vehicle classes.

As the Chinese automotive market continues its transition into this next, more mature stage of development, age, gender and geographic location are all decisive characteristics that will shape consumer behavior. Tailoring brand experiences to meet the demands of the new Chinese consumer generation is essential for transforming this period of rapid change into a source of new opportunities. The answers of how to maximize future sales in China’s auto market are there; one must only understand where the lines of these new consumer profiles are drawn.

**SIX TYPES OF CHINESE AUTO CONSUMERS**

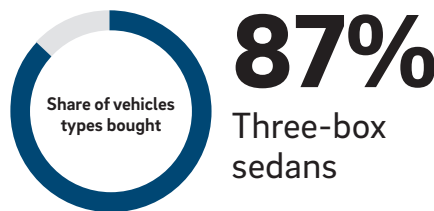
**1. The Metropolitan High Flyers**

Older men in leading positions with high purchasing power. They live in China’s metropolises and love SUVs of all kinds.



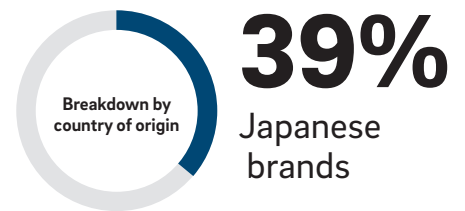
**2. The Down-to-Earth Pragmatics**

Middle-aged men with secure office jobs. They live in smaller metropolises and appreciate quality and practicality.



**3. The More-for-less Penny Savers**

Young men with small/medium income. They need to make compromises and therefore seek out the highest value at a given price.



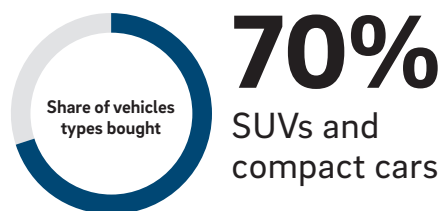
**4. The Young Guns on a Budget**

Young, sporty men from medium-sized cities. Their income is low but they appreciate individuality and like to have fun.



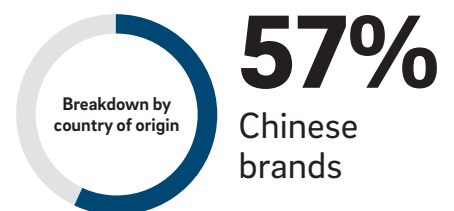
**5. The Successful Style Mavens**

Well-educated middle-aged women who have made a career. They appreciate quality and high-end products.



**6. The Economical Trendsetters**

Younger women with small/medium income. They love fashion and like to demonstrate individuality as far as their budget allows.



Sources: Bitauto big data, Roland Berger research

# HERALDS OF DISRUPTION

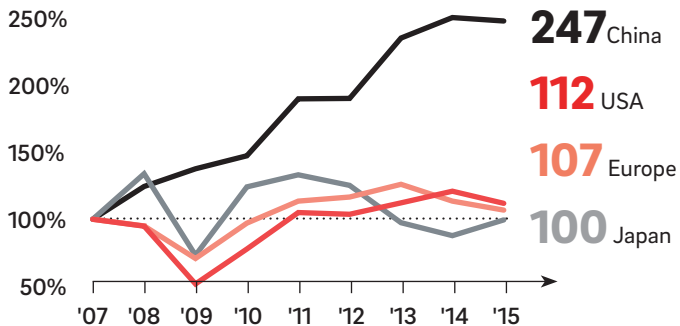
Although volatile, development of the automotive industry over the past few decades is clearly typical: It has entered a late stage of the maturity circle. What comes next?

## A MATURE BUSINESS

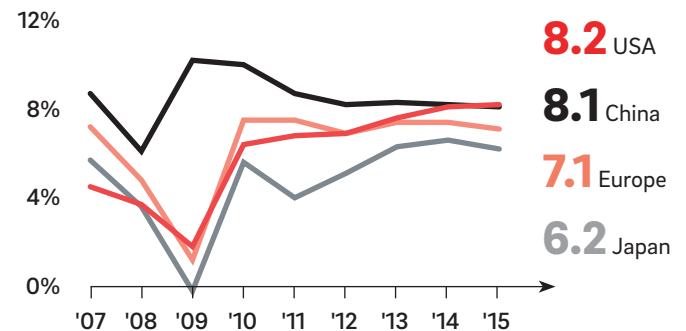
Most of the incumbent suppliers and OEMs will no longer see any significant growth in terms of revenues and margins. Where are the new fishing grounds?

### OEMs

Revenue growth [2007 = 100]

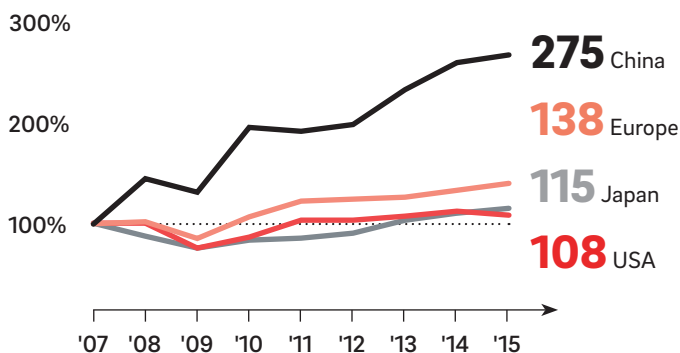


EBIT margin [%]

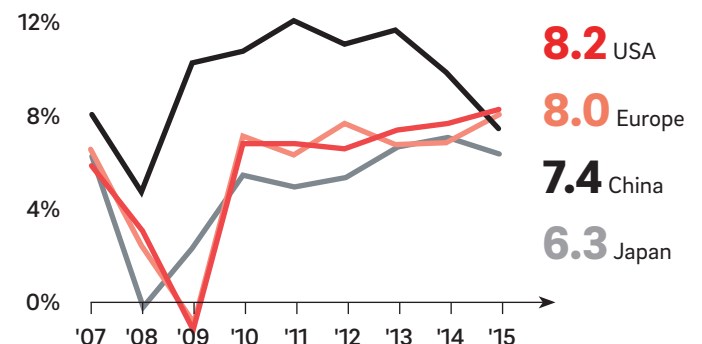


### Suppliers

Revenue growth [2007 = 100]



EBIT margin [%]

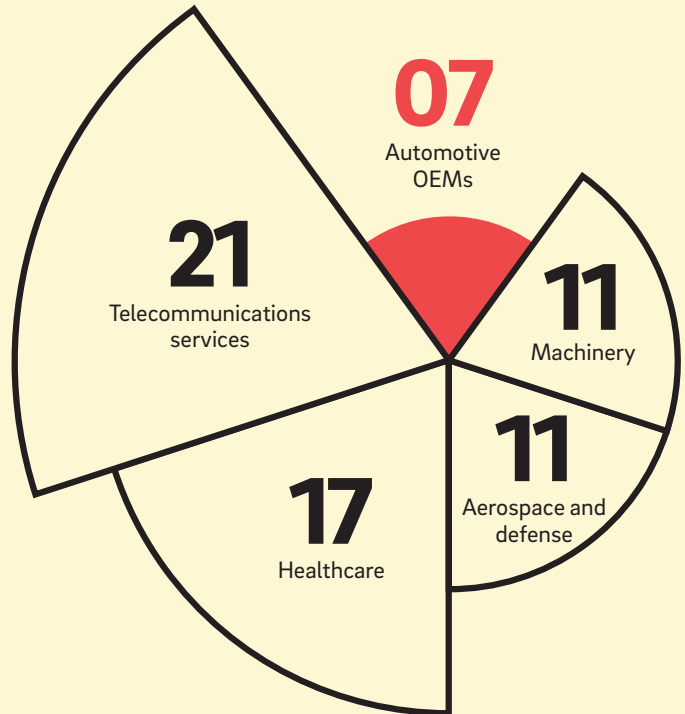


Sources: Capital IQ, Lazard, Roland Berger

# LACK OF LEEWAY

Due to small EBIT margins compared to other industries, OEMs need to rearrange resources before they are able to adapt to major shifts in their ecosystem.

**EBIT margin across selected industries\* [avg. 2005-2014]**



\*Top 100 publicly traded companies worldwide in each sector

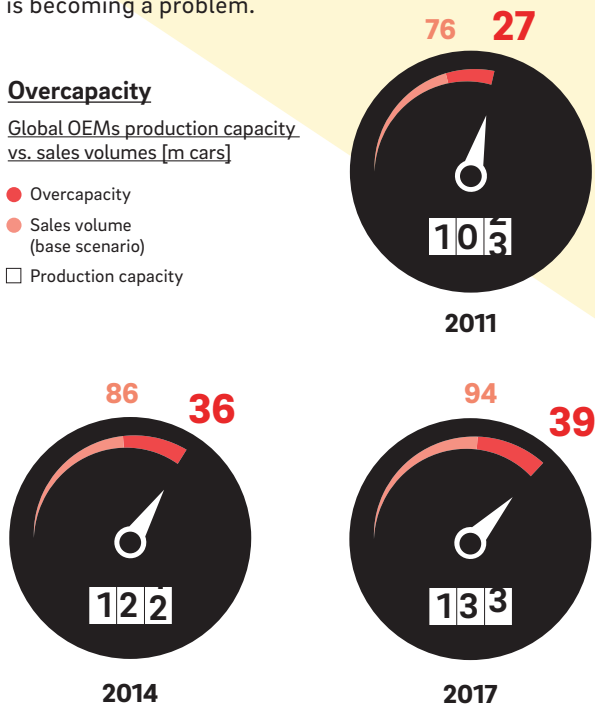
# HEAVY CAPITAL COMMITMENTS

Not every car produced in a region is sold there. However, a comparison between production capacity and sales volume reveals that overcapacity is becoming a problem.

## Overcapacity

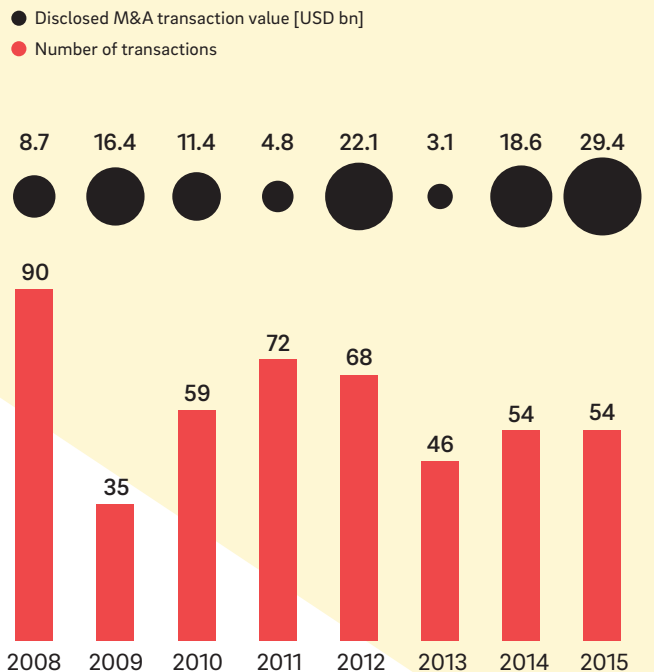
Global OEMs production capacity vs. sales volumes [m cars]

- Overcapacity
- Sales volume (base scenario)
- Production capacity



# CONSOLIDATION AHEAD?

The average size of supplier deals in 2015 has exceeded that of the past 8 years, although the number of deals stagnated. Largest transaction: German ZF Friedrichshafen acquiring U.S. player TRW for USD 14.5 billion.



Sources: Capital IQ, LMC/IHS Automotive, Roland Berger



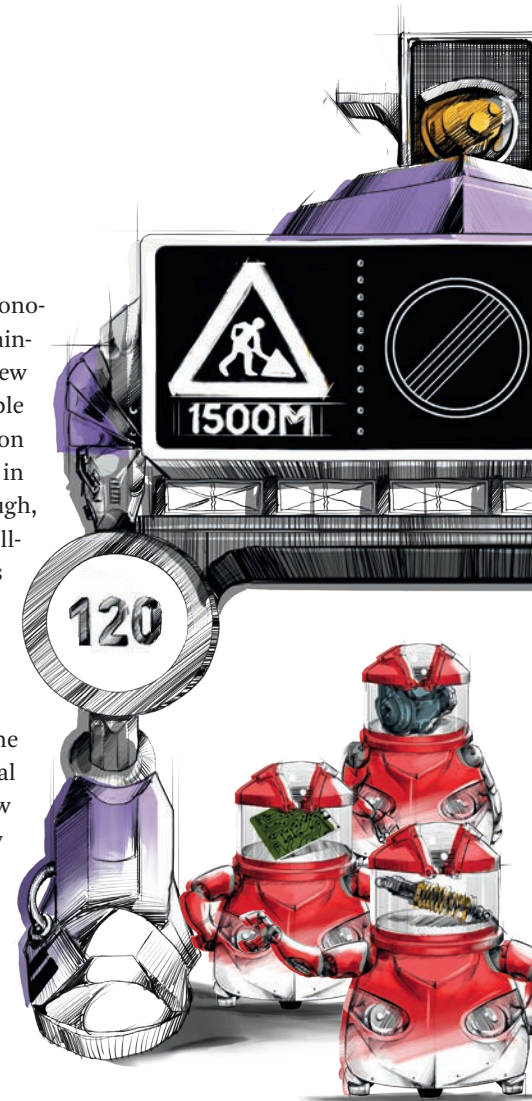
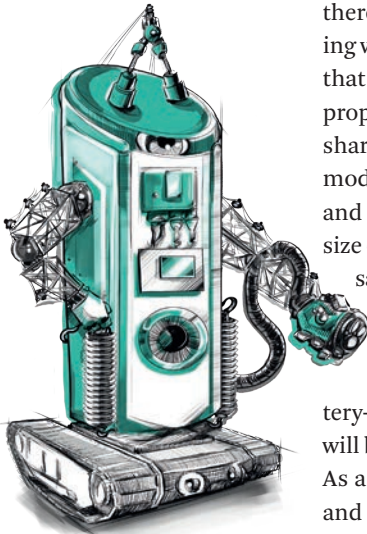
# Archetypes of transformation

We calculate the effects of mobility trends through 2030, identify five archetypes adaptive to the new environment and sketch strategies to seize future treasures of the automotive industry.

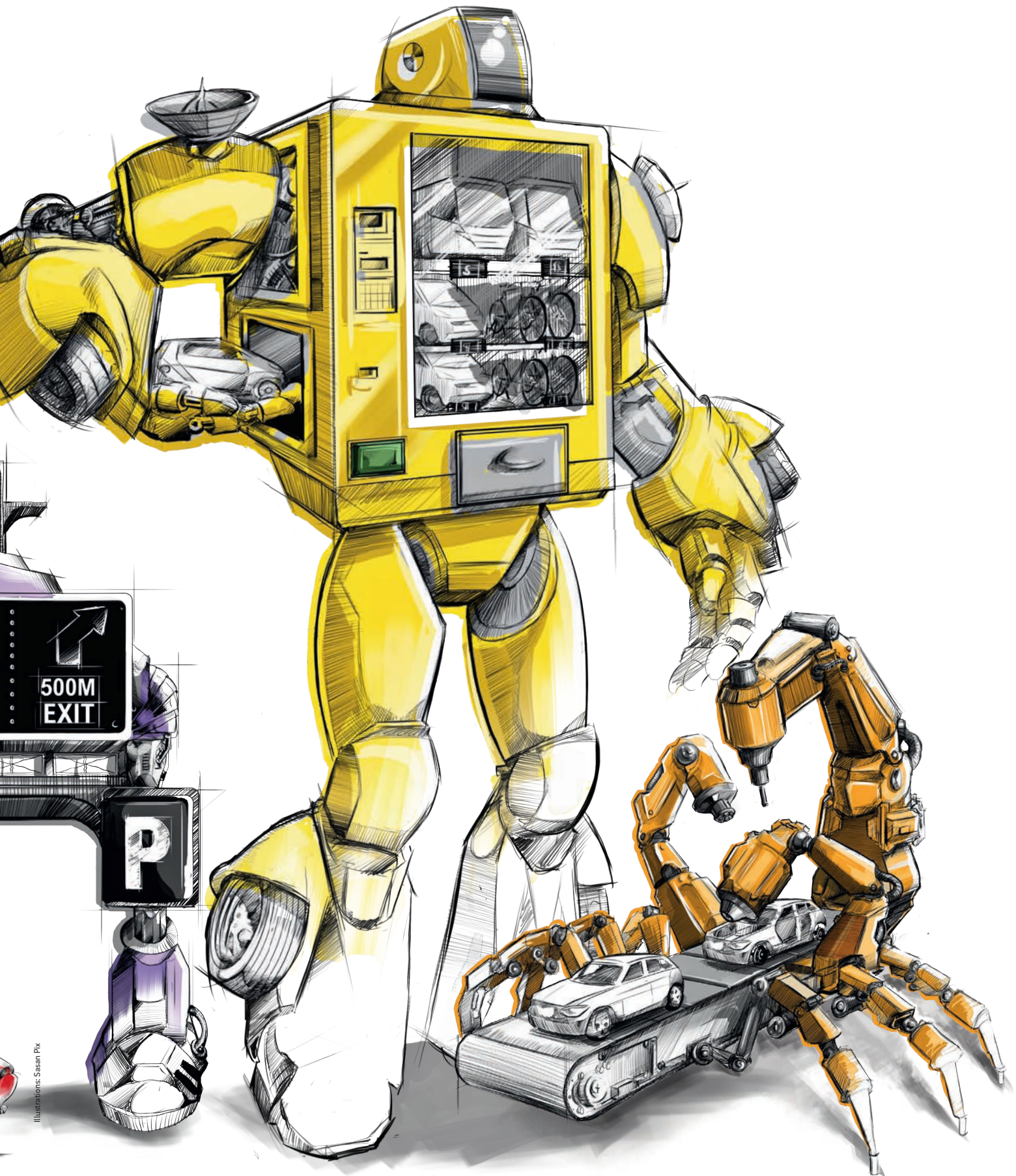
Are OEMs and suppliers ready to shift resources?

by Wolfgang Bernhart, Jan-Philipp Hasenberg,  
Marc Winterhoff and Ludwig Fazel

In a milestone decision that paves the way toward fully autonomous driving, the U.S. National Highway Traffic Safety Administration (NHTSA) recently recognized the computer as a new type of vehicle operator. After more than a century of people behind the wheel, machines could be about to replace them on US roads. Industry players all agree they face a fundamental shift in consumer attitudes toward the automobile. At the moment, though, there are more questions than answers – who will earn money selling what exact products or services? The three overarching trends that will drive the industry are commonly known. Alternative propulsion systems, driverless and connected cars as well as the shared economy are all expected to give birth to new business models complete with their own respective sources of revenue and profits. In January 2016, Ford CEO Mark Fields estimated the size of this transportation services pie at USD 5.4 trillion in annual sales alone – above and beyond the traditional car market. How exactly to tap into this demand and what the future may bring is something of a hotly debated topic. Industry executives still do not share a common view of whether battery-powered electric vehicles or hydrogen fuel cell cars or both will be the technology powering transportation in the long term. As a result, OEMs and suppliers are forced to hedge their bets and continue plowing their limited resources into all three. Just







Illustrations: Sasann Pix

one possible outcome is a world where battery-electric vehicles act as thousands of miniature, decentralized power plants balancing out peak and trough demand for energy in urban areas. During operation they transport consumers point-to-point with zero emissions, and when parked they are plugged into the power grid, storing excess electricity from renewable sources and feeding it back into the grid as needed. We aim to quantify the changes facing the automotive ecosystem in order to make this structural shift more tangible. By plugging certain values into our Global Automotive Ecosystem Revenue Stream and Profit Pool Model – the number of kilometers driven globally, customer preferences, availability of technology under certain conditions – we can anticipate where demand will migrate as well as calculate its extent for different

scenarios. Approaching the issue from this particular perspective differs materially from previous attempts to quantify market conditions, which so far have been oriented predominantly toward the number of cars sold.



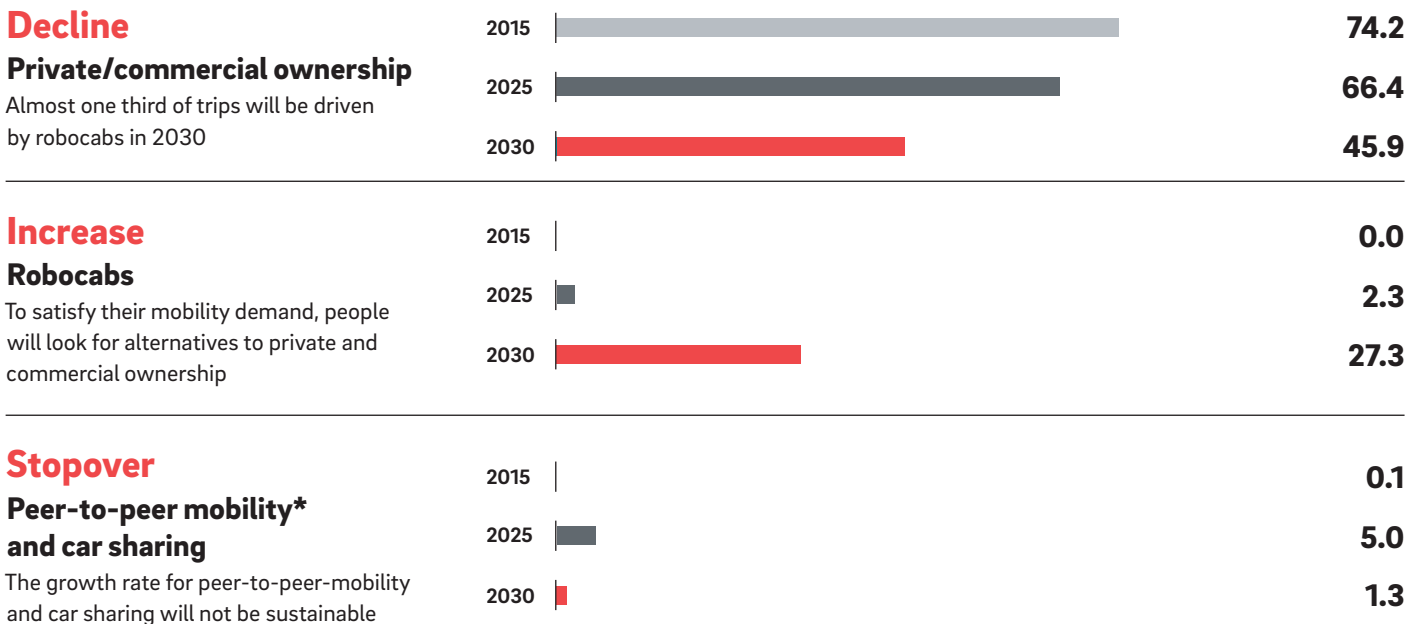
### Mapping the treasure

While car usage today is primarily individual and focused on ownership, one possible scenario is that providers of electric

"robocabs" capable of fully autonomous driving could seize control of more than one third of the worldwide automotive mobility market by 2030. This sounds long, but to put it in automotive industry terms, it is less than two product lifecycles away. The message here is that customer demands could be highly differentiated as soon as technologies are available, and a new market could develop where service providers offer a range of individualized options tailored to meet diverse conceivable mobility needs. One key result from our simulation is that the demand for individually owned cars, the conventional business for incumbent players including auto manufacturers, might decline by almost 30 percentage points 2030. Demand for conventional car sharing and peer-to-peer mobility would increase until around

## HOW FOCAL POINTS WILL SHIFT IN THE NEW AUTOMOTIVE ECOSYSTEM

We expect that a large amount of business focused on ownership and ownership-like models to be transacted in the future through mobility providers. Rental car businesses, peer-to-peer mobility schemes and car sharing could be replaced by new service offers.



► Kilometers driven worldwide in %

\* Contains "asset-light" platform services, e.g. ride hailing, ride sharing, etc.

Source: Roland Berger



2025, only to then be replaced by autonomously driving robocabs. Their cost advantage could entirely eliminate the need, and hence the market, for ride hailing and conventional car sharing. A certain demand for car rentals would remain, however, most likely in the form of larger mobility service packages. As a result it doesn't seem too far-fetched to think robocabs capable of triggering the demise of the two-car household in many areas. The shift within the ecosystem gains clarity when you look at the revenue and profit streams. The OEMs and OES shares of total revenues would decrease. The same is true for independent retail, aftersales and financial services. The prospects for the development of profits in these traditional segments would be even bleaker. In such a scenario, OEMs would see their profits drop by 16 percentage points by 2030, OESs by 17 percentage points. There is plenty of evidence to suggest that the business will need drastic repositioning. Market participants must consider reallocating their capital to those parts of the business judged most promising. Volume carmakers face the biggest challenge as they need high volumes to compensate for low-margin vehicle sales.

**IT WILL NOT BE A FLYING START**

Naturally this is easier said than done. The industry has not faced disruptive change for the last 100 years. It is grappling with longstanding structural problems that range from overcapacity and legacy costs, especially on the manufacturing side, to ever-rising CAPEX requirements and research expenditure. It is no secret that profit margins earned in other industries continue to dwarf those of carmakers. Mainstream players in particular are notorious for not even recovering their cost of capital. While the return on invested capital (ROIC) achieved by automotive companies amounted to nearly 8% in 2014, manufacturers in other heavy industries boast much better figures, such as chemical companies with 13% or pharmaceutical makers with 19%. Margins from the operating business also trail behind those of

**CASTING FOR THE BIG FISH**

Total profits are expected to increase through 2030. Although cars still will be manufactured and sold by car manufacturers and suppliers, mobility services (robocabs) are likely to earn the biggest share of the future profit pool.

**Global revenue pool**

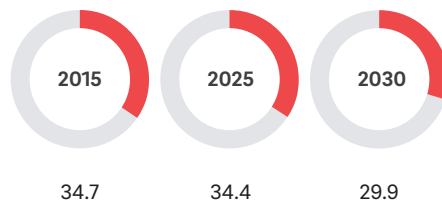


► Total revenues in EUR bn

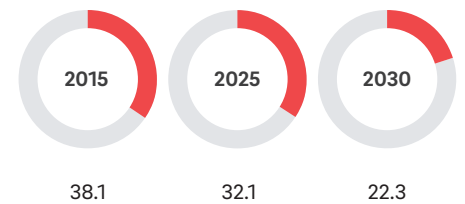
**Global profit pool**



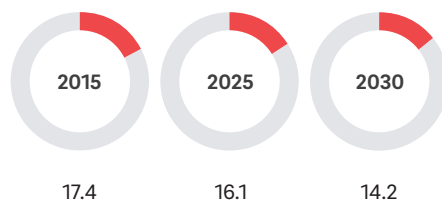
**Car manufacturers (incl. retail, aftersales, financial services)**



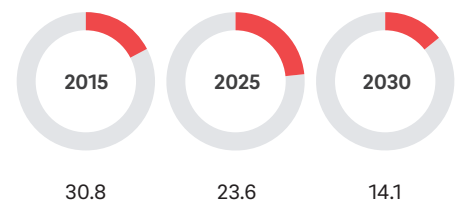
**Car manufacturers (incl. retail, aftersales, financial services)**



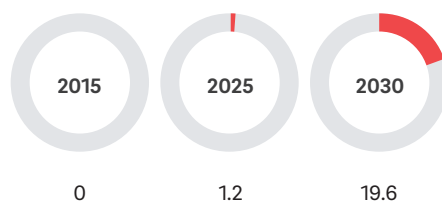
**Suppliers (incl. aftersales)**



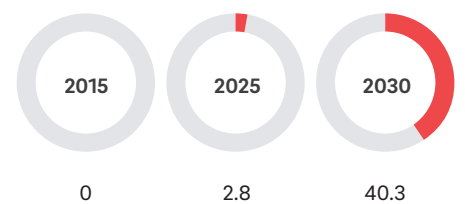
**Suppliers (incl. aftersales)**



**Robocabs**



**Robocabs**



► Share of total revenues worldwide in %

Source: Roland Berger

## 1 Device Component Manufacturers

are companies that supply the hardware and software installed on a mobility device. With manufacturers of mechanical and electronic parts facing increasing pressure on their margins as their products become commodities, firms that specialize in software, semiconductors and complex battery technologies will offer the added value in this segment.



## 2 Device Manufacturers

fall into one of three categories:

### **Contract Manufacturers**

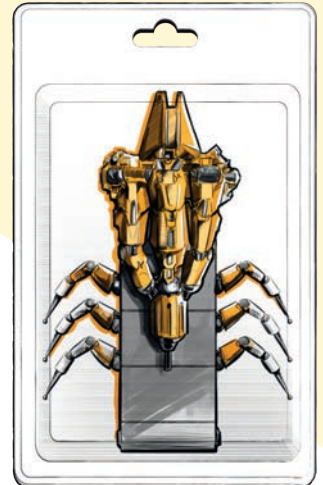
develop and build cars according to the specifications given. They can differentiate themselves through product and branding in addition to service quality and breadth.

### **White Label Manufacturers**

provide a base version of a vehicle without branding. Like in the handset industry today, Mobility Service Providers purchase a standardized product and use their own brand.

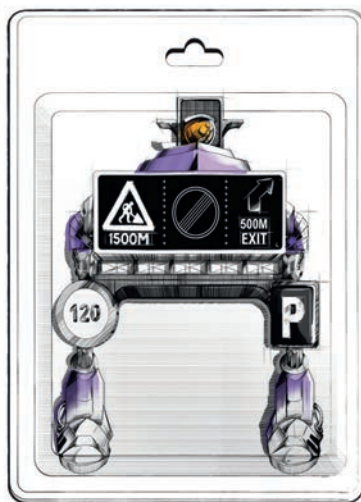
### **Branded Device Manufacturers**

produce vehicles under their own brand. They are the most likely species to provide an integrated offer comprising vehicle and services directly to the customer. But integration from service to manufacturing is also possible.



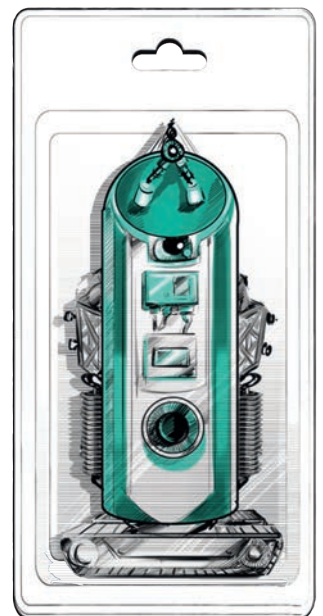
## 3 Infrastructure Component Providers

develop technologies for use outside of a vehicle, supporting connectivity and data transfers such as intelligent traffic light installations or technologies that help manage and direct traffic flows. In addition, we expect to find new players delivering technologies that enable data streaming and connectivity on the infrastructure side. This could be a playground for start-ups in the future.



## 4 Infrastructure Players

will be relevant business partners for MSPs. We will find here operators of physical and virtual infrastructures like charging stations for electric cars, toll systems, traffic control systems, utilities, parking garages, etc. Intelligent transportation system providers might operate in oligopolistic structures and reap stable and solid revenues in the future automotive ecosystem. They will enable electromobility, optimize vehicle fleet routes in order to minimize pollution, and manage urban traffic. Moreover, the usage of toll infrastructure according to consumption patterns will become big business.





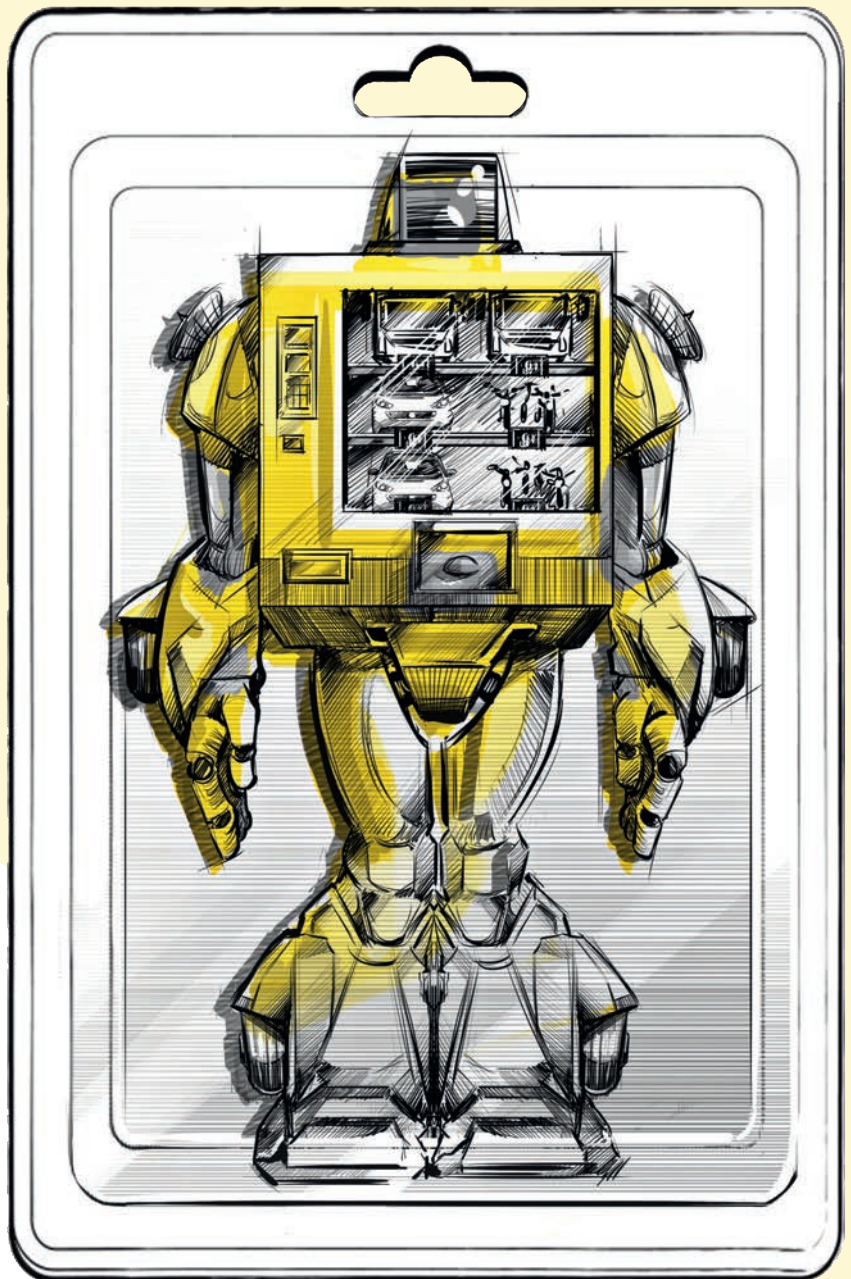
# THE CAR – JUST ANOTHER DEVICE?

Many of the OEMs we know today will end up as mere Device Manufacturers. Trends like connectivity, automation and electrification contribute to a new distribution of market shares. Mobility Service Providers will be at the fat end of the automotive value chain.

## 5 Mobility Service Providers (MSPs)

MSPs are the focal point of the new automotive ecosystem. They control the direct relationship with the customer. From financing and leasing all the way to flat rates for public transportation, they offer both standardized and bespoke mobility and service packages. This will include offers for urban dwellers and rural residents alike. MSPs have the means to grow rapidly and possibly define new rules in the market, because they are able to draw on network effects from a vast customer base. Their competitive advantage will be grounded in intelligence and algorithms, plus platforms that provide access to customized mobility services for their target groups.

- Asset-light version:**  
Platform providers  
and aggregators
- Asset-heavy version:**  
Fleet owners



other sectors. This lower profitability translates to fundamentally less attractive valuations on a secular basis compared with other peer groups. Mass market carmakers essentially receive a failing grade as evidenced by metrics commonly employed by both capital markets and private equity investors. On average their enterprise value is priced at only four times their earnings before interest, taxes, depreciation and amortization (EBITDA). To return to the example of the chemical and pharmaceutical industries, these sectors are valued much higher by the market, at nearly 11 or 13 times their EBITDA, respectively. In other words, should OEMs seek to raise fresh equity capital for their funding plans, they won't receive anywhere near the same for their "currency" from shareholders as a drugmaker might.

#### **STORMY SEAS AHEAD**

Money simply is not present in sufficient abundance for carmakers, so prioritizing investments is absolutely essential to surviving in a market beset by change. As if earnings prospects were not already slim enough, current cyclical waves are exacerbating problems further. Above all the slowdown in China – long a kind of El Dorado for carmakers – has massive implications for automakers, as it is common for their profits to be generated predominantly in China. For carmakers to properly position themselves for the future, they need to have a plan now that reaches well beyond the next product cycle and answers a fundamental question: Who will their customers be 15 years from now and what will they need? The automotive industry has typically been slow to adapt to rapid changes in consumer preferences due to its long product development cycles. Half a decade can pass between the moment a designer first begins sketching a new model and the day it finally replaces its predecessor on the market. Traditionally the auto industry was in the enviable position of being a business where barriers to market entry were high. Manufacturing was capital intensive, came with an enormous fixed-cost base, and in return, offered low margins in the single

digits. Delivering the product to the customer required building and maintaining an extensive distribution network. As a result, most carmakers that sprouted up in the past few decades were not founded for financial reasons. More often, national governments felt it was a matter of strategic interest to have their own automotive industry, much like operating their own airlines. The advent of electric cars and autonomous driving is eroding these barriers and new players that had previously sought to profit from the flow of information at home or in the office now see the car as just another frontier. A superficial glance says carmakers have attempted to gird themselves for the future by rolling out a range of new activities.

# 2

## **Five archetypes adaptive to the ecosystem**

Both OEMs as industry giants and their specialized suppliers could end up playing roles very different from the ones they play today. We drew on the numbers from our simulation, took into account talks we had with various automotive customers, and compared to developments we have seen in other industries. The result is a vision of five main strategic archetypes (p. 20/21) that could characterize the future of the automotive industry. The picture that emerges is not unlike that already witnessed in the telecommunications and consumer electronics industry: Service providers take control of the value chain and push Device Manufacturers into the background. Many of the OEMs we know today may well become mere Device Manufacturers. Their business model would be limited to developing, manufacturing and selling vehicles. But in the future, not all of them would be able to sustain the complex automotive retail system we know

today. Most of them would sell, or more likely lease, to Mobility Service Providers as they are the ones with the direct access to the customer. This scenario suggests that only the strong brands of Branded Device Manufacturers will be able to maintain a good position in the mobility service. White Label and Contract Manufacturers deliver commoditized vehicles for different needs and customer groups. The model range offered by these archetypes is quite narrow compared to the current portfolio, and specifications are defined by the Mobility Service Provider. Innovation would be part of the Branded Device Manufacturers' business, as well as the White Label Manufacturers' to a certain extent, but not the Contract Manufacturers'. For the future automotive ecosystem, we see Mobility Service Providers at the "fat end" of the value chain, meaning they are the ones who are in touch with mobility customers of all kinds: orchestrating fleets of robocabs, car sharing, financial services, location-based services, entertainment – all in bespoke packages. They are the ones to reap the lion's share of revenue and profits. But who has seriously merged these initiatives with their core business? Who has shifted their resources enough? Most of all, who is prepared to interpret their existing business model anew in the face of the ongoing transition in their industry rather than simply optimize current business models? So far automakers have only just begun to experiment with new services built around their core product. Take Daimler, for example: it launched its car-sharing provider Car2Go and consistently expanded its mobility solutions business "moovel" through small acquisitions of GlobeSherpa, FlixBus, RideScout and myTaxi. Customers in Stuttgart can now book a ride on the local metro system for part of a trip and then use a Smart ForTwo for the rest, all paid for centrally and digitally via their moovel app. Audi is testing solutions for parcel delivery directly to a customer's vehicle in cooperation with Amazon Prime and DHL. Inspired by Uber's soaring popularity, GM recently invested half a billion USD in Lyft, a fast-growing rideshare company in the U.S.,



# Evolution invariably results in the extinction of automotive species incapable of adapting.

## Make sure you are one of the next-generation players.

to create an integrated network of on-demand vehicles. Another sign of a paradigm shift was the decision by Germany's trio of fiercely competitive premium carmakers (namely Audi, BMW and Mercedes) jointly to acquire high-definition map provider HERE. While the ostensible reason was to prepare for the day when accurate maps are needed to steer a piloted car, the three wanted to keep the former Nokia subsidiary from falling into the hands of a company like Uber. As they look to compete with Silicon Valley, carmakers are also adjusting their management model to allow for flatter hierarchies. Volkmar Denner, CEO of German car parts supplier Bosch, has been an especially strong proponent of smaller, more agile teams capable of responding to trends by bringing new products or services to market faster.

### **OTHERS PREPARE TO OVERTAKE**

Incumbents initially underestimated new market players such as Tesla. Despite its very low production volumes, the electric car manufacturer run by Elon Musk has become a serious competitor to German premium brands, both in terms of image and

innovation. Tesla has shown that it is possible to build a competitive, fully electric vehicle from scratch within a significantly shorter development time than traditional players are capable of. Sales of the Tesla Model S in the U.S. outstripped those of the Mercedes S-Class last year, more than doubled the volumes of the BMW 7 Series and easily achieved over four times the equivalent of Audi's A8. Tesla lost over a half a billion dollars in the first nine months of 2015 and the stock plumed two-year lows on the back of the collapse in oil prices. However, equity markets still expect a lot from Tesla – this is reflected in a USD 20 billion valuation. BMW, one of the few pure-play luxury carmakers listed on the market, earned easily over USD 5 billion in the same period but weighs in at only about USD 50 billion market cap. Moreover, it needed to sell over 2.2 million cars in 2015 against Tesla's estimated 50,000 in order to achieve that valuation. If Tesla's meteoric rise merely foreshadowed the challenges to come, the entry of major Silicon Valley corporations like Google and Uber with their almost inexhaustible financial resources threatens to throw the industry into complete turmoil.

# 3

## **Strategies to master the transformation**

At present, most of the OEMs are integrating certain activities that move in the direction of Mobility Service Providers. They are careful not to shake up their existing business model as Branded Device Manufacturers. But moving slowly bears the risk of never fully embracing either approach. Being a real champion in the service industry is not in the DNA of most of the car manufacturers. It will be interesting to see what a cultural change in this industry would mean.

### **Revitalize your agility**

Competition in the Mobility Service Provider segment is expected to be uncomfortable. There will be new players that are better prepared than traditional ones, for

two reasons: Firstly, their resources are not encumbered by fixed assets and production facilities. They can react quickly to changes in consumer behavior, while traditional players still think in product life-cycles. Combining traditional manufacturing business with mobility services might turn into a setback, impairing agility and potential for growth. Integrated players would not be able to choose the best offer among competing Device Manufacturers; they would first have to ensure they utilized their own production capacity. If traditional players want to become more agile, they need to break up their organizational structures – from functional silos and "not invented here" to open cooperation and a value-adding ecosystem. Secondly, incumbents lack digital knowledge and structures. Many competitors will be digital natives who are used to selling services in a connected world. Their organizations are dedicated to their service business, having already designed analytical tools that traditional players would have to establish from scratch.

### Reinvent your customer experience

In a world of autonomously piloted vehicles there will be less regulatory acceptance of individual consumers purchasing cars because they are "fun to drive". For example, the city of Singapore clearly states that it does not want individually owned cars in the city, and Oslo plans to ban them in the city center before the end of the decade. To combat smog, Beijing has often limited traffic on the road to cars with even-numbered plates on one day and odd-numbered plates the next. Other metropolitan authorities are also considering ways to reduce congestion and improve air quality. Efficiency and convenience of day-to-day mobility will be the new paradigm in the ecosystem.

### Refocus your innovation

If the value add for Mobility Service Providers in the future automotive ecosystem comes from services rather than from products, innovation activity patterns should re-

## Transformation strategy checklist

### Agility

From the physical assets to knowledge, connectivity software and service

### Customer

From "fun to drive" to seamless convenience

### Innovation

From car features to intelligent services

### Processes

From product development to manufacturing processes optimization

### Talent

From engineering of physical products to more software and analytics expertise

flect that. Innovative mobility services are needed, along with processes to generate them. What we are talking about here are data sciences. The result would be new apps, intelligent algorithms for big data, or redefined interfaces between various mobility and infrastructure providers.

### Reframe your manufacturing processes

Here, the divide between device business and service business is most evident. Innovation initiatives in the device business usually aim at process efficiency and optimization of manufacturing. This is a matter of mechanical engineering rather than of developing features for the car itself.

### Reshuffle your talent base

Engineering is the core competency of today's car manufacturers and suppliers, but this might not be the skill that ensures success in the mobility service business in the future. Here customer knowledge will be key, and it does not end with cars and single brands. Experts will be highly sought after

for community building in the context of mobility needs, multichannel experience, and especially mobile and digital marketing. New businesses will require specialists that are familiar with data ownership, big data and analytics. At present, traditional automotive players are not attractive employers for talent in the most sought-after fields.

### USE THE FULL EXTENT OF YOUR STRATEGIC LEEWAY AS CEO

Today's players need to find out which archetype offers the most promising prospects for the future. OEMs decision makers should ask themselves whether they are willing and able to become Mobility Service Providers. Do they really understand the implications this will have on their resource base? There might be niche strategies that are much more promising than trying to span the divide between product business and mobility services. Is it an option to become a pure Device Manufacturer, for instance – focused on development and manufacturing? OESs should find out if they can build up the competency to do so. Or is it more reasonable to act as the "Foxconn" of the automotive industry? Other industry giants have already shown how a completely new strategic direction can work. The change in the industry's dynamics will call for thorough strategic thinking. Core competencies and their relevance need to be revised to ensure profitable survival in a world of robocabs. Could carmakers one day decide to spin off their heavy, fixed-cost production operations to focus on the higher margin development, design and marketing of their products much as Apple does currently? GM and Ford once before showed a willingness to reconsider their manufacturing depth by floating their components business in the form of Delphi and Visteon. Whoever wants to still be at the forefront of the industry in 2030 has to sit down and consider making the decisive changes today to investment plans for 2017. It's time to fundamentally rethink existing structures and tackle legacy costs before more nimble rivals can outcompete the automotive industry as we know it.



# "Digitization reduces organizational constraints"

As the role of OEMs is about to change in the automotive ecosystem, others will have to follow. We talked to one of the major players in the supplier business: Faurecia. Future CEO Patrick Koller explains the challenges that digitization poses to his firm's business.

He shares his thoughts on managing a digital firm, from smart manufacturing to new models of leadership.

Interview: Max Blanchet, Cornelia Geißler  
Photos: Emile Luider





Discussion: Senior Partner Max Blanchet, Automotive Insights Editor Cornelia Geißler and Patrick Koller at Faurecia headquarters in Nanterre near Paris.

**Q: The digitization of the automotive industry is in full swing, so let's look at the industry from a bird's-eye view. What kind of shifts do you expect?**

**A:** Digitization is a real challenge for the automotive industry which is the only "heavy" industry that is active in a B2C business. New entrants such as Google, Apple and Uber are developing new data-driven business models for mobility and are capturing value through their customer relationships. Automakers need to adapt to see how they are going to capture the value in this new digitized industry. The car could increasingly become a connected device in the internet of things.

**What does that mean for margins?**

It means a change in the business model. The total value would be made up of the physical car and all the services around it as with mobile devices today. The question is

### Patrick Koller

Patrick Koller will take over the role of CEO of French automotive supplier Faurecia on July 1, 2016, having previously served as COO and Executive Vice President of Faurecia's Automotive Seating Business Group. Before joining Faurecia, he held various positions at Rhodia (part of Solvay Group) in the chemical industry, and automotive supplier Valeo. He holds degrees in engineering and in management.

who will be able to capture the value from the services. An automaker may no longer be the direct point of sale to the consumer. **Is the automotive industry well prepared for this challenge?**

I think everybody – OEMs and suppliers alike – is aware of the challenges and we are all working on solutions. OEMs are already increasing their levels of integration and developing their own mobility solutions.

**How will suppliers be affected by the shifts you are describing?**

Obviously when such a disruptive change occurs in the business models of our customers, we have to adapt accordingly. We will need to develop new products and new services. For example, the anticipated increase in car sharing will call for new specifications such as stain-resistant, easy-to-clean vehicle interiors, technologies

"When employees are no longer working together at the same physical location, they [...] need a community that shares the same values."

Patrick Koller



supporting the availability and traceability of vehicles, connectivity to payment systems, and the seamless and ad hoc connection of different customers' devices, as well as ancillary equipment in the vehicles.

**How will the relationship between suppliers and OEMs change?**

That depends on which part of the automotive value chain suppliers operate in. Where OEMs start to integrate activities, they could find themselves competing with their former suppliers. We saw this happen in engine management, when OEMs decided to bring value chain links back in house. What is different today is that the reasons for integrating specific areas of the value chain for an automaker are more about intensifying the consumer relationships than about flexibility of production and reduction of engineering costs.

**How do you see the customer relationship evolving for Faurecia?**

I expect that, in a business like Faurecia's, digitization will create a wealth of additional opportunities. The digital world is connected, so value creation will require an ecosystem of partners. We will have to get used to the concept of sharing, and to the much greater transparency that this brings with it. Since we are investing significantly in our systems and technology competencies in order to become a key system supplier, we will be able to relieve the OEMs of some of the complexity they currently have to deal with. So to me, closer cooperation between Faurecia and its customers seems the most likely evolution.

**What would that cooperation look like?**

We are already working on a range of innovations in many areas in close cooperation with our customers, the OEMs. One example is the next generation of cockpits. In the future, I could imagine us combining competencies and co-developing applications for an active safety environment inside the car. Sensors in the seat are able to measure blood pressure and heart rate in real time and could alert the driver by adjusting the seat position. Other sensors collecting further data, plus an algorithm

monitoring driver stress could automatically trigger the automated driving mode if certain critical parameters are reached.

**Data generated in this way would be valuable for other business models as well – not just in the automotive industry.**

So far, the automotive industry has no clear and common understanding of how to handle data. There are a lot of unanswered questions. There is the issue of data ownership – with health data, for example: Does the data belong to the vehicle owner? Or to the seat manufacturer who developed the algorithm? Or is it owned by the car manufacturer?

**But isn't data the currency of digitization?**

Exactly, which is why we need to define both who the user is and the context in which data are to be employed. One example would be data that the individual perceives as having value. If drivers were able to document that they chose not to drive during periods of intense stress, for example, would those drivers be able to reduce their monthly insurance premiums to reflect that? The situation becomes more complex with data that are valuable only when collected on a very large scale.

**Data handling is clearly crucial. Are you considering specific models?**

We can draw on initial experience with data collected and used for production purposes. In our Interior Systems Business Group, we employ around 1,000 injection molding presses equipped with sensors that collect information for predictive maintenance. We define the sensors and develop the algorithms that improve efficiency in our plants. This data belong to us. However, others – such as the people who make the machines – could likewise benefit from the information.

**In what way will digitization change your business processes in the near future?**

If we have reliable predictive maintenance data, we can outsource this activity completely. Repair work can be timed precisely. It's a very different way of dealing with our current processes. Today, we buy equipment and need an inventory. Tomorrow, we will be able to buy operating time and a given service level.

"We will play an active part in shaping the global vision of the automotive industry."

Patrick Koller

## Faurecia

Faurecia is one of the world's largest automotive suppliers and employs 103,000 people at 330 sites in 34 countries. It is the global technology leader in its three core businesses: automotive seating, emissions control technologies and vehicle interiors.

**If processes change significantly, organizational setup, employees' behavior and management style will have to adapt as well. How digitally mature is Faurecia?**

At this stage, can anyone claim to be proficient in digitization? We are just starting out. However, we are proceeding in an organized, pragmatic and value-focused way. We are approaching digitization across all disciplines within the company. In R&D, for example, we use big screens that allow us to visualize complex 3D models. They allow high-definition communication in real time. Employees can draw and write on them. Devices such as these are only one piece of the puzzle. Experience is already teaching us that digitization can reduce organizational constraints companies face today. It's a new path that promises greater freedom of operation. It is opening doors.

**What are the main challenges?**

Digitization creates many different working patterns. Faurecia has employees in a traditional working mode such as at our production sites. They would continue to have strict working hours and clearly defined processes. At the same time, you have more and more people teaming up globally for temporary projects, collaborating with people they have never met before – people on the other side of the planet and with different cultural backgrounds. I'm sure you can imagine that the question of time zones is only one of many issues. Digitization is potentially able both to improve individual flexibility and to generate considerable cost efficiencies for the company as a whole. However, it also creates massive challenges for leadership: How do you address the issues of open collaboration and hierarchies? What about the gap between digital natives and the pre-internet generation?

**Tell us about the solutions you found for these leadership issues.**

We have to rethink how we assess performance, for example. We now look at results rather than behaviors. And we also have to flatten hierarchies wherever they present a threat to creativity. When we first started our digital initiative inside





the company, our people were bubbling over with excellent ideas. Moreover, when employees are no longer together at the same physical location, they feel the need to belong even more strongly.

They need "their" community, a community that shares the same values. So it is even more important to support digitization initiatives with a strong company culture. We coined the term "Being Faurecia" to describe our culture and desired behaviors. These two simple words embody our ambition to adapt our organization and culture to a wider scope of business, and thus to support the future development of our company. We believe a defined culture helps give meaning to the things you are doing. This can be expressed in many ways, such as how people communicate and share information.

**Is that enough to get ahead of the curve?**

It is absolutely necessary but maybe not sufficient. Looking at the innovation process, we discuss a lot of ideas. Integrating start-ups has considerable potential, for example. They are fast, think out of the box and have a state-of-the-art technological mindset. Today, we spend a lot of money on in-house R&D. Tomorrow, innovation will be fostered both internally and externally. The industry needs some breakthrough innovations, such as a "mouse" for automotive interior electronics. This technology would integrate any devices and sensors in an easy-to-handle human-machine interface. External stimulus is crucial to this kind of research task. However, the role as incubator is not an easy one for a company like Faurecia. You have to support entrepreneurs and leave them on a long leash.

**Where do you see Faurecia in ten years' time?**

We will be one of the key system suppliers in the industry. In the future, technology vision will grow out of collaboration between suppliers, automakers and other actors, which means we need to better anticipate relevant trends. We have laid the groundwork: a global presence close to the OEMs and a robust financial position. We have launched our digital and cultural transformation. Now we need to expand our competencies to develop more electronics and software skills, because they are enablers for the future. We have to accelerate our investment in innovation, as this is a product-driven industry. By doing these things, we will play an active part in shaping the global vision of the automotive industry.

### FASTER REPURCHASE

I have been using the same car for ...

- Captive finance buyers
- Cash customers

4.4 years

0 years

### MORE BRAND LOYALTY

The car I drive today is the same brand as the last car I had.

- Captive finance buyers
- Cash customers

63%

46%

0%

# TURNING WHEELS INTO GOLD

Captive finance – financial service offers by car manufacturers – is far more than a lucrative side business. Numbers show\* that it supports the core. We recommend crafting an adequate strategy.

by Philipp Grosse Kleimann and Alexander Brenner

\*data based on a survey by Arbeitsgemeinschaft der Banken und Leasinggesellschaften der Automobilwirtschaft (AKA) for 2015 and 2016

### VALUE UPGRADE

The offer of financing is an incentive for me to ...

- upgrade the configuration inside my car.
- buy a new car instead of a used car.
- spend more than I planned.
- buy a bigger model than I planned.

0%

19%

29%

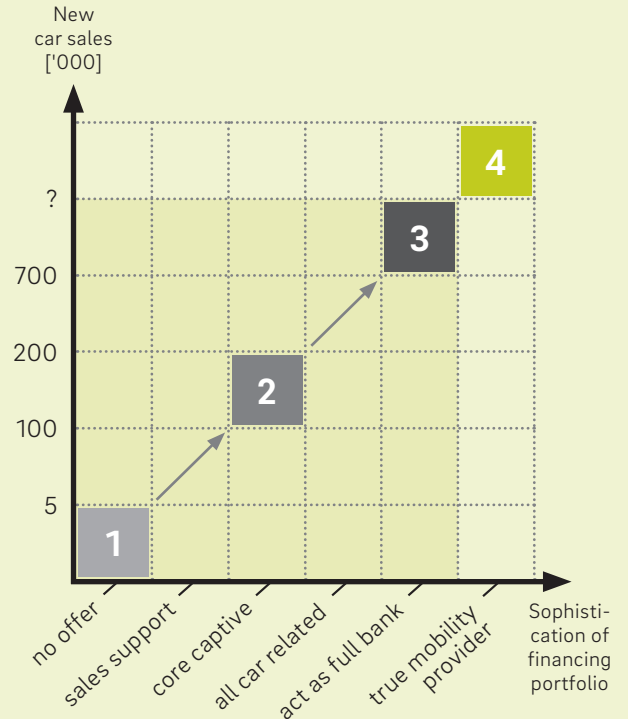
37%

43%

29%

# WINNING STRATEGIES

The Roland Berger approach: Match your market position with the sophistication of your captive finance portfolio



**1** Move out of niche markets, clear your strategy to grow and reach significant size. Captive finances can be an enabler for realizing future growth potential

**2** Once you set up your captive offer, getting into higher stages of maturity is the crucial task, shifting the focus from sales support to profit generation

**3** The strategic challenge in this position is to fully exploit the car-/OEMs-related revenue and profit potential with synchronized and personalized offerings

**4** There is potential to maximize profit by going beyond pure OEMs sales support and becoming a true mobility provider – One lever could be using data available to captive business

5.9 years

27,635 EUR

25,762 EUR

## HIGHER PRICE

I bought the car I drive today at a price of ...

- Captive finance buyers
- Cash customers

0 EUR

48%

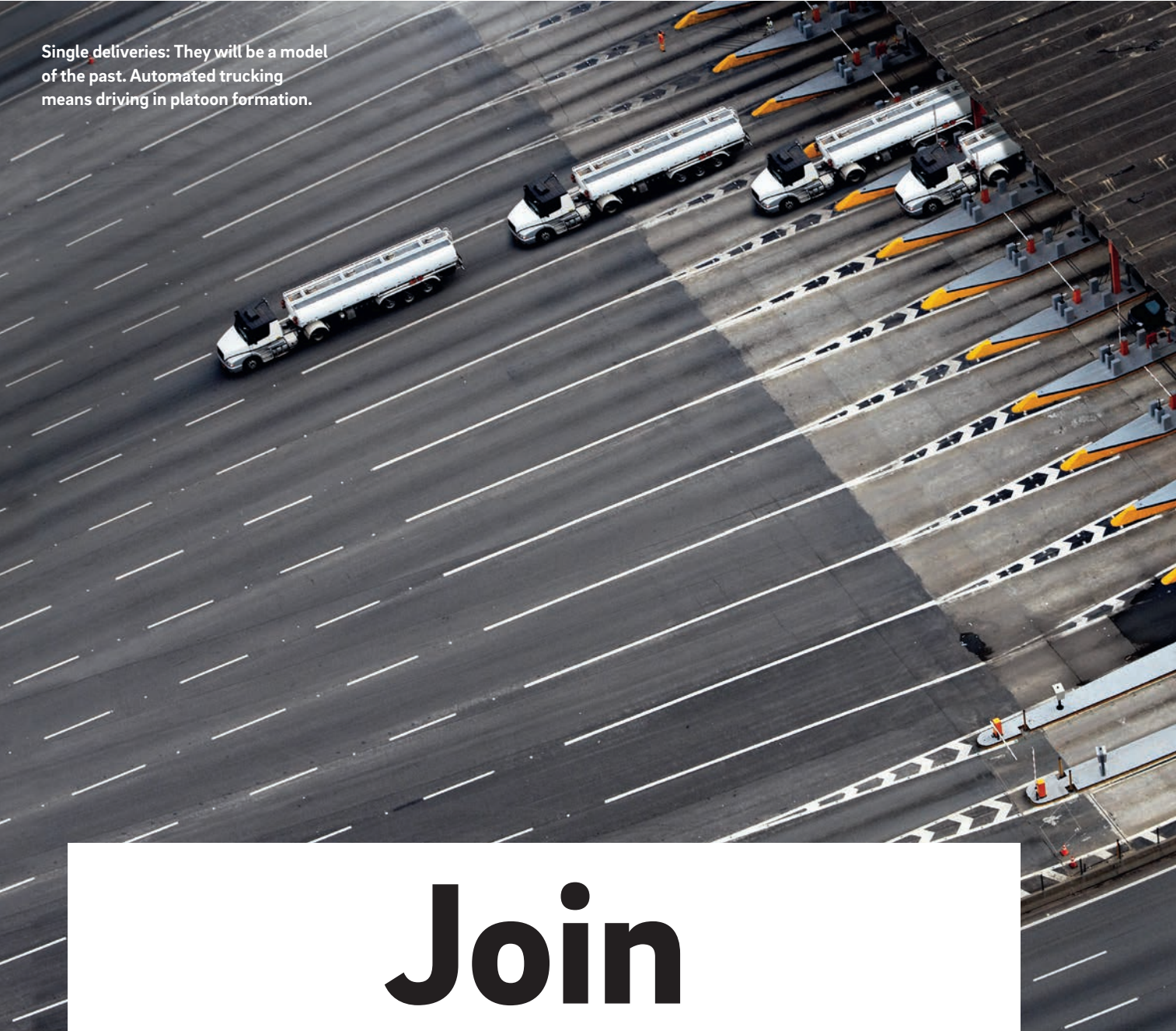
## BETTER DEALER LOYALTY

If I had to replace my car today I would chose the same dealer.

- Captive finance buyers
- Cash customers

0%





Single deliveries: They will be a model of the past. Automated trucking means driving in platoon formation.

# Join the road train

The truck industry has achieved major milestones in automation. However, self-driving trucks progress through the next stages of evolution only if investments pay off for truck operators within a reasonable timeframe and legal frameworks are properly adapted.

by Stephan Keese, Wolfgang Bernhart, Norbert Dressler and Walter Rentzsch





Last year, Daimler presented a prototype for a fully autonomous semi-truck in Nevada, where it has been officially licensed to operate on public highways. In 2012, Swedish truck maker Scania started testing platoons of trucks, a procession of vehicles controlled by the leading truck driver. It was announced in March this year that trials of truck platoons would be held on UK roads in late 2016. In the U.S., Peloton, a specialist for automation technologies, has received heavy financial backing from companies like truckmaker Volvo or logistics service UPS to develop a platooning system.

Photo: Imageplus/Corbis

All these examples indicate that there is considerable potential for positive technological disruption in an industry that, in the U.S., transports 70% of all freight and employs 2.8 million people – potential for operators, society and the environment. Fleet operators will save money on fuel and driver costs, roads will be less congested with fewer accidents, greenhouse gases reduced. One of the most interesting questions is who will ultimately drive the adoption of automated trucks. Will the demand from fleet operators be enough to bring the technology to the market? Will OEMs find an investment case to push the technology? Or will safety regulation be the most important influence in the end?

#### **ON THE WAY TO FULL AUTOMATION: COSTS AND BENEFITS**

Fully driverless trucks are the final stage in an incremental development process, in which driver engagement is reduced at each stage. Driver assistance systems such as ACC or lane keeping assist are already implemented in many trucks – stage one automation has already arrived. Stage two will be partial automation. This will allow the driver to be “feet-off” and “hands-off” while still monitoring the road. Stage three, conditional automation, enables the vehicle to drive autonomously on highways but requires the driver to resume control quickly if necessary. In stage four, high automation, the vehicle takes complete control in most situations and the driver is no longer expected to keep an eye on the road. In the fifth and final stage, full automation, automated vehicle operation is possible under all driving conditions and a driver is potentially no longer required.

Each stage of higher automation brings with it higher system complexity and increasing costs, ranging from USD 1,800 per truck to implement stage one and USD 4,400 per truck to move from stage four to stage five. The sum of the incremental costs from stages one to five is expected to be USD 23,400 per truck. The principal cost factor, accounting for 85% of incremental cost, is software, while sensors and hardware account for only 15%. By stage three,

all sensor functionality will have been implemented and stages four and five will demand only an evolution in software. The complex software systems will need to merge data streams from multiple sensors and to create environmental maps. The necessary safety tests in stages four and five will require additional financial outlay.

The cost savings gained from automated trucks for fleet owners are threefold: first, the fuel savings that result from improved aerodynamics and predictive powertrain control; second, reduced driver costs; and third, reduced insurance costs.

Truck platoon schemes, such as those being run in the UK and Sweden, are theoretically possible already in stage one (Driver Assisted Truck Platoon – DATP) but drivers are still required to be engaged. By stage four, vehicles can operate autonomously on highways and allow drivers to rest. Legal regulations in most countries typically require drivers to take a thirty-minute break after eight hours of continuous driving. In the future, drivers might be able to take this break while the vehicle drives autonomously, thus logging more miles. However, this would require legislative changes.

#### **USE CASES ANALYSIS SHOWS LIMITS OF APPLICATIONS**

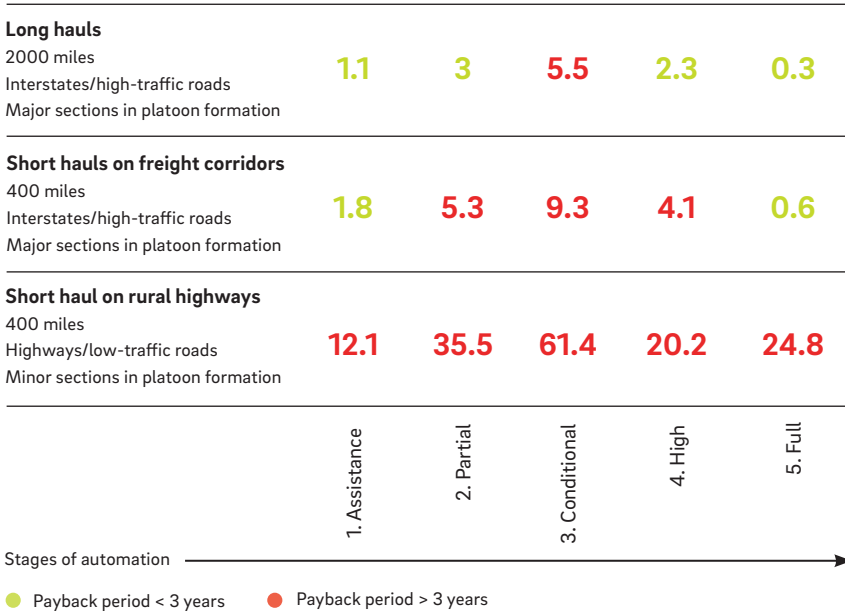
We selected use cases to get insights into the specific commercial feasibility of automated trucks and the likely adoption path (see graphic on page 34). We calculated the likely return for fleet operators at the different stages of automation – from assistance (stage one) to full automation (stage five) – taking into account estimated incremental investments as well as each stage’s expected cost savings. Use cases of varying journey lengths, type of roads and different platooning densities were then modeled and the payback time was calculated in each case. Fleet operators would usually expect a return on investment in less than three years.

Fuel and driver cost savings are the main factors that bring returns on initial investments. Fuel savings from predictive powertrain control are estimated to be around 2%. Platooning offers higher savings of

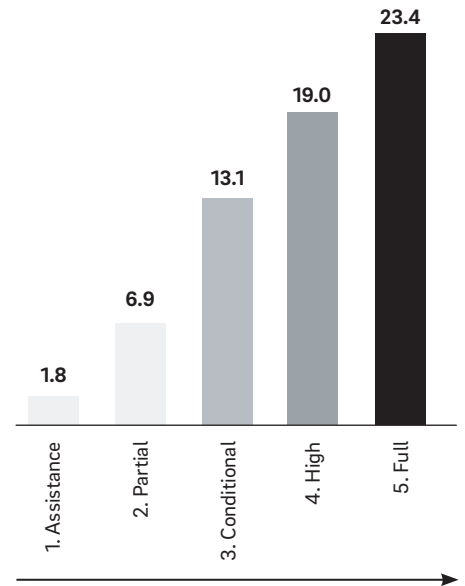
## SMALL ROOM FOR A SUCCESSFUL BUSINESS CASE

The biggest impact can be seen in the 5th stage, at distances of over 400 miles with high traffic and platoon formation. Investments for 3rd stage are not profitable. In stage 4, they are profitable for long-haul operations. For local trips, automation technology is generally unsuitable.

Payback period for incremental vehicle costs [years]



Total vehicle investment [USD '000 per truck]



Source: Roland Berger

about 6%, averaged over the leading and trailing vehicles. Total savings, however, are strongly dependent on how many miles of a trip are actually driven in a platoon. Different analyses of driving patterns and surveys of fleet operators indicate that no more than 40-50% of a long-haul trip could be driven in a platoon. Initial investments in stages one and two are minimal, so DATP platooning still offers an opportunity for a quick return on investment, even if less than half of the trip is driven in a platoon. Stage three, however, requires higher investments with limited additional operating cost savings.

### TIGHT LEEWAY FOR SUCCESSFUL INVESTMENT OUTCOMES

As a result, not all use cases where trucks mostly drive in a platoon result in a quick payback for investors. In fact, other fuel-saving measures like low-resistance tires might turn out to provide a better return on investment for fleet operators than platooning.

The situation changes once stage four has been reached. Here, driver cost savings kick in and payback times again decline. For fleet operators, a quick progression to stage four would be needed to attain a clearly positive business outcome. Cost savings become significant only in the case of full automation, when drivers are no longer required.

### SAFETY: A CAUSE FOR CAUTION AND AN IMPETUS FOR CHANGE

While a fast progression to stage four of automation makes sense in investment terms, truck manufacturers and suppliers currently face several challenges that are causing them to move ahead with caution. These include concerns over the safety of autonomous vehicles, both in terms of driving safety and cyber vulnerability. In stages one to three, vehicles may still be operated by humans but in stage four, the liability is likely to be shifted to the manufacturer. This is a new scenario that needs to be addressed.

As much as they represent hurdles, safety considerations may well prove to be a significant driver for the development of automated trucks. In 2012 in the U.S., large trucks were responsible for 330,000 accidents, in which 4,000 people were killed.

90% of these crashes were due to driver error. Automated trucks have the potential to considerably improve road safety, as regulatory changes in different regions are already demonstrating. Take Europe for example: The European Commission has mandated that, from the end of 2015 onwards, all newly registered trucks must be equipped with lane departure warning systems and advanced emergency braking systems. The public perception of the safety of automated driving, both of trucks and passenger cars, will continue to play an important role in driving the political decision-making and regulatory change needed to realize the enormous potential of automating trucks in the future.



# THE BEL AIR

## Built to last

With three new series of the '53 Bel Air, Chevrolet offers the widest choice of models in its field. They introduce major improvements like the new Powerglide automatic transmission with "flashing getaway" or new power steering. But these technical features cannot outshine the breathtaking beauty of the new Fashion-First bodies. We say: "Fashions come and go, but classic stays."



Once one of the world's most famous closed markets, Cuba is slowly beginning to open up to foreign trade – but after 54 years of isolation, restrictive domestic trading laws still mean that new cars are out of reach for the majority of the population. What does this mean for an island that was effectively turned into an automotive museum after America's 1960 trade embargo?

And what does it mean for the 1953 Chevy Bel Air? As the most common car in Cuba, it will continue to live on. Advertised at the time as "entirely new through and through", the 1953 Bel Air is charmingly awkward with hardbody convertible styling, vast expanses of chrome, and one of the first one-piece curved windshields. It may never have achieved the same cultural cachet as its more iconic 1957 cousin,

but this is one car that was built to last. You only have to look at Cuba's streets to prove it. Vintage purists, however, beware: innovative Cubans kept these classics on the road for more than 50 years without access to factory parts, and the majority now feature Russian or Japanese diesel engines – something that puts a whole new twist on the model's original advertising slogan.

# Food for thought

Take a deep dive and find out more in related articles, studies and magazines by Roland Berger authors.

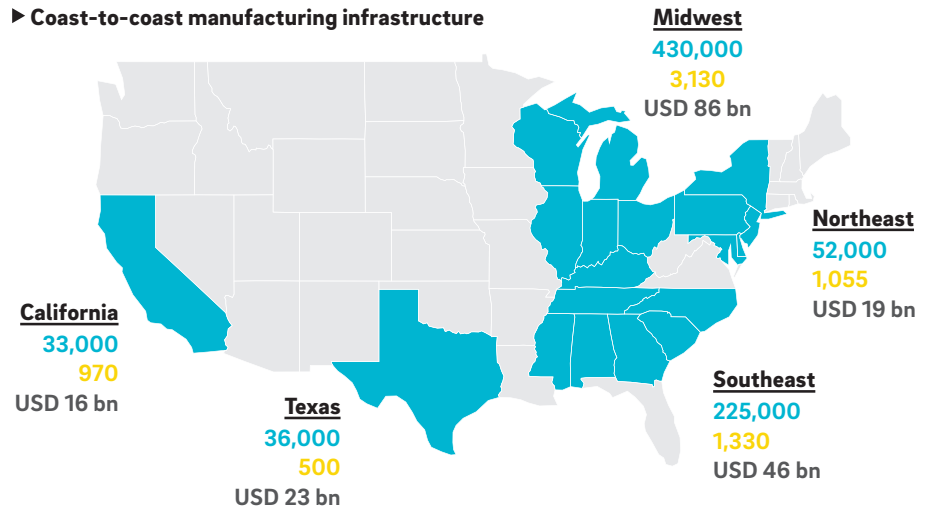
## INDUSTRY 4.0

### American makerspaces

Digitization in automotive is normally viewed through the lens of multichannel retail solutions. But the next digital revolution is not about the consumer, it's about productivity. Annual savings of USD 16 to 32 billion are waiting to be reaped in U.S. automotive production. This equates to 10 to 20% of the addressable production costs and is realized by harnessing a trend also known as the fourth industrial revolution, or simply Industry 4.0.

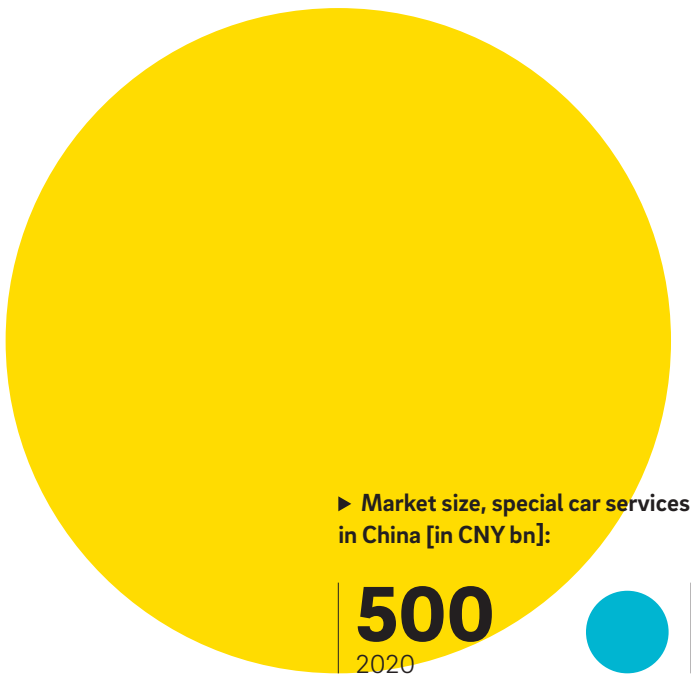
[<http://bit.ly/Digital-Factories>]

#### ► Coast-to-coast manufacturing infrastructure



● Total auto employment ● Total auto establishments ● Total auto manufacturing GDP

Source: Roland Berger



[<http://bit.ly/Chauffeur-Services>]

Source: Roland Berger

## MOBILITY SERVICES

### Relax on the back seat

In China, special car services that offer private car pick-ups with better service and higher fares are booming. Chauffeur services might eventually take the place of other means of transportation like taxis or rental cars. We expect to see demand for 22.1 million chauffeur rides per day in 2020.

## FOOTPRINT

### Automotive fiesta in Mexico?

Driven by exports to the U.S., Mexico's car production has boomed in the last five years. The market combines several favorable conditions: friendly trade agreements and regulations, adequate infrastructure and a cost-competitive labor force. However, the export environment is in constant flux. One of the downsides is in the supplier segment, many technologies are currently unexplored. We estimate that the top 5 investment opportunities are together worth a total of USD 46 billion.

[<http://bit.ly/Mexico-Study>]

## LOGISTICS

### Smart logistics for future city dwellers

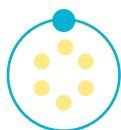
By 2050, about 64% of the developing world and 86% of the developed world will be urbanized. The United Nations recently projected that nearly all global population growth from 2016 to 2030 will be absorbed by cities, creating about 1.1 billion new urbanites over the next 14 years. Think of the amount of shipments these people will require to support their lifestyles – from food supply to consumer goods.

► We came up with five patterns of smart next-generation urban logistics:

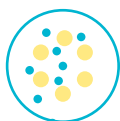
**Eco-regulation**



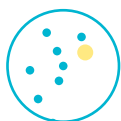
**Public service delegation**



**Rolling stores**



**Crowd logistics**



**Automated logistics**



Source: Roland Berger

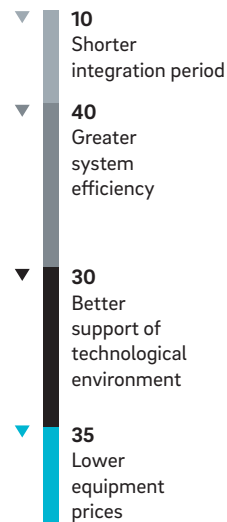
## AUTOMATION

### Of robots and men

Global investments in start-ups in the robotic field have more than quadrupled since 2010 to almost USD 570 million in 2014. As web giants like Amazon take over e-commerce, automated solutions for logistics are making very fast progress. Now, they allow human operators and machines to work within the same warehouse. The impact will be twofold: automation will dramatically reduce companies' logistics costs, but the labor market will see an increase in unemployment.

[<http://bit.ly/Robots-and-Men>]

Cost savings from implementing a robot-based logistics solution in 2015 [EUR '000/unit]



Source: Roland Berger



## DIGITIZATION

### Revolution or evolution?

"The digital drive", our cover theme in Automotive Insights 1/2015, sketches the wider scope of changes taking place right now, zooms in on individual country markets (the U.S., China and Brazil) and examines how the automotive industry is doing in areas such as multichannel retail, electromobility and automated driving.

[<http://bit.ly/Automotive-Insights2015>]

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+49 89 9230-0  
[www.rolandberger.com](http://www.rolandberger.com)

### Person in charge according to German press law

Marcus Berret

### Editors

Dr. Cornelia Geißler  
*(Editor-in-chief)*  
Dr. Katherine Nölling  
*(Managing editor)*  
Johann von Georg  
Jan-Philipp Hasenberg

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Blasius Thätter  
*(Art director)*  
Axel Springer SE Corporate Solutions  
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# GLOBAL AUTOMOTIVE EXPERTISE @ROLAND BERGER

We advise all relevant players in the automotive industry – car and commercial vehicle manufacturers, suppliers and many other automotive players – and deliver top-quality projects. With our seamless global team setup and focus on content that matters, we cover the automotive industry's entire value chain. Our insightful studies and use of proven tools contribute to our position as automotive thought leaders

## 1 CAR MANUFACTURERS

Our mission is to support global OEMs in seizing the opportunities of the future. Whatever your concerns – from cross-functional transformation programs to innovative growth strategies – we know where to take action to get you on the right track.

## 2 COMMERCIAL VEHICLE MANUFACTURERS

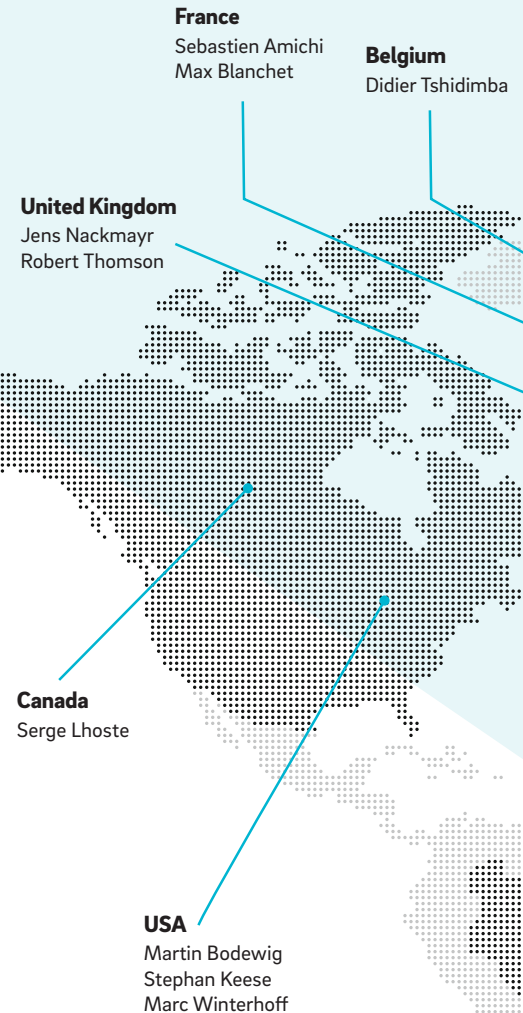
We are experts on mature and developing markets alike. For our customers in the commercial, agricultural, and construction vehicles segments, we provide individualized solutions to address concerns in both market types.

## 3 AUTOMOTIVE SUPPLIERS

Our vast project experience allows us to develop successful strategies. We are the global market leader in executing projects with automotive suppliers, in all segments and along the entire value chain.

## 4 ADDITIONAL AUTOMOTIVE PLAYERS

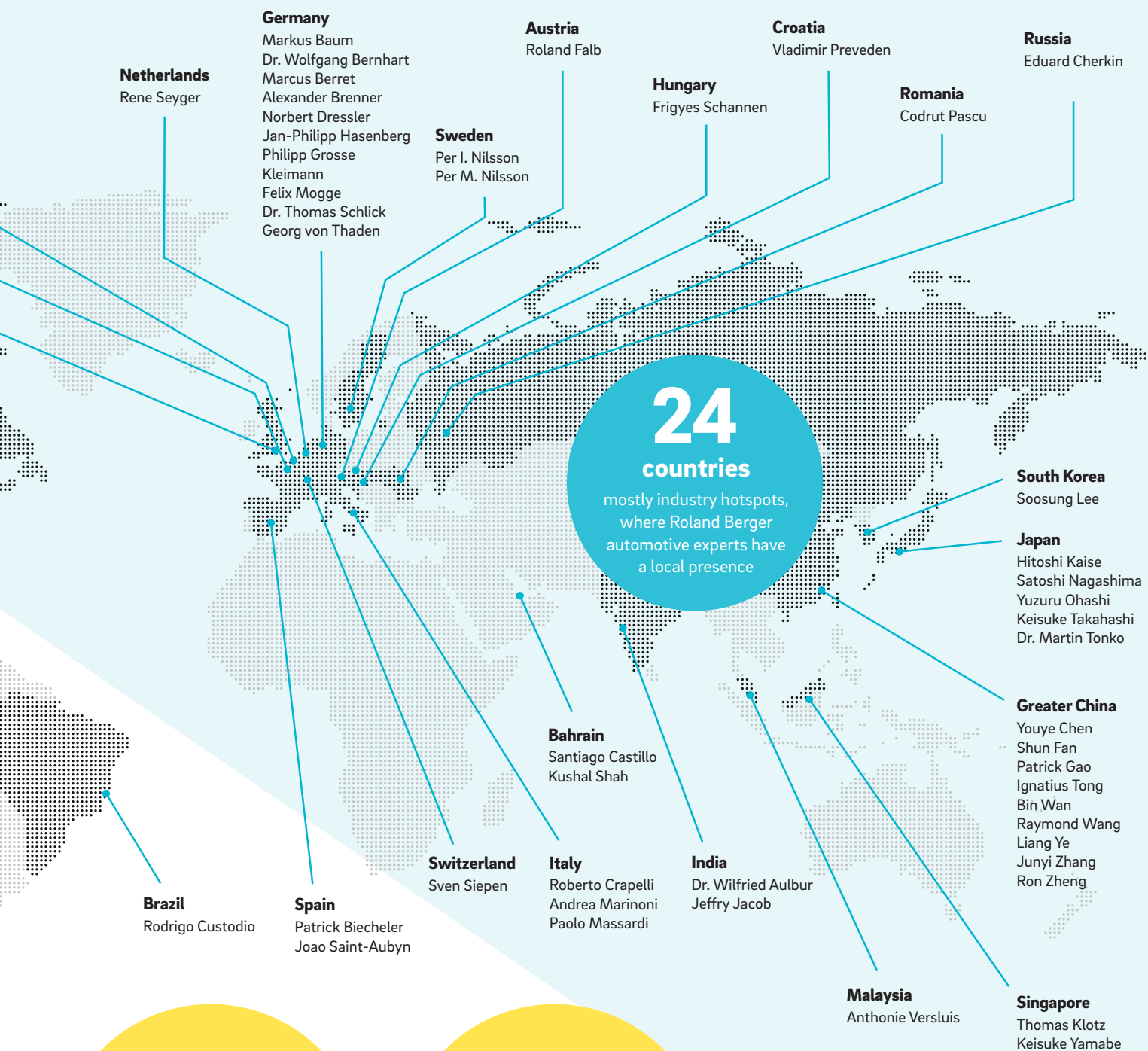
Our experts with their in depth knowledge have helped change the game also for all other players in the automotive ecosystem – such as raw material suppliers, engineering service providers, dealer groups, financial investors, aftersales and financing players as well as mobility service providers. We generate insights and new ideas to make their business fit for the future.



# 2,000

**projects**

for the automotive industry in the last five years, spanning all aspects of value creation



**300**  
consultants  
who globally develop innovative approaches and valuable results by sharing their thought leadership in automotive topics

**60**  
partners  
and principals dedicated to automotive clients around the world

**MARCUS BERRET**

**Head of the Global Automotive Competence Center at Roland Berger**

marcus.berret@rolandberger.com  
Phone: +49 711 3275-7419