

# A Smarter Future

## EMPOWERING CITIES, EMPOWERING PEOPLE

Today, everything aspires to be smart: from the ubiquitous—the smartphone in your hand—to sometimes the ridiculous (Google Glass, Fitbit for dogs, Lily the selfie drone). But, if we want our future to be smarter, we need to start thinking beyond smart for smart's sake now.

Tomorrow we face new challenges: a growing global population that is living longer and moving to big cities. To be prepared, we have to work out smarter ways to move around and to sustain basic human needs, from automating food production to personalizing healthcare. And in times of accelerating change, we need smarter ways to live together, drawing on the insights of big data,

Internet of Things (IoT), and the power of light to transform our world into a place where everybody enjoys better quality of life.

Consumption leads to prosuming, as big companies become smaller and the role of individuals rises. And circular economy thinking reduces waste, promotes reuse and produces a seismic shift for business, from selling products to providing services.

This week, the Smart City Expo World Congress in Barcelona focuses on the imperative need to discuss smart cities and how they must be created not only for citizens but also with them.

Referring to research that Philips Lighting commissioned to assess the progress cities were

making toward adopting smart technologies, Susanne Seitinger, the company's global sub-segment manager, professional systems, believes, "we need to re-frame the concept of smart cities around what they mean to residents and how they see them delivering something useful."

Seitinger recalls that one of Philips Lighting's most surprising findings concerned the way people felt about their data. "When we asked if they wanted to share data to improve services, they were really interested," she says. "It demonstrates the need for governance and transparent frameworks to use open data and share back. Citizens were willing to engage, to be in communication with government. They want to use different channels that generate a sense of direct connection. That is very meaningful to people."

Just being "smart," Seitinger feels, is missing the point: "It has to be about using technology in surprising and new ways that provide real value. That sets you up for a totally different approach. It is a much more holistic, people-centric view of what smart cities mean."

Another interesting finding was how open and keen the worldwide business community is to be part of a more collaborative setting.

**Most citizens want a say on the digital channels that deliver smart city services. They want to be engaged with, rather than have technology imposed upon them"**

Eric Rondolat, CEO, Philips Lighting

As a global technology partner leveraging IoT, Philips Lighting is constantly coming up with ways to use illumination to make tomorrow's cities smarter, more livable and more satisfactory for people's daily needs. And Philips Lighting, Seitinger believes, has an advantage over other companies vying for a slice of the smart market precisely because it works with light.

"Lighting is special," Seitinger says, "because it bridges the technical and emotional realms. We have a much stronger sensibility around quality of life issues. You cannot do this if you do not care about tangible outcomes and benefits for people." ■



Philips Lighting's innovations improve life in the city



## The lights that switched on a city

The Bay Lights. It's not just an installation. It was the world's largest temporary LED lighting sculpture. From dusk until dawn our dynamic lighting illuminated San Francisco's skyline. It increased tourism and boosted the waterfront economy by more than \$100 million annually. But most importantly, it was instantly embraced by the citizens. And now it has earned a permanent place in the skyline. It's just one of the many ways Philips Lighting is taking **Light Beyond Illumination.**

innovation ✨ you



The Bay Lights by Leo Vitareal  
San Francisco-Oakland Bay Bridge, San Francisco, California USA  
Special thanks to ILLUMINATE, The California Department of Transportation, and The Metropolitan Transportation Commission  
Photo by James Ewing

Learn more at [philips.com/thebaylights](https://philips.com/thebaylights)



## SMARTER CITIES, SMARTER CITIZENS

Cities are complex ecosystems that must be run efficiently to function well—and they are growing fast. According to the United Nations, by 2050 the number of urban residents will reach 6.2 billion, 66% of the projected global population.

As cities get bigger, managing them becomes tougher. Since the advent of the Information Age, planners and policymakers have turned to technology to solve urban challenges. Leveraging digital connectivity drives the IoT, revolutionizing how we live and work in cities. IoT is empowering urban managers to make informed decisions about what needs to be done now and next.

**My priorities include improving connectivity to deliver public services more easily and efficiently”**

Sadiq Khan, Mayor of London

The smart-city market will be worth an estimated \$400 billion a year by 2020. Corporations see expanding urban areas as a growing opportunity to offer solutions and improve lives today, while generating revenues for tomorrow. The most forward-thinking are changing their business model to foster long-term partnerships with urban managers, shifting from selling products to providing services.

Given global urbanization trends, while heads of state decide

the fate of nations, mayors may one day rule the world. Mark Watts, executive director of C40, a network of over 80 of the world's biggest metropolises, sees cities as leaders in setting sustainability standards and introducing innovative ideas. “Cities consume 70% of energy. A low-carbon development path, high degrees of mobility, and attractive public spaces create an environment people want to live in,” he explains.

Some mayors believe cities do not just need to be smart to survive, but must become even smarter to thrive. That means putting in place the hardware to power cities as well as empowering citizens. According to Ada Colau, the mayor of Barcelona, “Citizens need to be the center of focus for institutions.” Rio de Janeiro's mayor, Eduardo Paes, agrees: “Mayors make change; the things we do affect people's lives for better or worse.”

A shining example of how a private-sector partner can illuminate future urban development in collaboration with local leaders took place in Sweden's fourth-largest city at the start of 2015. At the request of Uppsala's municipal government, and working alongside design consultancy Bjerking, Philips Lighting installed its connected LED street lighting and CityTouch LED management system, as well as color architectural lighting, in Tegnerparken to brighten up the night.

Spun off from its parent company, Royal Philips, and separately listed on the Amsterdam stock exchange in a \$3.3-billion



Barcelona puts citizens at the heart of its planning

IPO in May, Philips Lighting has been a global leader in illumination for 125 years. At first a pioneer in electric lighting and now in high-quality, energy-efficient LEDs, Philips Lighting is committed to developing connected lighting systems that focus on improving people's lives.

Located an hour north of Stockholm and seven degrees south of the Arctic Circle, Uppsala enjoys long, light days in its short summer, but equally lengthy, dark nights during the long winter. City officials saw how much time people spent in Giraffe Park in summer and wanted to give residents, especially children who attended kindergarten and lived nearby, an incentive to venture outdoors in the darker months of the year.

Rather than relying on conventional floods, Philips' smart lighting solution uses colored spotlights to emphasize playground equipment and make the park feel warm and welcoming, contrasting light and dark to appeal to the emotions of the young. At the same time, area lighting on pathways makes the park safer, allowing parents to relax as their children play.

“Together, we created a whole different park,” says Per-Erik Johansson, who works for Uppsala's municipal government. “It's like the difference between night and day.”

“Light has a strong impact on how you feel,” explains Bram Joosen, senior concept business architect at Philips Lighting. “It can change your lifestyle tremendously. We can achieve the same type of thing in cities by using lighting in a

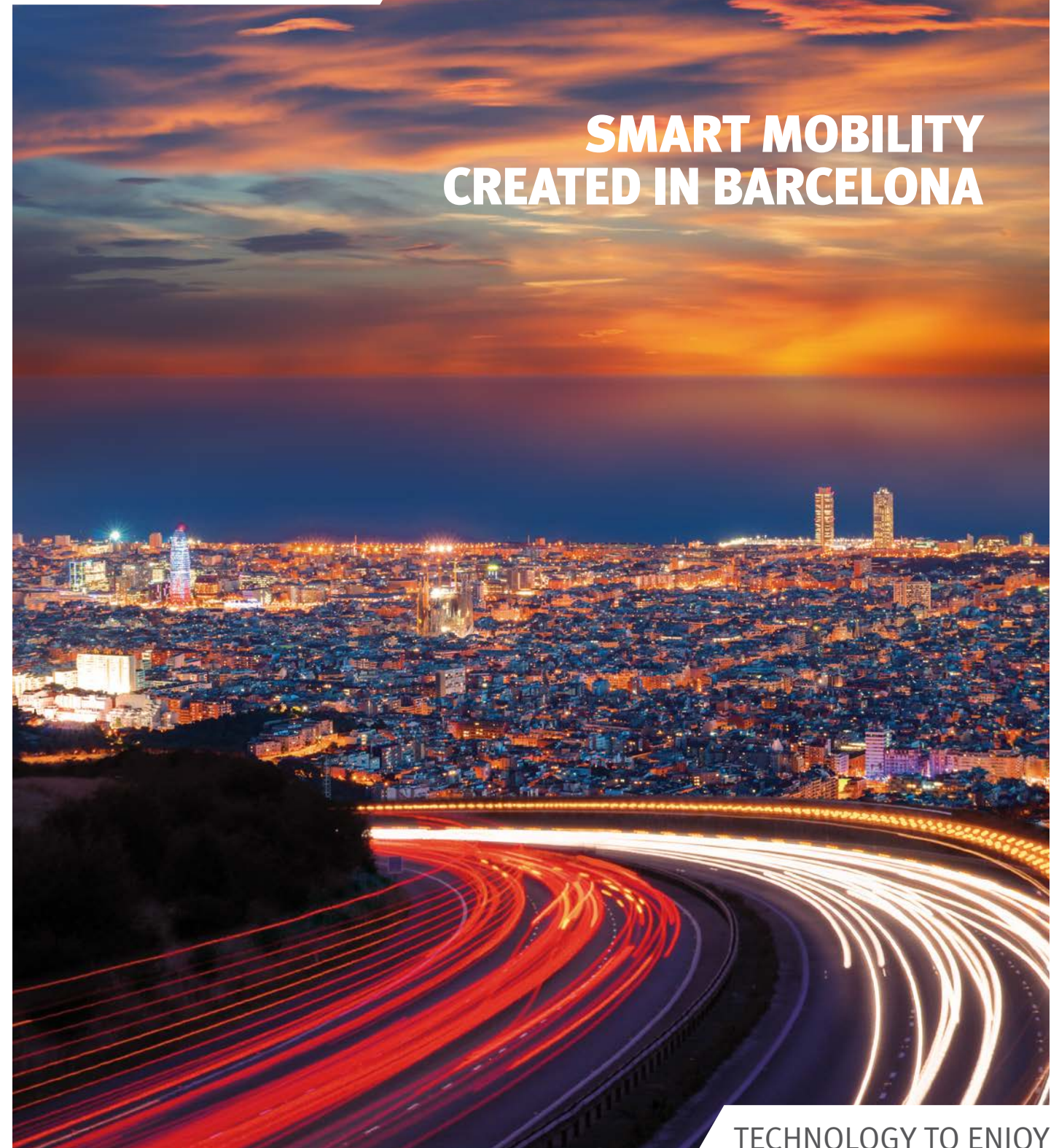
smart way in the future to improve the lives of citizens.”

In November 2015, Los Angeles became the first city worldwide to install Philips smart poles—connected LED street lighting that integrates small-cell 4G, LTE wireless technology from Ericsson—to add capacity to telecommunications networks. Los Angeles was already the first American city to introduce Philips CityTouch to manage its street lighting system, but embedding sensors in street lights and the arrival of smart poles take urban connectivity a giant leap further, becoming the digital backbone upon which to build IoT platforms in the future.

**The smart city is a complex domain because there are so many stakeholders involved”**

Bram Joosen,  
Senior Concept Business  
Architect, Philips Lighting

“We are looking at how to use technological innovation to improve life in cities,” Joosen insists. “Our connected lighting infrastructure provides potential sensor points every 20-30 meters. We are not working alone. We are building key partnerships with different verticals and technology partners to enable a sensing network that can measure air quality, noise levels, cameras, and much more. Connected lighting infrastructure provides a grid of information that is locally relevant, serving both cities and their citizens. The potential is staggering.” ■



# SMART MOBILITY CREATED IN BARCELONA

TECHNOLOGY TO ENJOY

## DRIVING INNOVATION FORWARD

At SEAT we want to move from being a product provider to being your service provider too. With our automotive expertise we are creating leading-edge Smart Mobility services in our inspirational native city of Barcelona. A city considered to be the 4<sup>th</sup> most creative in the world and Europe's 4<sup>th</sup> Smart City. Very soon, driving a SEAT will not only mean moving from one place to another but also being connected to everyone and everything around us while keeping on the move.



A children's park in Uppsala, Sweden, is given life through new lighting

## TURNING THE AUTO INDUSTRY UPSIDE DOWN


Luca de Meo is a respected automotive industry player. He has twenty-five years' experience working for Renault, Toyota, Fiat and, since 2009, the Volkswagen Group before taking the helm at SEAT last year. SEAT's recently launched Easy Mobility team plays a key role in his ambitious strategy to take the youthful brand to the next level in an era of connectivity.



Luca de Meo, President of Barcelona-based SEAT

### Where is the industry going?

There are three big technological trends: electrification, autonomous driving, and the connected car. For SEAT, the connected car is the most interesting development. Technology

 **SEAT's Easy Mobility mission is to simplify the whole automotive experience"**

Luca de Meo,  
President, SEAT

only works when people do not have to compromise what they already have: if you own a car, you expect your new one to be better. When manufacturers add a new option and the cost exceeds 10% of the total product

price, it never gets ordered. There is pressure on us to deliver in terms of cost and technology. Innovation, however, must be dictated by the needs of our customer base.

### Where is SEAT planning to take the lead?

With the connected car. A significant advantage is that we are part of the Volkswagen Group, and we are leveraging this to gain a serious competitive edge. To stay ahead of the game in 2020, we need to sell electric cars. We may not be a leader in this segment, but we understand that this is something we need to be a part of. I believe autonomous driving is still a long way off. Trucking and public transportation will adopt the technology first. At

R&D, business development and customer experience.

### What are SEAT's competitive advantages?

I believe SEAT is a brand that can take advantage of its young customer base. Our customers are, on average, 10 years younger than our competitors' in Europe. We have a young workforce with an average age of forty. We are probably 10 years closer to new trends. We boast the CTS (SEAT's Technical Center). It is one of Spain's biggest R&D centers with over one thousand engineers developing cars, entertainment, suspension and emissions systems. We are transforming CTS into a center of excellence to build digital ecosystems.

### What is your approach to the war on talent?

I am investing in our workforce. We are training our own people, giving them the chance to fail and take risks so that in the future they can develop ecosystems. We offer SEAT employees training to be ready for industry 4.0, so that the people who fit brakes on our vehicles today can program robots in five years' time. ■

SEAT we intend to race ahead in the connected car space.

### What changes are you driving?

All auto manufacturers are organized sequentially with a silo culture that goes from design to purchasing to production to engineering, and then to marketing. I decided that in this period of disruption we needed to shake up the company organization in a move away from traditional manufacturing toward Easy Mobility. I have radically restructured the way we work and interact physically. Our new organization has diverse transitional teams reporting to me directly, co-sponsored by different vice presidents and below them the three work groups: digitization and

### SEAT'S EASY MOBILITY TEAM

In the next decade, the auto industry will undergo greater change than it has witnessed over the last century. Electrification, digitization, connectivity and mobility will all define personal transportation in the future.

In response, SEAT has set up an Easy Mobility Team, encompassing professionals from across its business units, to drive the company's transformation in three key areas: digitization and R&D,

customer experience and business development.

The Barcelona-based automaker is determined to lead the pack in digital connectivity. It was the first brand worldwide to introduce a CarPlay-compatible app, allowing iPhones to be used seamlessly while driving and traveling.

The recently launched SEAT Live Store is a platform that enables users to personalize cars virtually before they become a reality. The company has also signed a deal to sell its Mii by Mango model via online retailer Amazon in France.

SEAT is now working with private-sector and academic partners to develop new mobility ecosystems for cities. The CARNET urban mobility research center and a

recent agreement with Conector to launch a start-up accelerator, both based in the vibrant and innovative city of Barcelona, are important steps on the road to easy mobility. ■



From left to right: David Gendry, Customer Journey Responsible; Fabian Simmer, Chief Digital Officer; Arantxa Alonso, Business Development Responsible

# How do we change today to change the future?

When we open up our energy, we open our lives to improvement and growth. As we grow our own potential, so we enable everyone else to do so too. This is why we work with the most innovative technologies, we seek out new service applications, we incubate cutting-edge startups and we establish innovative new partnerships. This is how we become more dynamic, more flexible and faster in adopting an increasingly efficient industrial strategy. Because only by changing can we remain a leader in a rapidly changing energy world. And only by placing people at the centre of our change, can we really change the future.



## BETTING BIG ON ELECTRIC VEHICLES

### THE INTELLIGENCE TO SEE WAY DOWN THE ROAD

Encompassing eight global automobile brands, the Renault-Nissan Alliance was established in 1999 and last year sold 8.5 million units, one in 10 new cars worldwide. Where the Alliance leads the way, however, is in electric vehicle (EV) sales, with more than 360,000 global

**We are pioneers in EVs aspiring to more than mobility; we aim to be part of an ecosystem that optimizes energy usage"**

Daniele Schillaci, Executive Vice President, Global Sales & Marketing, Nissan

zero-emissions vehicle sales to date. Nissan Motor Co. makes the world's best-selling EV, the LEAF, while Renault ranks as Europe's leading EV manufacturer.

Nissan's key brand strategy differentiator is Intelligent Mobility, says its executive vice president for global sales and marketing, Daniele Schillaci. "It has three pillars," he explains, "Intelligent Driving, which relates to autonomous driving; Intelligent

Power, which is about EV leadership; and Intelligent Integration

referring to the connected car. The first makes life easier, the second makes driving exciting and the third keeps the customer connected."

The future of Intelligent Mobility is smarter still. EVs potentially represent a cleaner way to get around, compared to conventional internal combustion engines. While growing numbers of greener cars will produce lower levels of carbon dioxide and other pollutants, they can only deliver net emissions and energy savings if the electricity they use comes from sustainable sources. For now, however, in most places these are neither abundant nor reliable enough to guarantee supply.

In response, Nissan aims to transform its existing technology to power everything else, Schillaci reveals. Rethinking EVs as mobile battery packs, Nissan is re-engineering our relationship with the car. EVs can "fill up" from renewable energy supplies at off-peak times and pump power back to the grid as and when required, to cope with spikes in demand — all without needing to burn fossil fuels.

The company is already partnering with Enel and NUUVE in Denmark and the United Kingdom on pilot programs that will see "the car become part of urban energy strategies," Schillaci explains. "Imagine, one day, thousands of EVs placed on the grid. Intelligent Mobility is also integration in the city and the environment."

The IDS Concept, unveiled in Tokyo last October and Geneva in March, shows how far Nissan's vision goes. "It remains a concept car," Schillaci admits, "but shows the direction we want to go. It is the perfect car for the smart city, for everything vehicle-to-grid and vehicle-to-home. The city plays the role of receiver and supplier." ■

### SETTING TRENDS AND SAVING THE PLANET

In August 2016, just as the Renault-Nissan Alliance surpassed 100,000 annual sales of its EVs, Renault sold its 100,000th EV to a customer in Norway. The car, fittingly enough, was a Renault ZOE, the best-selling EV in Europe. The French automaker remains the continent's biggest and fastest-growing zero-emissions brand, accounting for one in four EVs on Europe's roads and posting a 32 percent rise in sales in the first semester of the year.

"We believed in EV technology from the beginning," says Eric Feunteun, Renault's electric vehicle business unit director. "Carlos Ghosn (the Alliance's chairman and CEO) was the first in the industry to move in that direction in 2007, when we announced a full

**The most exciting thing here is disruption, changing the way we have been manufacturing cars for the last 100 years"**

Eric Feunteun, Electric Vehicle Business Unit Director, Renault

range of EVs. We approach electro-mobility not just as one item in our catalogue, but taking into account the whole ecosystem."

Renault markets the four-door ZOE alongside the Twizy, a futuristic runabout sold in twin-seat passenger and cargo configurations, and the Kangoo Z.E., a small van with lots of space and flexibility for professionals. Each appeals to a different demographic, Feunteun notes: "Buyers of ZOE come from high-end segments, Kangoo is clearly for fleets, and Twizy is good for car-sharing. They are practical, affordable, and a pleasure to drive."

Where Renault's EVs really excel is in urban environments. The Kangoo Z.E. offers logistics providers, such as the French Post Office, restriction-free access to congested city centers. With 8,000 vans, it has the biggest EV fleet in the world, Feunteun reveals. The ultra-compact Twizy takes up less space parked and in traffic. The ZOE, meanwhile, is bought by affluent, multi-car households who want an EV to go in and out of town.

"People who go electric are trendsetters," Feunteun argues. "Consciousness about going green is growing among the public, but pressure from cities and governments to solve the issue is also getting bigger. In addition to doing something good for the planet, you also make your life easier."

All the company's electric-powered models share a host of common characteristics, based on constant improvements in technology to extend range and enhance refinement. These lead to very high satisfaction rates. "When you ask our customers for their reaction after driving an EV, 90% say that it is powerful and fun," Feunteun enthuses. ■

# DRIVE ELECTRIC NOW.



Nissan LEAF and Renault ZOE,  
two concrete solutions for reducing our carbon footprint today.

The Nissan LEAF and Renault ZOE are 100% electric vehicles. They do not consume any petroleum whatsoever while driving, and they can be charged with renewable energy such as solar, wind and hydroelectric power.  
For more information, visit [blog.alliance-renault-nissan.com](http://blog.alliance-renault-nissan.com)



RENAULT NISSAN

## THE DIGITAL RETAIL REVOLUTION

Once upon a time, if you wanted something, you went to a store and, if the item was in stock, you bought it. In the last 20 years, all that changed. Since the advent of online banking and digital retailers such as Amazon and eBay, you can now get almost anything you can think of delivered to wherever you are with just a click.

The auto industry, however, resisted the revolution until recently, hanging on to an outdated business model that forced customers to drive to a dealership in their existing car to discover, order and pay for a new



The Rockar Hyundai store at Bluewater shopping center in the U.K.

one. According to a 2015 report by EY, entitled *Future of Automotive Retail*, this product-based approach will soon become customer-centric, fostering loyalty and adapting to clients' expectations.

Hyundai Motor Europe is way ahead of the curve. Inaugurated in November 2014, Rockar Hyundai is the world's first digital car retailer, now with two outlets. Launching its Hyundai Click2Drive and opening its

corresponding dealership in Madrid's Gran Plaza 2 shopping center is the latest achievement in the company's digital strategy to revolutionize traditional car sales. With these two concepts, Hyundai has opened stores in some of the biggest shopping malls in the U.K. and in Spain, attracting young, tech-savvy customers. The Rockar Hyundai store in the U.K. Bluewater Shopping Center welcomed 163,000 visitors in its first year. Half of its new customers completed the car purchase at home, 94% were new to the brand, and 96% satisfied with their retail experience. ■

### CAR BUYING TURNED ON ITS HEAD

#### What is the automotive retail revolution?

The biggest issue is about the customer and the value chain. The auto-manufacturing industry has taken a while to sit up and take notice of competitors like Uber, Google and Apple. Consumers are digital. In the car industry channels, some dealers are still living in the

 **The biggest challenge we are facing is the clash between the digital industry and the old car industry"**

Jochen Sengpiehl,  
Vice President Marketing,  
Hyundai Motor Europe

past where everything is manual. You see this if you try to test drive or make an appointment over the internet. Some 95% of interested customers contact a dealer online and 80% change dealers if they do not receive an email within seven hours. Around 41% would consider buying a car online and as

many as 25% would do so without even test driving it.

#### What are the key steps when buying a car today?

There are five digital moments in the customer journey that are crucial for every manufacturer: Which car is best? Is it right for me? Can I afford it? Where should I buy it? And am I getting a good deal? This is the new mantra of car buying and why the digital value chain is so important in getting things right.

#### Tell us what Hyundai is doing differently.

We started some initiatives with Rockar whereby we are leapfrogging the old legacy system and going directly to the consumer. We are working with our dealers to help them make the digital transformation. With our digital strategy in Europe and the digital hubs, we are taking a shortcut to increase new business, income and interest from buyers who want a Hyundai.

#### What is the secret of your current retail success?

The idea behind the Rockar and Click2Drive story is that we went



Jochen Sengpiehl, Vice President Marketing, Hyundai Motor Europe

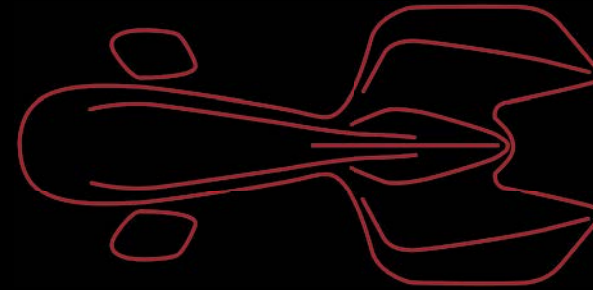
to a busy shopping center where customers go on a frequent basis to buy food and clothes. People don't have the time or inclination to go to a dealership in the suburbs for a test drive. So, we saw the potential for a completely new online retail strategy. We welcome customers in to take a look and, if they are interested, get in touch with someone who is not a salesperson, but instead comes from the hospitality industry. We do not want to replace dealers, but we want to find a new contemporary way to reach our customers' needs. Under these premises we build incremental business by installing

digital hubs and retail stores that invite people to develop a relationship with the brand in a different, more efficient way. Everything is built around the customer.

#### What else is included in Hyundai's digital communication strategy?

For the first time Hyundai Motor is launching the new IONIQ models across Europe primarily via digital channels and video content. In doing so, the IONIQ Digital Hub bundles all relevant content about the vehicle tailored to the target audience by data-driven storytelling based on the different customer interest and needs. By using the potential of the digital approach, we are able to directly address the customer with a product that fits his or her needs. Through this approach the customer becomes familiar with the technology and features and finds the perfect match. The customer can digitally explore the IONIQ family from the outside and inside while also being helped by augmented reality. ■

# CNH INDUSTRIAL



## IMPROVING THE PRESENT **BUILDING** **THE FUTURE**

**CNH Industrial** is a global leader in the capital goods sector that, through its various businesses, designs, produces and sells agricultural and construction equipment, trucks, commercial vehicles, buses and specialty vehicles in addition to a broad portfolio of powertrain applications. Present in all major markets worldwide, CNH Industrial is focused on expanding its presence in high-growth markets, including through joint ventures.

CNH Industrial is committed to investing in R&D programs which develop cutting edge technology to boost the productivity and efficiency of our customers. CNH Industrial's concept autonomous tractor technology is a true industry first. It provides the world's farmers and agribusinesses with a vision of how advanced precision farming solutions could help to increase their yields and optimize both their machinery fleets and skilled labor at key times of the year.

A cabbed concept delivers operating flexibility and the futuristic cabless variant is the ultimate expression in autonomous application.

[www.cnhindustrial.com/autonomoustractors](http://www.cnhindustrial.com/autonomoustractors)



### THE PROS AND CONS OF SUMING

**W**e are all consumers. Consumption is what our economies are built upon. At the most basic level, A produces something and B buys it.

More and more, people ask me about prosumption. That is, A produces something and B buys it, but B also produces something to sell back to A or on to C.

This changes the economic paradigm. Consumers become producers and vice versa, turning the law of the market in which supply and demand are balanced upside down.

For example, electric vehicles (EVs) are today seen as a way to get from A to B. But, looking down the road, they can become batteries that store and sell electricity back to the grid.

Via 'vehicle-to-grid' (V2G) technology, EVs can power homes, offices and anything else, whenever we need it. V2G lets users pull from the grid if they want to go somewhere and push when they don't.

Power is increasingly produced from renewable sources, but they don't deliver as and when it is needed. Scaled up, V2G could supply grid-balancing inputs when demand rises.

V2G also cuts the cost of EV ownership, as power companies pay to use your battery when your car is parked, creating a virtuous cycle that could generate a real revolution.

If you use your EV to store and sell energy, big producers could, one day, be replaced by millions of individual prosumers. At Enel, we plan to produce and consume, because the sum of both adds up to more than one. ■

**Ernesto Ciorra,**  
Head of Innovation and Sustainability, Enel

### FORD: THINKING OUTSIDE THE CAR AND THE BOX

**S**peaking at the Further with Ford 2016 conference at the automaker's Michigan headquarters in September, CEO Mark Fields insisted that "the world is changing very quickly," moving from owning vehicles to sharing them. Ford is revising its business model to focus not just on how many cars it sells, but what services it should offer.

The creation of its Ford Smart Mobility subsidiary in March 2016, which former 3M executive Raj Rao has been hired to run, aims to position the company as a leader in autonomous driving, connectivity, data analysis and, above



all, customer experience in the mobility space.

"It is all about being a consumer-focused company and maintaining our relevance," asserts Mike Nakrani, director of global business associations. "Cars will remain important, but fewer people want them like they used to. Millennials we talk to are interested in what cars can provide. That may not be ownership, but being able to use one when they wish to."

According to Nakrani, Ford controls about six percent of the traditional auto segment, worth \$2.4 billion a year. But the total mobility sector is worth around \$5.4 billion, making it a much larger profit opportunity if the company can achieve

a similar share of the marketplace.

"The more a car can do, the better," Nakrani says. "More is going to happen in cars, which is a big focus of our research."

**It's not about moving from an old business to a new business. It's moving to a bigger business"**

**Mark Fields,**  
CEO, Ford Motor Company

Connectivity is massive; IoT is a huge space. The car is one of the most personal devices we have right now. It knows where you are going and where you have been. There are ways of enabling it to do so much more. People need to figure out what they want it to know. Automakers need to think beyond the car too; the market is really about the miles people travel." ■

### HONDA'S HYDROGEN SOCIETY

**O**nce you look beyond burning petroleum, using any source of energy to drive vehicles is, in theory, possible. But if you also take eliminating air pollution into account—not just emissions of carbon dioxide but a whole cocktail of other environmentally harmful compounds—the answer, according to Honda, is elementary.

**What is a zero-emissions vehicle? An electric motor combined with a hydrogen fuel cell"**

**Thomas Brachmann,**  
Chief Project Engineer,  
Honda R&D Europe

In response to the United States' original Clean Air Act of 1970, Honda began to manufacture lean combustion engines to reduce

emissions. Then, following amendments to the law in 1990, it moved on to battery-powered EVs that produced zero emissions, as long as the electricity came from sustainable sources.

At the time, EVs faced major obstacles to consumer take-up, such as long charging times and limited range. That led the Japanese automaker to explore the potential of hydrogen fuel cells of the kind used by the Apollo space program for its cars, explains Thomas Brachmann, chief project engineer at Honda R&D Europe.

Fuel cell electric vehicles (FCEVs) combine hydrogen with oxygen to produce power while only emitting water, "which is not regarded as dangerous in any way," Brachmann notes. "We wanted to have a true zero-emission vehicle."

In 2008 Honda launched its first production model, the FCX Clarity, in Southern California, under a fully-serviced lease plan.

It has run pilot schemes in Europe and Japan, but the lack of hydrogen filling stations has proved a hurdle to date. Now that Hyundai and Toyota are marketing FCVs in selected markets and more service stations are opening, Honda plans to unveil the new generation Clarity Fuel Cell by the end of 2016.

"In the next five years, we will be in a much better position to launch larger quantities of FCEVs, because volume is the most important consideration for carmakers," Brachmann says. "We are targeting economies of scale and need to generate demand." ■



## AUTONOMOUS DRIVE SHIFTS INTO GEAR

**T**he number of people sharing the planet continues to climb toward 9.7 billion by 2050, according to projections by the United Nations. Guaranteeing universal access to basic needs—clean air, water and food—is the only means to prevent human conflict and environmental disaster. Climate change is compounding the problem, making the all-important increasingly urgent

Finding more sustainable ways to sow and reap what we eat while limiting the impact agricultural production has on finite resources will be key to our long-term success as a species. For now, we cannot grow new land or harvest more water, but forward-looking multinationals, such as leading



**Autonomous vehicles are important because increasingly you need to be able work the field 24 hours a day, seven days a week"**

**Richard J. Tobin,**  
CEO, CNH Industrial

capital-goods producer CNH Industrial, are already introducing innovative machines to get higher yields from the field.

CNH Industrial has developed two concept autonomous tractors that are ploughing a new furrow in precision farming. They were previewed in August at the 2016 Farm Progress Show in Iowa and will be taken on and off the road around the U.S. over the next few



CNH Industrial is leading the way in autonomous drive for farming

months to gauge customer reaction. The New Holland T8 NHDive™ concept looks like a conventional tractor, while the Case IH Magnum is a cableless design; both can operate without a driver.

"At the end of the day, there will be a deficit between what is needed to feed the global population versus how much a fixed amount of land can produce every year," says Richard J. Tobin, CNH Industrial's CEO. "So we look at these tractors as a productivity enhancement, making farming more competitive globally."

In autonomous mode, the tractors are controlled by an application-controlled interface (API) that combines cameras, GPS and radar to create a truly ground-breaking solution. "That is the crux of what we are working on: weaving together this ecosystem and integrating it into the vehicle's electronic architecture," Tobin explains.

The technology applies to most of CNH Industrial's products, as they are all ultimately connected. While wheeled vehicles "get more play because of the sexy aspect," Tobin admits, they are just part of the bigger picture: "Everything that goes around the vehicle needs to be linked into the system."

Automation enables farmers and agribusiness companies to seed and gather all kinds of crops more efficiently and cost-effectively, without having to rely on the availability of labor at crucial and

and harvesting in the optimum window. As the leading company in its sector for the sixth consecutive year, according to the Dow Jones Sustainability Index, CNH Industrial takes its responsibility to the environment and people seriously, and recognizes that doing so is good for business.

"This is technology that is going to change farming to a certain extent," Tobin admits. "Autonomy is disruptive and implies a more efficient use of labor. The vast majority of feedback has been positive. However, we are not going to make the leap into full autonomy yet; we are probably 10 years away from having a farmer being able to remotely control the entire agricultural process. You could, however, have individual products commercially available within three years. It is upon us." ■

### IS INNOVATION OUTPACING INSURANCE?

**U**ntil now, to insure a vehicle, information about the driver was used to calculate risk and underwrite policies. But what about the future, if the vehicle is driving itself?

Most car crashes are due to human error, so it makes sense to replace people with computers. However, even with autonomous



driving, accidents can still happen and questions about liability will inevitably arise.

Let's say a software glitch causes a fender bender, a decision to manually override the system turns out badly, or the operating system is hacked. Is the person in the driver's seat or the machine and

its manufacturer responsible? Automation threatens to turn the insurance business on its head. Safer vehicles lead to fewer accidents and claims, and lower premiums. The industry is figuring out the answers before it has a wreck of its own.

"Advances in technology have laid the groundwork for a paradigm shift," confirms Monika Sebold-Bender, country chief P&C officer of Generali Germany. "Insurance will be transformed, but can also drive change, and compensation remains crucial. This is how it should be, because then everybody contributes to protecting victims." ■

## PERSONALIZING PREVENTION IS THE BEST CURE

In the future, we not only have to find better ways to share the planet among more of us, but we also have to deal with the fact that most of us will be on it longer. The older we get, the more likely we will develop a condition—related to environment, genetics, lifestyle or simply age—that needs care. The cost to society for healthcare will inevitably increase.

In developed countries, health-care bills are already in the double digits of GDP and are rising as populations and life expectancies

do. Today's approach—waiting until people are sick before treating them—is costly and strains systems at the seams. When people fall ill and need care immediately, communication between professionals can suffer while they try to ensure the patient does not.

The way forward, according to Dutch multinational Royal Philips, is to make healthcare more personal and preventative to improve outcomes, optimize lifetime health and reduce costs. The company is now focusing on health technology to



Philips' medical imaging and navigation technology create minimally invasive procedures that will provide benefits for both caregivers and patients, as part of its mission to improve the lives of three billion people by 2025. ■

### CONNECTING PHYSICIANS TO PATIENTS

After working around the world for Royal Philips from 1986 to 2004, before leaving to head up a spin-off company and his own consultancy firm, Frans van Houten returned to become CEO in 2011. During his tenure, Philips has streamlined operations, spun off its consumer electronics and lighting businesses, undertaken many growth initiatives and an M&A drive as part of its transformation into a global health technology leader.

**Care has to be patient-centric, proactive, supportive, and enable lifestyle change"**

Frans van Houten, CEO, Royal Philips

### How can healthcare become smarter?

In the health continuum concept, everybody will go, at some point, from being healthy to having an ailment that will be diagnosed and treated, before recovering and returning to a healthy



Frans van Houten, CEO, Royal Philips lifestyle. In a patient-centric system, you do the cycle as quickly as possible; in other words, personalized health. We need to integrate data to help doctors do a better job on the patient's journey. Via technology, we can connect doctors to patients to create a continuous relationship, supported by the cloud and IoT. Data allows patients and physicians to be proactive.

### How is that transforming Philips' role?

Historically, we developed technology in silos and supplied it. Now, we want to be the hospital's partner and for it to let us help how to apply technology. For example, at Karolinska Hospital, in Stockholm, where we have a long-term contract, we are collaborating on problem solving. To optimize stroke care, we review what happens in the

ambulance to help us determine the cause and send advanced data to the hospital so they are ready to receive the patient in the right ward without wasting time in the emergency room. We are partners challenging each other to redesign the way healthcare is delivered.

### Where is change happening now?

The division doing connected care and health informatics is changing fastest, because of the insight you get through connectivity. Most reimbursement systems are volume-oriented, so there is not always an incentive for care providers to work in an integrated way. In the U.S., you see the Affordable Care Act going in the direction of measuring output rather than volume. That is an important enabler for new kinds of care deliveries. In the next five years, there will be more output measurement and reimbursement for results, not effort.

### How concerned are you by the threat posed by tech companies moving into the healthcare space?

Everyone talks about big data and it has become a buzz word. The same has happened with health. Our advantage at Philips is that we are

in the last yard between patient and doctor. You can do big-data analysis, but how do you make it actionable? You need to touch an individual patient and help an individual doctor, because otherwise all insights are theoretical. We have diagnostic systems, informatics to integrate data, and clinical support. When patients are discharged, we stay in contact for monitoring. That is our game. We are a clinical company with products and services to support both the patient and doctor.

### Why are you introducing circular-economy thinking?

Sustainability is deeply ingrained in our company and a passion of mine. We have made it part of our strategy. We want to be a technology partner, rather than sell a box. Circular thinking is used to reuse a product in a more sophisticated model to sell as a service. We design differently, so it generates more value. That can best be done by continuing to own the technology. By selling a product as a service, we can extend its lifetime, upgrade, recycle, and more. It becomes an incentive to not create obsolescence. ■



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## THE POWER SHIFT

From 2001 through 2005, Enel, a multinational energy company that serves 61 million clients in 30 countries, began rolling out the world's first Smart Grid. In five years, it installed 32 million smart meters across Italy, establishing two-way communication with its customers and collecting data on consumption, contract parameters and the quality of electricity supply.

**Our future cities strategy is to leverage the smart grid to maximize convergence"**

Livio Gallo,  
Head of Global Infrastructure  
and Networks, Enel

Today, it has seven million smart meters in Spain and plans to reach all 13 million customers in the near future. Meanwhile, Enel's

Open Fiber group began laying a \$2.8-billion, ultra-fast network in Italy in September that will reach 224 cities and towns nationwide by 2020. This will connect the next generation of 32 million Enel Open Meters, permitting faster and more flexible data measurement to respond to its clients' desire to optimize energy use and efficiency.

As the global population migrates to urban areas and demand for services mostly powered by electricity increases exponentially, Enel's vision of the Smart City is focused on convergence. Power networks, telecommunications, transportation and other infrastructure that makes cities tick will need to be upgraded in terms of capacity, responsiveness and quality service.

Once Enel has the high-speed hardware in place to connect millions of homes and businesses to its grid, it will be able to deliver almost any service required, now and in the future. "Our grid has a very



Enel created the world's first completely electric smart city for Expo 2015

smart architecture; not just electricity but also water and heat," says Enel's head of global infrastructure and networks, Livio Gallo. "With intelligent substations, we can collect data from sensors about air pollution, wind speeds, temperature, even waste. Using these connections, we are creating an Internet of Things."

The next step, Gallo says, will be redefining the relationship between power providers and consumers and transforming bilateral communication into commerce. Using decentralized storage and smart distribution, customers will be able to draw down power from the grid if they need it, and inject

energy back into the network when they have a surplus and when renewable generating capacity does not satisfy demand.

Analyzing big data, balancing usage and demand, providing on-demand power when possible and purchasing from prosumers as required, Enel aims to work with urban managers on smarter sustainable solutions for tomorrow. "Municipalities have to have a clear plan. They play a major role in the development of infrastructure," Gallo says. "When you talk about smart cities, you're talking about smart customers and smart institutions." ■

## THINKING BIG ABOUT ADDING VALUE TO DATA

Big data presents an opportunity that has to be managed to not be missed. It can provide vital knowledge into how, in our connected world, everything works or fails. It is massive and rapidly-expanding, in hundreds of formats, yet virtually worthless without analysis and visualization. The challenge "will come from keeping IT resources connected and coherent as deployment broadens," notes David Chalmers, vice president and chief technologist EMEA, Hewlett Packard Enterprise (HPE).

Since the 1960s, improvements to IT architecture have been driven by faster processors, but Chalmers points out that you can only go so fast in an old model before it breaks. HPE's "The Machine" project aims to

revolutionize computing by putting data first. Driven by memory, connected by light and with limitless storage, it offers a scalable solution to transform data securely, efficiently, and cost-effectively into intelligence that customers can act upon.

"At HPE, we see a dramatically larger need for sophisticated infrastructure that enables information to flow for the new world," Chalmers explains. "Organizations have a critical role to play, putting in place the infrastructure at the heart of these solutions, talking to devices on the edge and the IoT, assimilating data, analyzing it, getting value from it, processing it and protecting it."

HPE is committed to open-source standards rather than closed, proprietary solutions, because, Chalmers insists, it believes collaboration offers greater benefits to customers. The last company left

in the marketplace to sell the entire technology portfolio, HPE is working closely with peers and clients

**Getting value from big data demands powerful analytics at the edge, the data center, and in the cloud"**

David Chalmers,  
Vice President and  
Chief Technologist EMEA,  
Hewlett Packard Enterprise

to avoid potential roadblocks to currently unforeseeable demands.

With a projected 30 billion connected devices worldwide by 2030 generating more data than ever, the process by which we gain insight also needs to change. Instead

of using data to confirm trends we think are already there, we need to dig deeper to discover "gold dust" where we did not expect to find it. Doing so will require ever more powerful analytics to combine and consolidate data.

HPE's value proposition is all about seeing beyond big data to the bigger picture. "The value from the pieces you do not expect is where I think we will see a lot of gains in smart cities," Chalmers says. "You can only do that if you have enough ability to gather and look at all the data, from the center, the cloud and the edge. Our openness of approach, breadth of perspective, and willingness to partner really make a difference." ■

PROJECT DIRECTION: SIAN GODDARD  
INTERVIEWS: SIAN GODDARD  
WRITING: JAMES SOUTHERAN

EDITING: CARMEN MOURA  
ILLUSTRATIONS: VASAVA  
DESIGN: ANTONIO CAPARRÓS

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