



BOSCH

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**Bosch embraces sustainability:
climate neutrality worldwide by 2020
and new solutions for better air in cities**

Presentation by Dr. Volkmar Denner,
chairman of the board of management, Robert Bosch GmbH,
and Prof. Stefan Asenkerschbaumer,
deputy chairman of the board of management,
at the annual press conference on May 9, 2019

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There are images, ladies and gentlemen...

...that can change how we see the world. So it was almost exactly 50 years ago with the *Earthrise* photo, which shows the Earth peeking out from beyond the lunar surface. More than anything else, it is an image of the vulnerability of our blue planet. Its effects continue to be felt to this day – up to and including this annual press conference, to which I wish to welcome you.

More than ever, we're concerned with the question of what companies can do to prevent our blue planet from overheating. Specifically, we want to quickly reduce a certain number to zero: the 3.3 million metric tons of CO₂ emissions Bosch produces every year. For the continued existence of our civilization and of our economic system, climate action is a crucial undertaking. Companies like Bosch must also act without delay. Today, therefore, we would like to announce our own corporate moonshot project. By 2020, all Bosch locations worldwide will be completely carbon neutral. Let me be clear: I mean that all our locations worldwide, not just German plants or new buildings, will effectively never again leave a carbon footprint. In a little over one year, we will be the first major industrial enterprise to achieve this ambitious goal.

Climate change is not science fiction. It's really happening. But all too often, the grand goal of climate action is seen as just a long-term aspiration – one that, when it comes down to it, should not cost our generation anything. Bosch is taking a different view, and swiftly and boldly investing in the future of our blue planet, and thus in its own future as well. Put simply, we will be spending a billion euros on carbon neutralization by 2030. Global warming is not something that will miraculously solve itself by the end of the century thanks to the power of wishful thinking.

Such a “happily ever after” scenario will not materialize if energy consumption and CO₂ emissions continue to set new records, such as those just confirmed by the International Energy Agency for 2018. Climate action certainly requires staying power, but equally it calls for immediate measures – and last but not

least it needs the determination of companies like Bosch to aim for carbon neutrality, not at some distant point in the future, but here and now.

- However, environmental protection is about more than climate action. I will also be addressing Bosch's efforts to improve urban air quality as part of my strategy overview. We see ourselves as having responsibility that is both global and local.
- First, however, let us look back at Bosch's financial performance over the past business year. Despite a cooling economy, Bosch sales and result once again reached record levels in 2018.
- Our sales and result forecasts for the current business year are cautious. The economic outlook for 2019 is subdued. In addition, there are growing risks from trade barriers across the globe.

Mr. Asenkerschbaumer will now discuss Bosch's business performance this year and last in more detail.

**The business situation of the Bosch Group:
Good progress in 2018, subdued outlook for 2019**

Ladies and gentlemen,

I would now like to walk you through the key financial figures. As Mr. Denner said, our company developed well overall in 2018, despite an ever stronger headwind in the automotive market, which is currently gathering force.

First of all, let's take a look at last year's macroeconomic conditions:

- On average for the year, the global economy developed better than expected in 2018. Global GDP grew by 3.2 percent, almost as much as in 2017. However, the global economy slowed down as the year progressed.
- Moreover, the development of worldwide automotive production was already much less positive in 2018. We had expected slight growth here, but in fact production fell by around 1 percent to 97.3 million vehicles. One important factor was the slump in automotive production in China, the first time this had happened in decades.
- By comparison, mechanical engineering experienced a robust recovery, even if here, too, there was less momentum than in the previous year.
- The growth in global private consumption was at a level similar to last year's, although it lagged behind expectations, particularly in China.
- In addition, the growth in global construction activity decreased slightly year on year.

Against this backdrop, Bosch Group sales developed well. Without consolidation effects, we were able to increase sales by 2.2 percent to 78.5 billion euros; after adjusting for exchange-rate effects, this figure is 5 percent. Accordingly, once adjusted for exchange-rate effects, sales growth exceeded our forecast. The consolidation effects of 1.3 billion euros mainly relate to the carve-out of the former Starter Motors and Generators division at the end of

2017. In addition, the exchange-rate burdens of 2.1 billion euros in 2018 were far above average. If we include consolidation effects, sales increased by 0.5 percent; adjusted for exchange-rate effects, the increase was 3.2 percent.

How was performance by business sector and region? Again, the most significant figure is growth adjusted for consolidation effects.

In these terms, our largest business sector Mobility Solutions increased its sales by 3.5 percent to 47.6 billion euros; or by 5.8 percent after adjusting for exchange-rate effects. This positive result was achieved despite a challenging market environment, thanks to a variety of product successes ranging from systems and components for exhaust-gas treatment, transmission technology, and driver assistance systems to attractive solutions for e-bikes, motorcycles, and commercial and off-highway vehicles. But we too felt the considerable slowdown in automotive production in China; on top of this, power-train technology was affected by the continued decline in the proportion of newly registered diesel vehicles in Europe.

The Industrial Technology business sector was very successful, increasing its sales by 8.8 percent to 7.4 billion euros; after adjusting for exchange-rate effects, this was a double-digit increase of 11.7 percent. This growth was driven by the Drive and Control Technology division, which developed very well following a successful realignment. Connected Industry 4.0 solutions also played an important role. As reported, after intensively and thoroughly considering all strategic options, we have decided to sell our packaging machinery business. The divestment process is currently underway.

In Consumer Goods, performance was modest. Sales fell by 3.1 percent to 17.8 billion euros; after adjusting for exchange-rate effects, they increased slightly, by 0.7 percent. BSH Hausgeräte was hit somewhat harder than Power Tools by the decline in sales and by exchange-rate effects, which were particularly pronounced in this business sector. By contrast, the Energy and Building Technology business sector continues to grow, with sales rising

in 2018 by 2.4 percent to 5.6 billion euros, or by 5.1 percent when adjusted for exchange-rate effects.

Business performance also varied widely by region. Sales growth was encouraging in Europe, increasing by 3.3 percent, or 4.8 percent after adjusting for exchange-rate effects. If we take the exchange rate-adjusted growth figures as the basis, then the Americas grew the fastest. Our sales in North America rose 2.7 percent to 12.3 billion euros, or by as much as 7.4 percent after adjusting for exchange-rate effects. In South America, business also recovered with exchange rate-adjusted sales growth of 11.6 percent. Nominally, however, sales fell again by 6.2 percent to 1.4 billion euros. With an increase of 0.7 percent to 23.4 billion euros, and of 3.7 percent after adjusting for exchange-rate effects, growth in Asia Pacific including Africa has slowed considerably compared to previous years. A main reason for this is the weak development in China, where automotive production fell in 2018 for the first time in roughly two decades – and by a hefty 4 percent at that. In Africa, incidentally, we managed to surpass 500 million euros in sales, partly on account of the complete takeover of a Bosch Rexroth joint venture in South Africa.

Despite the falloff in automotive production and substantial upfront investments in areas of future importance – whether in the form of research and development spending or capital expenditure – we again managed to increase our result from operations year on year, from what was already a high level. In the Bosch Group, we generated an EBIT from operations of 5.5 billion euros in 2018 compared to 5.3 billion euros the previous year, and an EBIT margin from operations of 7.0 percent compared to 6.8 percent the previous year. As in previous years, the impact from depreciation and amortization in connection with the full acquisition of the former joint ventures BSH Hausgeräte and Automotive Steering in 2015 has not been not factored into the result from operations.

The EBIT reported in the statement of income also rose to 5.5 billion euros, compared with 4.9 billion euros the previous year. This is also due to a non-

recurring extraordinary effect resulting from a change in accounting standards, and more specifically to the changed reporting of the company pension scheme with regard to additional benefits in the event of disability or death. The good result also led to a further increase in the equity ratio to 47 percent from the previous year's already high level of 46 percent.

Moreover, all business sectors contributed to the good result from operations. In Mobility Solutions, EBIT from operations amounted to some 3.4 billion euros. Despite heavy upfront investments, this matched the previous year's level, while the margin from operations was slightly below the previous year's level. Industrial Technology saw its EBIT rise sharply to around 630 million euros and its margin increase to over 8 percent. Despite the drop in sales, the Consumer Goods business sector was able to achieve high levels for both result and margin, with 1.4 billion euros and 7.8 percent respectively. Energy and Building Technology achieved a result on a par with the previous year's level.

Moving on to research and development spending, we once again increased our upfront investments substantially in 2018. However, a portion of that – the development work charged directly to customers – is no longer recorded as development cost. Under the revised IFRS accounting standards that apply to the 2018 financial statements, this is now disclosed under cost of sales. But to give you an idea nonetheless: if the same standards had applied, our research and development expenditure would have increased by some 300 million euros to approximately 7.3 billion euros. Under the new accounting standard, research and development cost for 2018 amounts to 6 billion euros. The Mobility Solutions business sector accounted for three-quarters of our research and development spending. Key areas for upfront investments in this sector are electrification, automated driving, display and infotainment systems, and sensors.

Our comprehensive upfront investments in the future are also apparent in our capital expenditure, which rose significantly to 4.9 billion euros compared to

4.3 billion euros the previous year. The increase in capital expenditure in the Mobility Solutions business sector was particularly pronounced. The main focus areas were electromobility, automated driving, and our new wafer fab for 300-mm technology in Dresden.

So much for the good business year in 2018. The outlook for 2019 is decidedly more subdued.

We are skeptical about the prospects not only for the global economy, but also for most of our major market segments. Only in global construction activity do we expect the rate of growth to remain unchanged, albeit with regional differences. Accordingly, we are expecting growth of global GDP growth to slow considerably in 2019, to just 2.3 percent. In addition, the risks posed by the worldwide trade disputes, the high levels of debt in major European countries, and the Brexit situation remain high.

Particularly affected by the economic slowdown is our largest market, the automotive sector. We expect automotive production to fall by 3 percent to 94.7 million vehicles. This will be the first time that production figures have contracted in two successive years since the financial crisis. In fact, figures will probably drop below 2016 levels. This trend affects all regions. In Asia, another sharp decline in China and much slower growth in India will play a major role. But in Europe and especially in Germany, we expect automotive production to decrease considerably. In North America, we expect production to be slightly weaker.

At Bosch, we are also feeling the effects of this business climate. In the first three months of 2019, Bosch Group sales were nearly on a par with the previous year. For the year as a whole, we currently expect sales to be slightly better than the previous year. EBIT margin from operations should be some 6 percent – partly due to substantial upfront investments in areas of future im-

portance, but also due to the costs associated with our company's transformation. And speaking of "the future," I would like to hand over to Mr. Denner again.

Bosch strategy and logic: "Invented for life"

...Thank you, Mr. Asenkerschbaumer. In my remarks about Bosch strategy, I will show just how serious we are about our "Invented for life" imperative. We firmly believe that we can make the world a better place with more technology. And environmental questions also call for technological answers. Even when faced with negative consequences of technology, such as the risk of accidents on our roads, we respond positively with new and improved technical solutions. That is the logic of Bosch – and the best thing an innovative company can do.

Specifically, we are currently focusing on two topics:

- First, the issue of climate change is becoming more pressing than ever before. Rising sea levels, extreme weather conditions, droughts, flooding – I don't need to spell out the foreseeable consequences of climate change here. But this much I will say: they endanger the stability of our world. A company like Bosch, which wants to improve people's lives with technology, cannot ignore this. Consequently, we are taking a fast route to carbon neutrality in all our locations worldwide.
- As well as climate action, Bosch wants to make a contribution to air quality – and that is my second sustainability topic. A lot of things have improved over the past decades, yet the WHO still cites air pollution as the greatest environmental threat to human health. According to the OECD, it also causes major economic damage: health costs in particular are set to increase worldwide from 21 billion dollars at present to 176 billion dollars by 2060. Studies like these assume that no progress will be made, but this makes us want to do even more. Confirmation for this point of view comes in the form of the recommendations made by the Leopoldina academy of sciences to the German federal government. It says that

driving bans fall short of the mark, and that what is really needed is a traffic sea-change.

Responsibility here and now:

Bosch to become first carbon-neutral industrial enterprise by 2020

But first, let us look at carbon dioxide, which is obviously not a contaminant in our air, but the principal greenhouse gas. Like no other topic, climate change epitomizes the ecological side of globalization. And hardly anything else is as symbolic of global responsibility as the Paris Climate Agreement. However, the temptations to shift responsibility are unmistakable – whether into the future, as the changes are in any case long term, or into other people’s backyards – polluters who, either in fact or allegedly, emit more CO₂. Bosch is countering this with its “here and now” approach.

Climate change waits for no one. We must respond in shorter timeframes to reach the Paris targets: limiting the temperature increase in the Earth’s atmosphere to a maximum of 2 degrees Celsius by 2100, and if possible to 1.5 degrees, compared to pre-industrial levels. The latest special report by the Intergovernmental Panel on Climate Change (IPCC) calls us even more urgently to action. According to the report, the 1.5-degree target only has a chance of success if global energy consumption becomes carbon neutral by the middle of our century. It is precisely this carbon neutrality that Bosch wants to achieve – not in 2050, not in 2030, but in 2020. It wants to become the first industrial company with locations around the globe to accomplish this.

Why do we think we can do it? Well, partly because we have clearly exceeded all our CO₂-reduction targets up to now. In 2007, Bosch undertook to reduce the CO₂ emissions of its locations by 20 percent relative to value added by 2020. We achieved this goal by 2014, in just half the time. So we decided to raise our target to a reduction of 35 percent. And we will achieve that, too. After all, last year the CO₂ emissions of our locations, measured as

a proportion of value added, were some 30 percent lower than the baseline value twelve years ago. The question that then arose was what we would do beyond 2020. Making all locations carbon neutral – we initially discussed this possibility with an eye to the next decade. But prompted by the latest IPCC special report, the scientific discussion grew more intense again. Against this backdrop, we moved up the deadline for Bosch’s major climate-neutrality goal from 2030 to 2020. The calculations show that it is possible. So what are we waiting for?

**Climate action is taking concrete shape:
Rapid measures by 2020, further refinement by 2030**

Basically, we can apply four levers in striving for our goal: one, increase energy efficiency; two, expand our supply of green energy; three, procure more green electricity; and four, offset unavoidable CO₂ emissions. We will be moving the latter two levers more in the near future, and beyond next year, we will increase our use of the other two. This means that we can reach our major goal of carbon neutrality next year, but we won’t then discontinue our efforts to achieve a transition to a green energy economy. Instead, we will further improve the quality of our climate action.

But what will we be doing up to 2020? We will be stepping up our energy-saving efforts right from the start, which I’ll say more about in a moment. However, it is impossible to immediately and radically reduce Bosch’s energy consumption – in 2018, it was around 7.8 terawatt hours, which is equivalent to the annual power consumption of all the private households in Berlin and Munich put together. But it is possible to completely neutralize the corresponding CO₂ emissions – some 3.3 million metric tons last year. We will be using two rafts of measures in particular to counterbalance these emissions next year:

- First, by buying in green electricity, we will be ensuring our energy mix is much greener than the current worldwide energy mix. According to our

plans, this bought-in energy will make up almost 40 percent of our energy consumption. And by green electricity, we mean sourced from existing solar or wind farms, and no fossil energy sources.

- Second, we will seek to offset just under 40 percent of our energy consumption. The reasoning behind this is clear: we are ensuring that the same amount of CO₂ emissions that is still unavoidable in a foundry, for example, is avoided somewhere else. Wind farms in the Philippines and the Caribbean, forest conservation in Africa, reforestation in Panama, taking emissions of the greenhouse gas methane and converting it into electricity – with measures like these, we are already offsetting all our natural gas consumption in Germany this year. Very importantly, these projects promote social as well as environmental development, and are certified by independent third parties according to strict standards.

It is above all these two levers that will bring Bosch's carbon footprint down to zero by 2020. But we're not stopping there: instead, in the years up to 2030, we'll be increasing the ecological quality of our carbon-neutrality measures. For example, we're planning to roll back the proportion of green electricity we buy in from existing plants. Instead, over the next decade, two other levers will come to the fore:

- First, we want to increase energy from renewables as a proportion of our power consumption to as much as 40 percent. To this end, we're also expanding our own photovoltaic plants – indeed, recently we built the largest plant of this kind in the Indian automotive industry at our Nashik site. In total, the installed capacity of our on-site renewable energy supply will increase tenfold by 2030. In addition, we're backing "new clean power." That means we are concluding long-term, exclusive supplier contracts with new wind and solar farms. We're also seeking to sign such contracts outside Germany. In Mexico, we're already covering over 80 percent of our energy demand with such new clean power.
- Second, we're striving to cut energy consumption by 1.7 terawatt hours, more than a fifth of our current annual consumption, equivalent to the

power consumption of all private households in Cologne. Energy efficiency is hard work, but we will not stop once we reach carbon neutrality. On the contrary, our efforts are more ambitious than in earlier years, as we want to reduce energy consumption and CO₂ emissions in absolute terms and no longer just in relation to value added. We will therefore reduce our consumption by 1 to 2 percent each year up to 2030 – something we managed to do in 2018 with almost 500 energy-efficiency projects. We're well on our way, and it's worth noting that the significant progress we're making is coming from the cumulative effect of many small projects. These include measures like heat recovery and on-demand ventilation and cooling. Moreover, connectivity in manufacturing has now become a main driver of efficiency. We're already using the energy platform from our Industry 4.0 solutions portfolio in more than 30 plants around the globe. This allows the plants to monitor and control the power consumption of each individual machine. In Homburg, more than 10,000 measurement points are connected via the platform. The result on site: almost 5,000 metric tons of carbon dioxide have been saved over the past two years alone – a reduction of 11 percent. Because of the success of the solution internally, we're also marketing it externally.

Viewed systematically, two of our major strategic fields converge here: energy efficiency and connectivity. Energy efficiency has always been a driver of innovation at Bosch. Since the first oil crisis in 1973, energy-saving priorities have been at the forefront of our product development. At that time, we first launched our "3S" program to make driving safer, cleaner, and more economical, or "sicher, sauber, sparsam." That was the starting point of our "Invented for life" strategy, which is now the guiding principle for all the business sectors in our portfolio. When we tap the market of the connected world today, then we do so again with three S's – with know-how in sensors, software, and services. This also results in all kinds of efficiency solutions, and not least with regard to energy efficiency. It is precisely here that Bosch makes climate action technically feasible and commercially viable.

Climate action pays off:

energy efficiency makes environmental goals economically attainable

There remains the question of how our efforts to achieve climate neutrality will pay off over the coming years. Once again, energy efficiency is key.

There are three main points in particular in our model calculation up to 2030:

- First, we will incur added costs of a billion euros for buying in green power, offsetting CO₂, and increasing our supply of renewable energy.
- Second, we will invest a billion euros in increasing our energy efficiency.
- Third, we will save a billion euros by virtue of increasing energy efficiency. After all, every kilowatt hour we do not consume avoids CO₂ and saves money at the same time. Ultimately, then, the cost of the carbon-neutrality project will be reduced to one billion euros.

That said, we're very much aware that the value of climate action goes far beyond such considerations. The foremost of Bosch's values is future and result focus – and it is precisely this value that we're re-imagining and placing in a wider context. We think that a company like Bosch should also focus on the future of its environment. Whenever we forgo revenue, then it's generally in favor of upfront investments in research and development: that is, for the business of tomorrow. But climate action also needs upfront investments – this time for the future of our blue planet. And yet we're not splashing out wildly, as business sense and environmental action converge in the topic of energy efficiency. And one of the reasons why we're laying bare our calculations is because we hope that other companies will follow our example.

Beyond the car hood:

Bosch works to improve air quality, also with new solutions for mobility

Finally, ladies and gentlemen, climate action hinges on global efforts – but the air we breathe can only ever be improved locally. Nonetheless, the quality of air in cities around the globe is a no less pressing issue – and Bosch has

things it can contribute, as I will show in my second topic. Last year at this point, we reported on our breakthrough in diesel technology. And we have further progress to show this year. At the same time, however, we're looking beyond the car's hood, working together with cities to develop clean air solutions that are aimed at road traffic as a whole.

But first of all, what progress have we made beneath the hood? We've made our breakthrough in diesel technology even more robust – bringing emission levels down even lower, including in critical driving situations. These advances are being incorporated into all customer projects for upcoming diesel vehicles. Even now, some of them feature in production vehicles, as is attested by 70 independent test reports: they state that 84 percent of newly tested diesel vehicles fall well within the emissions limits that will apply only as of next year. The emissions from modern internal-combustion engines will no longer make any appreciable contribution to air pollution in our cities. Particulate emissions are also no longer an issue – neither for diesel nor gasoline engines.

Nonetheless, we're continuing the work, which includes going above and beyond upcoming emissions standards. Although we estimate that around 25 percent of new cars and light commercial vehicles on the world's roads will be all-electric by 2030, the flipside of this is that some 75 percent will still have an internal-combustion engine on board. In addition, environmental legislation is getting tighter across the globe. This is serving to drive technological development. To this end, we're employing artificial intelligence as part of our approach – for example, to predictively control exhaust-gas treatment according to patterns in individual driving behavior. The growing legal requirements are also acting as a market driver. For example, exhaust-gas treatment and exhaust sensor technology are two growing business units at Bosch – they currently employ 3,500 associates worldwide and collectively generated sales of 2.3 billion euros in 2018. This figure is set to reach 3 billion euros by 2025.

With the expertise from these business units, we're now also developing mobile analyzer units to continuously measure urban air pollution. We're already testing them in the Stuttgart metropolitan area as well as in Paris and Marseille. In addition, we use the driving behavior of individual cars to draw reliable inferences from the vehicle fleet as a whole and thus derive the emissions for the current traffic situation. To do this, we work with simulation models. In the future, we want to gain a much better understanding of the relationship between emissions and air pollution: that is, between road traffic and the environment.

In the end, the question is how traffic needs to change to bring about an improvement in air quality. This is precisely what we want to determine with our analyzer units used in conjunction with the simulation models. For example, we've been able to demonstrate that steady traffic flows can lead to an almost 20 percent reduction in pollutants. In the future, it will be possible to create new services based on the data from mobile analyzer units. This can include things like high-resolution pollutant concentration maps, which would permit more precise traffic management. It is our goal to provide the necessary data and services. This is just one example of how we can improve the air quality in cities with a broader approach. Our vision is a smart city that will also be a clean city.

Bike-leasing, ridesharing, telecommuting:

Bosch associates in cities can leave their cars at home

We recently set up a new project at Bosch to pursue the vision of near-zero air pollution from traffic. The project brings together what we're doing for air pollution in cities both beneath and beyond the car's hood – that is, the development of extremely low-pollutant powertrain technologies coupled with approaches to achieve steady traffic flows. Another pillar of the project is our company mobility management system. We may be automotive suppliers, but specifically in conurbations we help our associates leave their cars at home. This begins with shuttle buses that we run for our large locations – and incidentally not just in the Stuttgart region, but also in Brazil, China, India, and Turkey. It also encompasses new measures, such as those we are initially trialing in the Stuttgart metropolitan area. In addition, we have formed a Clean Air Alliance with other employers. Three examples show how we're changing the mobility of our associates:

- First, you don't need four wheels to get places quickly in conurbations. We offer our associates an attractive leasing model for bicycles and pedelecs and pay a subsidy for them.
- Second, we support telecommuting wherever possible. One in five associates in the Stuttgart metropolitan area works from home on average one day per week – that avoids trips to and from work and helps the environment and families alike.
- Third, we're bringing connectivity to commuting. We're already trialing the SPLT ridesharing platform in Mexico, and now we are introducing it in the Stuttgart metropolitan area, too. To begin with, the associates at our Reutlingen location have been able to use the ridesharing app since March. Harnessing connectivity for commuting is another effective way of reducing traffic.

**The mobility of tomorrow also helps improve air quality:
Bosch delivers progress in automated and electrified driving**

The last example suggests how we will take the progress we make in the mobility of the future and apply it toward the goal of improved air quality. Our engineers are working on three development paths – making driving not only connected, but automated and electrified as well. On these three strategic paths, we're making huge strides:

- First, automated driving – this also helps reduce consumption and emissions, already by virtue of the positive impact its steady driving speeds have on traffic flows. Above all, however, it can avoid one in every four accidents that result in injury, according to our accident researchers. So right from the start, we see that automation furthers sustainable mobility in two ways. We're pushing forward this development – with upfront investments totaling 4 billion euros by 2022, and with more than 5,000 engineers, twice as many as two years ago. This is a strong team that is already getting a front camera with artificial intelligence ready for production this year. The camera understands what it sees. Its artificial intelligence, for example, infers from a pedestrian's movement whether they are going to step out into the road or not, making the reaction times of automatic emergency braking even faster. Moreover, our developers are working together with Daimler on driverless robotaxis, such as the ones we will be testing in San José, California, before the year is out. It's very important here that legislation in Germany and Europe keeps pace with this rapid technological progress. Lawmakers must ensure that each subsequent level of automated driving functions is given the green light on European roads as well. In any case, the path to automation is already a commercial success. Its starting point is driver assistance, with which we'll also grow by 15 percent in 2019, with sales of around 2 billion euros. Sales of radar sensors alone will grow 20 percent this year, and those of video sensors by 30 percent. Technologically and commercially,

we're leading the way in driver assistance. It is an area of future promise that's already a growth area for us today.

- In the area of electric driving as well, we are growing rapidly. By 2025, we expect to generate 5 billion euros of sales in this field, ten times what it was in 2018. At the same time, however, we foresee growing competition for value added in the powertrain of the future. One reason we see opportunities for Bosch here is the unique economies of scale that enable us to supply a large number of automakers. Bosch powertrain components already feature in over a million electric cars around the world. By the end of 2022, this number is set to rise to nearly 14 million. We've already carried out powertrain projects for 50 electric vehicle platforms; last year alone, we managed to acquire 30 new projects worth a total of nearly 8 billion euros. Accordingly, we can say that our development work for electromobility is thoroughly energized. It's not enough that we offer powertrain technologies from bikes to trucks – we doing this on a technology-neutral basis. For example, we're preparing for the breakthrough of fuel-cell technology in cars, and particularly in trucks. Just recently, we entered an alliance with Powercell, a Swedish manufacturer of fuel-cell stacks. Such stacks convert hydrogen into electrical energy and make up two-thirds of the value of a fuel-cell system. Through the alliance, we want to commercialize the stacks; that means manufacturing them cost effectively and launching them by 2022 at the latest. Whatever the technology behind electric driving, it is emissions-free if the electricity is generated from renewable energy sources. Last but not least, because electric cars largely use regenerative braking, we're also able to reduce brake dust with them by over 95 percent. And this brings us back nicely to air quality in cities.

**Companies don't have to wait for politics:
environmental and climate action without abandoning growth**

Ladies and gentlemen, a company like Bosch has to understand and realize sustainability primarily in technological terms. From brakes to artificial intelligence, we're exploring all innovative possibilities. We want to do more for air quality than we have to. And beyond that, I'm convinced that it's time to take unconventional approaches to climate action. It's a subject that affects everyone, but it's not enough if everybody waits for others to make the first move. Everyone has to play their part. And a company like Bosch is not prepared to wait any longer either. The manufacturing industry must not of course lapse into environmental activism, but it can nonetheless be environmentally active – and its technological capabilities will make it particularly effective. To this end, it's vitally important that we should not have to abandon growth – not even for the goal of carbon neutrality. As Bosch is demonstrating, energy efficiency helps bring climate action and cost effectiveness down to a common denominator, showing us that with innovative environmental solutions, it is still possible to achieve growth. Consequently, we can absolutely strike a commercial balance between economic and ecological responsibility. But it's about more than that, including the responsibility we bear for the stability of our society. The yellow vest protests in France, the demonstrations by diesel drivers here in Stuttgart – both these phenomena indicate that large sections of the population believe that environmental protection and climate action cannot be reconciled with economic necessity. Although companies cannot provide direct political answers, they can ease the strain on politics with their technical solutions. If we successfully manage to bring about climate action that makes business sense, if we manage to noticeably improve the air quality in cities with new solutions for engines and transport, then we will also stabilize the social climate.

At Bosch, we take on responsibility – beyond the boundaries of our company – true to the example set by Robert Bosch.