

46th Tokyo Motor Show **Bosch Defines the New Era of Mobility with PACE** Focusing on Personalization in addition to Automation, Electrification, and Connectivity

October 24, 2019
C/CGR-JP-2019-19

- ▶ All-in-one 48-volt central drive unit covering all components needed for electric two-wheelers is ready to be provided in the Japanese market
- ▶ Sales of vehicles featuring 48-volt mild hybrid system from Japanese automakers planned in the beginning of 2020
- ▶ Working to collect Road Signature data on expressways in the Kanto region

Tokyo — Bosch will exhibit a range of products and technologies for realizing a mobility that is as emission-free, safer and fascinating as possible at the 46th Tokyo Motor Show. At a press briefing held at the event location on October 24, Dr. Stefan Hartung, member of the Bosch board of management and Chairman of the Mobility Solutions business sector, and Dr. Markus Heyn, member of the Bosch board of management, gave an overview of Bosch's solutions for an automated, electrified and connected mobility. Additionally they announced that Bosch would add "personalized" to pursue development of solutions under the concept of PACE (Personalized, Automated, Connected, Electrified).

Solid Performance in the Mobility Solutions Business

The Bosch Mobility Solutions business sector is again developing better than the global automotive production in 2019. Despite the market's current downward trend, a fall by 5% to some 93 million vehicles in 2019, the sector's sales from operations will come in at just under the previous year's level. In Japan, after a good start during the beginning of the year, the 2nd half of 2019 will be affected by the downward trend of the global market. For 2019, Bosch Japan expects sales to third parties to be above previous year.

Developing an Extensive Portfolio for Emissions-free Mobility

While the transformation of mobility presents market challenges, Bosch also sees many opportunities for further innovation and growth. Over the past years, Bosch has invested around 400 million euros annually in emission-free mobility and is leading the way in electrification, both technologically and commercially. As early as 2020, our sales in electromobility will pass the one-billion-euro mark. For 2025, Bosch has set a sales target of 5 billion euros – a target which Bosch will surpass.

Bosch's two-wheeler portfolio for electrification solutions includes lithium-ion batteries, displays, control units, drive units, safety systems (ABS) and others. It can be provided as an electrified system, the "48-volt central drive system," that integrates all of the main components needed for an electric two-wheeler. The 48-volt central drive system has already been adopted by Govecs in Germany, NUUK in Spain, Peugeot in France, and can be provided in Japan as well. At the press briefing, Stefan Hartung noted increasing activity in Japan towards promoting the uptake of electric two-wheelers, such as the establishment of a consortium aimed at standardizing exchangeable batteries and battery exchange systems for two-wheelers. He also said that Bosch's 48-volt central drive system is expected to contribute to Japan's two-wheeler market.

Bosch's main electrification solutions are its 48-volt mild hybrid system and the eAxe. The 48-volt mild hybrid system boosts fuel efficiency by up to 15%, while costing less than a full-hybrid system. It is also compact and easy to mount on an automobile. These features have attracted much interest from Japanese automakers. In fact, in the beginning of 2020, a Japanese automaker is planning to sell a model that will feature Bosch's 48-volt mild hybrid system. Moreover, in 2020, automobiles fitted with the eAxe powertrain are scheduled to be launched in the Chinese market. The eAxe powertrain can be fitted to a wide range of automobiles, from compact cars to sports cars, and mini delivery vehicles.

In addition, Bosch is preparing to manufacture a Bosch Stack to commercialize fuel-cell powertrains, by industrializing the stack licensed from Powercell, which already offers the highest power density in the market.

Pursuing Increased Accuracy in Automated Solutions to Realize Safer Mobility

Bosch is developing solutions for an increasingly automated driving, such as driver assistance systems, automated valet parking technology, and accurate vehicle localization to realize safer mobility.

In July this year, Bosch and Daimler obtained approval from the relevant authorities for automated valet parking technology at the Mercedes-Benz Museum in Stuttgart. It is the world's first infrastructure-based solution for a fully automated SAE Level 4 parking function to be officially approved for everyday use. "Automated parking will be put to practical use even before fully automated driving is achieved," said Stefan Hartung at the press briefing.

In addition, realizing automated driving will require vehicle localization technologies to enable an accurate understanding of the location of the vehicle. Bosch has been working since 2017 in Japan to develop Road Signature vehicle localization technology using vehicle-mounted video and radar sensors. Since October 2019, the company has been working to collect data on expressways in the Kanto region, such as the Tomei Expressway and the Chuo Expressway. In 2020, Bosch expects to complete acquisition of map data that can be integrated into a highly precise 3D landscape for automated driving in the Kanto region.

Serving as a leading provider of connected mobility services

Bosch expects that by 2025, there will be 470 million connected vehicles worldwide. There is no global company other than Bosch, that has experience and expertise on every level of the IoT including hardware, sensors, software, services, and artificial intelligence. "Perfectly Keyless" is one of Bosch's leading connected solutions. The system enables the user's smartphone and automobile to communicate so that door locking/unlocking and engine start can be executed without an actual key. The solution provides the convenience of being able to use a smartphone as a key, while ensuring a level of safety that was not possible with conventional keyless entry systems.

Adding Personalized - Defining the New Era of Mobility with "PACE"

People's awareness of the automobile has changed, and for some people, cars are no longer the first choice. Since various services such as ride sharing, intermodal and ride hailing have appeared, we are turning into a society where individuals can personalize their choice of transportation method to meet their needs.

Bosch has already started mobility services such as the eScooter sharing service "COUP" and the commuter carpooling service "SPLT", which support individual mobility needs. Furthermore, the battery management cloud service, "Battery in the Cloud", which is being provided to DiDi in China, improves the performance and service life of batteries, thereby increasing vehicle range for drivers. In Japan, Bosch is currently proposing implementation and pilot tests of "Battery in the Cloud" to Japanese OEMs

and Mobility Service Providers. Through innovations such as these, Bosch is providing a personal experience while easing the burden on drivers, cities and the environment.

"Since its founding, Bosch has been focused on providing solutions that enrich people's lives and society in line with the corporate slogan 'Invented for life.' Bosch will continue to shape the new era of mobility with PACE, which is the addition of Personalized to the three elements that we have been focused on: Automated, Connected, and Electrified," said Markus Heyn.

Contact person for press inquiries

Kiyohiko Sumiya

Aiko Furuichi

Phone: +81-3-5485-3393

Mobility Solutions is the largest Bosch Group business sector. In 2018, its sales came to 47.6 billion euros, or 61 percent of total group sales. This makes the Bosch Group one of the leading automotive suppliers. The Mobility Solutions business sector pursues a vision of mobility that is accident-free, emissions-free, and fascinating, and combines the group's expertise in the domains of automation, electrification, and connectivity. For its customers, the outcome is integrated mobility solutions. The business sector's main areas of activity are injection technology and powertrain peripherals for internal-combustion engines, diverse solutions for powertrain electrification, vehicle safety systems, driver-assistance and automated functions, technology for user-friendly infotainment as well as vehicle-to-vehicle and vehicle-to-infrastructure communication, repair-shop concepts, and technology and services for the automotive aftermarket. Bosch is synonymous with important automotive innovations, such as electronic engine management, the ESP anti-skid system, and common-rail diesel technology.

The Bosch Group is a leading global supplier of technology and services. It employs roughly 410,000 associates worldwide (as of December 31, 2018). The company generated sales of 78.5 billion euros in 2018. Its operations are divided into four business sectors: Mobility Solutions, Industrial Technology, Consumer Goods, and Energy and Building Technology. As a leading IoT company, Bosch offers innovative solutions for smart homes, smart cities, connected mobility, and connected manufacturing. It uses its expertise in sensor technology, software, and services, as well as its own IoT cloud, to offer its customers connected, cross-domain solutions from a single source. The Bosch Group's strategic objective is to deliver innovations for a connected life. Bosch improves quality of life worldwide with products and services that are innovative and spark enthusiasm. In short, Bosch creates technology that is "Invented for life." The Bosch Group comprises Robert Bosch GmbH and its roughly 460 subsidiary and regional companies in over 60 countries. Including sales and service partners, Bosch's global manufacturing, engineering, and sales network covers nearly every country in the world. The basis for the company's future growth is its innovative strength. At nearly 130 locations across the globe, Bosch employs some 68,700 associates in research and development.

Additional information is available online at
www.bosch.com Bosch Global Website (English)
www.bosch-press.com Bosch Media Service (English)
<https://twitter.com/BoschPresse> Bosch Media Twitter (German)
www.bosch.co.jp/ Bosch Japan Website (Japanese)
<https://twitter.com/BoschJapan> Bosch Japan Twitter (Japanese)
<https://www.facebook.com/bosch.co.jp> Bosch Japan Facebook (Japanese)
<https://www.youtube.com/boschjp> Bosch Japan Youtube (Japanese)