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## Electric (R)Evolution

The electrification of vehicle powertrains is a topic which is being publicly discussed with an extremely polarising “black-and-white” logic: will we all be driving battery electric cars 20 years from now or will we still be using internal combustion engines? As is often the case in the field of technology, solutions of the future will be as diverse as customer needs, and the drive portfolio will follow the relevant legislation. This is now focusing more and more on the total life cycle greenhouse gas balance.

Besides purely electric drivetrains for local emission-free driving, the future will bring a large number of plug-in hybrid vehicles for electric driving over short distances travelled every day as well as long ranges at a low fuel consumption. There will be many hybrid powertrains and concepts with highly efficient combustion engines only, and, of course, the high-performance internal combustion engine, providing a fun-to-drive experience at low cost.

For suppliers, this wide range of powertrains offers many opportunities. An example is electrically assisted boosting, which increases boost pressure in the lower speed range and improves transient performance considerably. Noticeably enhancing comfort and efficiency for the customer, this technology has a promising future as a supplement to conventional

turbocharging concepts. More powerful vehicle electric systems, more compact electric motors and improved power electronics nowadays facilitate boost power levels of 2.5 kW at 12 V and 5 kW at 48 V, which were not feasible a few years ago.

Another example is electric cabin heating. Highly efficient, scalable solutions are necessary in the spectrum ranging from hybrid vehicles, which partially make use of exhaust heat from the engine, to battery electric vehicles. A third example is our light and very efficient gearbox especially developed for electric cars. Weight and efficiency are both key factors contributing to driving range. In addition, individually adaptable gear ratios enable high scalability.

The list of examples of new, intelligent products in the field of electrification could be continued ad infinitum. This shows that the road to electrification builds continuously on existing technologies and is more an evolution than a revolution. In a way typical for the automotive industry, this evolution will take place rapidly but with ample testing, as the demands of the customers with regard to quality and reliability remain justifiably high. Ultimately, the only revolution will concern the number of powertrain variants which customers will be able to choose between in the future.