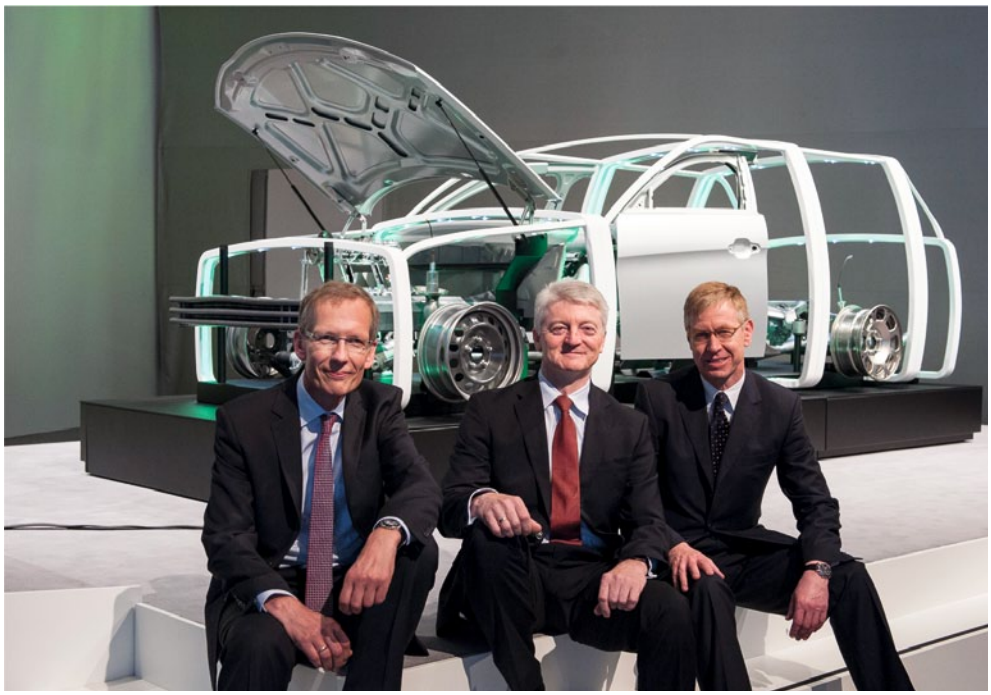


DR. KARSTEN KROOS
Chairman of the Management Board of the Components Technology Business Area at ThyssenKrupp AG

DR. HEINRICH HIESINGER
Chairman of the Executive Board of ThyssenKrupp AG

DR. HERIBERT R. FISCHER
Member of the Executive Board of ThyssenKrupp Steel Europe AG

(from left to right)

INCAR PLUS: HIGH LEVEL OF MATURITY FOR HIGH STANDARDS

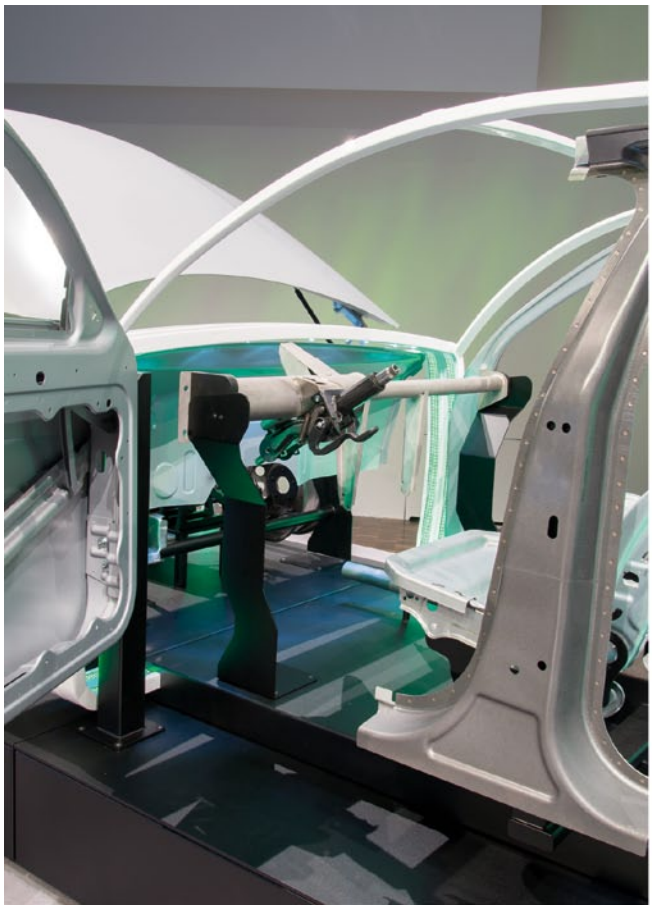
The automotive sector is undergoing rapid transformation. Global competition, high rates of growth in many parts of the world and a sharp awareness of mobility which is as environmentally friendly as possible are driving this change. This is underpinned by circumstances such as demographic trends, progressive urbanization and climate change. These are resulting in both enormous challenges and significant opportunities for the automotive industry. As a diversified technology group and long-term partner to the automotive industry, we are involved in structuring this change process and are developing products and services that are meeting demand for "more" in a "better" way.

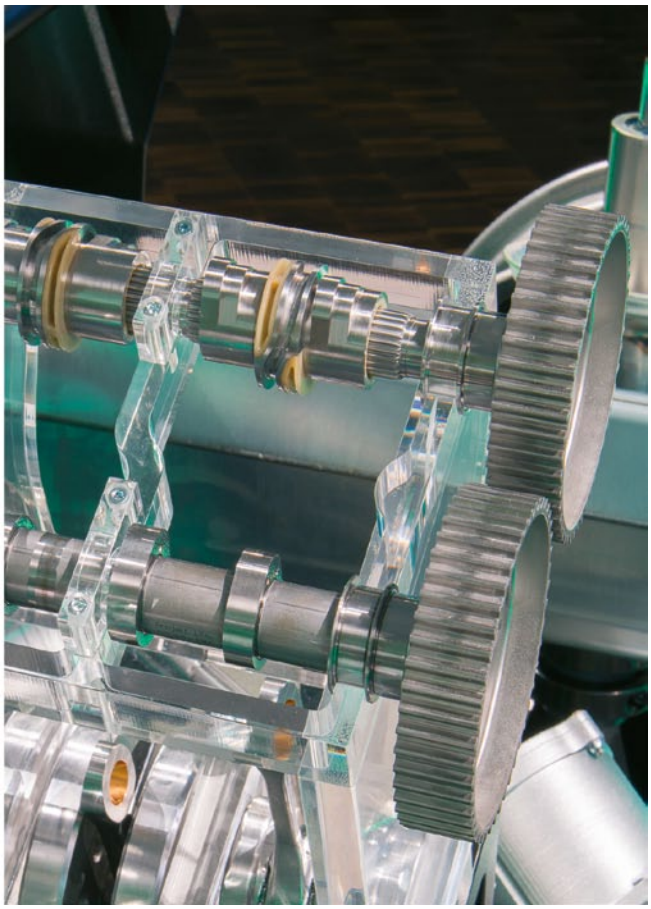
The automotive industry has been an important customer to ThyssenKrupp for many years. Around a quarter of our sales are generated in this sector. Today, we are one of the world's leading material and component suppliers to OEMs and are also an important development partner.

Under the motto "ThyssenKrupp InCar plus – Solutions for Automotive Efficiency", we have implemented the largest development project ever undertaken by a supplier without OEM involvement. At the same time, InCar plus is currently the most extensive ThyssenKrupp research project of all time. In over 30 subprojects with more than 40 individual solutions, our engineers have developed new products in the areas of powertrain, chassis and steering, as well as body. These are focused on environmentally compatible solutions concerning energy efficiency, electric mobility and lightweight design. Irrespective of whether weight, economy, sustainability or performance is concerned: each of our InCar plus innovations will surpass the present state of the art in at least one of these points.

The powertrain subproject is concentrating on the further development of the valve train. Our objective was to increase the efficiency of the combustion engine and significantly reduce fuel consumption and therefore emissions. One example of this is our innovative camshaft technology. We are able to reduce energy losses within the engine using alternative bearing concepts. The integration of further functions such as oil separation into the camshaft is giving our customers access to new options. This innovation therefore saves space and additionally reduces emissions. With our electric drive innovations, we are treading new ground in the field of electric mobility. High-strength electrical steel with its improved magnetic properties is of central importance in this regard, because it increases the efficiency of electric machines.

As material specialists, we have focused our attention on economic lightweight design in the body subproject. Thanks to the use of new grades of steel, innovative composite materials





The InCar plus R&D vehicle encompasses over 30 innovations from the powertrain, chassis and steering, as well as body segments

and modern processing methods such as hot-forming, we have succeeded in meeting our customers' increasing requirements on lightweight design, economy and safety with new products. This applies to both classic structural components such as the longitudinal member or B-pillar and closures as well as add-on parts such as the hood or doors. We have also included body-based topics such as seats or wheels in the developments and have achieved excellent results in terms of economy and weight reduction with high-strength steels.

The chassis and steering subproject is focused primarily on the further development of electronic steering systems. Electric power steering is the ticket into the world of partially or fully autonomous driving and goes hand-in-hand with a significant reduction in fuel consumption in comparison with conventional hydraulic steering systems. Our InCar plus innovations help to use these steering systems even more efficiently and make them available to new vehicle classes. The multi-material design of damper tubes and steering components is a further development focus. We have also developed corresponding manufacturing and assembly processes for implementation in large-scale production.

ThyssenKrupp InCar plus bundles the Group's entire automotive know-how. The Components Technology, Industrial Solutions and Steel Europe business areas have integrated their expertise. The result is innovations that have been tested and validated along the entire value chain. This includes material forming and machining steps, tool and prototype construction as well as joining and assembly technology for large-scale production. This interdisciplinary approach has led to unique results. Numerous InCar plus solutions can significantly improve the ecological life cycle assessment, for instance. This encompasses all phases of a product's life – from raw material extraction and processing, to material production and component manufacturing, to end product usage and recycling. One further advantage for our customers is comprehensive validation of these new developments. Our objective is the smoothest possible integration of our components into volume production. To ensure this, we have done the groundwork and have developed tools, built prototypes and conducted a variety of tests. The result is the extremely high level of maturity of almost all of the InCar plus solutions developed for our demanding customers in the automotive sector.

Discover our automotive expertise for yourself. We hope you enjoy reading about the many exciting developments within the InCar plus project.