

OEM & Lieferant

SPECIAL EDITION

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The drive for innovation

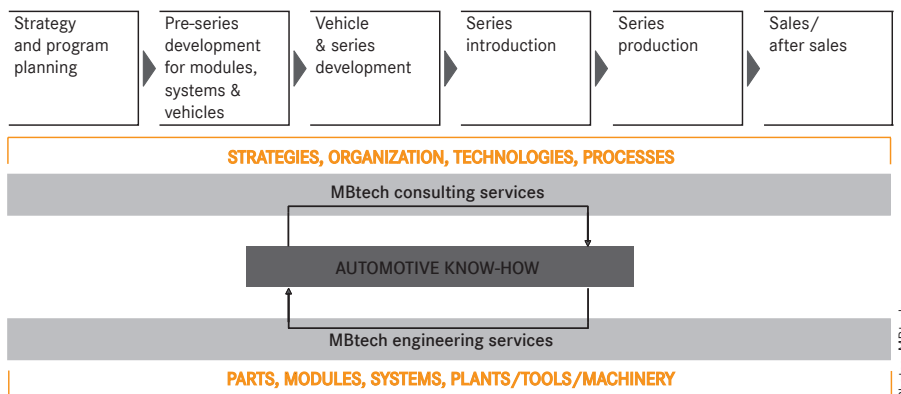
By Michael Kühn and Hartmut Wirth, MBtech Group, Sindelfingen

The growing worldwide mobility and energy requirements are currently confronted with the finite limits of fossil fuels and the continuing climate changes. Alternative powertrains are necessary in order to ensure the future mobility of both people and goods. The technology stands ready – from natural gas to the hybrid engine. However integrating the complex solutions into existing platforms represents a problem. OEMs and suppliers place their trust in the full-vehicle expertise of the engineering and consulting service provider, MBtech Group.

While opinions differ regarding the effects of the CO₂ – driven greenhouse effect on the world's climate, scientists, politicians and the industry all agree on one point: Worldwide climate protection measures must be taken immediately. As such the European Union proposal aims to limit the manufacturer's fleet emissions for every vehicle in Europe to an average of 120 grams CO₂ of per kilometer by 2012. At the same time it is also necessary to reduce the dependency on finite fossil fuels. The rapidly increasing energy and mobility requirements in emerging countries such as India and China are already having a noticeable affect through continuously increasing oil prices – a trend which will continue to grow in the coming years.

Passenger and commercial vehicle manufacturers also face the challenge of counteracting this development. It is essential to put significantly more efficient powertrain alternatives – from natural gas to hybrid engines to hydrogen – on the market with ever decreasing development times. However the reduced fuel consumption or their suitability for new fuel generations are not the only factors determining the actual success of new engine variants – End-customers rightfully demand the same measure of reliability, safety and driving comfort from alternative technologies as they are accustomed to from conventional vehicles. Ultimately it is essential to offer the new technologies at a price which the end-customer is willing to pay.

MBtech Group: Engineering and consulting along the entire automotive value creation chain



MBtech
Mercedes-Benz technology

Photos: MBtech

Through the combination of engineering and consulting services along the entire value creation chain, MBtech offers its customers special added value.

Integration in greater demand than ever

Particularly with regard to cost-effectiveness it will become necessary to realize both conventional and alternative engines utilizing one and the same vehicle platform during the transitional period. However this presents numerous challenges as, especially in the automotive industry, the sum of the individual solutions only seldom results in a conclusive overall concept. When an engine causes a change to the overall vehicle concept this in turn requires an entire series of development adaptations. This demands integration – and not only in technical terms. The processes in both the series development and production and the supplier management must match the alternative drive concept. This is where MBtech is at its most

impressive: Because as one of the few development service providers, MBtech possesses a high level of expertise in both full vehicle competence and consulting competence. Thanks to its four segments, one particular advantage of MBtech as an engineering and consulting service provider is its ability to offer complete services throughout the entire vehicle development process from a single source.

In addition to the powertrain application development (MBtech powertrain solutions) this also includes electronics development (MBtech electronic solutions), the full-vehicle integration and testing (MBtech vehicle engineering) as well as process adaptation and implementation (MBtech consulting). With comprehensive technological knowledge and long-standing experience

MBtech works together with its customers to develop customized solutions for vehicle-specific problems.

The integration of alternative engines is one of numerous possible examples of MBtech's competence. Because precisely this expertise along the entire automotive value creation chain is required. Along the adaptation of a vehicle model already in series production for bivalent operation with natural gas and petrol requires a row of design and technical changes – not only to the powertrain. In addition the engine's entire injection system needs to be re-developed or enhanced in order to enable a clean combustion process for both fuel types. The engine control software has to be modified accordingly or re-programmed and the secondary powertrain elements adjusted to the altered parameters – as well as the appropriate testing. Changes to the bodyshell due to the installation spaces – for example as a result of installing the additional gas tanks – need to be taken into account as do the balance-related effects on the driving behavior.

The hybrid engine for passenger and commercial vehicles demands an entirely new solution approach in order to ensure that the complex interaction between the electric motor and the combustion engine as well as the batteries in the series hybrid function without problems – in particular with regard to recuperation mode for energy reclamation. Ultimately this criterion decides whether drivers will accept the hybrid engine. The transition from one engine form to another must be unnoticeable under everyday conditions and have no effects whatsoever on the driving behavior. Specific technology and process knowledge are required from the very beginning of the planning phase for a hybrid vehicle. Here MBtech is able to offer OEM's and their module suppliers a clear benefit arising from the combination of technology expertise with the strategic competence from MBtech Consulting. The consulting during the planning, implementation and optimization of technologies can substantially reduce both the costs and the development times for innovations.

MBtech regards its primary task as transferring the OEM's requirements



Continuing the development of the powertrain is the central challenge for safeguarding future mobility concepts – MBtech addresses this challenge with innovative solutions.

over to the development and production of series vehicles cost-efficiently and in compliance with the quality specifications. As such MBtech supports international OEMs with integrating alternative engine technologies into existing passenger vehicle platforms, for example – from the initial



With the development of an alternative engine the work is not finished. For its integration into an existing vehicle platform all of the electronics must be adapted and thoroughly tested.

concept for individual technologies to their implementation in the vehicle to testing the life span. Observing the effects of every detail change on the entire vehicle and its manufacturability is the highest priority for every one of the more than 2000 engineers and consultants from MBtech. The specialists from the MBtech segments collaborate closely in order to develop cus-

tomized solutions for their customers from the international automotive and automotive supplier industries – solutions which are also internationally oriented.

In the foreseeable future the different market requirements and exhaust gas laws in the USA, Europe and the emerging nations will give rise to a large number of alternative approaches to engine technologies for solving the CO₂ problem. While hybrid engines are spreading quickly in the USA and in Japan's major cities, Europe is increasingly focusing on new fuels and further optimizing the diesel engine. In contrast India and China – not least as a result of the low purchasing power – currently display little interest in environmentally friendly engine technologies.

Whichever engine alternative an OEM decides on – MBtech stands ready to provide competent support. ■



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