

FVA

Research and
innovation network in
drive technology

VDMA

Working group
›Power-to-X
for Applications‹

FVV

Competence Center
Climate & Energy

VDMA

Multiplied benefits

VDMA is the voice of the mechanical and plant engineering industry in Germany, and has organised the FVV office ever since its foundation. The result is a network that extends far beyond the boundaries of the research association. FVV member companies such as MAN Energy Solutions, Rolls-Royce Power Systems or ZF are involved at several levels and thereby multiply their benefit from the collaboration.

Calling the system into question

The perfection of a tooth flank // It is a vivid symbol of the values behind the German mechanical engineering industry's export prowess. However, merely having the necessary mechanical properties is no longer enough to guarantee success in the global market, and hasn't been for some time. This has an impact on the work of the **Research Association for Drive Technology (FVA)**, the office of which, like FVV's, is organised in Forschungskuratorium Maschinenbau (FKM) – the research federation for the mechanical engineering industry within VDMA. »As electrification increases, electronic hardware and software is gaining in importance,« explains Dr. Otmar Scharrer, Senior Vice President R&D E-Mobility at the supplier ZF and Board member of FVA. He believes that this systems expertise will play a key role in giving future powertrains properties that make them stand out from the competition: for example, he views hybrid powertrains as a technical marvel, the acoustic

behaviour of which is dependent on the interplay of all subsystems, whether the control system, the engine and gear mechanisms or the electrical components. Scharrer feels that collective research plays a dual role here: »Firstly, it gives even small and medium-sized suppliers knowledge of the basic interrelationships. And secondly, the young engineers involved in the research projects learn to think systematically right from the beginning.«

FVA's research focuses are changing along with the needs of its member companies: »We added the work on electrified powertrains to the portfolio early on,« comments Hartmut Rau, the long-standing Managing Director of FVA. »Through the E-MOTIVE expert forum for electric vehicle powertrains, we and FVV generate knowledge that the members of both research associations benefit from.« Rau, who is also Deputy Executive Director of VDMA, sees collective research from a different angle: »Together, FVA and FVV not only cover the entire range of energy converters, but also all applications.« After all, if collective research succeeds in creating climate-neutral and competitive powertrains for all mobile applications from forklift trucks to heavy-duty mine trucks, the whole of the mechanical engineering industry will benefit.



DR. OTMAR SCHARRER
Senior Vice President
R&D E-Mobility
(ZF Friedrichshafen)

The timing

Getting the timing just right //

Dr. Uwe Lauber, Chief Executive Officer of MAN Energy Solutions, is convinced that a climate-neutral world can only be achieved with green hydrogen and synthetic energy carriers that are based on it. Indeed, around 300 million tonnes of fuel are currently used in shipping alone, with only a small portion of this able to be replaced by the direct use of electricity. Synthetically produced ammonia or methanol could be used on board instead: »Research and development are already at an advanced stage,« explains Lauber. »From a technical point of view, we could completely replace fossil-based energy carriers in most applications by 2030 at the latest.« Lauber believes that the real challenge is in ramping up the production of synthetic fuels. »We are talking about major plant investments in regions outside Europe.« This will require many specialised companies to collaborate on a technical level, as well as the political will to shape the change, for instance when working together with states in which solar and wind energy allow electricity – and thus also hydrogen – to be generated cheaply. VDMA's **Power-to-X for Applications (P2X4A)** working group, chaired by Lauber, will help with both aspects. »We bring together the worlds of politics and business, for instance in order to draw up realistic road maps.« Such a road map has already been devised for aviation, and a similar concept is currently in development for the marine sector.

Peter Müller-Baum, Managing Director of VDMA's Engines and Systems trade association, has headed the working group since its foundation in 2018. »We have drawn a lot of attention to the topic of power-to-X in a short period of time,« he reports, while highlighting the fact that many political decision-makers in Berlin and Brussels are now very aware of the key role played by synthetic energy carriers. Moreover, lively technical exchange is taking place between the member companies, which, alongside large plant manufacturers, include many small and medium-sized suppliers of parts such as compressors or pumps. The European mechanical engineering industry is in the starting blocks.



DR. UWE LAUBER
Chief Executive Officer
(MAN Energy Solutions)

The rules

Hydrogen – the driver of the energy transition // Renewable power production needs to become much more cost-efficient – that is the demand of Dr. Daniel Chatterjee, who is responsible for the technology strategy of Rolls-Royce Power Systems. However, technical progress alone will not be enough to make hydrogen and the synthetic fuels based on it cheaper than fossil-based energy carriers. »Regulation plays a decisive role here,« explains Chatterjee, who chairs the VDMA Climate and Energy Forum. »All sectors that require very high energy densities are prepared to make the switch to climate-neutral energy carriers. However, no company will risk its economic competitiveness for this.« Providing the political actors in Berlin and Brussels with constructive criticism is one of the association's most important tasks: »Many member companies are highly specialised small and medium-sized enterprises which would not be heard on their own,« continues Chatterjee. Global corporations from all sectors are also involved in the association – something the physicist sees as a significant advantage: »The climate protection policies of the future must not stop at the borders of individual countries or be restricted to certain industry sectors. We believe in global solutions.« Chatterjee praises FVV's orientation studies, which in his view have provided an important basis for the association's political work.

Because climate policy is of key importance for the entire mechanical engineering industry, VDMA has founded a **competence centre** dedicated to the topic of **climate and energy**. It is headed by Matthias Zelinger, who is responsible for turbomachinery research at FVV in his role as Deputy Managing Director. In his view, allowing the sector to innovate is his most important task: »I can certainly understand the state also making decisions regarding technology before making large-scale investments in infrastructures,« says Zelinger. However, it should always be kept in mind that climate protection is a global task and that business is keen to develop functional global solutions together with the legislators. //



DR. DANIEL CHATTERJEE
 Director Technology Management
 (Rolls-Royce Power Systems)

The interplay

By bringing together the various disciplines, members multiply their expertise and their ability to play an active role on the ›road to change‹.

→ FVA (Forschungsvereinigung Antriebstechnik e. V.) is a research and innovation network in power transmission engineering and drive technology, and funds Industrial Collective Research in this area. To date, FVA has realised more than 2,000 projects with around 200 member companies and 100 research institutes.

→ fva-net.de/en

→ The ›Power-to-X for Applications‹ working group organises political and technical exchange along the entire P2X value creation chain. It lobbies for alternatives to direct electrification and a technology-neutral view of the energy transition in the political and public arenas.

→ p2x4a.vdma.org/en

Electric powertrains

Chemical energy sources

Synthetic fuels

→ The Competence Center Climate & Energy is where VDMA conducts its activities regarding energy and climate policy; furthermore, the centre brings together the sector's combined technological expertise on the topic of sustainability and energy.

→ vdma.org/sustainability-energy

E-MOTIVE
BY FVA



EMISSION-0
BY VDMA

