

Supporting Efficient Electrified Vehicle Development by Virtual Component and System Integration

A consortium of leading European automotive manufacturers, technology providers, universities and research institutions, coordinated by AVL List GmbH based in Graz/Austria, has successfully completed the collaborative research and innovation project VISION-xEV. Funded by the European Commission under the HORIZON 2020 program, 14 partners from all over Europe worked closely together to elaborate and demonstrate advanced simulation tools and methods for supporting the time and cost-efficient development of all kinds of future electric and hybrid vehicles with optimized overall energy efficiency.

Graz, Austria, December 2021: Successfully meeting future fleet CO₂ emission limits requires a further accelerated introduction of a broad range of hybrid and pure battery-electric vehicle configurations to the portfolio of the European passenger car and commercial vehicle OEMs. Electrified powertrains are complex mechatronic systems involving a multitude of components and sub-systems, with the overall energy efficiency governed by the powertrain configuration and the technology and size of the adopted components, as well as the proper control of the interaction between the various mechanical, thermal, electrical and electronic sub-systems. The goal of the VISION-xEV research project has been to address these challenges and to unveil and demonstrate a consistent modelling and simulation-based methodology for component and system integration. This approach enables virtual prototyping from component to sub-system to powertrain/vehicle system level, to support the efficient and effective development of future electrified/hybrid vehicles.

The results and achievements of VISION-xEV clearly demonstrate the potential of virtualization: increased development efficiency, enhanced speed and greater process maturity via a deeper integration of academia and technology providers into the automotive product-creation process. The positive impacts of the novel component and system integration framework can also be seen in a significant reduction of development iterations by increased frontloading. Moreover, the VISION-xEV approach provides access to fully functional models of the hybrid powertrain system early in the development cycle. In this way, key decisions on development and control strategy can be supported by simulation models. The result is considerable time reductions during the later stages of vehicle integration and field testing.

The VISION-xEV project was funded by the European Commission's HORIZON 2020 program as part of The European Green Vehicles Initiative. The following partners were involved in the VISION-xEV project: AVL List GmbH project coordinator (Austria), Aristotle University of Thessaloniki (Greece), AVL Thermal and HVAC GmbH (Germany), Consiglio Nazionale delle Ricerche (Italy), Centro Ricerche Fiat (Italy), FPT Motorenforschung AG (Switzerland), Kungliga Tekniska Högskolan (Sweden), Politecnico di Milano (Italy), Renault SAS (France), Technische Universität Berlin (Germany), Universitat Politècnica de València (Spain), Univerza v Ljubljani (Slovenia), Vrije Universiteit Brussel (Belgium), ZF Friedrichshafen (Germany).

About AVL

With more than 11,000 employees, AVL is the world's largest independent company for development, simulation and testing in the automotive industry, and in other sectors. Drawing on its pioneering spirit, the company provides concepts, solutions and methodologies to shape future mobility trends. AVL creates innovative and affordable technologies to effectively reduce CO₂ by applying a multi-energy carrier strategy for all applications – from hybrid to battery electric and fuel cell technologies. The

Contact

Markus Tomaschitz, Company Spokesman AVL
Tel +43 664 100 0289
E-mail: Markus.Tomaschitz@avl.com

company supports customers throughout the entire development process from the ideation phase to serial production. To accelerate the vision of smart and connected mobility AVL has established competencies in the fields of ADAS, autonomous driving and digitalization.

AVL's passion is innovation. Together with an international network of experts that extends over 26 countries and with 45 Tech- and Engineering Centers worldwide, AVL drives sustainable mobility trends for a greener future. In 2020, the company generated a turnover of 1.7 billion Euros, of which 12% are invested in R&D activities.

Contact

Markus Tomaschitz, Company Spokesman AVL
Tel +43 664 100 0289
E-mail: Markus.Tomaschitz@avl.com