講演番号	074

文献番号	20225074

The Thermal System as a Key Differentiator for Performance and Comfort in a BEV

- Using Vtms Benchmark Results for Target Setting to Define the Right Operations Strategies

Michael Bires [1)] **Georg Schrank** [2)]

1) AVL List GmbH, Director Product Line Thermal & HVAC 8020 Graz (Michael.Bires@avl.com).
2) AVL List GmbH, Product Manager Vehicle Benchmark, 8020 Graz (Georg.Schrank@avl.com)

KEY WORDS:benchmarking, thermal management solution, virtual development phase, model based testing

But what are the customer demands on today's and tomorrow's vehicles? How do these demands affect the vehicle system (e.g. powertrain, vehicle thermal management system – VTMS) design of an electrified powertrain including component characteristics and development of additional functions?

No one doubts anymore that the evolution from fossil based mobility towards electrical propulsion is rapidly progressing. Therefore, we face new challenges in the usage of energy in vehicles. A significant part of the energy consumption is used to condition the components like battery, as well as cabin conditioning; for a BEV this can reduce the drive range at extreme conditions by up to 50%.

To address the above-mentioned challenges, its key to have developed a balanced thermal management system with the right features and a harmonized operation strategy to deal with the different temperature levels in the system.

In our presentation, we show how the generated models help choosing the right concept. Therefore, we use the models at least in real-time environment, so that we are able to run different use cases as well a virtual WLTP cycle. The expert of AVL will perform several virtual tests to match integrated thermal systems and features with customers requirements and identify the best fit with customer conditions. The interconnected approach allows simultaneous virtual testing of several conditions thus shortening iterations. Finally, we transfer the generated models to our ThermalLab solution, for system tests with models in the loop. Consequently re-using the generated models along the V-Process, especially in the early stage, is the key to securing a stabilized developing process and reducing prototype variants.

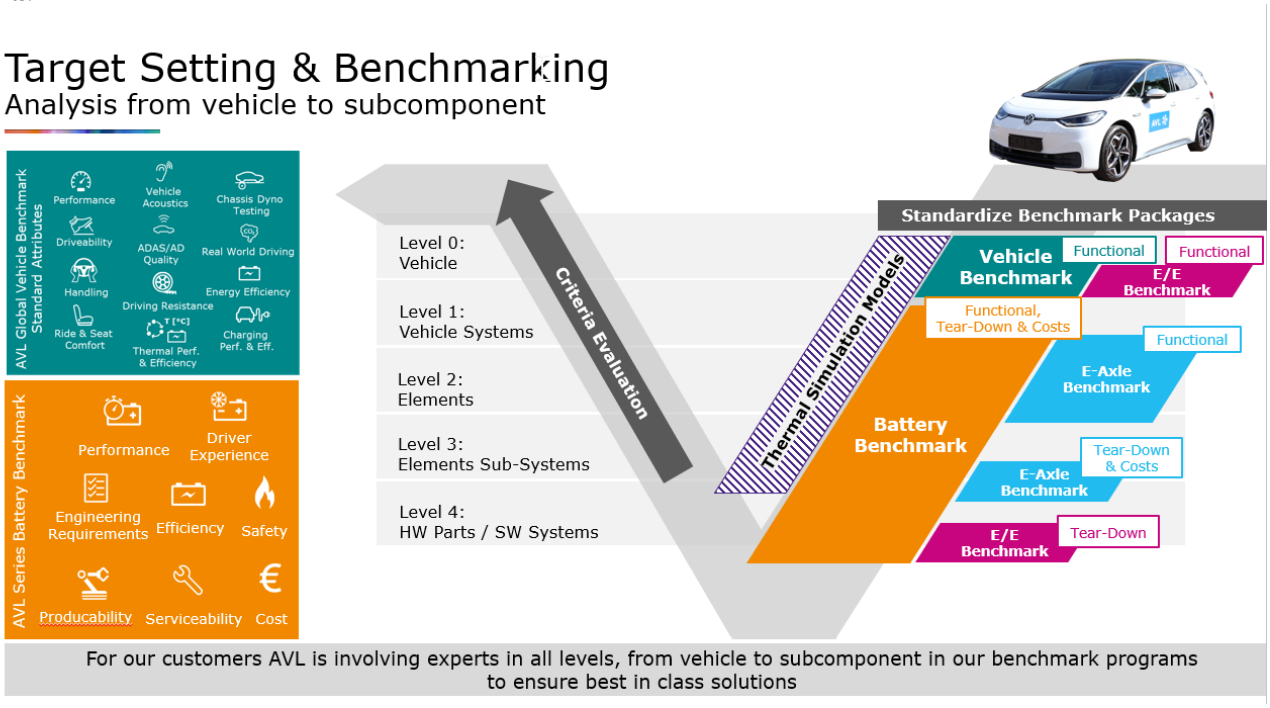

Fig.1 AVL Target Definition Process
Tailored Thermal Management concept developed - vehicle attributes are covered in AVL Co Simulated Tools & Platforms. Shown the methodolygy for Functional calibration and integration with unique dynamic model-based testing approach by using the inpusts from AVL benchmark data.