HighScape - High efficiency, high power density, cost effective, scalable and modular power electronics and control solutions for electric vehicles

Objective

Focused on BEV architectures with distributed multiple wheel drives, and, specifically, in-wheel powertrains, HighScape will explore the feasibility of a family of highly efficient power electronics components and systems, and including integrated traction inverters, on-board chargers, DC/DC converters, and electric drives for auxiliaries and actuators. The proposed solutions will be assessed on test rigs and on two differently sized BEV prototypes. The project will result in:

i) component integration with the incorporation of the WBG traction inverters within the in-wheel machines to achieve zero footprint of the electric powertrain on the sprung mass; the functional integration of the traction inverter with the on-board charger, and the incorporation of the latter and the DC/DC converters within the battery pack; and the implementation of multi-motor and fault-tolerant inverter solutions for the auxiliaries and chassis actuators;

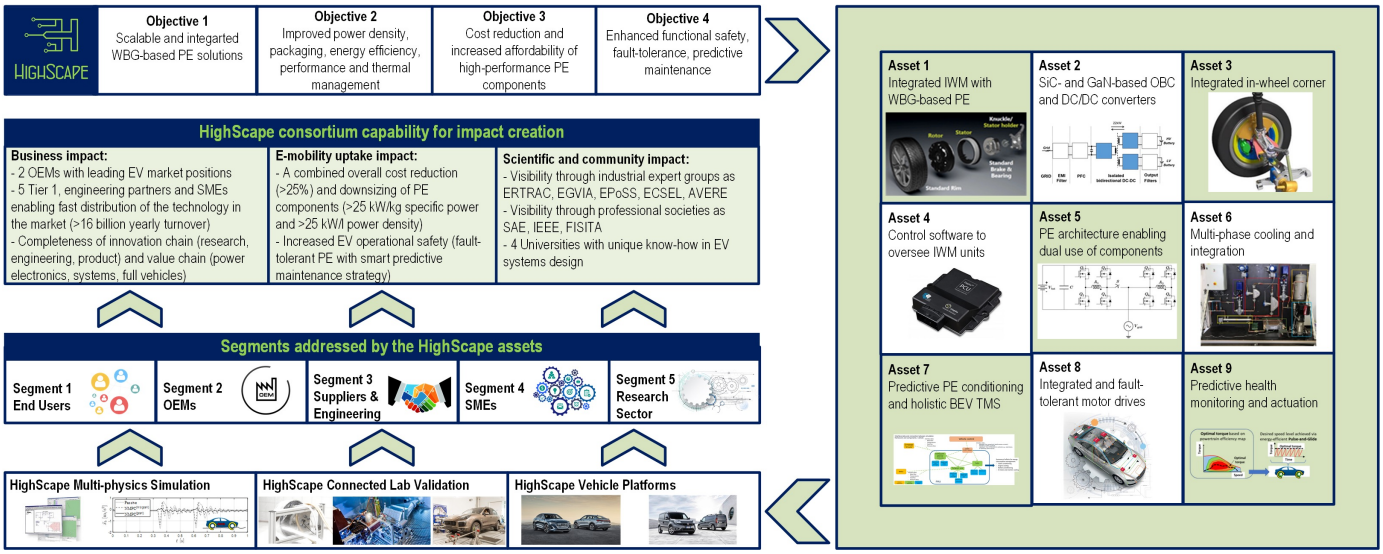
ii) novel solutions, including the implementation of reconfigurable winding topologies of the drive, as well as integrated and predictive thermal management at the vehicle level, with the adoption of phase changing materials within the power electronics components;

iii) the achievement and demonstration of significantly higher levels of power density, specific power and energy efficiency for the resulting power electronics systems and related drives;

iv) major cost reductions thanks to the dual use of parts, subsystem modularity, and model-based design to eliminate overengineering; and

v) increased dependability and reliability of the power electronics systems, enabled by design and intelligent predictive health monitoring algorithms.

Through HighScape, the participants will establish new knowledge and industrial leadership in key digital technologies, and, therefore, directly contribute to Europe's Key Strategic Orientations as well as actively support the transformation towards zero tailpipe emission road mobility (2Zero).



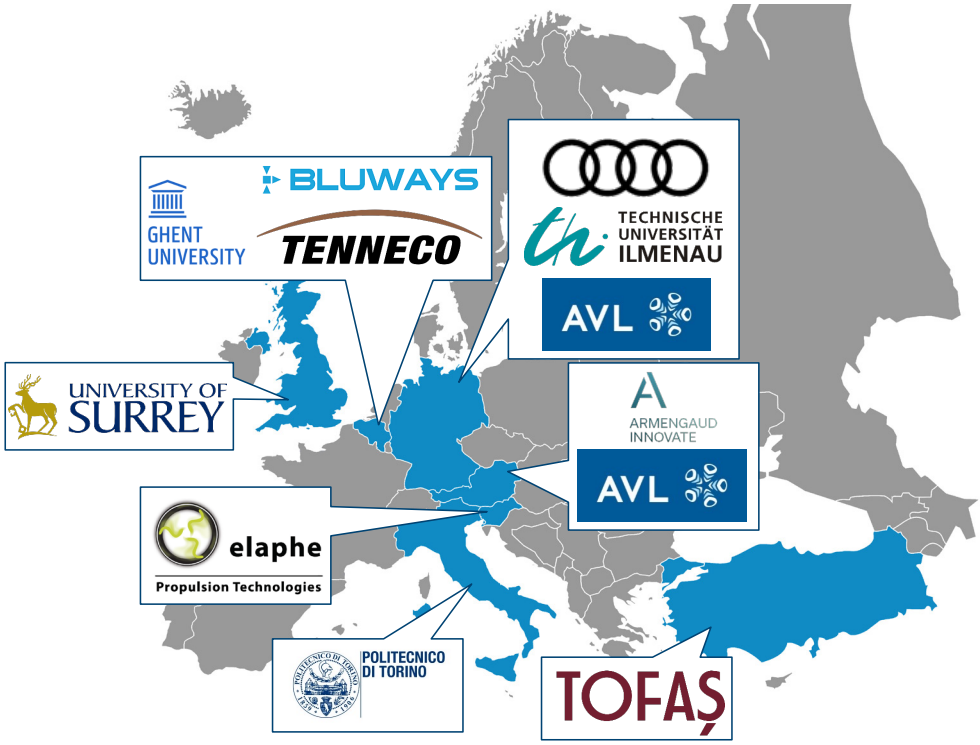
Facts

Funding scheme: HORIZON-CL5-2022-D5-01-02
Status: Project start by January 1st, 2023
Duration: 3 years
Consortium: 12 partners
Total budget: approx. 5.090 k€
Coordinator: AVL List GmbH

HighScape Partners

The consortium partners are:

1. AVL List GmbH
2. Universiteit Gent
3. Politecnico di Torino
4. Technical University Ilmenau
5. Blueways International BVBA
6. Elaphe Pogonske Tehnologije Doo
7. Tenneco Automotive Europe BVBA
8. AVL Deutschland GmbH
9. AUDI AG
10. TOFAS Turk Otomobil Fabrikasi Anonim Sirketi
11. University of Surrey
12. Armengaud Innovate GmbH



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