



NEWSLETTER 07/23

It was time for face-to-face meetings in June! The many members of the EM-TECH, HighScope and HiPE projects got together to work on their projects and give each other an update on what has been happening so far and were planning the periods coming up.

Be sure to also check out all the information about the next events.

We wish you a nice summer and hope you enjoy this E-VOLVE newsletter summertime edition!

MEETINGS & EVENTS

EM-TECH



EM-TECH

Innovative e-motor technologies covering e-axes and e-corners vehicle architectures for high-efficient and sustainable e-mobility

Hosted by the University of Surrey, the EM-TECH project consortium gathered in Guildford, UK, in June to discuss the activities performed in the first 6 months of the project and planned the next upcoming activities.



Figure 1 – EM-TECH group picture

Not even the fire alarm was able to interrupt the spirit of the meeting! We concluded the meeting with many results presented, learnings, action items, and – above all – a clear way forward and a continuing collaborative project spirit.

Outcomes after 6 months project operation

- 5 deliverables successfully submitted to reach the first project milestone.
- 3 deliverables at management level laying the basis for efficient project operation (project handbook), data management (DMP) and communication / dissemination / exploitation activities (corporate identity and communication plan)
- 2 deliverables summarizing the core technologies and technical requirements for electric motors and electric drives for in-wheel motor and axial flux motors.
- 2 peer-reviewed papers submitted.

Next steps: Beside the already planned partners' contributions, a focus will be set to ensure interoperability between the simulation models and control strategies, to refine the planning for demonstrator setup and operation, and for completeness and consistency of the datasets related to life-cycle sustainability assessment.

Follow the project:



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HighScope



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

Connected to the EM-TECH meeting, also HighScope met in June in Guildford.

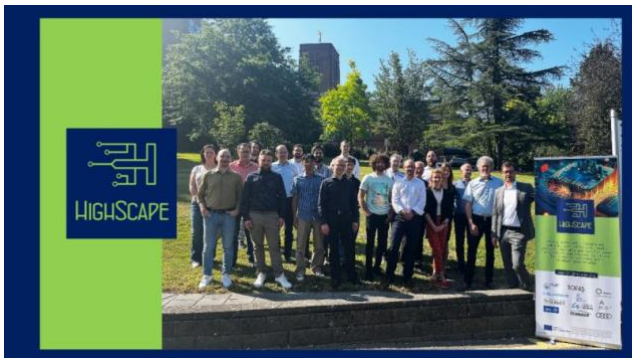


Figure 2 – HighScope group picture

The days were filled with interesting updates on the project and a lot of exchange on different aspects of the project – including but not limited to outreach activities. The plans are there, actions are set and we can continue in the collaborative spirit already established during the last 6 months.

Summarizing:

- 6 deliverables submitted to reach the first milestone.
- Data management plan as well as communication / dissemination / exploitation plan fully linked to the “Key Exploitable Results” from HighScope, finally providing detailed planning on the usage of the datasets and on the strategy for impact creation.
- 2 peer-reviewed publications submitted.
- More detailed planning of the two vehicle demonstrators.
- Different initiatives under preparation with our advisory board.

Follow the project:



HIPE



High Performance Power Electronics Integrations

The HiPE project deals with new technologies for power electronic (PE) components of battery electric vehicles (BEV), which aim to increase efficiency and thus range. This will be achieved by reducing energy losses within the individual PE components by using new materials, innovative cooling technologies and reducing the weight and volume of the PE components. In addition, component costs are to be reduced and reliability increased. In order to demonstrate an increase in efficiency within the project, appropriate tests are planned at different levels.

HiPE, thus, aims to develop a new family of highly energy efficient, cost-effective, modular, compact and integrated **wide bandgap** (WBG) power electronics solutions for the **next generation of battery electric vehicles** (BEVs).

The project’s **outputs (OUT)** will be:

- **OUT 1:** A scalable and modular family of WBG-based traction inverters
- **OUT 2:** A family of integrated WBG-based bidirectional on-board chargers (OBCs) and high-to-low voltage (HV/LV) DC/DC converters
- **OUT 3:** Integrated, fault-tolerant and cost-effective Gallium Nitride (GaN)-based power electronics (PEs) for high-voltage ancillaries and chassis actuators

For this, four **experimental Use Cases** (UCs) were developed covering the HiPE outputs:

- **UC1:** Integrated WBG-based traction inverters for e-axle for **high volume passenger vehicle up to 150 kW** (OUT 1)
- **UC2:** Integrated WBG-based traction inverters, HV/LV DC/DC converters and electric motors for **light commercial vehicles** (OUT 1)

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- **UC3:** Integrated WBG-based bi-directional on-board chargers (SiC) and HV/LV DC/DC converters (GaN) (OUT 2)
- **UC4:** Integrated and fault-tolerant power electronics for ancillaries and chassis components (OUT 3)

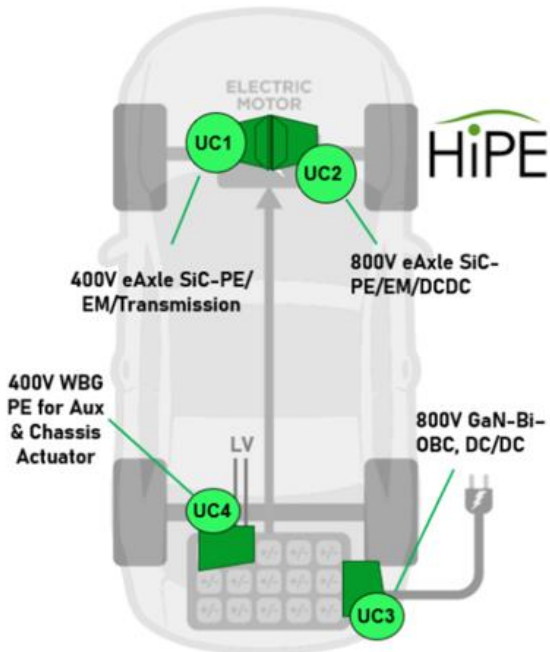


Figure 3 – Demonstrator vehicle with use case indication

For the experiments, demonstrators will be built incorporating the HiPE innovations. This makes it possible to **compare the HiPE innovations with the state-of-the-art technologies** regarding power density, energy and cost efficiency as well as size and weight reduction and increased reliability.

The HiPE project has several improvement targets for power electronic components used in the electric powertrains. Improvement targets require an application which can be compared with the work done in related work packages to show the enhancement made. These applications

are defined as baseline applications. In addition to baseline applications, comparison parameters must be also determined to objectively evaluate evidence of improvement. Based on baselines and comparison parameters, objectives and impacts of use cases are evaluated.

In the first months of the project Key Performance Indicators (KPI) as to be comparison parameters and determines baselines for applicable vehicles and project use cases have been defined. Furthermore, test specifications, test levels, test requirements as well as necessary hardware and software requirements are to be defined that are required to test the components and technologies of the individual project partners. A corresponding planning of the integration of individual components for the respective test levels and procedures should also be developed.

On June 20th – 21st consortium members gathered in Venaria Reale (Turin, Italy), generously hosted by Marelli and Ideas and Motion to align further actions.

The HiPE partners used the opportunity to discuss the latest developments in the project and the outlook for the coming months.



Figure 4 – HiPE General assembly group picture

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COMING UP



SELFIE Final Event Online
(more info [here](#))

July 18th July, 09:00 – 12:30 CET



SCAPE's Workshop
University of Modena Reggio Emilia
(Find the agenda [here](#) und sign up [here](#))

July 19th 2023, 15:00 – 18:00



SCAPE's 3rd General Assembly

20 -21 July 2023



TRA – 10th Conference in Dublin

April 15th-18th 2024



Next Edition of the E-VOLVE Newsletter

21 August 2023

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