



DRIVEMODE

Integrated Modular Distributed Drivetrain for Electric & Hybrid Vehicles

DRIVEMODE: Flyer

D8.4: DRIVEMODE Flyer
WP8, T 8.2

Authors: Marcello Bardellini, Mario Martinoli, Elena Gaboardi (ICONS)



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N°769989

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Technical references

Project Acronym	DRIVEMODE
Project Title	Integrated Modular Distributed Drivetrain for Electric & Hybrid Vehicles
Project Coordinator	Mikko Pihlatie VTT Technical Research Centre of Finland mikko.pihlatie@vtt.fi
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Lead beneficiary	12 (ICONS)
Contributing beneficiary/ies	1 (VTT)
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* PU = Public

PP = Restricted to other programme participants (including the Commission Services)

RE = Restricted to a group specified by the consortium (including the Commission Services)

CO = Confidential, only for members of the consortium (including the Commission Services)

v	Date	Comment	Author	Beneficiary
0.1	16/07/2018	Initial version	Marcello Bardellini, Mario Martinoli, Elena Gaboardi	ICONS
0.2	26/07/2018	Minor corrections	Alexander Smirnov	VTT
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0.6	17/09/2018	Executive summary update	Alexander Smirnov	VTT
1.0	24/09/2018	Final check and submission	Mikko Pihlatie	VTT



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Executive Summary

The current document reports on the flyer produced for DRIVEMODE project. The flyer offers a concise overview of the project's approach, goals and advantages of the integrated drivetrain module to be designed and manufactured by the project. In the last page, it lists each partner's logo, contact details of the project coordinator and official disclaimer of EU funding.

The flyer constitutes the official hand out material designed for offline distribution at events such as conferences, workshops and meetings for dissemination purposes. The layout has been designed in view of maximising the use of graphical elements, respecting the project visual identity and tone of voice defined.

Attainment of the objectives and if applicable, explanation of deviations

The release of the flyer accomplished with the project workplan timing, M10 (August 2018). The flyer is ready for distribution in line with selected visual identity of the project, thus contributing to task 8.2 Project identity and task 8.4 Public communications, distribution and monitoring.



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DRIVEMODE Flyer

Introduction

DRIVEMODE flyer was developed in English language by Fondazione iCons and validated by project's coordinator VTT. It is compliant with the project's visual identity and provides concise, yet exhaustive information on the following aspects of DRIVEMODE:

- Main objectives;
- Explanations of the main keywords related to the project developments (including, *Energy Efficiency, Compact, Modular, Cost-effective, Scalable, Light-Weight*);
- Overall concept;
- Main advantages;
- DRIVEMODE partners' logos;
- Contact details of the project coordination and EC funding acknowledgment.

The flyer has been designed as A5 (210x148mm) and consists of four pages. The flyer addresses the community of DRIVEMODE stakeholders and makes use of a direct and easy-to-read writing style.

Content

This chapter provides a brief description of the content of each flyer's page and the next paragraph as well as screenshots of each page.

Page 1 (front)

The flyer's cover consists of the DRIVEMODE logo, official payoff and core visual.

Page 2

This page displays DRIVEMODE visual elements with a key message on the top of the page (*Pushing for the next generation electric drivetrains*) and a brief overview of the project and key concepts underneath its objectives and expected impacts.

Page 3

This page provides with a visual overview of the integrated concept, a short description of each component (Gearbox, Motor and SiC Inverter) as well as the main advantages brought by the integrated module.

Page 4 (back)

The last page lists the contact details of the project coordinator, provides link to the official project website and gives an overview of the project's consortium by showing the partners' logos. Finally, EU flag, the reference to the Horizon 2020 funding and DRIVEMODE Grant Agreement number are reported at the bottom of the page.



Layout

This paragraph is aimed at providing an overview of the DRIVEMODE flyer.



Witnessing the breakthrough of electric vehicles, DRIVEMODE aims to develop a **distributed and integrated drivetrain module (IDM)** that will fit in all types of mass produced electric and hybrid cars, from light and C & D passenger vehicles, to high performance and light duty vehicles.

Economic feasibility of **mass-manufacturing** of different electric machine topologies will be studied to choose the best trade-off between performance, manufacturing cost and efficiency in the selected performance range.

The drivetrain module will be:

- **Energy efficient**, based on systems integration and optimised design
- **Compact**, by integrating drivetrain module components in a single frame
- **Modular**, enabling incremental changes between neighbouring vehicles' classes without major changes in design and manufacturing
- **Cost-effective**, through optimised design for manufacturing
- **Scalable**, to cover demand variation of vehicles in the same category
- **Light-weight**, by using a high-speed motor with reduced mass and usage of raw materials.



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Exploring the DRIVEMODE concept



High-speed gearbox

High-speed motor

SiC inverter

The integrated drivetrain in its humble size can provide 1350 Nm starting torque with the maximum power up to 80 kW. The top rotational speed on wheel is around 1425 rev/min. The main components are joined together to form a compact and integrated drivetrain module together with a cooling unit.

The power for the module comes from a high-voltage battery. This concept will be tested and validated in a demonstration vehicle with top speed on a flat road up to 180km/h.

ADVANTAGES

- The high-frequency power inverter and the high-speed electrical motor will reduce the materials usage and footprint.
- The SiC semiconductor will dramatically decrease the switching losses and improve the efficiency significantly while enabling drivetrain to operate at higher frequencies.
- The usage of high-voltage (600-900V) battery will decrease the required copper weight, thus, simplifying the operation of the motor at high speeds and improving the efficiency of the SiC drive and reducing the charging times.
- The module will increase by 50% the maximum operating speed, leading to a 30% increase in specific torque and power of electric motors, whilst reducing by half motor losses.
- Modularity provides the advantage of mass manufacturing reducing the final price of the unit.

DRIVEMODE

Learn more about our project
and its latest development on
drivemode-h2020.eu



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Figure 1: DRIVEMODE Flyer



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Conclusion

The project flyer will be an essential tool to support the project's dissemination activities and to be distributed by project partners at dedicated conferences, events and workshops. It has been designed in line with DRIVEMODE visual identity and to target a broad audience of stakeholders.



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