ADVICE will bring technological solutions to a higher Technology Readiness Level (TRL). Therefore, following the project completion and thanks to the high TRL achieved, **ADVICE** results could have both a rapid industrial integration and subsequent market introduction and penetration.

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The Consortium

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ADVICE

advancing user acceptance
of general purpose hybridized vehicles
by **improved cost and efficiency**

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- **Duration:** 36 months
- **Project Start:** 1st April 2017
- **Consortium:** 20 partners
- **Project Budget:** 12.7 Mio. Euro
- **Project Funding:** 10.0 Mio.

The Project **ADVICE**

ADVICE aims at increasing the numbers of HEVs and P-HEVs up to 10 % of all vehicles registered in the mid-term range. This will be achieved by focusing on a market segment called "premium class", which covers medium class, upper medium class, luxury vehicles and SUVs. This segment is facing severe problems in reaching the more and more ambitious European CO_2 targets, when running on fossil fuel only, not the least due to the considerable vehicle weight.

In ADVICE three physical demonstrator vehicles are built, ranging from mild-hybrid to full plug-in hybrid and – concerning fuel type – from gasoline to diesel-driven.

It will be shown that the whole range in between these demonstrator vehicles can be well covered by means of validated simulation, yielding a complete coverage of the whole "premium class" segment.

Fulfilling the energy efficiency and emission requirements of the call and limiting additional costs to 5 % with respect to the best in-class non-hybrid diesel and 15 % premium for a P-HEV are key topics of the project. Particular attention is devoted to optimum drivability and drive performance, which are essential when purchasing a "premium class" vehicle and thus crucial to achieve the market penetration aimed at.

All these objectives will be accomplished by:

- **Architecture level hybrid powertrain solutions** suitable to be modularly applied to different segments to increase their volumes, thus reducing costs
- **Advanced (predictive) control strategies**, taking advantage of future knowledge from external media and model predictive control strategies, taking the whole vehicle into account
- Novel optimised approaches in the **aftertreatment system**
- Newly developed **high-temperature electronics**, enabling novel strategies and approaches for **energy- and thermal-management** and
- **Multi-core processor architectures**, enabling sophisticated, computationally expensive control strategies and models processed on board of the vehicles

Hybrid typology:
HEV – V1 (VCC)
E-power levels: 65 - 100 kW

Hybrid typology:
P-HEV – V2 (CRF)
E-power levels: 80 -100 kW
(full hybrid)

Hybrid typology:
HEV – V3 (GM)
E-power levels: 10 -20 kW
(mild hybrid)

Hybrid energy storage systems will be used to demonstrate both targets, energy efficiency and cost reduction. The ADVICE consortium brings together 20 partners from the whole vehicle value chain to meet these ambitious technical challenges in order to sustainably impact the market penetration of HEV and P-HEV in the European and global market.

ADVICE overall targets at a glance

- **Objective 1:** Additional costs of 5 % for mild and full hybrid and 15 % for P-HEV compared to best in class non-hybrid diesel vehicles available on the market
- **Objective 2:** Reduction of fuel consumption on WLTP cycle by 20 % and 25 % increase in electric driving range for P-HEV, respectively.
- **Objective 3:** Demonstrating the vehicles' noxious emissions RDE compliance with a 1.5 compliance factor.
- **Objective 4:** Improvement of vehicle performance according to proper performance index and the objective assessment of driveability.
- **Objective 5:** Verification and assessment along 3 vehicle classes and 3 hybrid vehicle architectures.