1st Newsletter Edition/June 2018

PROJECT MEETINGS

Kick-off Meeting, Graz 4-5 April 2017

Representatives of all 22 partners gathered in the premises of the Virtual Vehicle (Vif) to sharpen the vision of the project and to foster mutual understanding.

General Assembly, Turin 21-22 March 2018

Hosted by General Motors, the meeting focused on the status of the main 6 work packages and the upcoming challenges.

General Assembly and Mid-term Review, Aachen October 2018

General A. in Turin on March 21st, 2018

1 YEAR ADVICE – HARD WORK AND GOOD PROGRESS

The project ADVICE aims at increasing the numbers of HEVs and P-HEVs up to 10% of all vehicles registered in the mid-term range. To reach this ambitious goal, ADVICE's 22 project members are committed to **5 OBJECTIVES:**

1. **Cost premium of 5%** for mild and full hybrid and **15%** for P-HEV compared to best in class non-hybrid diesel vehicles

2. **Reduction of fuel consumption by 20% and 25% increase in electric driving range** for P-HEVs

3. Demonstrating the vehicles' noxious emissions RDE compliance with a **1.5 compliance factor**

4. **Improvement of vehicle performance** according to proper performance index and the objective assessment of driveability

5. **Verification and assessment along 3 vehicle classes** and 3 hybrid vehicle architectures.

To meet the tough targets of ADVICE, the project is divided into different types of activities, **3 horizontal and 3 vertical lines**, each representing one work package.

One of the recent highlights was the new information in enhanced after-treatment systems and high temperature electronics that has been gained in work package 2 (Innovative components & subsystems for HEVs) while working on the simulation process.

Other highlights are the RDE testing in work package 3 (independent validation and testing), the post Li-ion technology news in work package 5 (Gasoline – PHEV) and the concept validation in work package 6 (Diesel – mild HEV), see all three articles below.

Major challenge for the upcoming months is the simulation based optimisation of different drive train concepts. Key question: Which concept will be implemented and what are the benefits?

Dr. Michael Noest, IESTA and Maurizio Maggiore, Policy Officer and Senior Expert of European Commission on April 17th at TRA

HIGHLIGHTS OF DISSEMINATION

AABC in Mainz, January 2017**,** presentation by AVL
TRA in Vienna. 16-19 April 2018, presentation by AVL, FEV, IESTA and Vif
International Vienna Motor Symposium, 26-27 April 2018, presentation by AVL and GM
JSAE Annual Congress in Yokohama. 23-25 May 2018, presentation by AVL and GM

UPCOMING EVENTS IN 2018

SAE Torino in June 2018, conference paper by Siemens
Engine and Environment in Graz, 7-8 June 2018, presentation by AVL and GM
Aachen Kolloquium, 8-10 October 2018, presentation by AVL and GM

REAL DRIVING EMISSIONS (RDE) TESTING

In work package 3 the independent testing procedures were defined for the following parameters:

- Vehicle preparation and instrumentation
- Fuel consumption
- Electric drive range
- Acceleration performance
- Grade ability
- Drive-off performance
- Driveability
- Max speed
- In-field consumption
- Eco-driving/routing evaluation

The RDE testing is a good example how to measure emissions independently. Exhaust gas measurements will be performed according to the new WLTP test. The WLTP lab measurement is supplemented by the so-called RDE test, which measures the pollutant emissions (such as nitrogen oxides and particulates) of vehicles.

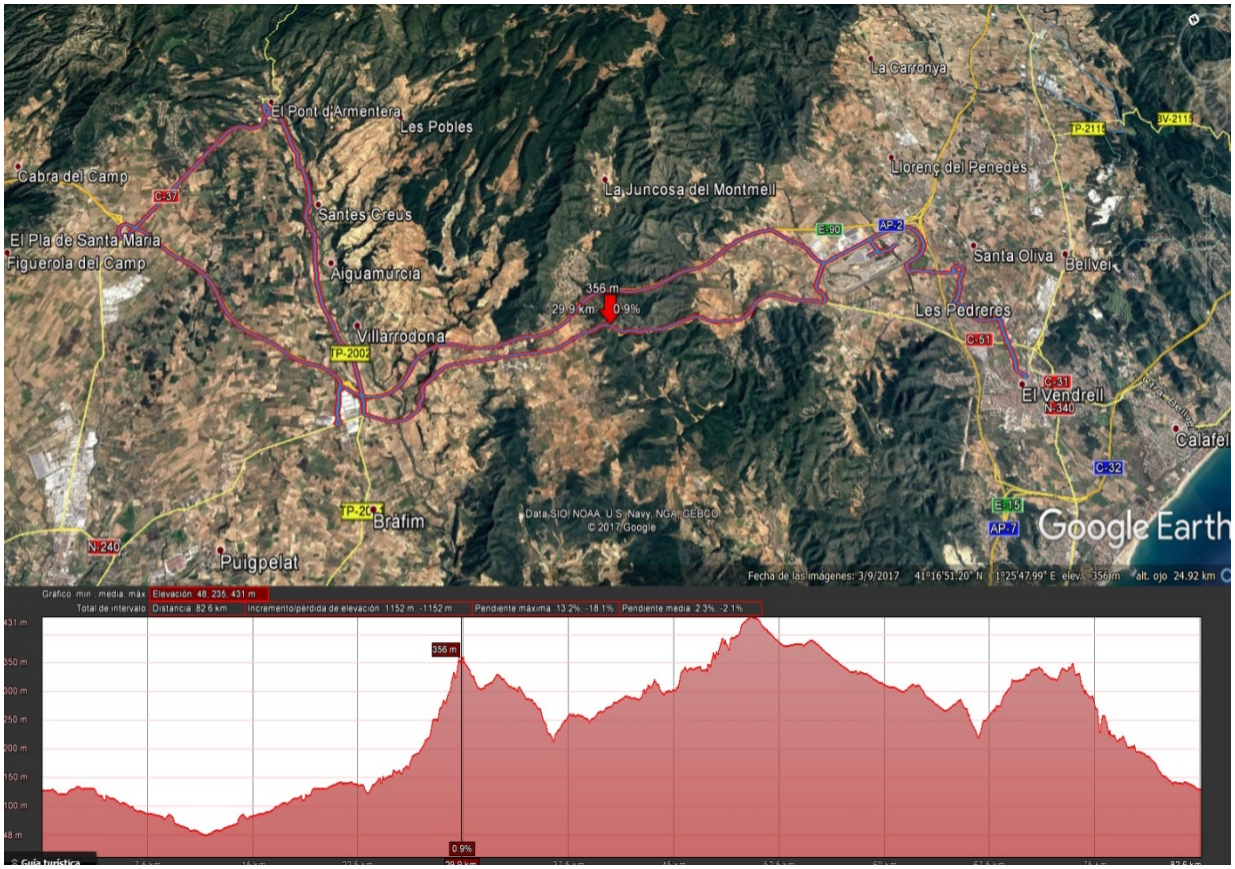
The additional RDE test is intended to allow the pollutant emissions to be tested under real driving conditions. In contrast to a lab test, the RDE test does not follow a set driving cycle. Instead, the emissions are tested under real driving conditions with legally defined permissible ambient conditions.

IDIADA, as an independent validation partner in this project, will measure the improvement of the technology implemented in the Advice vehicles according to these standards.

The following figure shows a route agreed in advance between the different OEMs and IDIADA and defined according to the last RDE requirements.

Route IDIADA – El Vendrell – Pont d'Armentera - IDIADA

- Theoretical duration: 5,950 s
- Route distance: 83 km
- Altitude minimum / maximum: 50 / 438 m



CONCEPT VALIDATION FOR THE DIESEL MILD-HEV DEMONSTRATOR

In work package 6 the reference vehicle for the diesel mild-HEV demonstrator is the Opel Insignia 2017 2.0DTH Diesel with 8 speed automatic transmission and front wheel drive.

The new hybridization concept for the base vehicle includes the following modifications:

- Downsized 1,6l 4 cylinder EU6 diesel engine
- 6 speed automatic transmission
- Motor generator unit (PO MGU)
- Electrically heated catalyst (eHC)
- Bidirectional 12V direct current to 48V direct current converter (DC/DC)
- Lithium ion battery
- Electric rear axle (P4).

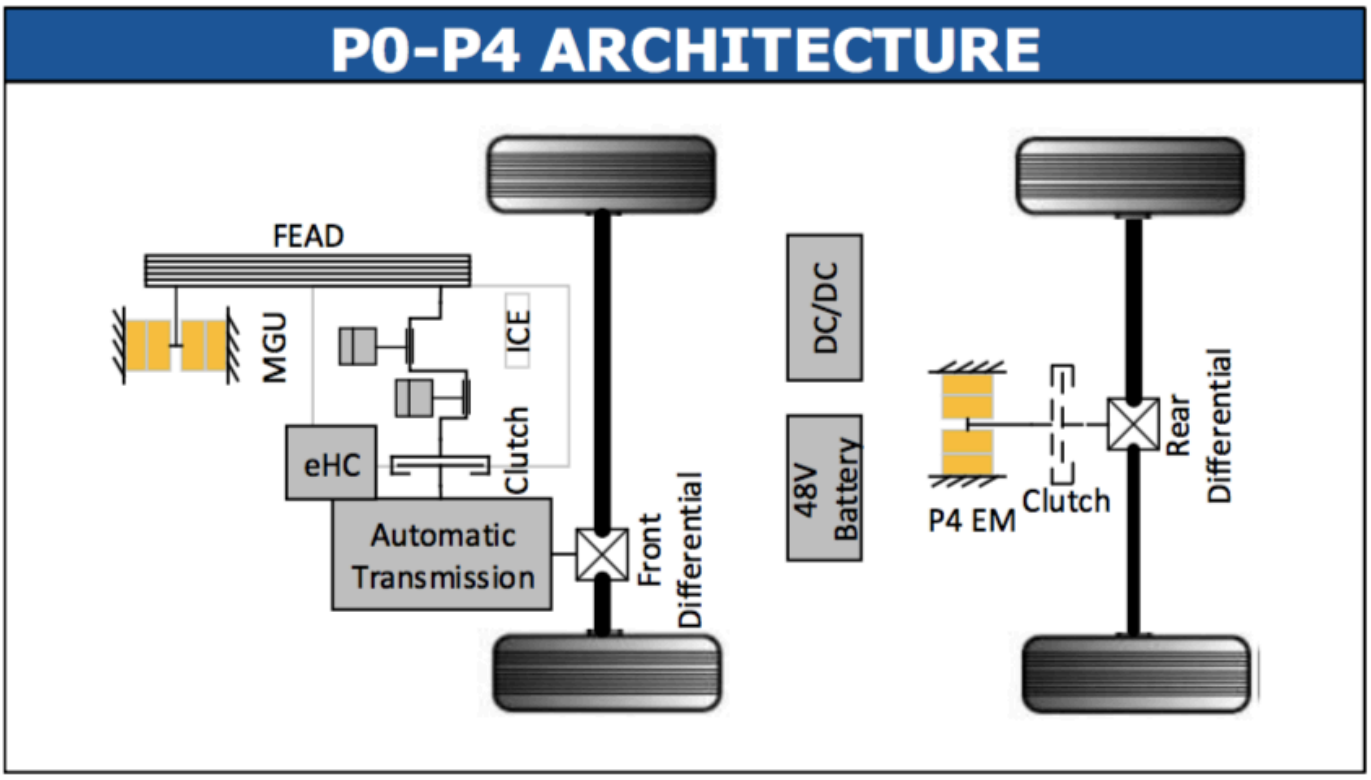


Figure 1: Hybrid system layout

A preliminary concept validation has been initiated by use of simulation tools for initial component sizing. The new 48V hybridization concept has been assessed with a first result for the initial components dimensioning for battery and the P4 concept. All P4 relevant hardware and the battery have to be developed. According to these facts the advanced simulations for performance approval and fuel consumption reduction are still on-going.

NEWS ON POST LI-ION TECHNOLOGY

In work package 5, two objectives concerning the enhancement of on board electrochemical storage system have been committed:

1. Investigate the performance of post Li-ion technology using performance and endurance tests for xEVs applications with a special focus on Li-Sulphur and Na-ion chemistry
2. Develop a combined physical and virtual Cell-to-Module/Pack extrapolation with electric and thermal investigations

Cell at prototype/commercial level (Li-Sulphur, Na-ion, etc.) will be tested on a test bench. The results will be introduced in the model previously designed in order to predict the performance of a battery pack using the post Li-ion technology.

The measurements of the post Li-ion cells will be used in order to estimate the potential of future cell chemistries and support the layout process of future battery solutions for the next generation of xEVs.