

LONG RUN

D3.5 –

High efficient hybrid engine concept performance test

Innovation Action

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Publishable summary

WP3 has the aim to develop and demonstrate >10% energy saving in a long-haul hybrid powertrain concept, application 35/40ton vehicle. This work reports on the development of the engine concept, combustion engine and exhaust aftertreatment.

The objective for this task is to reach 50% brake engine efficiency and reduce 30% of regulations emissions, NO_x, CO and hydrocarbons refer to EURO VI.

A new combustion system with high brake thermal efficiency has been developed, with increased compression ratio and a tailored piston shape. The new engine applies higher peak cylinder pressure, which enable to utilize higher boost pressure.

The emissions were fulfilled by precise control of EGR (exhaust gas recirculation) handling, provided by an EGR-pump, together with the new exhaust aftertreatment system (EATS) design based on split SCR (selected catalyst reduction) with dual urea dosing.

Engine system calibration has been conducted. Initial results show the potential for the EATS system to complete the emissions target. The engine test demonstrated an increasing engine efficiency, current around 48% brake efficiency. To reach the 50% target, more application work is required, including engine hardware update, for example integration of an electric turbo compound.

Preliminary VECTO hybrid calculations, based on the presented engine results, show a good potential to complete the 10% energy savings.

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Project partners:

#	Partner	Partner Full Name
1	FEV	FEV EUROPE GMBH
2	DAF	DAF TRUCKS NV
3	FPT	FPT INDUSTRIAL SPA
4	FORD	FORD OTOMOTIV SANAYI ANONIM SIRKETI
5	IRIZAR	IRIZAR S COOP
6	IVECO	IVECO S.p.A.
7	VOLVO	VOLVO TECHNOLOGY AB
8	VDL	VDL ENABLING TRANSPORT SOLUTIONS BV
9	ABEE	AVESTA BATTERY & ENERGY ENGINEERING
10	AVL	AVL LIST GMBH
11	EATON	EATON ELEKTROTECHNIKA SRO
12	GARR	GARRETT MOTION CZECH REPUBLIC SRO
13	IDIADA	IDIADA AUTOMOTIVE TECHNOLOGY SA
14	IFP	IFP Energies Nouvelles
15	AVL	AVL MTC MOTORTTESTCENTER AB
16	NESTE	NESTE OYJ
17	PRIMA	PRIMAFRIO SL
18	SHELL	SHELL GLOBAL SOLUTIONS (DEUTSCHLAND) GMBH
19	SIE	SIEMENS INDUSTRY SOFTWARE SAS
20	TECHNA	FUNDACION TECHNIALIA RESEARCH & INNOVATION
21	TOTAL	TOTAL MARKETING SERVICES
22	UMIC	UMICORE AG & CO KG
23	UNR	UNIRESEARCH BH
24	JRC	JRC -JOINT RESEARCH CENTRE – EUROPEAN COMMISSION
25	CHALM	CHALMERS TEKNISKA HOEGSKOLA AB
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