

NoWaste

Engine Waste Heat Recovery and Re-Use



MOTIVATION AND OBJECTIVES

The re-use of the engine waste heat (60% of the combustion energy) can significantly contribute to the overall vehicle energy efficiency increase. The technology is compliant and complementary with a hybrid powertrain where the generated electric energy will be used to power electric auxiliaries or will be stored.

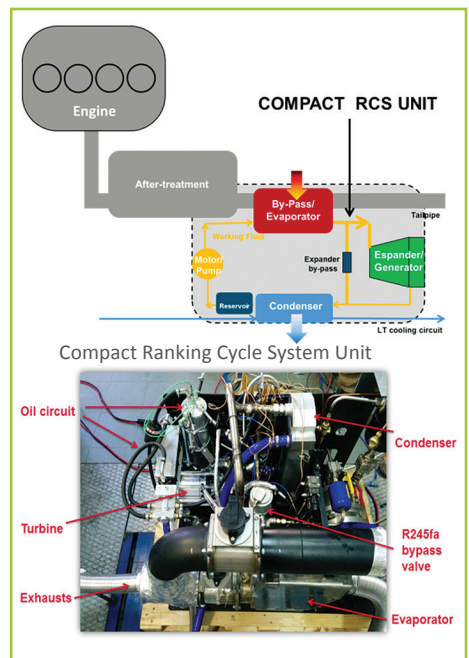
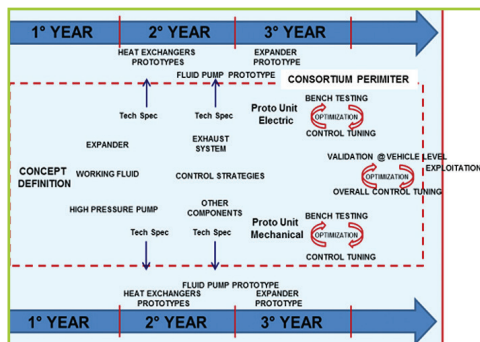
NoWaste aims to demonstrate the feasibility of such a heat recovery system based on a Rankine Cycle.

- Fuel Economy: -7 % fuel consumption at vehicle level on a reference mission
- Cost (for the OEM): < 4500 Euro/system
- Weight: < 150 kg

PROJECT PLAN, MILESTONES AND DELIVERABLES

The project is clustered with CORE.

The figure conveniently summarises the major project milestones and outcomes.



TECHNICAL APPROACH

The project **key points** are:

- Reference mission definition
- Selection of the most appropriate architecture
- Selection of the most appropriate working fluid
- Heat rejection system minimising the cooling drag
- Heat exchangers development to maximise the heat recuperation efficiency
- Integration with the exhaust system
- Validation of the developed system on a **test rig** and then on a **vehicle demonstrator**
- Benefit evaluation on different powertrains by means of a model approach

ACHIEVEMENTS

- Study and realisation of two Rankine Cycle System architectures:
 - ORC based on ethanol, mechanical power output use for a thermal engine without EGR (VOLVO-Renault Truck)
 - ORC based on 245fa, electric output use for a thermal engine without EGR (CRF-Iveco Truck)
- ORC systems validation @ engine test bench level
- Control strategy hardware & software development and tuning
- Overall on-board system integration on the demonstrator vehicle (Stralis truck)



Budget 4.7 M€
Duration 48 months
DG Research & Innovation
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