EE-VERT

Energy efficient vehicles for road transport

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Motivation and Objectives

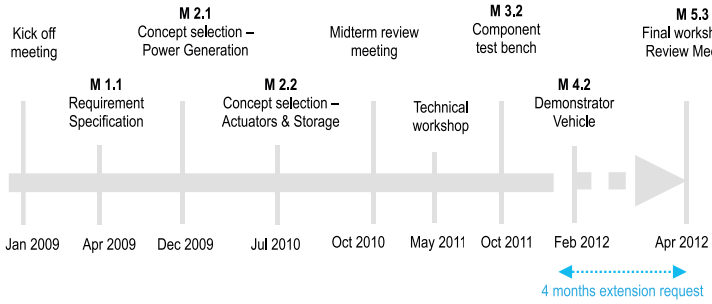
Present day vehicles have a certain number of features and constraints that make it difficult to optimise the use of electrical energy. Some examples:

- A single electrical power bus (the power net) with the generator, the battery and all consumers connected continuously to this bus,
- Electrical power generated and consumed continuously irrespective of operating conditions,
- Many auxiliaries consume power continuously,
- Some "islands" of technology already deployed that change this model e.g. regenerative alternator, EPAS, electrified auxiliaries (especially in hybrid electric vehicles),
- New functions e.g. stop-start exceeding the capabilities of the present architecture.

The objectives of the project are:

- Reduction of 10% in CO_2 on NEDC through coordinated energy generation and consumption,
- Technologies and processes developed in the project are applicable to vehicles with a conventional powertrain as well as hybrid electric vehicles,
- Life cycle assessment methods are used to evaluate the environmental impact of the new technologies compared to existing vehicles.

Project Plan, Milestones and Deliverables



Technical Approach

- Electrical power used for energy transfer between systems.
- Electrical power generation scheduled according to when it can be generated with low energy losses.
- Energy recovered from other sources (e.g. regenerative braking, waste heat, solar cells) and placed in short-term or long-term storage depending on present and predicted demand.
- Required changes in electrical architecture to permit integration of multiple generation, actuation and storage devices with different optimal operating voltages and usage profiles.

Achievements

WP1: State-of-the-art, mission profile, and requirements specification reports delivered. Dual voltage architecture agreed.

WP2: Developments include:

- A new generator that can produce 10kW during the braking phase with an efficiency > 75%,
- A 40V Li-ion battery to absorb the 10kW during braking,
- A novel multiple input DC/DC converter connecting the two powernets,
- An electrically actuated vacuum pump,
- A universal smart electrical actuator e.g. to control VTG.

WP3: A simulation software platform has been developed which models the project reference car. Results for the EE-VERT system indicate average savings of 10% for real life driving cycles and up to 17% on real life urban cycles. System test bench ready for integration development.

WP4: Demo car fitted with solar panel, electric A/C compressor, electric vacuum pump and wiring to integrate other new components.

Budget	6.7 M€	Funding	3.62 M€
Duration	36 months + 4 months to be confirmed	Start	January 2009
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SEVENTH FRAMEWORK PROGRAMME