

CLEVER

Clean vehicle research: LCA (Life Cycle Analysis) and policy measures

DURATION OF THE PROJECT

Phase 1: 01/01/2007 – 31/01/2009
Phase 2: 01/02/2009 – 31/01/2011

BUDGET

671.155 €

KEYWORDS

Life Cycle Assessment; Alternative fuels and propulsion systems; pricing policies; Socio-economic assessment

CONTEXT

The finite nature of the oil supplies on the one hand and the increasing consciousness about the impact of vehicles on the air quality and greenhouse effect on the other hand, require drastic changes of the current vehicle fleet. The ever more stringent emission standards for vehicles force the automotive industry to reduce the environmental impact of conventional diesel and petrol vehicles by using new technologies (soot filters, improved engines, catalysts, etc.). Besides these improved conventional vehicles, vehicles with alternative fuels (LPG, CNG, alcohols, bio-fuels, biogas and hydrogen) and/or drive trains (battery, hybrid and fuel cell electric vehicles) form an attractive solution to establish a more environmentally friendly Belgian car park.

PROJECT DESCRIPTION

Objectives

The CLEVER project serves the following objectives:

- 1) To create an objective image of the environmental impact of vehicles with conventional and alternative fuels and/or drive trains;
- 2) To investigate which price instruments and other policy measures are possible to realize a sustainable vehicle choice;
- 3) To examine the external costs and to verify which barriers exist for the introduction of clean vehicle technologies on the Belgian market;
- 4) To analyse the global environmental performances of the Belgian car fleet;
- 5) To formulate recommendations for the Belgian government to stimulate the purchase and use of clean vehicles.

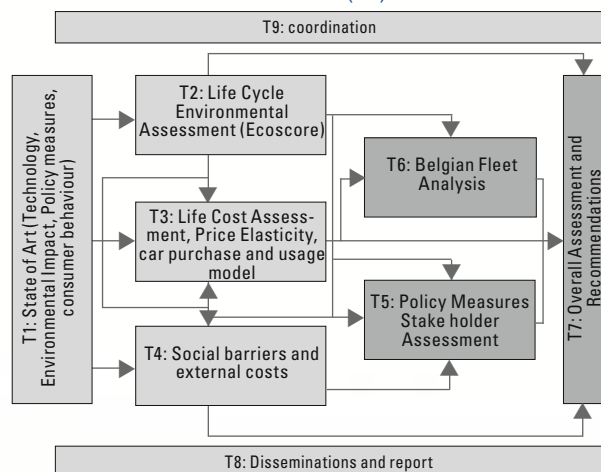
Methodology

The approach consists of the following steps:

- A literature study will be performed to obtain an overview of the existing and future vehicle technologies and environmental vehicle assessments (T1.1 and 1.2), policy measures (T1.3) and consumer behaviour for the purchase of cars.
- A Life Cycle Analysis (LCA) of conventional and alternative vehicles will be carried out, in which not only the well-to-wheel emissions (like in the Ecoscore methodology), but the complete cradle-to-grave emissions will be taken into account (T2).
- A Life Cycle Cost (LCC) analysis will be performed, which will investigate the impact of the proposed fiscal measures (see

T5). Price elasticities will be implemented in a consumer behavioural model and a car purchase and usage model will be developed (T3).

- The different barriers for the introduction of new vehicle technologies in Belgium will be identified. The different tasks will also be supported by input from the most recent external cost factors (T4).
- Potential policy measures for a more sustainable car choice of individuals, companies and governments will be investigated (T5).
- VITO's road emission model will be adjusted with the Ecoscore model and will be used to assess the global environmental performance of the whole Belgian vehicle fleet (T6). According to different scenario's, predictions will be made about the evolution of the performance for the mid term (2015) and the long term timeframe (2030).
- An overall assessment will be carried out on the basis of the results of the LCA, LCC, social barriers and fleet analysis. The integration of the results will be done by a multi criteria analysis. Recommendations for stimulating the purchase and use of clean vehicles will be formulated (T7).

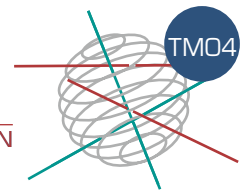


INTERACTION BETWEEN THE DIFFERENT PARTNERS

Each of the 5 partners within the CLEVER project will perform a number of specific tasks, in which an intensive collaboration with the other partners will be essential. The tasks are divided as follows:

- VUB-ETEC coordinates the project and will mainly focus on the performance of the LCA (T2), but also on T1.1, T1.2 and T7.
- VITO will mainly concentrate on the policy measures and fleet





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- analysis (T1.3, T5 en T6).
- VUB-MOSI will take care of tasks T1.4, T3 en T7.
- ULB-CEESE is in charge of task T4.
- RDC Environment will be responsible for the performance of the LCA in T2, together with ETEC.

EXPECTED RESULTS AND/OR PRODUCTS

- reports on the literature studies (vehicle technologies, environmental vehicle assessments, policy measures, consumer behaviour)
- reports on the different steps in the performance of the LCA (software selection, defining LCA objectives and functional unit, classification and characterisation, normalisation and weighting and LCA results)
- report on the LCC method and model, state-of-the-art research of price elasticities
- report on external costs and social barriers
- report on the sensibility analysis, the scientific validation of the Ecoscore approach and the optimal time of replacement
- report on the feasibility study on the utility of the methodology for other transport modes
- purchase and usage model: report and model

- report on the policy measures, the stakeholder support for the proposed policy measures and the scenario development
- report on the environmental performance of the Belgian vehicle fleet and the impact of the scenarios
- multi criteria analysis: method, analysis and results
- executive summary and overall recommendations
- every six months an intermediate report describing the progress of the project and the obtained results will be drawn up
- after the first and second phase of the project, a final report will be made containing all the results of respectively the first two years and the full four years

Every six months workshops and meetings will be organised for the user committee to disseminate the intermediate results and to validate the methodology and used data. Also meetings will be organised with stakeholders (consumer organisations, companies and governments) and with other projects. The dissemination of the results of the project will involve a website, a project leaflet, publications in national and international journals, participation in symposia, etc.

PARTNERS - ACTIVITIES

VUB-ETEC

- environmentally friendly vehicle technologies, mainly battery, hybrid and fuel cell electric vehicles and components such as electric drives and batteries
- traffic and emission models and Ecoscore

VITO

- energy use and environmental impact on vehicle level
- market introduction of new vehicle technologies and alternative motor fuels
- evaluation models for policies in relation to sustainable development

VUB-MOSI

- evaluation methods in the human sciences, in particular for social and economical decision problems; focus on transport and logistics, sustainable mobility, multi criteria analysis and location analysis

ULB-CEESE

- quantitative and qualitative evaluation of the interactions between the economy and the environment

RDC Environment

- studies in LCA, cost-benefit analysis, environmental impact assessment and strategic studies about the evaluation of technological projects

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Follow-up Committee

For the complete and most up-to-date composition of the Follow-up Committee, please consult our Federal Research Actions Database (FEDRA) by visiting
 http://www.belspo.be/fedra or
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