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GRPE - HDH

Institut für Fahrzeugantriebe & Automobiltechnik

TU Graz

TU WIEN TECHNISCHE UNIVERSITÄT WIEN Vienna University of Technology

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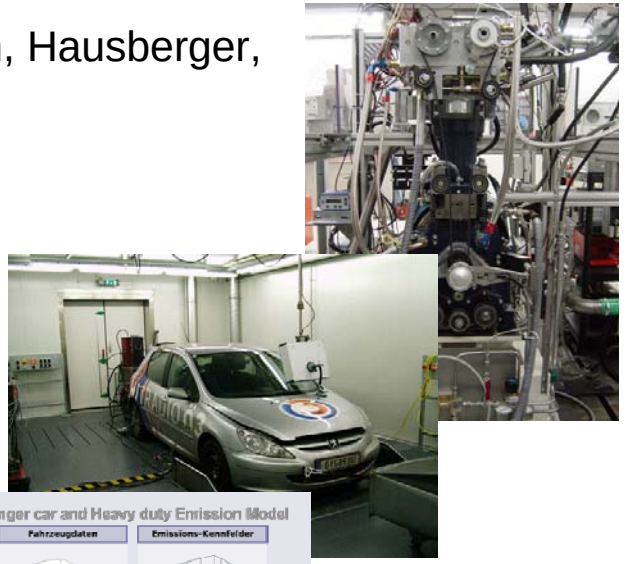
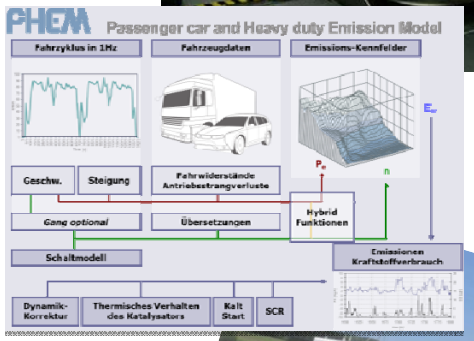
Introduction

Institute for Internal Combustion Engines and Thermodynamics (IVT), TU Graz

Personnel:

7 Univ.-Prof.:	H. Eichlseder, Wimmer, Almbauer, Sturm, Hausberger, DeJaegher, Klell
96	Researchers
25	Office and laboratory personnel





Infrastructure:

12 Engine tes beds
(small to large engines,)
3 Roller test beds (HDV, LDV, 2-wheelers)
1 On-Board system (PEMS)
2 Air quality measurement systems
1 Flow analysis test stand
1 Injection test stand,…..

Research areas (6 divisions of IVT):

Large Engines, Design, Combustion Process,
Emissions, Thermodynamics, Traffic & Environment

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IVT – Planned Methodology

WP 4: Inclusion of PTO operation

4.1 Options to simulate PTO power demand

a) bottom up approach (useful work of the equipment driven by the PTO as input),
b) based simply on an average power demand at the PTO.

4.2 Options to transfer different engine work into a benefit system

OEM experts consultation on ideas for an efficient benefit system.

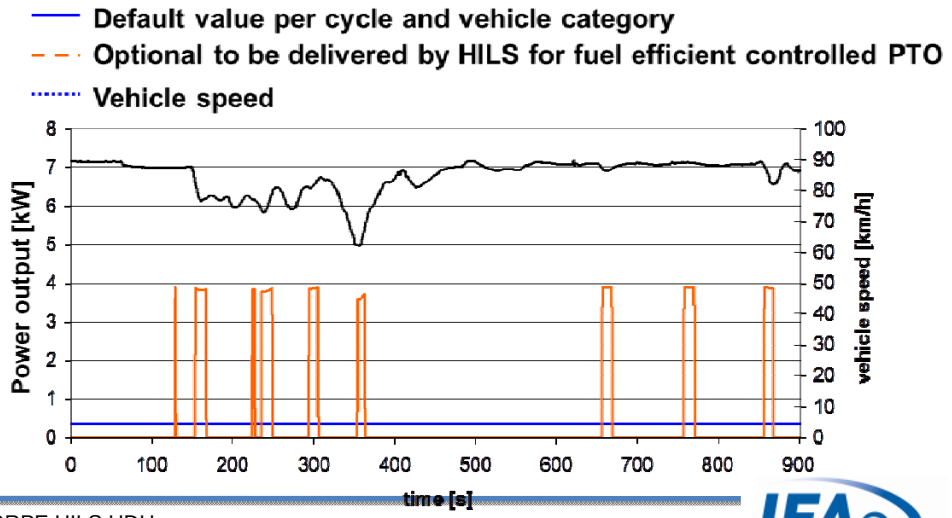
Options range from:

simple correction factor (ratio of engine work from HDH /conventional HDV)
Up to additional measurements on engine test bed

4.3 Collection of data for one vehicle mission profile

Collect data to operate the option selected in task 4.2

Example :
Given power demand
converted by HILS in HDH
engine power demand
→ Ratio HDH/conv. engine work



IVT – Planned Methodology

WP 5: WHVC weighting factors

5.1 Analysis of typical profiles for vehicle speed and propulsion power

Representative cycles from HDV-CO2 (optional also from WHVC data base) simulated with vehicle emission model “PHEM” → ”Real World” frequency distributions of Pe, rpm, v, a, etc. for different HDV categories

5.2 Elaboration of weighting factors for different parts of the WHVC

WHVC simulated with PHEM → frequency distributions of Pe, rpm, v, a, etc. for WHVC sub-cycles for the different HDV categories.

Extract weighting factors for the WHVC sub-cycles which result in same frequency distribution for the weighted WHVC as original “real world driving cycles” per vehicle category.

Validation via simulation of HDH vehicle over the WHVC and in the representative original cycles. Compare simulated fuel consumption and exhaust NOx emissions.

5.3 Elaboration of options to use the HILS method in HDV CO_2 procedures

Target is harmonisation of the two test procedures

a) Apply the cycle from the HDV-CO2 test procedure and driving resistance of the actual vehicle instead of generic data to simulate in HILS fuel consumption and CO_2.

b) Apply specific fuel efficiency value gained from HILS with the generic vehicle data for weighted WHVC as input into the HDV CO_2 test procedure tool.