



› STRATEGIES TO CLOSE THE GAP FOR CO2 EMISSIONS

SAM Session 4 | Norbert Ligterink

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SCOPING PAPER KEY QUESTIONS

What are the possible solutions to reduce the gap under WLTP and beyond (e.g. introduction of a "not to exceed" limit*)?

- How can the CO₂ measurements gained with the RDE procedure in combination with modelling approaches be useful to reduce the gap?
- What are the possibilities from a scientific point of view to use fuel consumption as an indicator of real emissions and which are the challenges of this approach?
- Which other aspects (e.g. acceptance by consumers) need to be considered?

**devaluation of the term "NTE": always and everywhere*

STAKEHOLDERS' PERSPECTIVES

› Fuel bill

- › consumers and fleet owners (*“total car view”*)

› (Manufacturers') limited liability

- › driving behaviour, usage and maintenance (*“type-approval reference”*)

› National targets

- › CO2 emission reduction targets (*“non-attributable fuel-sold basis”*)

› Big Brother

- › privacy and citizens' rights (*“data collection”*)

› Significance

- › bias in the vehicle and user selection and the measurements (*“the willing”*)

FUNDAMENTAL PRINCIPLES

› Definition

- › what is (normal, average, ...) fuel consumption?
- › what should be excluded?

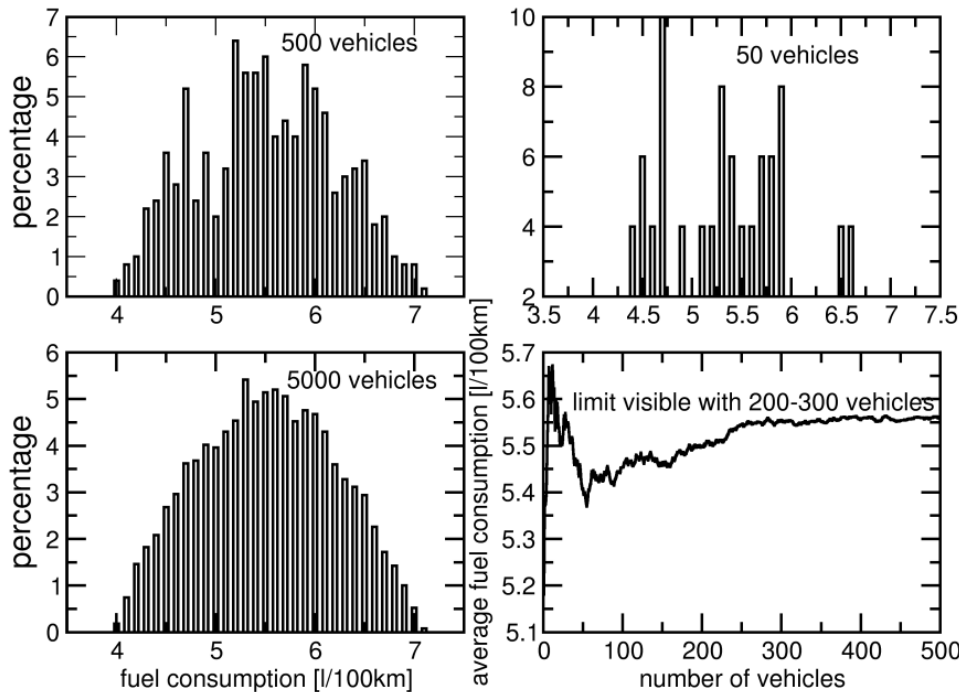
› Responsibility

- › car manufacturer, dealer, user, road authority, government, legislator
- › what is a reasonable scope for each responsible party?

› Observable

- › what can be measured with sufficient accuracy?
- › To whom is data available? (consumer, manufacturer, authorities)

MINIMAL NUMBER OF CARS FOR (UNCONTROLLED) MONITORING ~ 500 PER MODEL?



large variation in fuel consumption with usage may lead to bias in the sample.

(simulation)

CONTROLLED MONITORING

IS IT, AT ALL, POSSIBLE?

- › correcting for:
 - › velocities (e.g. motorway 120 km/h or 140 km/h driving)
 - › weight (e.g. passengers and luggage)
 - › auxiliary use (lights and a/c)
 - › temperature (air density, engine efficiency, lubricant, pollutants trade-of)
 - › trailer towing and roof racks
 - › road surface (texture and undulation)
 - › wind (speed and direction)
 - › fuel quality (energy density)
 - › etc.
 - › ...

POSSIBLE APPROACHES

- › Service provider approach:
 - › Car manufacturer pays the fuel for the first 50 000 km (~ 4000 Euro)
- › WLTP correction algorithms:
 - › correcting fuel consumption for the known effects
- › Validated in-car fuel monitoring:
 - › fuel consumption calibrated at every fuelling
- › Motivated deviation report for the user based on in-vehicle data:
 - › braking, temperature, velocities, unexpected driving resistance
- › Self-declared real-world fuel consumption by car manufacturer
 - › Similar to the NCAP system for safety, with an evolving test program
- › Large monitoring programs, based on fuel consumption:
 - › Like the Travelcard and Spritmonitor data, or voluntary programs
- › independent testing by EC or member states:
 - › in-use coastdown tests, chassis tests, eco-innovations testing

POSSIBLE APPROACHES (EXAMPLES)

- › Service provider approach:
 - › manufacturer responsible for fuel consumption in the first years of use
- › WLTP correction algorithms:
 - › e.g., motorway velocity correction
- › Validated in-car fuel monitoring:
 - › reliable OBD accumulated fuel consumption reporting
- › Motivated deviation report for the user based on in-vehicle data:
 - › e.g. “7% higher fuel consumption due to increased air drag”
- › Self-declared real-world fuel consumption by car manufacturer
 - › Voluntary label, possible based on specific vehicle usages
- › Large monitoring programs, based on fuel consumption:
 - › Brand specific reporting, trends, and comparisons
- › independent testing by EC or member states:
 - › without flexibilities and “spotting” large energy losses



› **THANK YOU FOR YOUR ATTENTION**

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