Stocktaking and data mining
Phase 1 of Euro 5 effect study

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Introduction

Source of the data

A - Stocktaking data

B - Type approval data

C - Literature study
Introduction

Regulation (EU) No 168/2013 ➔ Environmental effect study (Articles 23(4) and 23(5))

Pre-study: Experimental Test Programme

Phase 1
- A- Stocktaking
- B- Data mining of Type I test values
  - Public consultation
- C- Literature study
  - Detailed planning (including cost) of phases 2 and 3

Phase 2
- Modelling
- Verification testing and analysis
- Impact assessment

Phase 3
- Validation
- Reporting
Source of the data

A- Motorcycles and Mopeds placed on EU market: Circulating park and New Registration

- **ACEM website**
  "Powered two wheeler registrations in EU and EFTA countries 2014 statistical release" (Feb. 2015)
  "European powered two wheeler market statistics" (Mar. 2014)

- **DIONE fleet impact model**
  consistent with TRACCS project output based on PRIMES baseline projection

- **EUROSTAT databases**
  updated on the 02/03/2015
  accessed on the 06/05/2015

B- Type Approval figures:

- **KBA databases**
  Kraftfahrt-Bundesamt - Federal Motor Transport Authority
  2009 and 2014 databases
A- Stocktaking

Circulating park of **Mopeds** and **Motorcycles** in EU28

- **EUROSTAT** data displays lower values than **ACEM** and **DIONE** data

- Until 2012, **ACEM** and **DIONE Motorcycle** data match, however **Moped** data diverge $\iff 3 \text{ M vehicles in 2012}$
New registration of Mopeds and Motorcycles in EU28

- Until 2012, **ACEM** and **EUROSTAT Motorcycle** data match
- [2004-2011], **DIONE Motorcycle** data is greater (*max. ≠ 0.3 M vehicles in 2008*)
- Last year trend: **ACEM** data reduce by 10% while **DIONE Moped** data stabilise
2014 Circulating park in EU28

Mopeds and Motorcycles in millions (source DIONE)
Largest European markets

Total stock of L-category vehicles in EU28 in 2014. (source DIONE)

In 2014, Italy, Spain, Germany and France account for 2/3 of circulating park and 3/5 of new registration in EU28
New registration in EU key markets

Last 5-year trends of **Mopeds** and **Motorcycles** based on ACEM source

Moped NR decreased drastically, with the biggest drop occurring in Italy (-68%)
However, a sign of recovery appeared in 2014 in The Netherlands (+6%) which is the 2nd largest market in EU
New registration in EU key markets

Last 5-year trends of Mopeds and Motorcycles based on ACEM source

2010-2014, Motorcycle NR increased in Germany, Poland and UK, but decreased in France, Italy, Spain and The Netherlands.

However, Motorcycle NR increased in the 7 key markets last year.
Stocktaking - conclusions

- Stocktaking was carried out for **Mopeds (L1e)** and **Motorcycles (L3e)** as scarce data were available for the other L-categories

- Discrepancies appeared between data from different sources, in particular for **Mopeds**
  ⇒ This may lead to substantial divergencies when performing cost-benefit studies

**Comprehensive data, collected and harmonized for each L-category, are required to support robust impact assessment analysis**
B- Data mining of test type I values

Methodology followed for each L-category

Extraction of type I test values (model duplicates removed)

Part 1 - Computation of size-frequency histograms and cumulative percent curves by regulated pollutant (except HC+NOx for L1e)

Part 2 - Assessment of the share of models complying with proposed Euro 4 / Euro 5 type I emission limits (including deterioration factor - DF)

Part 3 - Comparison of 2009 and 2014 type I test values distributions (5-year trend)

Part 4 - Identification of the EU largest selling model in the 2014 type I test values distribution

Sources KBA 2009 and 2014 databases + ACEM best-selling data
Example for L3e category
Part 1 - CO type I test values - \( n = 1730 \) models

31% and 23% of the models already comply with the proposed Euro 4 and Euro 5 CO type I limits respectively.
**Part 2 - L3e models with the lowest CO, THC and NOx type I test values**

**Euro 4 limits**

**Euro 5 limits**

134 models from 23 manufacturers comply with the proposed Euro 4 limits (incl. DF)
16 models from 6 manufacturers comply with the proposed Euro 5 limits (incl. DF)
**Part 3 - 5-year trend of CO, THC and NOx type I test values from L3e category**

**NOx** and **THC** type I medians significantly decreased between 2009 and 2014. However, in absolute terms the HC emissions are still at a very high absolute level (NB compared to other vehicle).

**CO** type I median increased during the same period.
Part 4 - Type I test values from EU best-selling models in L3e category

**CO** and **NOx** type I medians from top-selling models were significantly lower than those form all L3e models. No significant difference was found for **THC**
Data mining - conclusions

Share of L-category models with type I test values lower than the Euro 4/5 proposed limits (including DF) - State of play based on the 2014 KBA database

<table>
<thead>
<tr>
<th>L-Category</th>
<th>n of models</th>
<th>Euro 4</th>
<th>Euro 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>L1e*</td>
<td>200</td>
<td>63%</td>
<td>&lt;1%</td>
</tr>
<tr>
<td>L2e</td>
<td>4</td>
<td>not sufficient number of models</td>
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</tr>
<tr>
<td>L3e</td>
<td>1730</td>
<td>8%</td>
<td>&lt;1%</td>
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<tr>
<td>L4e</td>
<td>0</td>
<td>no model</td>
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<tr>
<td>L5e</td>
<td>42</td>
<td>7%</td>
<td>4%</td>
</tr>
<tr>
<td>L6e</td>
<td>4</td>
<td>not sufficient number of models</td>
<td></td>
</tr>
<tr>
<td>L7e</td>
<td>107</td>
<td>0%</td>
<td>0%</td>
</tr>
</tbody>
</table>

* Type I test values (HC+NOx) compared to the sum of HC and NOx proposed limits

Assessment of current type I test values with Euro 4 and 5 Tailpipe emission limits after cold start, regardless of the test cycle associated
C - Literature study
Number of references collected = 114

Few references addressing the potential issues ⇒ Importance of Euro 5 Effect Study

First scientific output: Particle Emission Measurements from L-Category Vehicles
Giechaskiel et al. 2015, SAE 2015-24-2512
JRC Role
Facts & Figures

- **In-house science service** of the European Commission
- Independent, evidence-based **scientific and technical support** for many EU policies
- **Established 1957**
- **7 institutes** in 6 locations
- **Around 3000 staff**, including PhDs and visiting scientists
- **1370 publications** in 2014