

# Emissions from the transport sector

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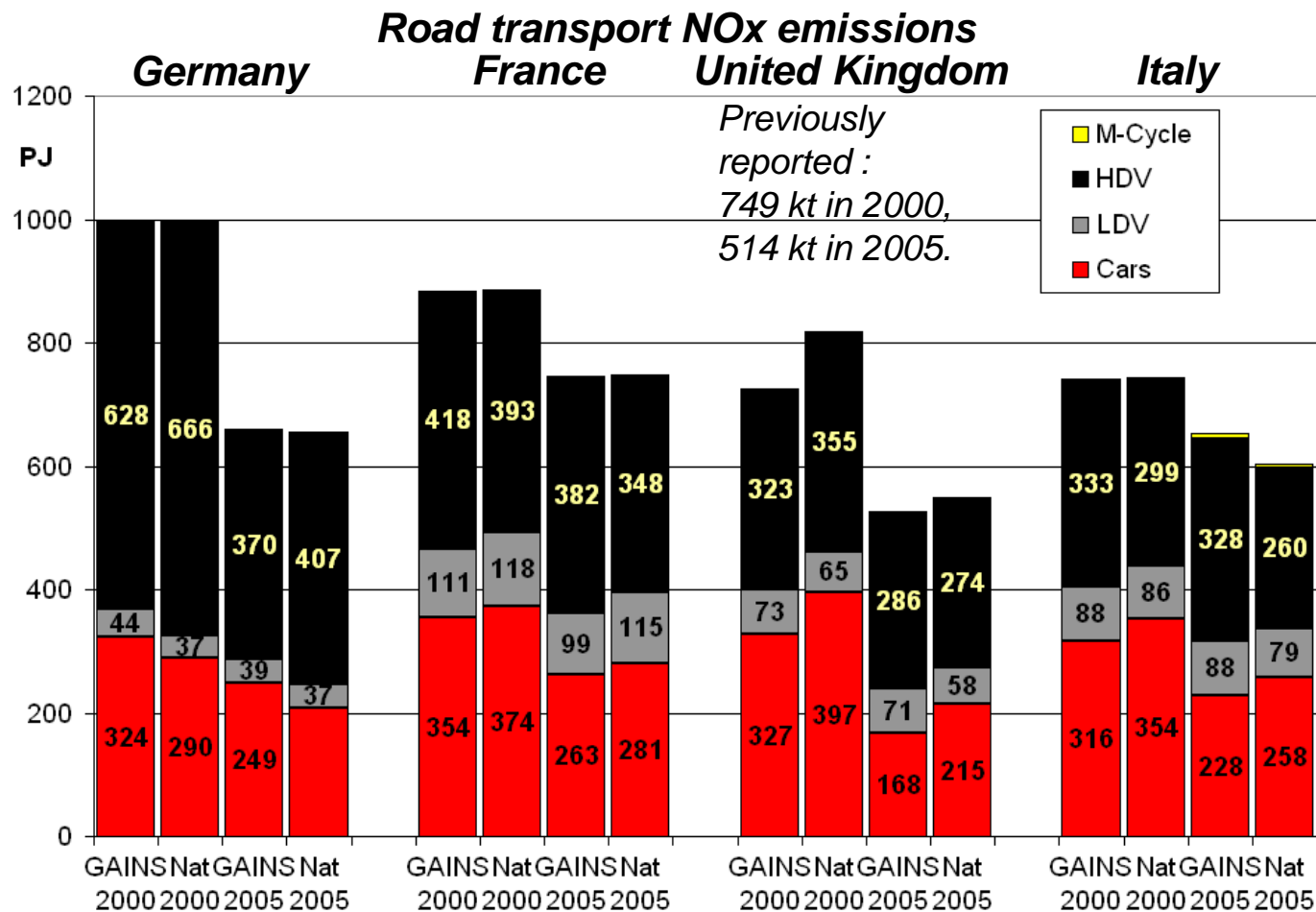
# Gothenburg Prot.: National reports & GAINS model



- EMEP region: 40+ countries
  - EU27,
  - 3 EFTA (excl. LIE),
  - 10 others (incl. Russia, Ukraine, Belarus, Turkey)
- Magnitude of national emissions greatly differs – e.g. NO<sub>x</sub>:
  - <20 kt: MALT, CYPR, ICEL, ALBA, MOLD,
  - over ~200 kt: AUST, DENM, NORW, FINL, SWED, BELA,
  - >1500 kt: RUSS\_Euro, UK, GERM, FRAN
- Still many gaps in reporting – modeling needed!

<b>Not reported NO<sub>x</sub> emissions</b>		Total All SNAP	TRA-RD SNAP 7	TRA-OT SNAP 8
17 countries	2000	-41%	-29%	-46%
5 countries	2005	-11%	-2%	-39%

# Road transport: National NOx emissions

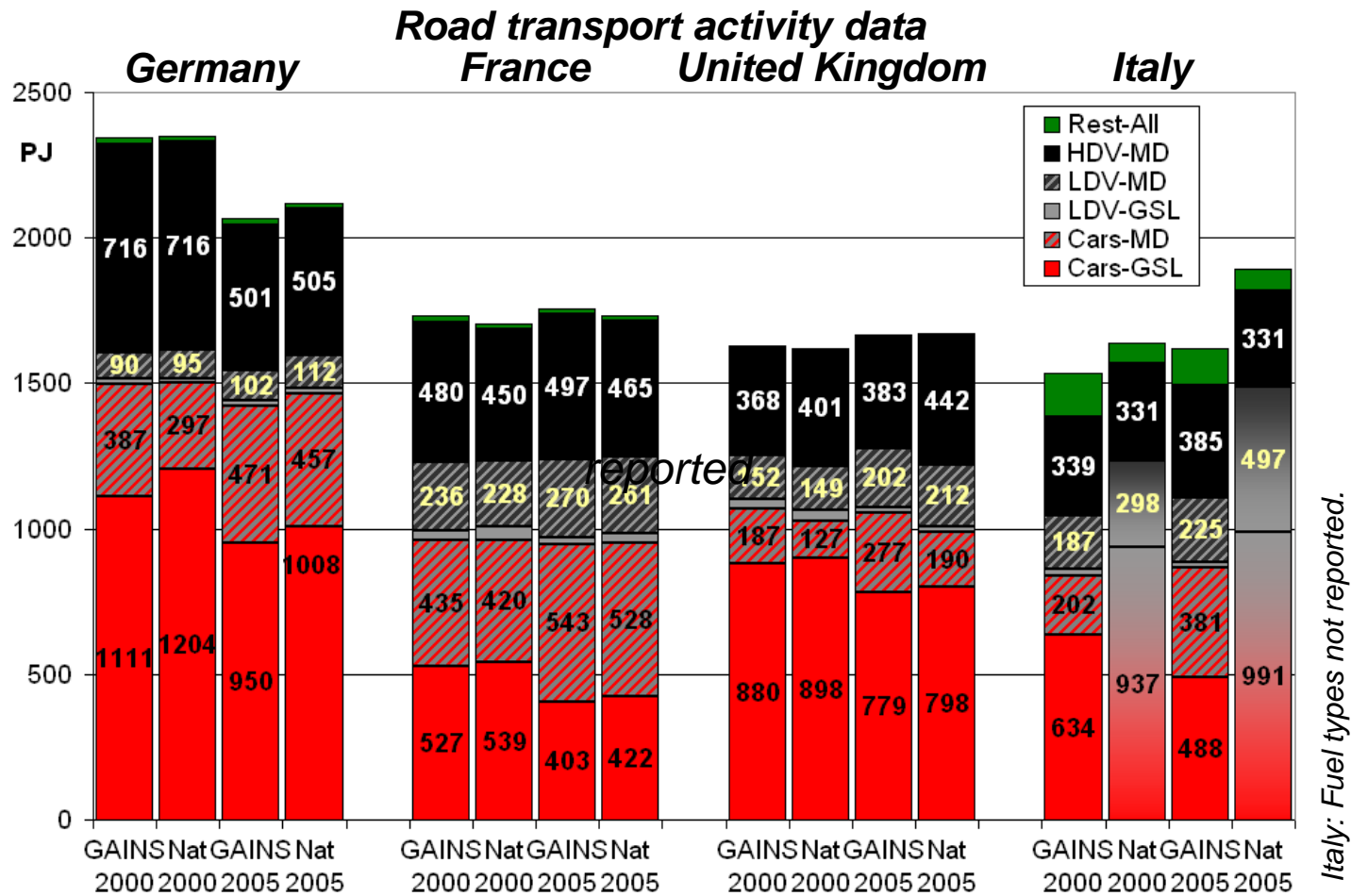


Calibration of model to nationally reported emissions.

Most important: Emissions from cars and trucks.

Data: GAINS „Goth Prot. Rev.“ National Baseline vs. CEIP submissions.

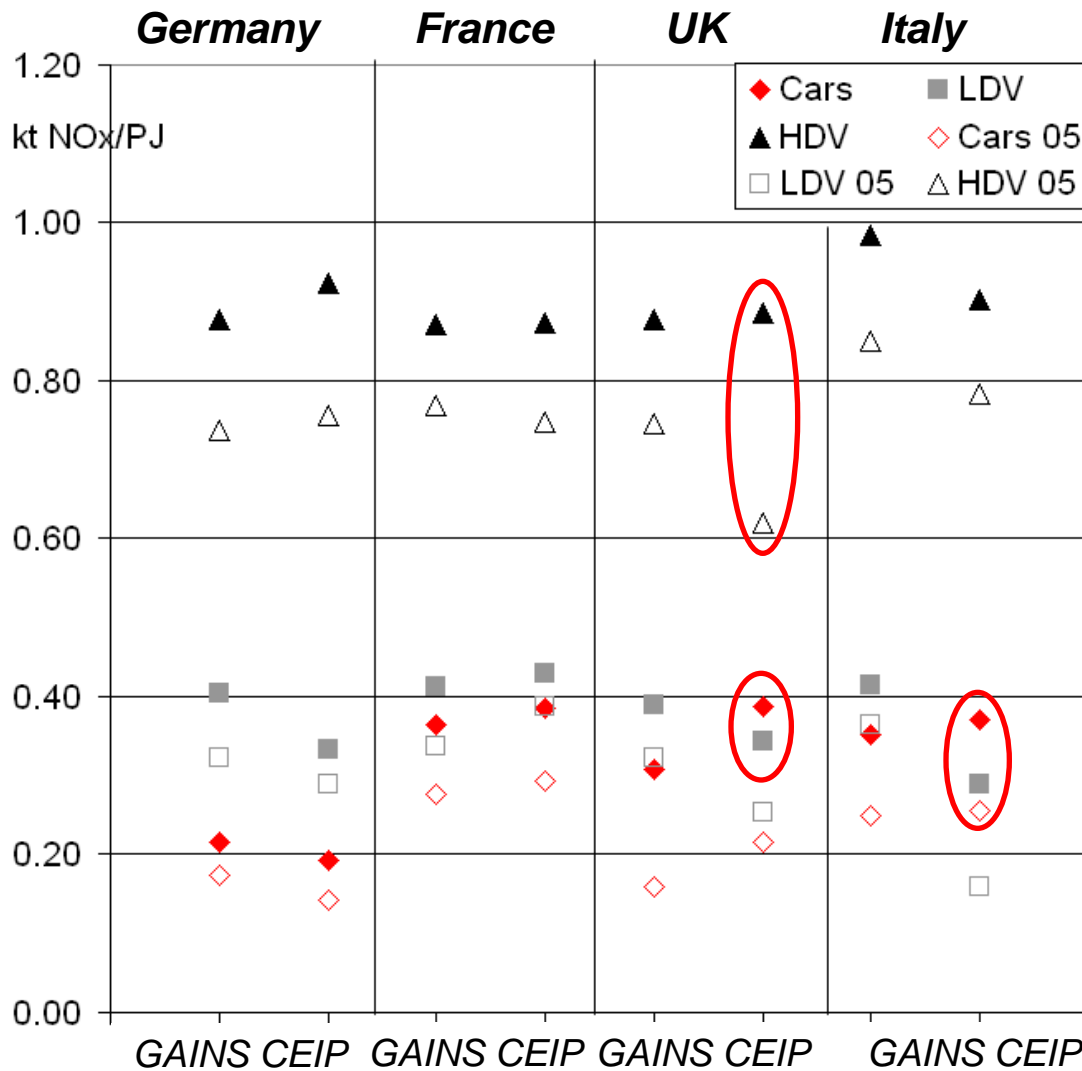
# Road transport: Activity data



With aligned emissions some differences in distribution of fuel consumption over vehicle categories.

Data: GAINS „Goth Prot. Rev.“ National Baseline vs. CEIP submissions.

# Comparing implied emission factors



Average implied emission factor = distribution of **exhaust controls** in fleet **x emission factor** per technology.

GAINS uses *TREMOVE* fleet distribution & *COPERT IV* emission factors.

In general little difference with national average emission factors but ...  
...sometimes surprising differences.

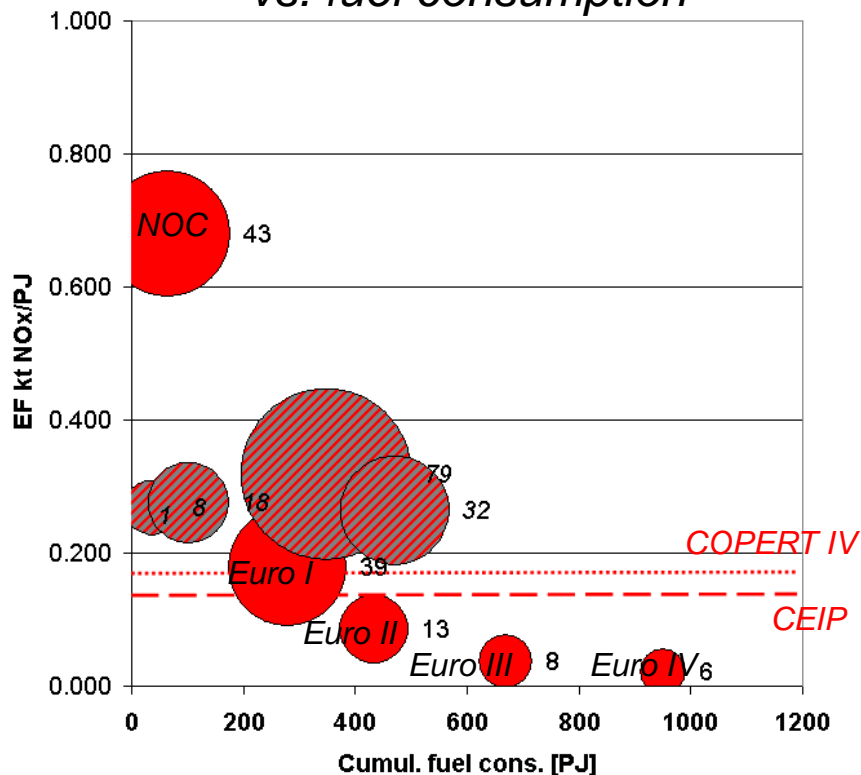
Thus GAINS provides a cross-check.

Data: GAINS „Goth Prot. Rev.“ National Baseline vs. CEIP submissions.

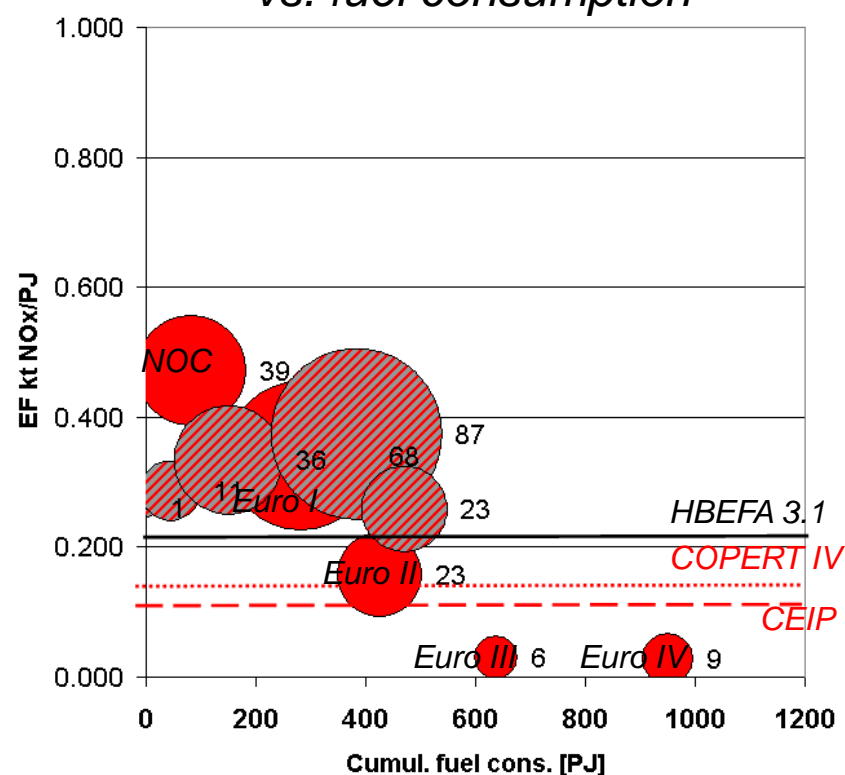
# Emission factors per technology for cars in COPERT IV, HB-EFA 3.1, CEIP (DE 2005)



**Cars: NO<sub>x</sub> EF by control stage vs. fuel consumption**



**Cars: NO<sub>x</sub> EF by control stage vs. fuel consumption**



Avg. EF COPERT IV : Cars: +23% vs. CEIP, -20% vs. HB-EFA 3.1

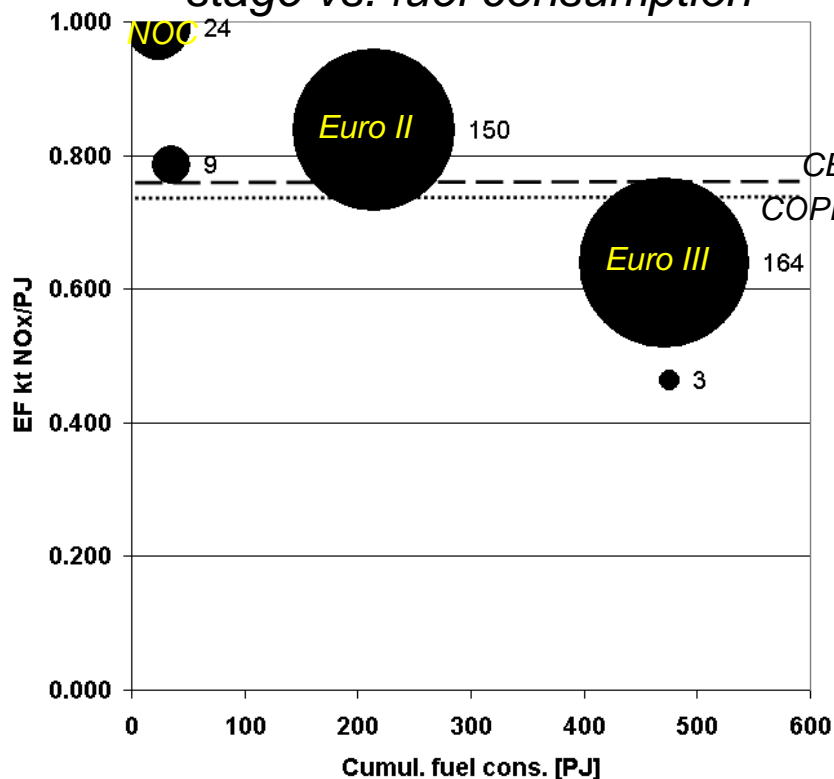
*i.e. different assumptions about fleet mix (and possibly technology), notably share of NOC GSL cars*

*=> Differences in detailed EF = differences in approach and interpretation of base emission factors -> that needs to be resolved by the respective engineers*

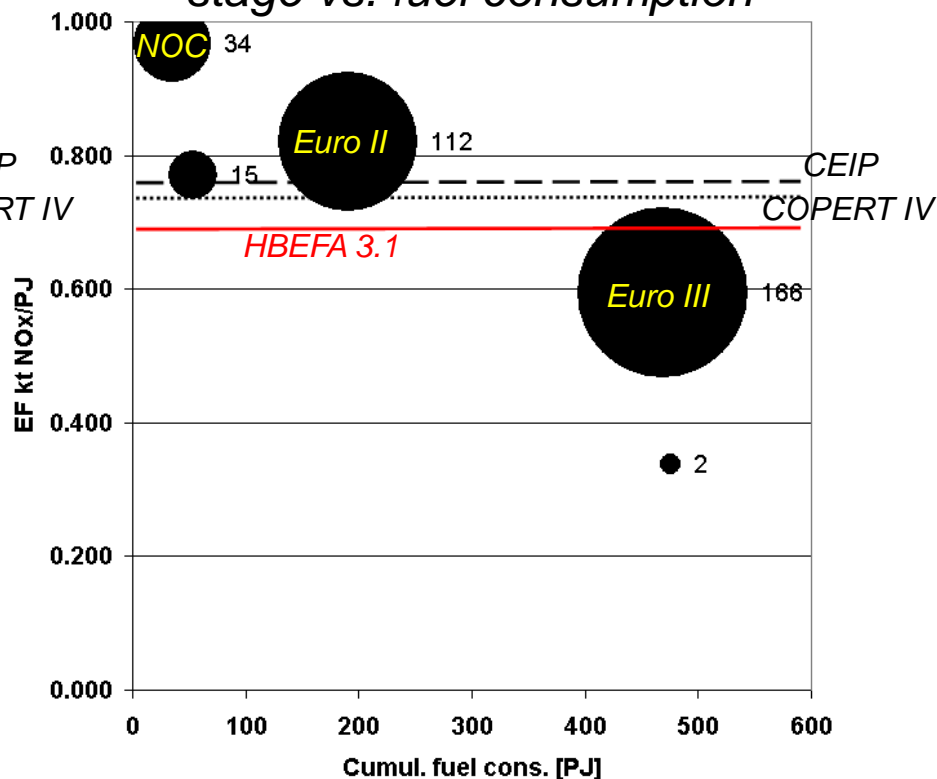
# Emission factors per technology for trucks in COPERT IV, HB-EFA 3.1, CEIP (DE 2005)



**Trucks: NO<sub>x</sub> EF by control stage vs. fuel consumption**



**Trucks: NO<sub>x</sub> EF by control stage vs. fuel consumption**



*Avg. EF COPERT IV : Trucks: -3% vs. CEIP, +6% vs. HB-EFA 3.1*

*different assumptions about fleet mix (and possibly technology), notably share of Euro II / III trucks*

*=> Differences in detailed EF = differences in approach and interpretation of base emission factors -> that needs to be resolved by the respective engineers.*



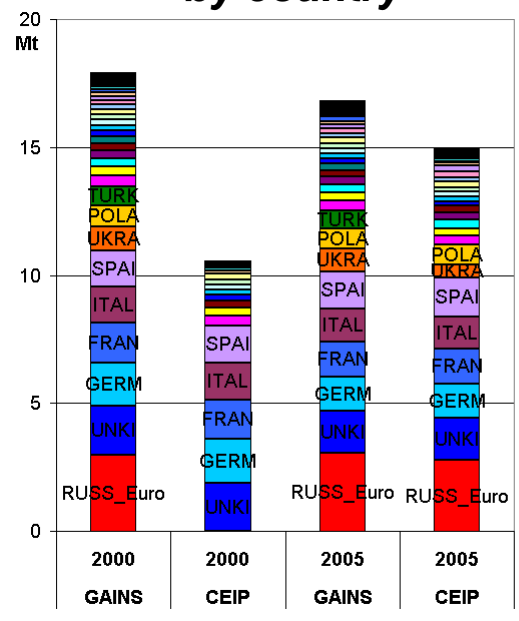


# National emissions & GAINS modeling, e.g. NO<sub>x</sub>

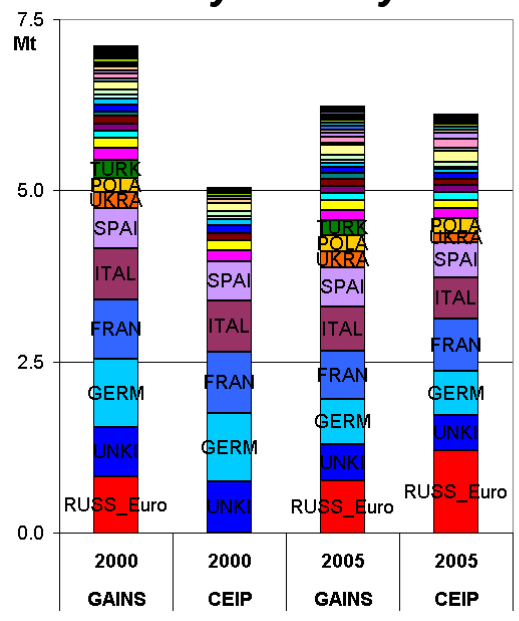


Not reported NO <sub>x</sub> emissions		Total All SNAP	TRA-RD SNAP 7	TRA-OT SNAP 8
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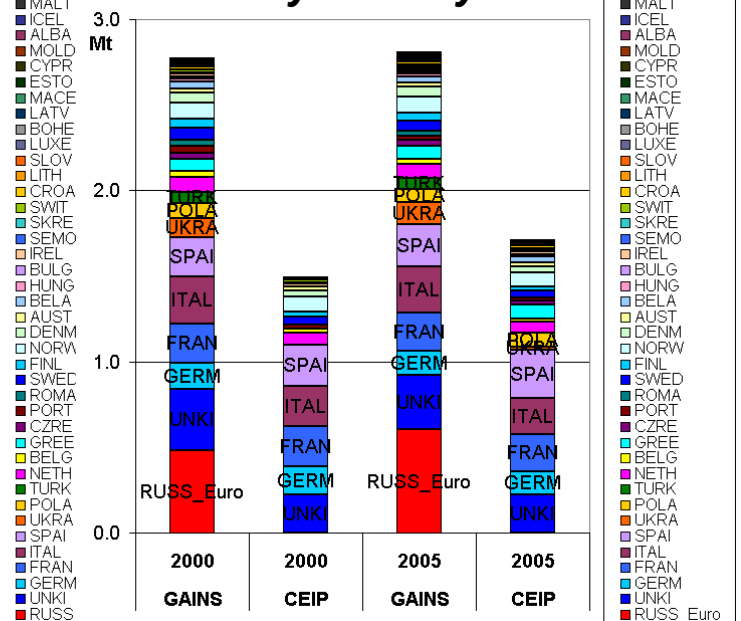
**All sectors by country**



**Road transp. by country**



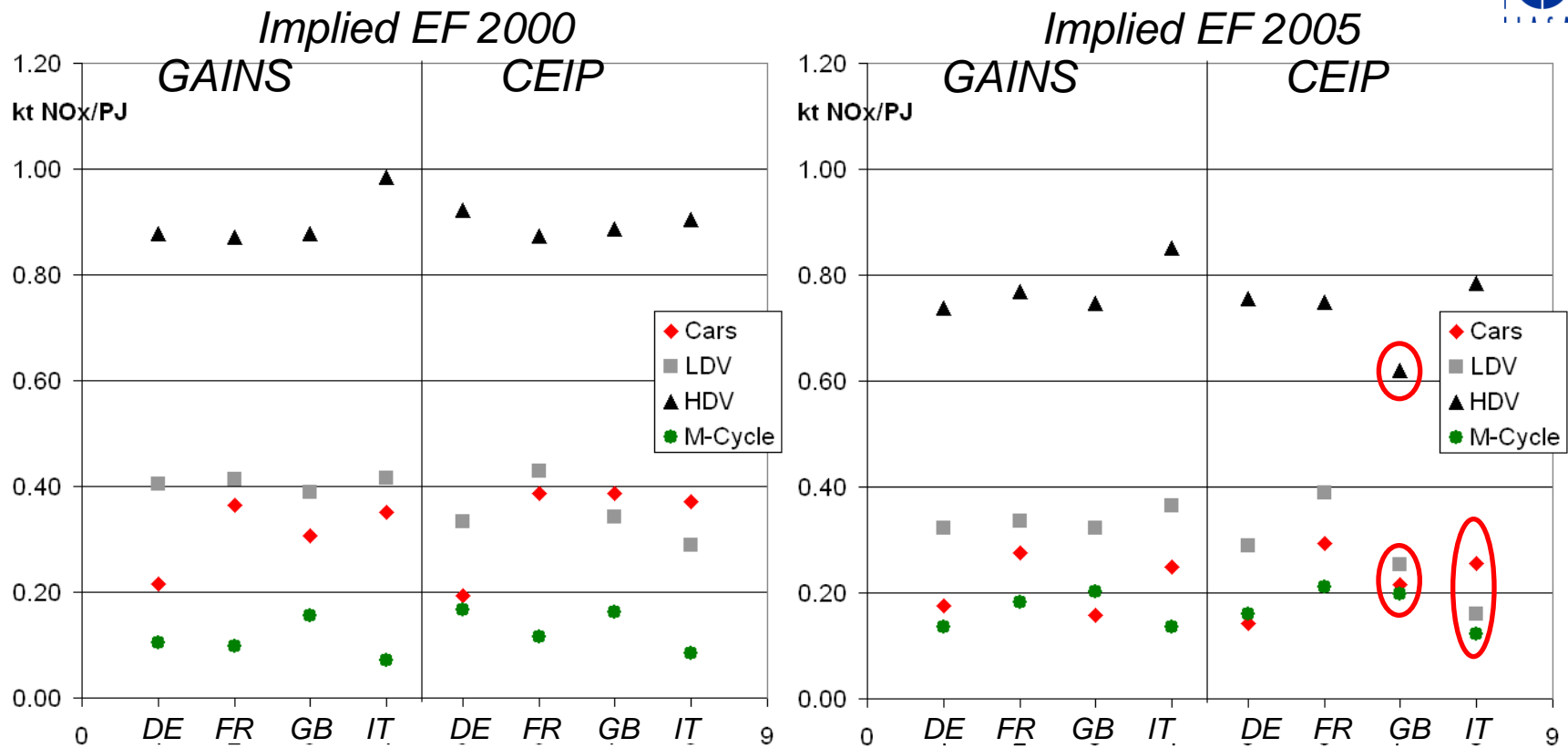
**Non-road transp. by country**



Where data available & consistent GAINS is calibrated to national emissions.

Data: GAINS „Goth Prot. Rev.“ National Baseline vs. CEIP submissions.

# Comparing implied emission factors

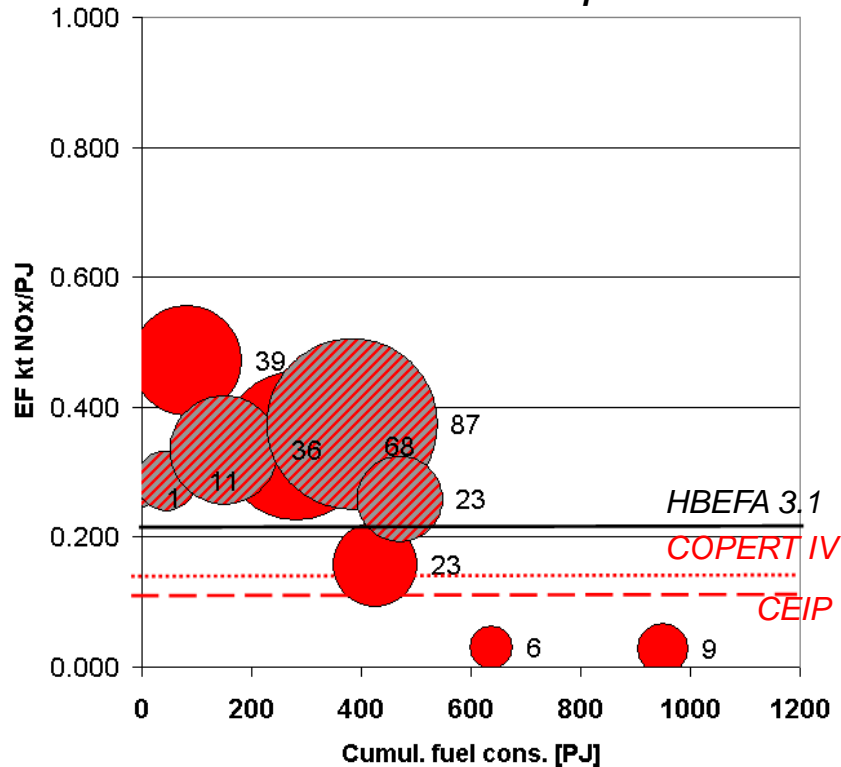


Data: GAINS „Goth Prot. Rev.“ National Baseline vs. CEIP submissions.

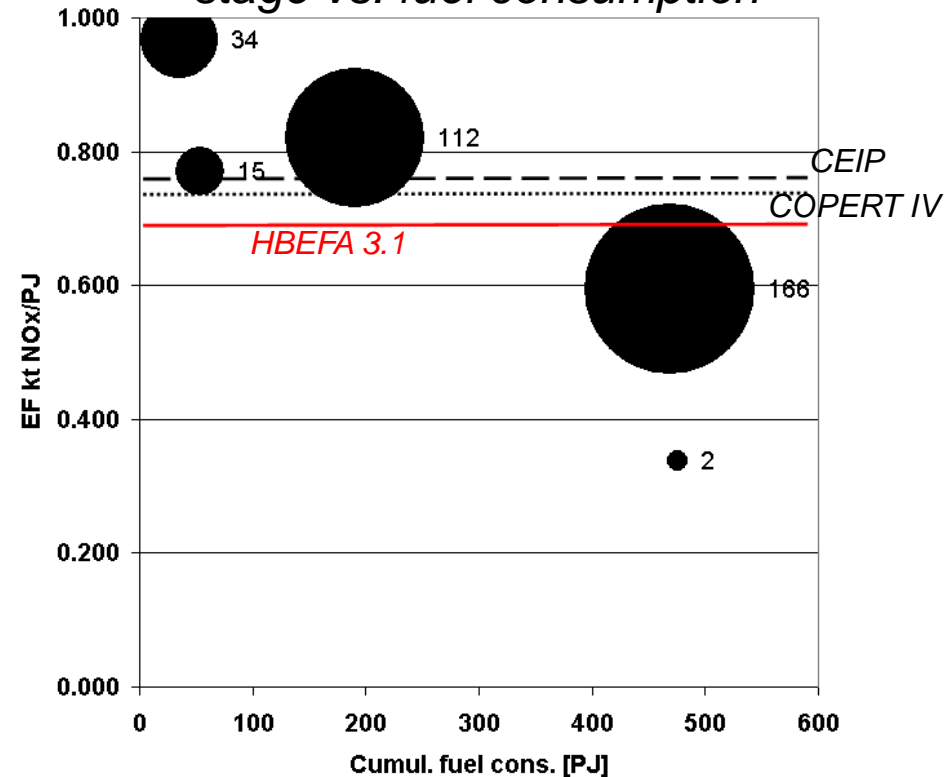
# COPERT IV vs. HB-EFA per technology (DE 2005)



**Cars: NO<sub>x</sub> EF by control stage vs. fuel consumption**



**Trucks: NO<sub>x</sub> EF by control stage vs. fuel consumption**



**AVG. EF COPERT IV VS. HBEFA 3.1: CARS: -18%, TRUCKS: +0% (here: DE 2005)**

*i.e. different assumptions about fleet mix (and possibly technology), notably share of NOC GSL cars and Euro II / III trucks*

*=> Differences in detailed EF = differences in approach and interpretation of base emission factors -> that needs to be resolved by the respective engineers.*