

Ricardo-AEA

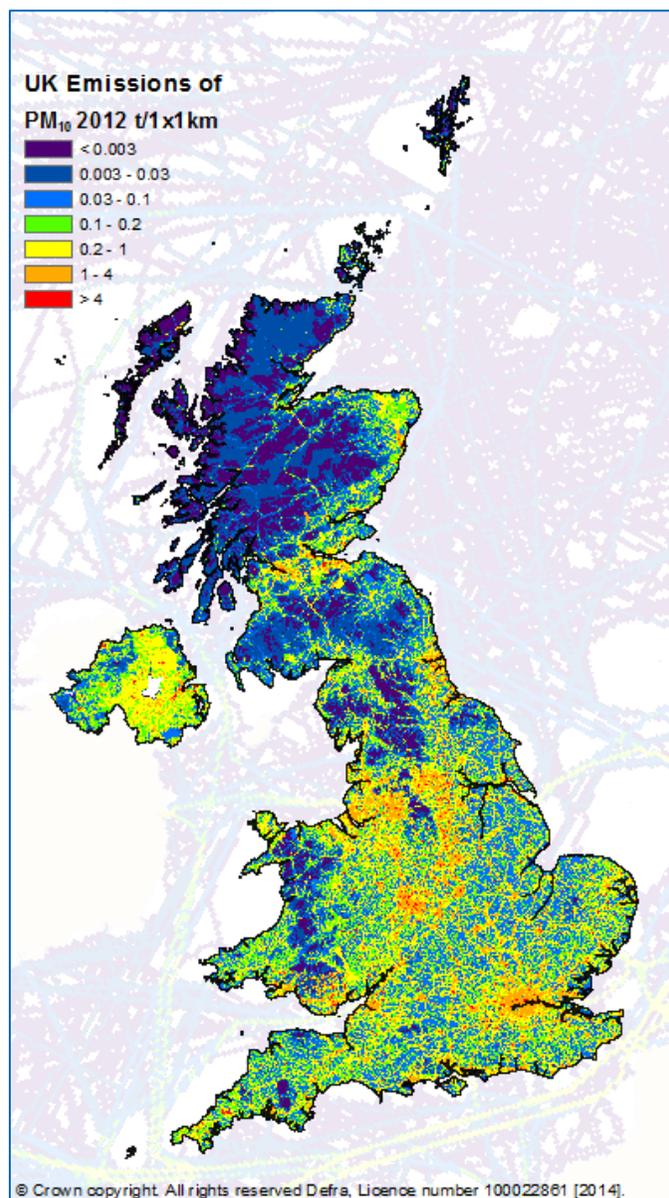
Testing the UK National Atmospheric Emissions Inventory (NAEI) with the FAIRMODE emissions tool

FAIRMODE Technical Meeting

25th of June 2015

WG2 - Emissions

Aveiro, Portugal



The National Atmospheric Emissions Inventory (NAEI) provides annual emission estimates for:

- **Acidification and eutrophication pollutants** – sulphur dioxide (SO₂), nitrogen oxides (NO_x), ammonia (NH₃), non-methane volatile organic compounds (NMVOC) and carbon monoxide.
- **Priority local air quality pollutants** – PM (PM₁₀, PM_{2.5}, PM_{0.1}), benzene, 1-3 butadiene and black carbon.
- **GHGs** – carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O) and F-gases.
- Heavy metals, POPs and base cations.

Emissions estimates available for the **UK** mainland, Crown dependencies and Overseas Territories. Provided as totals by sector and in a **1 km × 1 km** resolution (maps).

Evaluated Emissions Inventory: UK NAEI.

- Evaluated Version: 2009.
- Evaluated Pollutants: CO, NO_x, NH₃, PM₁₀, PM_{2.5}, SO₂, NMVOCs.
- 10 SNAP Sectors.

Reference Emissions Inventory: EC4MACS Inventory.

- Evaluated Reference Version: 2009.
- Evaluated Pollutants: CO, NO_x, NH₃, PM₁₀, PM_{2.5}, SO₂, NMVOCs.

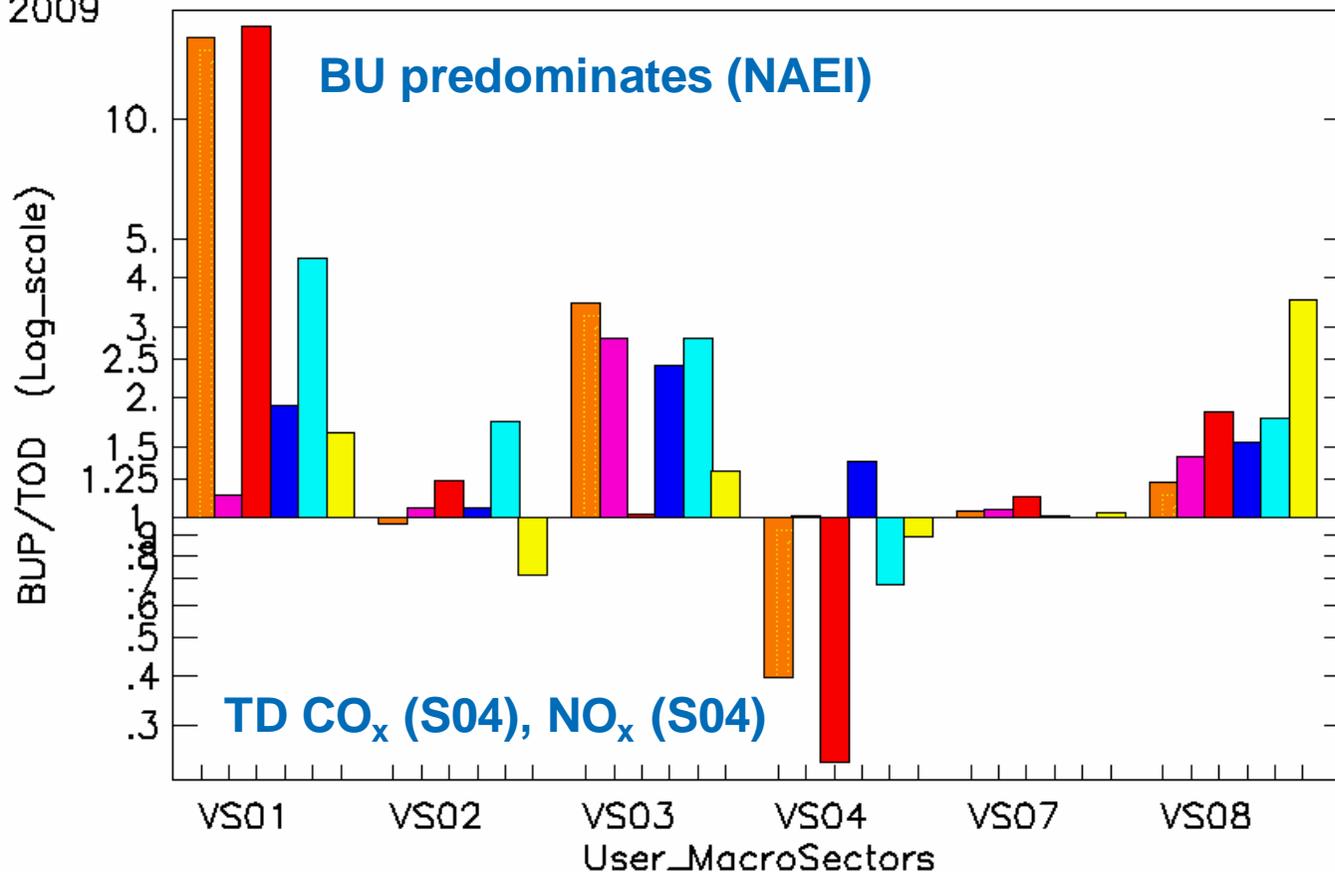
Emissions Tool Results

Bottom-up vs. Top-down bars.

BU_UK Ricardo AEA_info 2009
EC4MACS 2009

Emission BUP/TOD

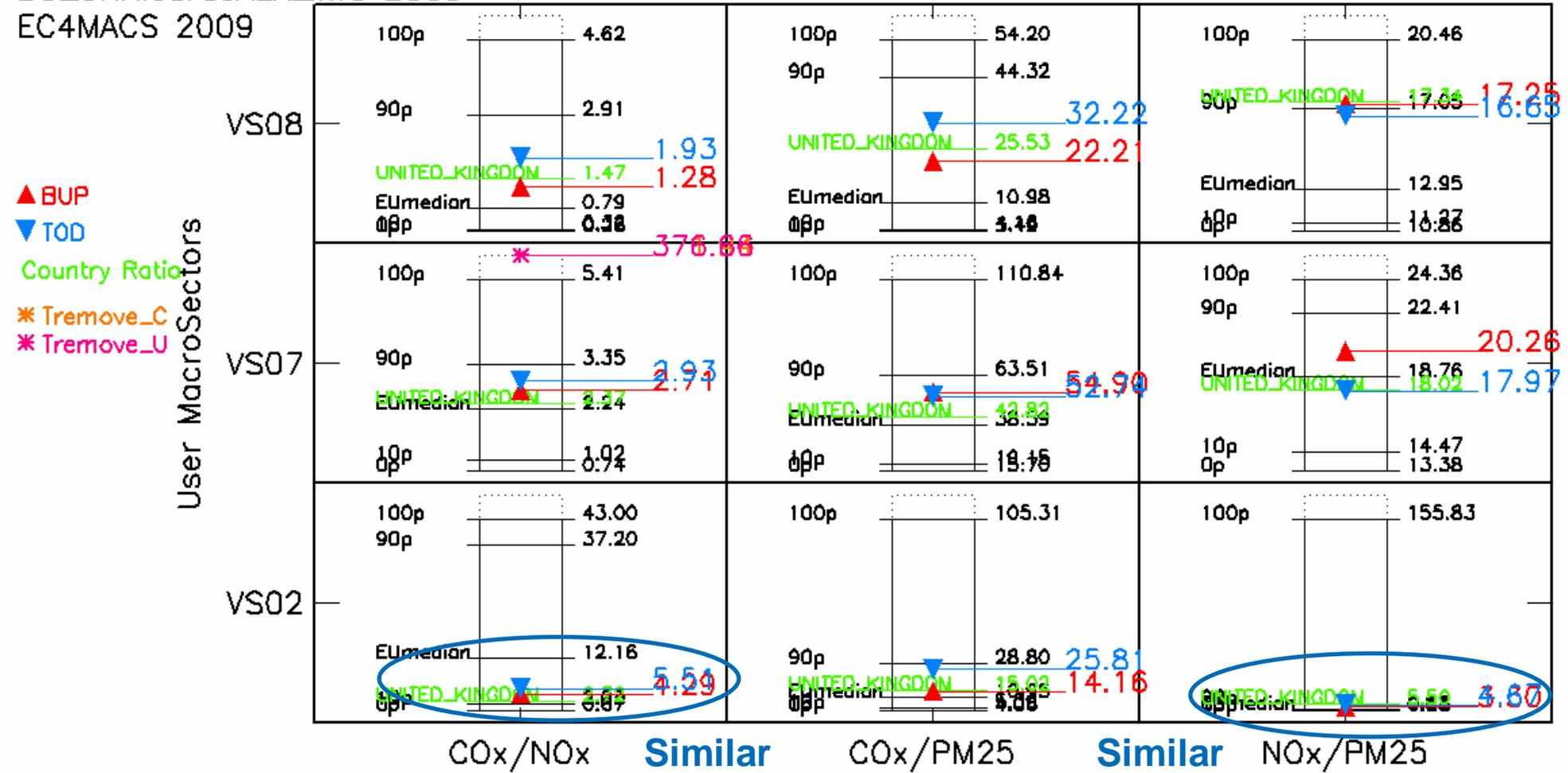
- CO_x
- NH₃
- NO_x
- PM₁₀
- PM₂₅
- S₀₂
- x NaValue



Emissions Tool Results

Bottom-up to Top-down ratios vs. GAINS.

BU_UK RicardoAEA_info 2009 RATIO (Pol1/Pol2) compared to GAINS_CountryRatios
 EC4MACS 2009

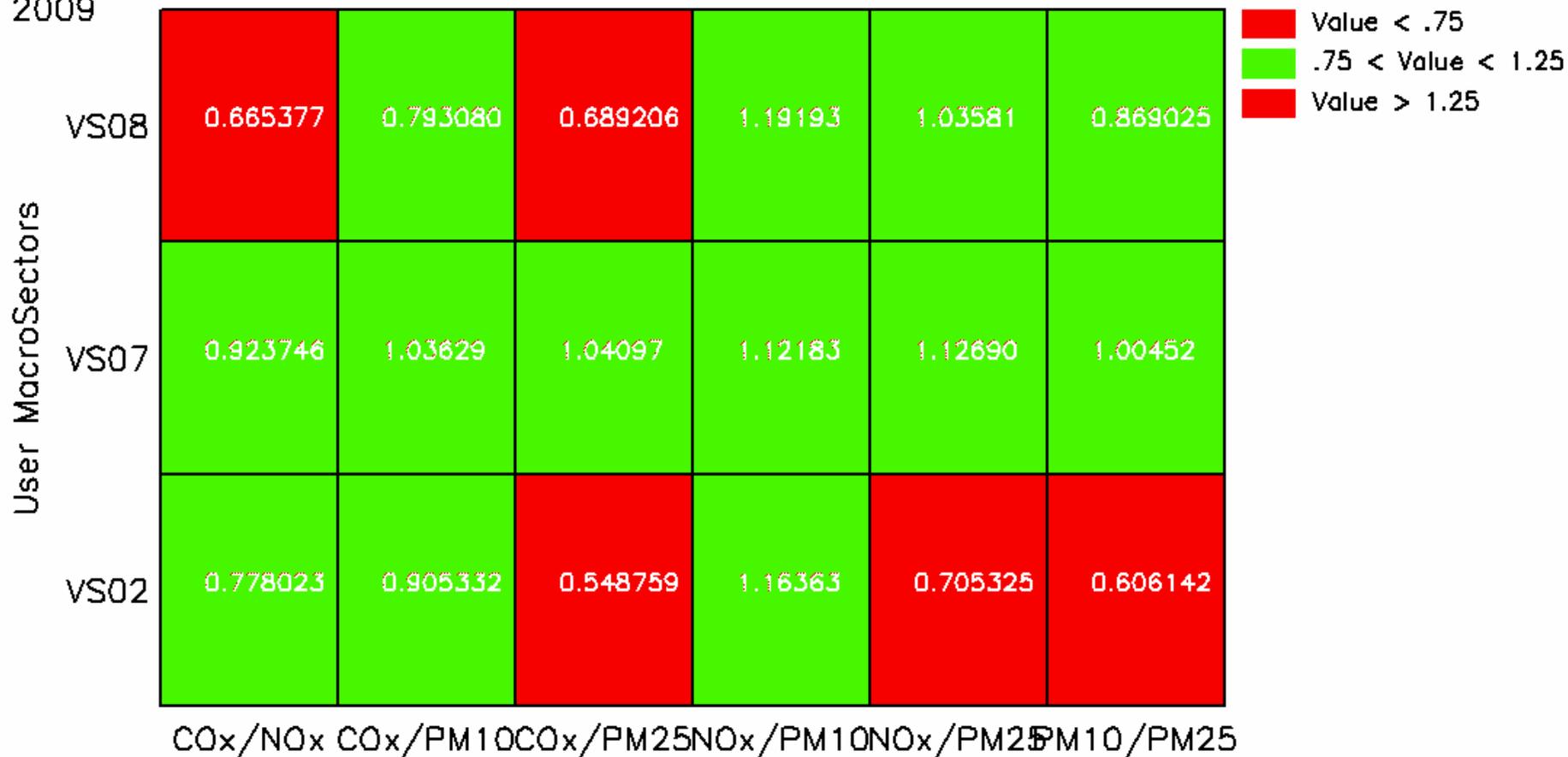


Emissions Tool Results

BU/TD ratios for pollutant ratios (ranges).

BU_UK Ricardo AEA_info 2009
EC4MACS 2009

BUP(PoI1 / PoI2) / TOD(PoI1 / PoI2)



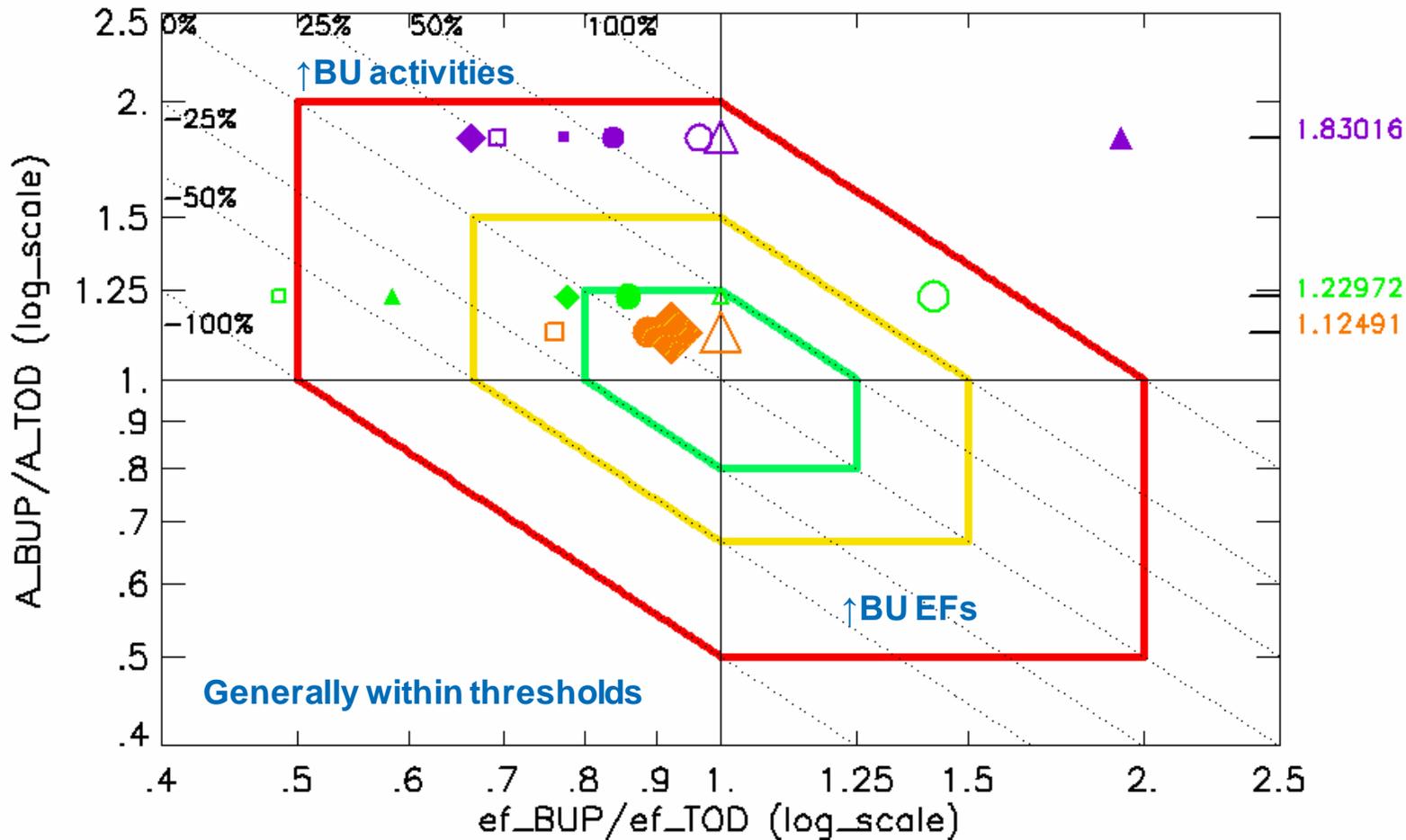
Emissions Tool Results

BU/TD diamond diagram

BU_UK Ricardo AEA_info 2009
 EC4MACS 2009

Emission Benchmark

- VS02
- VS07
- VS08
- ◆ COx
- NH3
- VOC
- △ NOx
- PM10
- PM25
- ▲ SO2

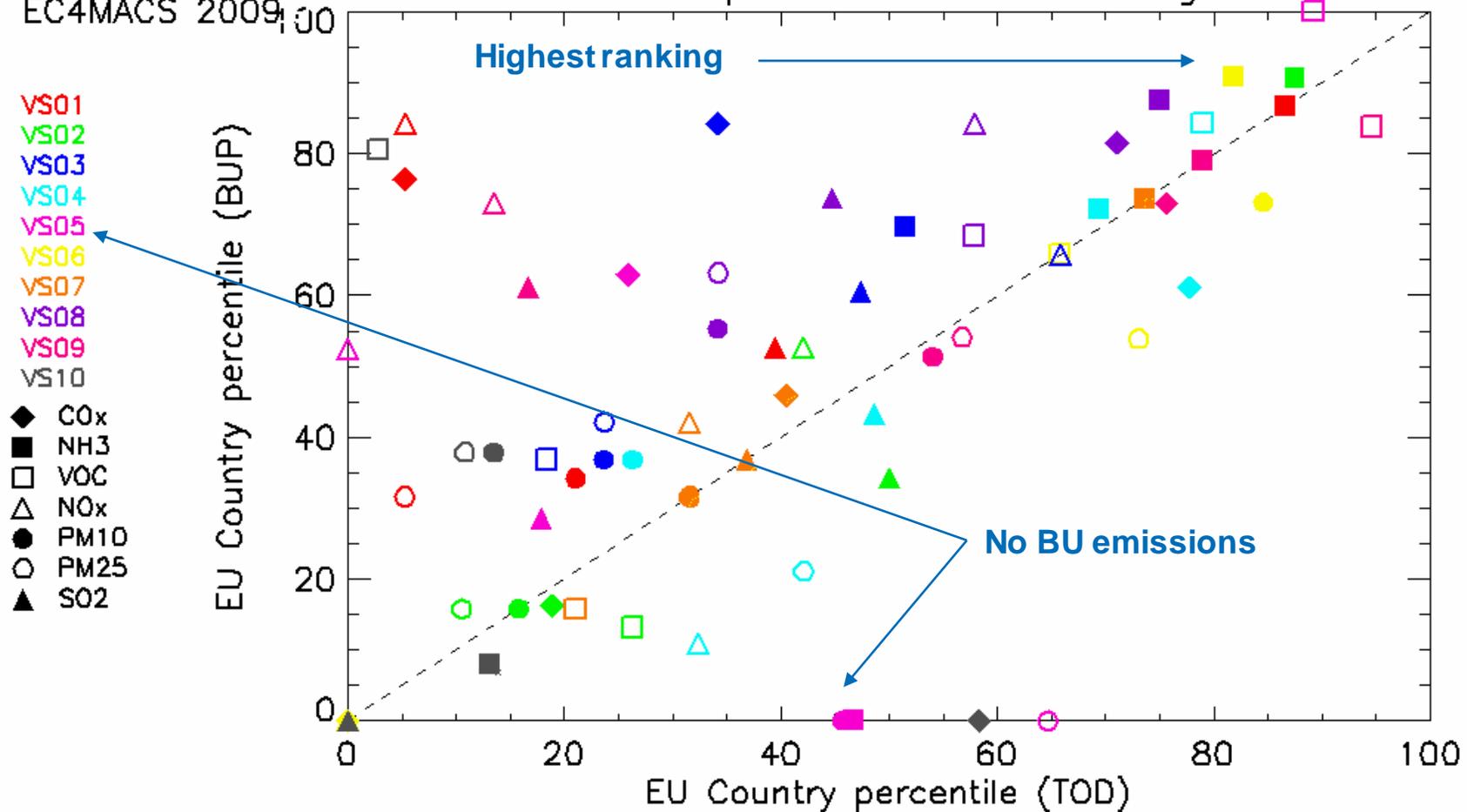


Emissions Tool Results

Per capita emission ranking.

BU_UK Ricardo AEA_info 2009
EC4MACS 2009_00

Per Capita Emission Ranking



Emissions Tool Results

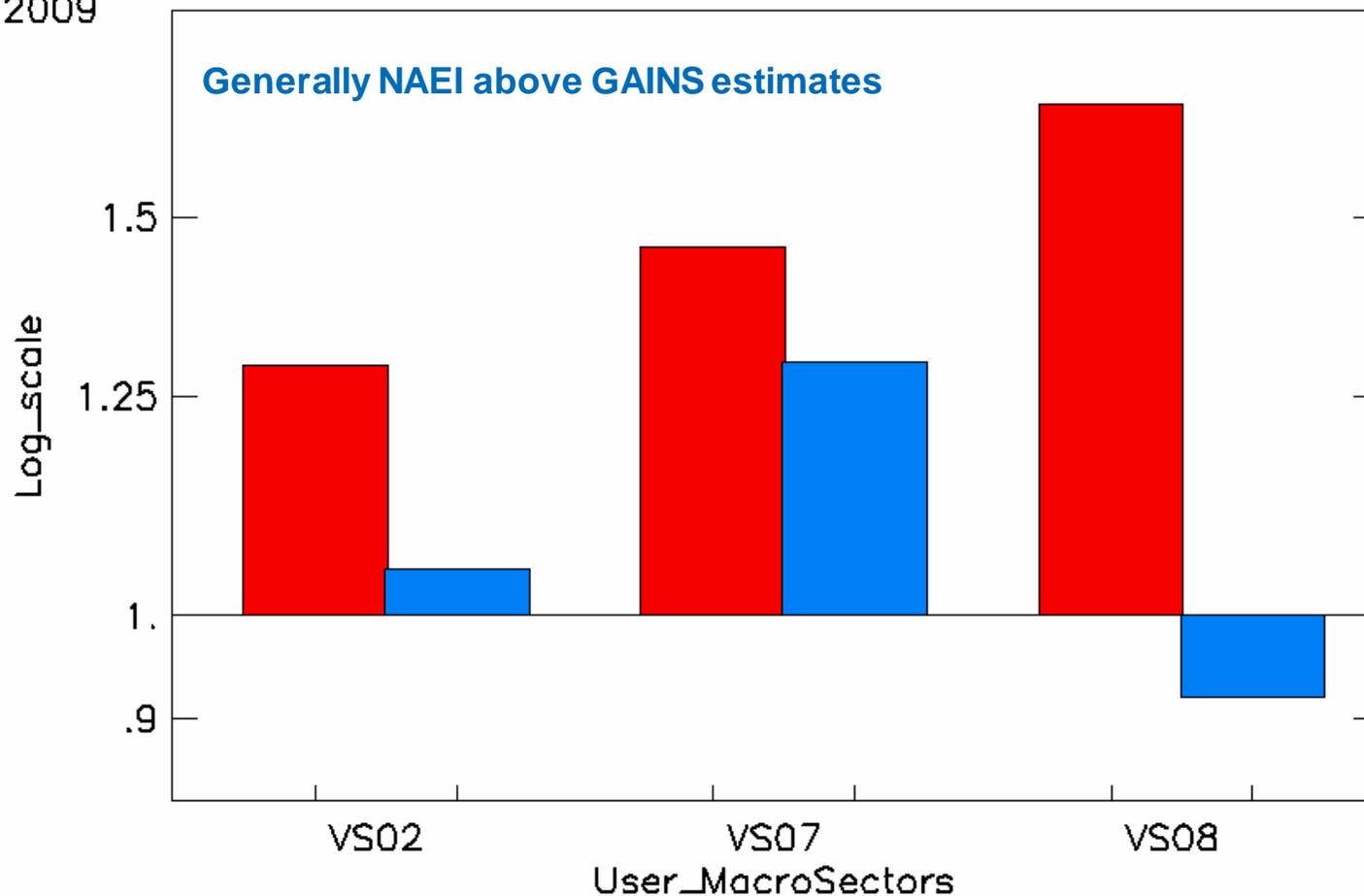
BU/TD ratios versus GAINS.

BU_UKRicardoAEA_info 2009

NOx Emissions vs GAINS

EC4MACS 2009

BUP/GAINS
TOD/GAINS
x NoValue



GAINS [kTon]:
VS02 52.2980
VS07 270.271
VS08 168.029

Tool usage feedback

- ✓ Simple and straightforward installation.
- ✓ Easy configuration of input files (inventories) – no NetCDF files!
- ✓ Simple running interface.
- ✗ Limited guidance on the plot types.
- ✗ Limited information on the significance of the indicators in the plot (ranges, thresholds, etc.).
- ✗ Limited technical documentation.

Other aspects

- It is hard to gather what value there is from using the tool for air quality assessment (and other applications).
- Comparison for a non-current inventory is also of very limited value.

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