European Commission

Eurostat's work on the Raw Material Consumption indicator

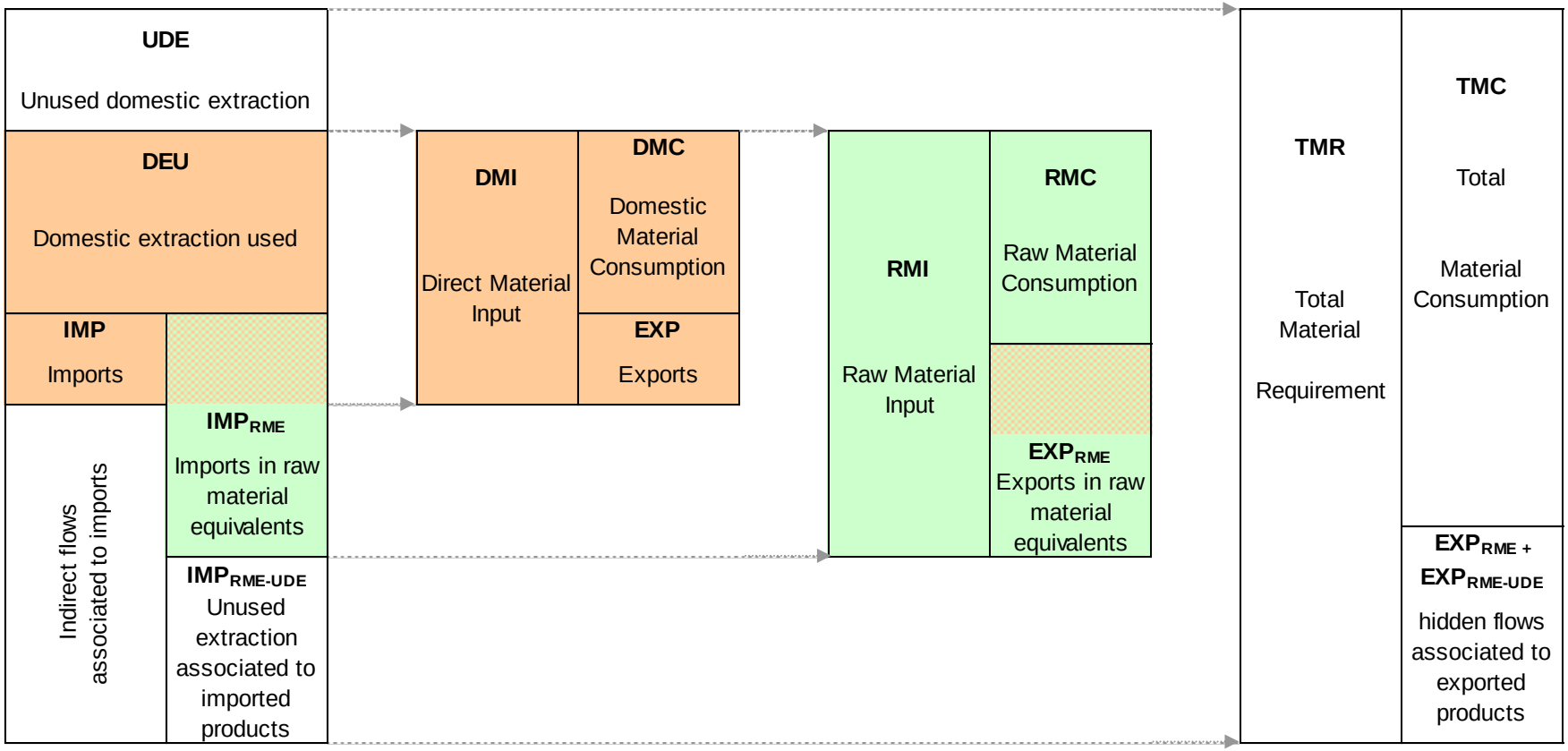
Stephan Moll, Eurostat

EEA webinar on RMC
5 December 2014

Overview

1. Economy-wide material flow accounts (EW-MFA) and derived indicators
2. Pros & cons of DMI & DMC ('direct flows')
3. Pros & cons of RMI & RMC ('raw material equivalents')
4. Illustrative examples

EW-MFA indicators (material inputs)



covered by legal base (Regulation No 691/2011 on European Environmental Economic Accounts)

estimated by Eurostat (aggregated EU27)

not available in European Statistical System

EW-MFA indicator production

- Eurostat produces DMC, DMI on legal basis (annual questionnaire)
  - Official statistics: data quality can be improved
- RMC, RMI is estimated for EU27 (Eurostat's RME model)
  - No standard estimation method: data quality not assessable
- Five EU Member States work on country level RMC estimates
  - DE, FR, IT, NL (UK excl. fossil energy materials)

DMI & DMC ('direct')
pros

- **defined in the same way as other physical production factors (e.g. energy, greenhouse gas emissions)**
- **portrays 'direct' material flows in the national economy (manageable nationally)**
- **official statistics (legal base)**
- **can be compiled timely (early estimates T+9m established)**
- **accuracy is considered high**

DMI & DMC ('direct')
cons

- **'Asymmetry':** countries replacing domestic extraction by imports of semi-manufactured and finished goods are better off (smaller DMC)
- **=> Country benchmarks: difficult, limited**
- **no 'footprint'-type indicator: does not show material extractions abroad due to domestic final use of products**

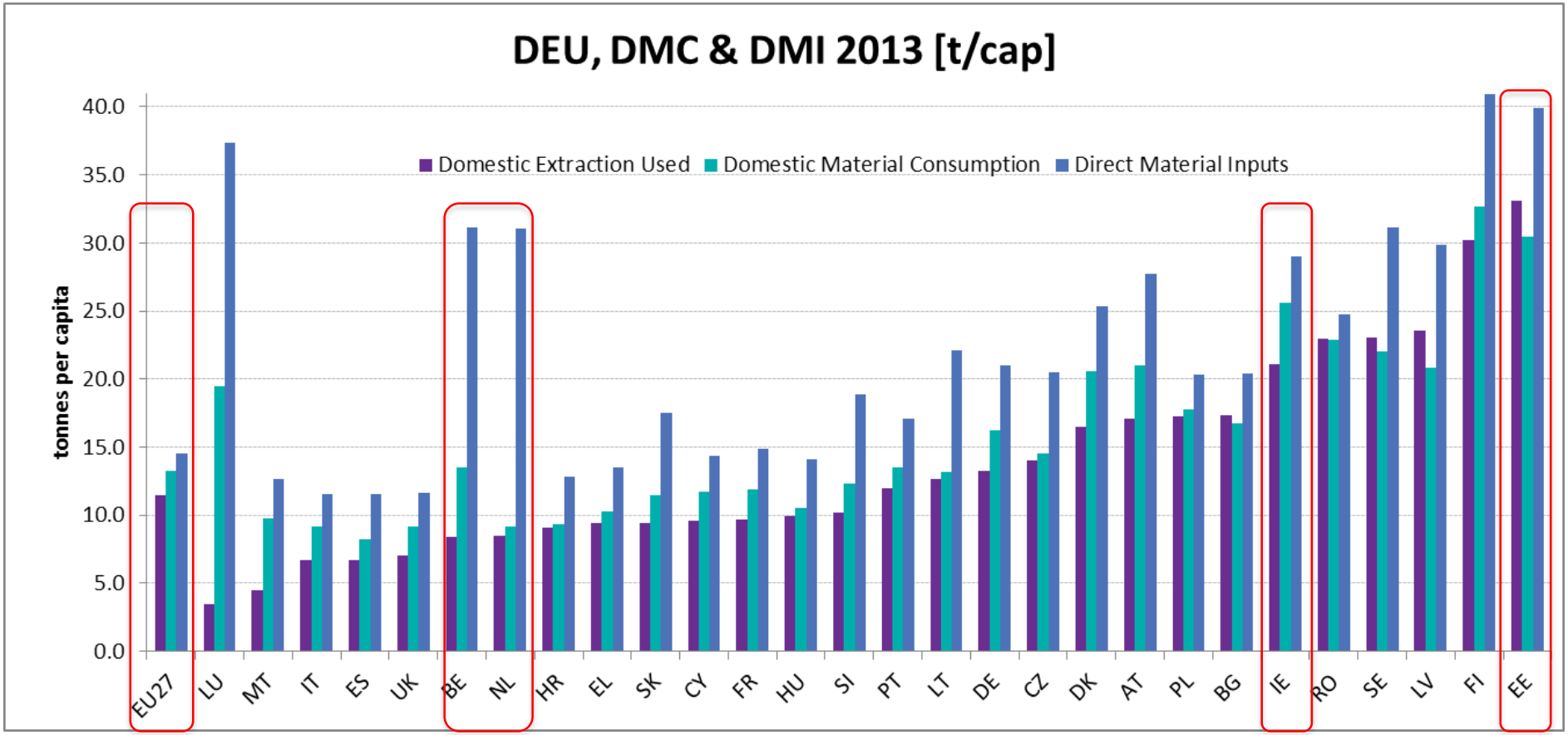
RMI & RMC ('raw material equivalents') pros

- **'Symmetric':** imports and exports are measured in the same 'unit' as domestic extraction
- **=> Country benchmarks: better to interpret**
- **'footprint'-type indicator: does show material extractions abroad due to domestic final use of products**

RMI & RMC ('raw material equivalents') cons

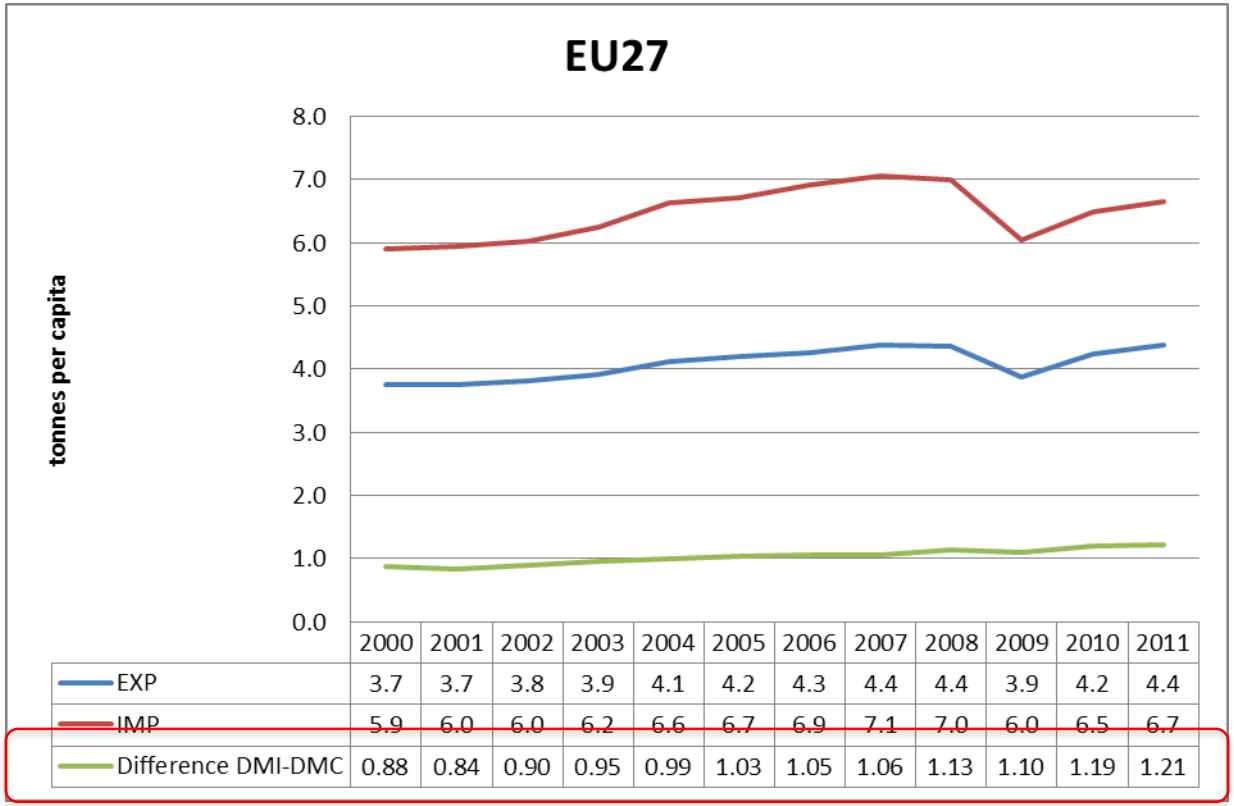
- **portrays partly 'virtual' material flows in the rest of the world (not directly manageable)**
- **no official statistics (estimates, modelling)**
- **no standard methodology established**
- **cannot be compiled timely**
- **accuracy is low** (results vary across estimation methodologies)
- **the more disaggregated (geo, material) => lower accuracy**

'Direct' material flow indicators


DEU, DMC & DMI 2013 [t/cap]
Domestic Extraction Used
Domestic Material Consumption
Direct Material Inputs
tonnes per capita
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
EU27
LU
MT
IT
ES
UK
BE
NL
HR
EL
SK
CY
FR
HU
SI
PT
LT
DE
CZ
DK
AT
PL
BG
IE
RO
SE
LV
FI
EE

DMI versus DMC

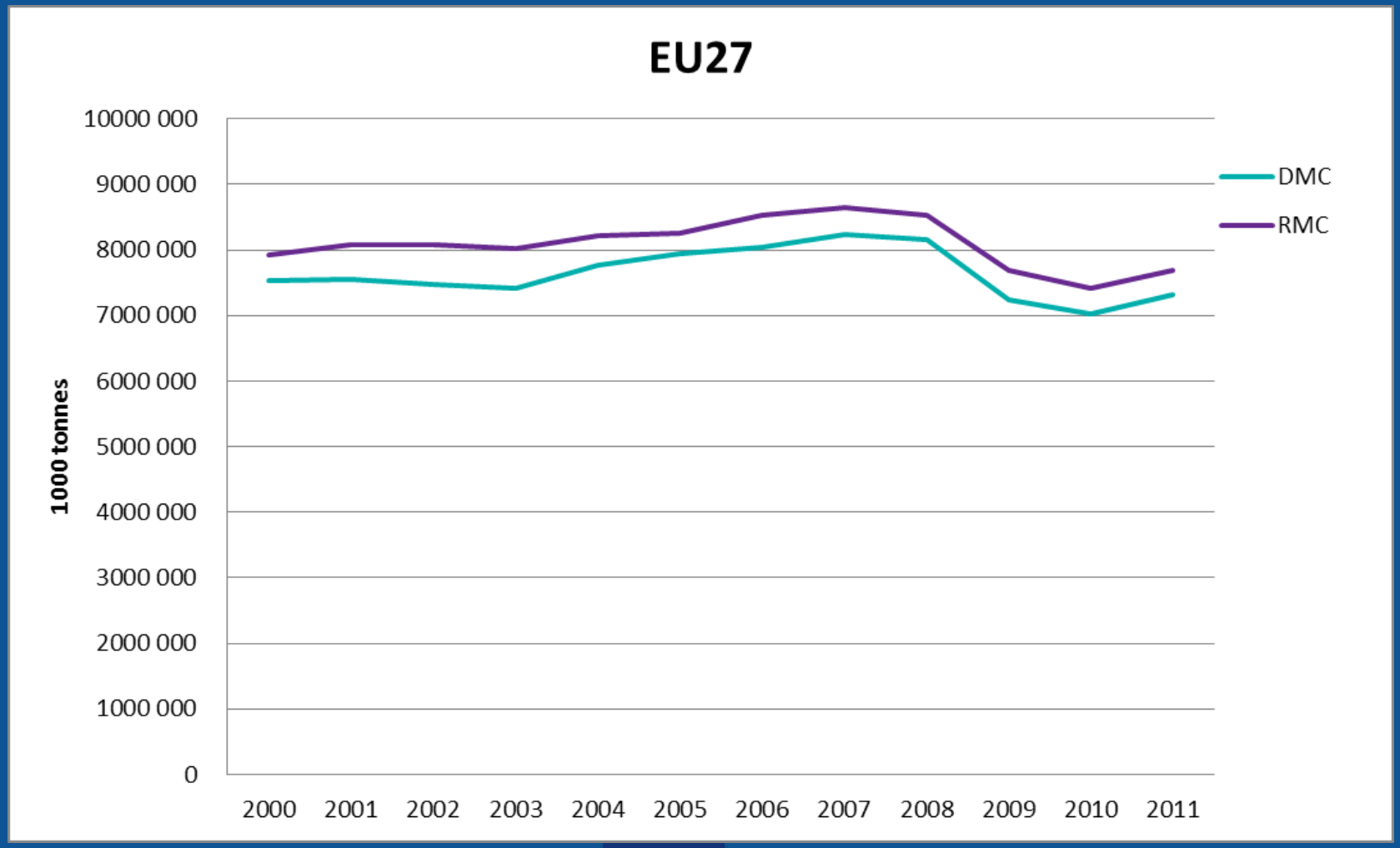
- DMI grows faster than DMC due to increased trade



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
EXP	3.7	3.7	3.8	3.9	4.1	4.2	4.3	4.4	4.4	3.9	4.2	4.4
IMP	5.9	6.0	6.0	6.2	6.6	6.7	6.9	7.1	7.0	6.0	6.5	6.7
Difference DMI-DMC	0.88	0.84	0.90	0.95	0.99	1.03	1.05	1.06	1.13	1.10	1.19	1.21

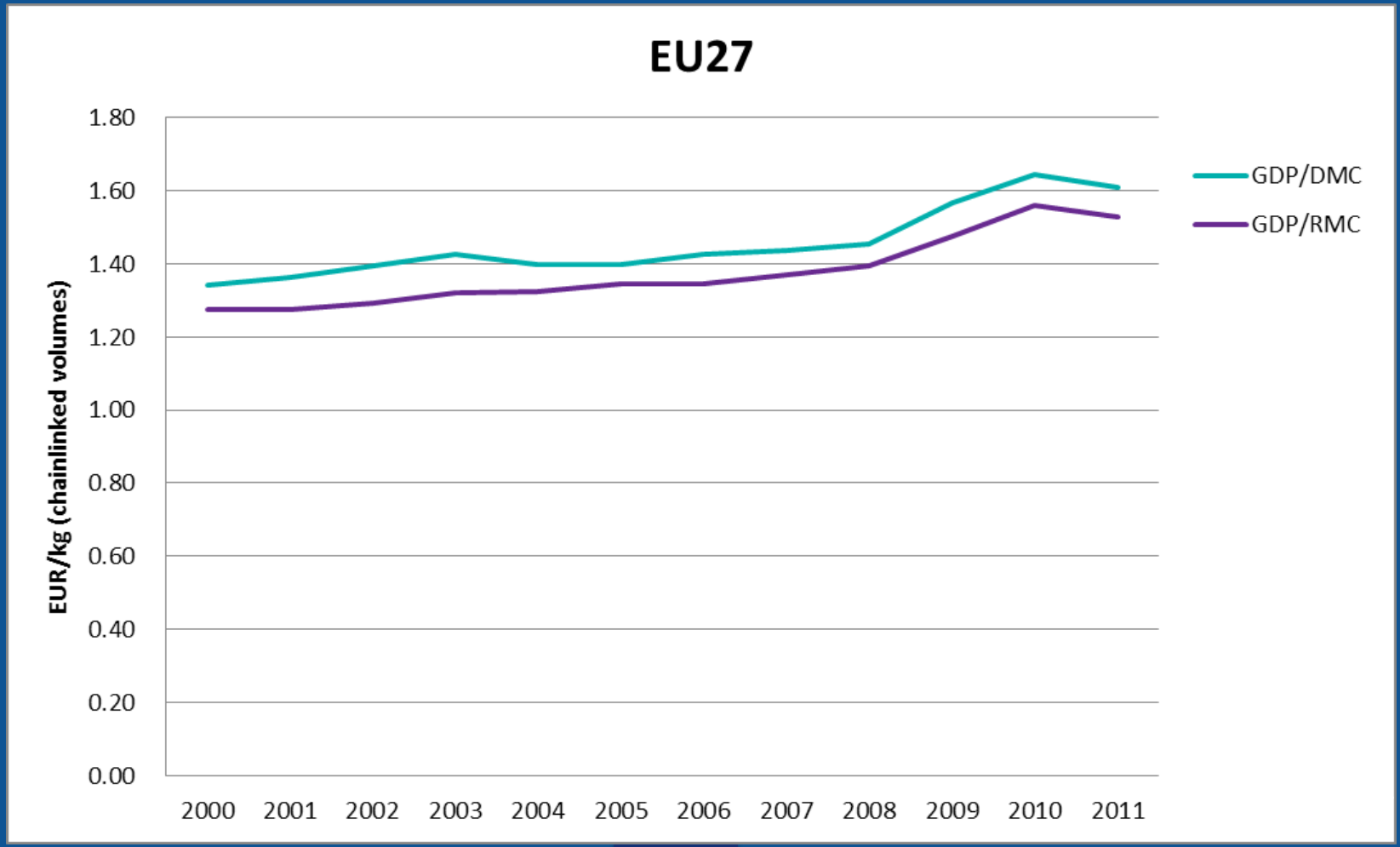
'Direct' versus 'raw material equivalents'

DMC versus RMC

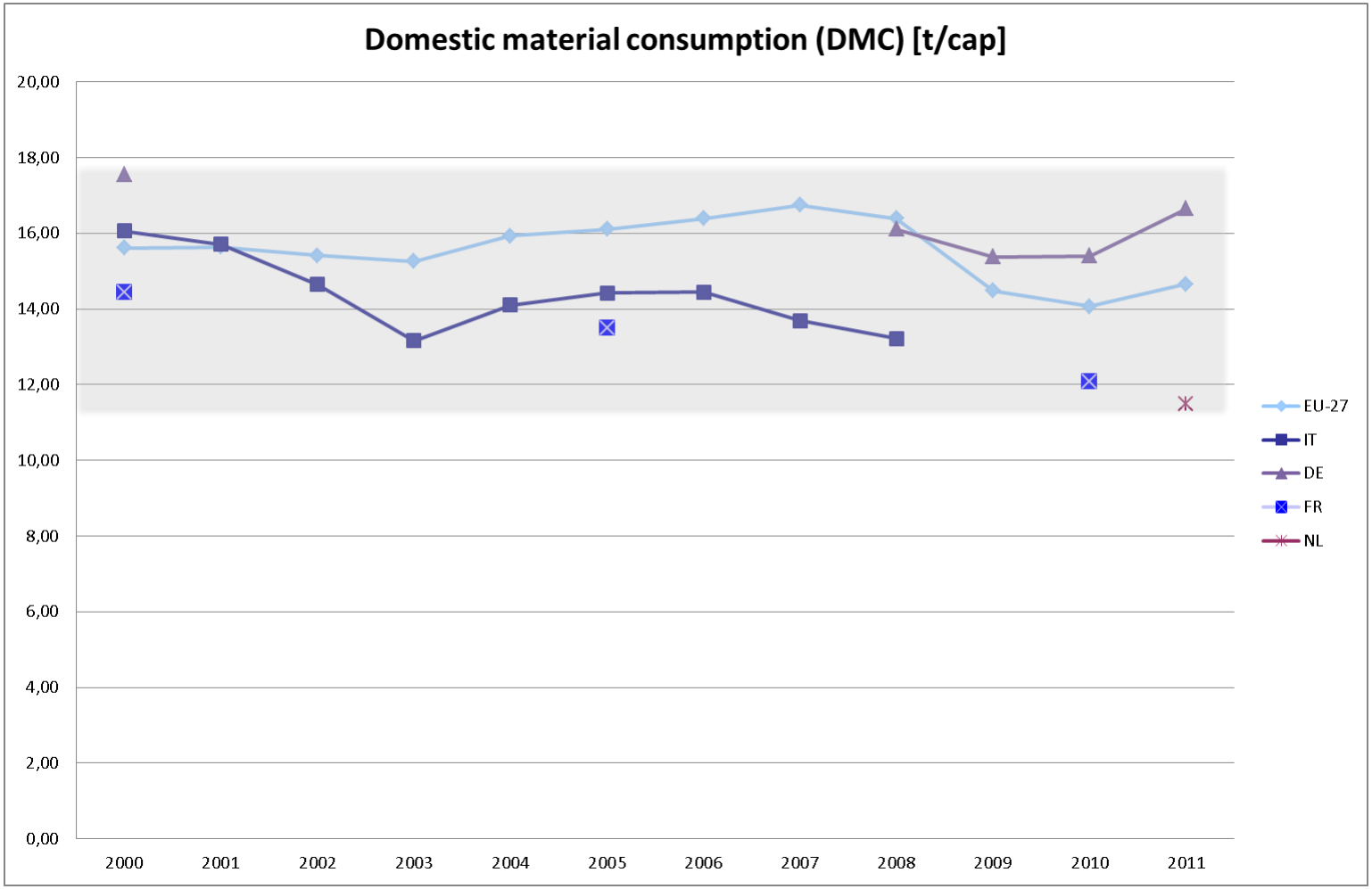


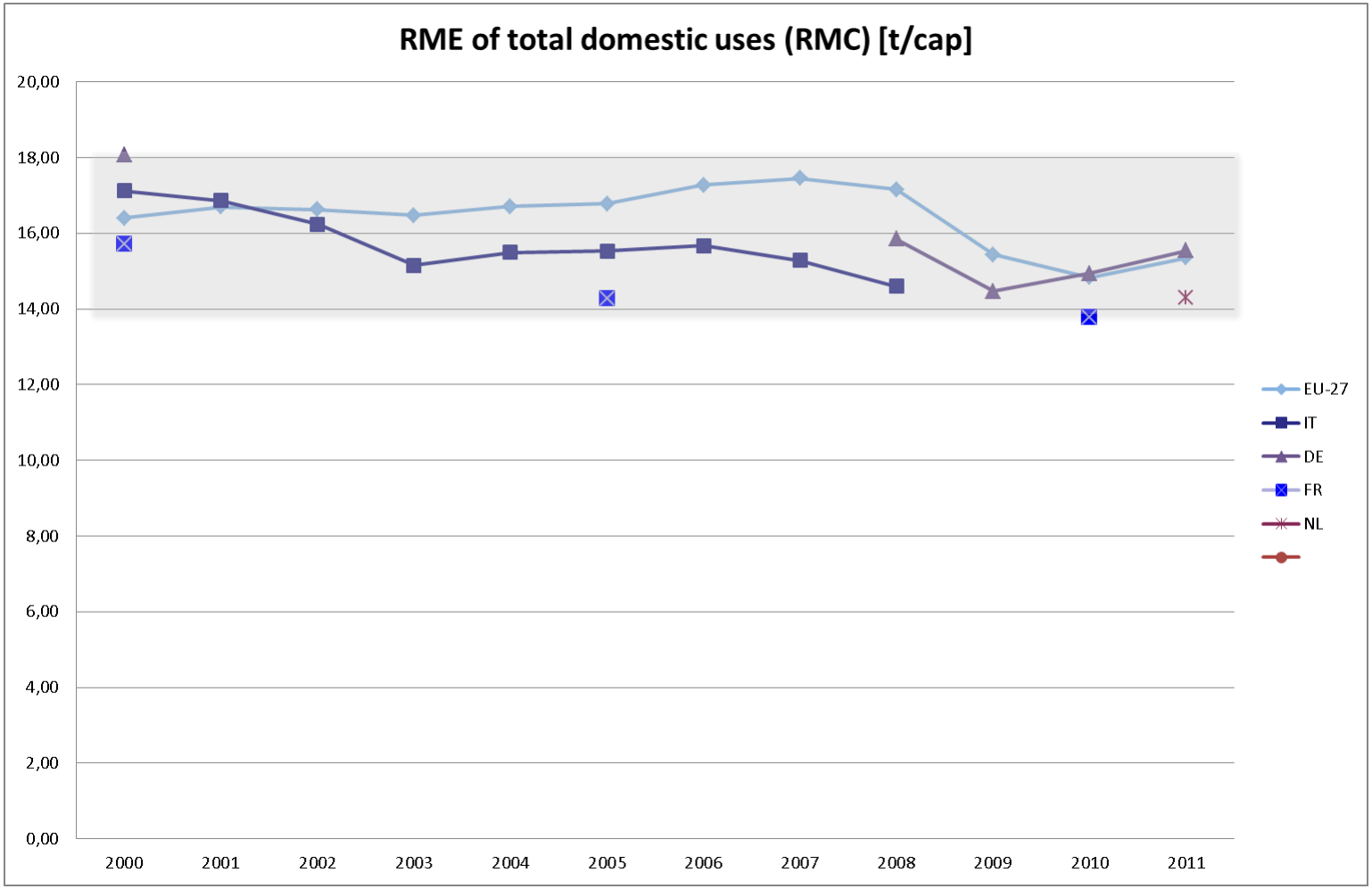
Eurostat

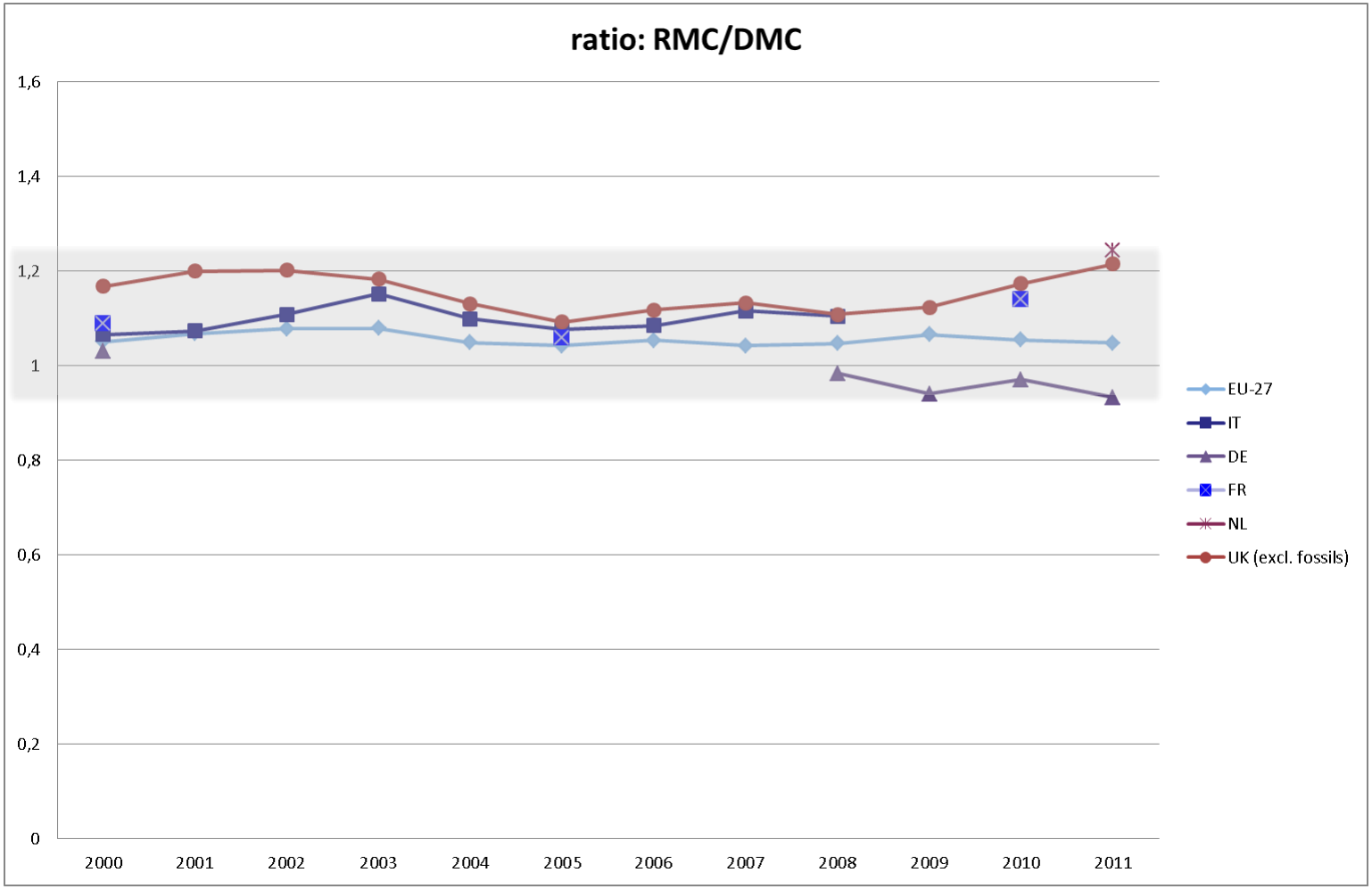
GDP/DMC versus GDP/RMC

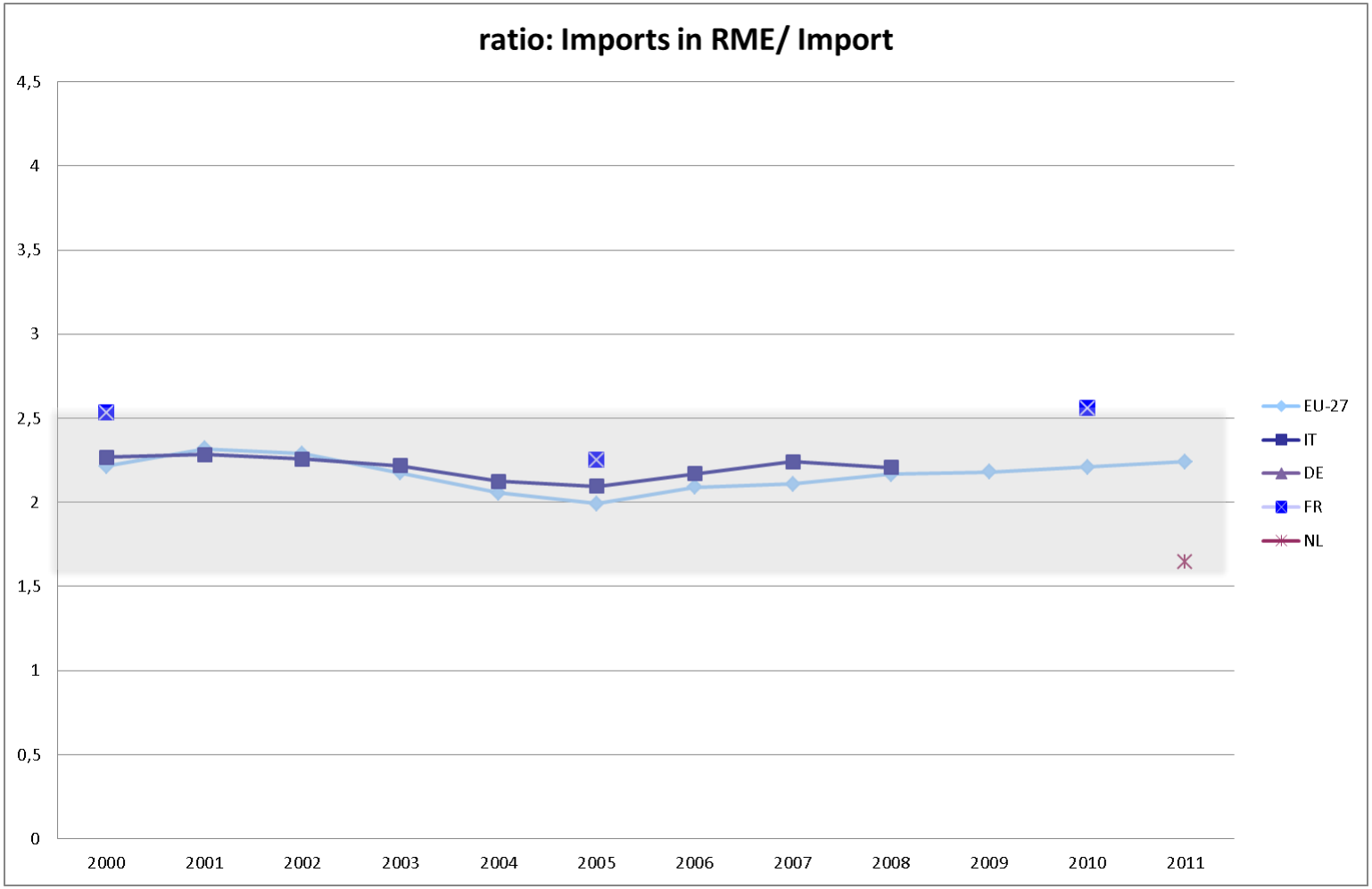


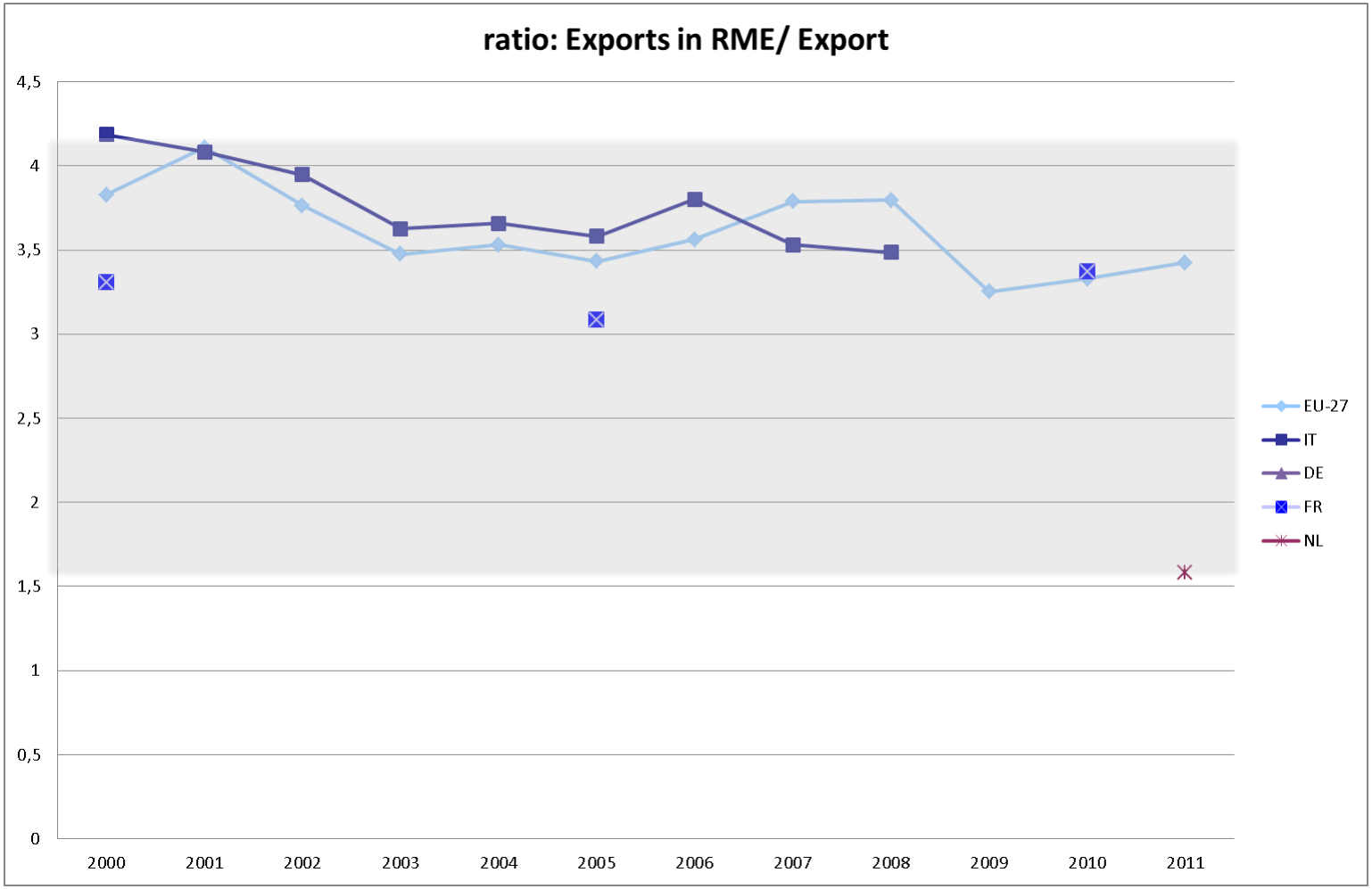
Eurostat

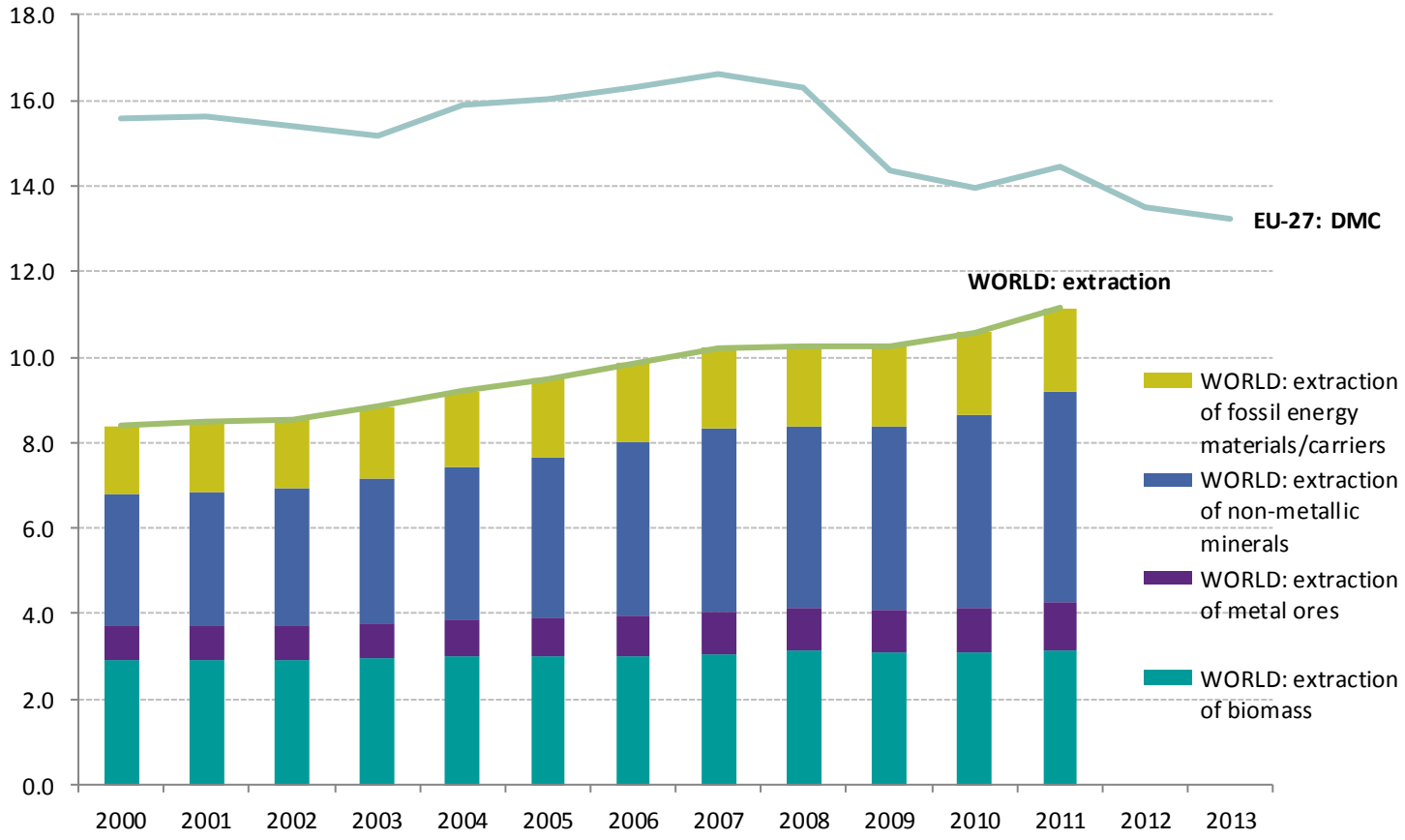

Domestic material consumption (DMC) [t/cap]
20,00
18,00
16,00
14,00
12,00
10,00
8,00
6,00
4,00
2,00
0,00
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
EU-27
IT
DE
FR
NL


RME of total domestic uses (RMC) [t/cap]
20,00
18,00
16,00
14,00
12,00
10,00
8,00
6,00
4,00
2,00
0,00
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
EU-27
IT
DE
FR
NL

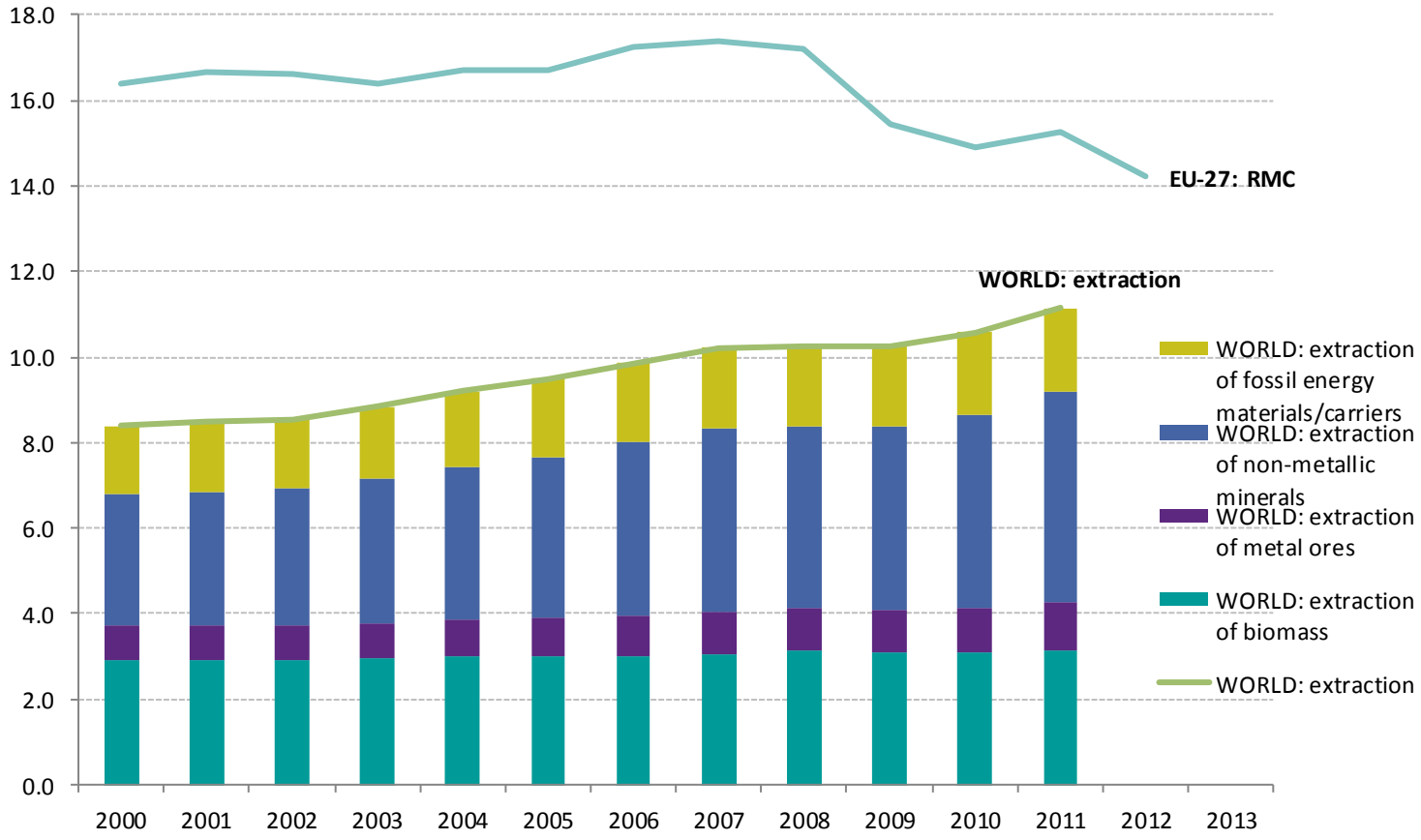

ratio: RMC/DMC
1,6
1,4
1,2
1
0,8
0,6
0,4
0,2
0
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
EU-27
IT
DE
FR
NL
UK (excl. fossils)


ratio: Imports in RME/ Import
4,5
4
3,5
3
2,5
2
1,5
1
0,5
0
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
EU-27
IT
DE
FR
NL


ratio: Exports in RME/ Export
4,5
4
3,5
3
2,5
2
1,5
1
0,5
0
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
EU-27
IT
DE
FR
NL



Source: Eurostat (env_ac_mfa, demo_gind), SERI and WU Global Material Flows Database (www.materialflows.net)



Source: Eurostat (env_ac_mfa), SERI and WU Global Material Flows Database (www.materialflows.net), and United Nations

RMC estimates EU - various models

RMC estimates

EU27, tonnes per capita, year = 2007

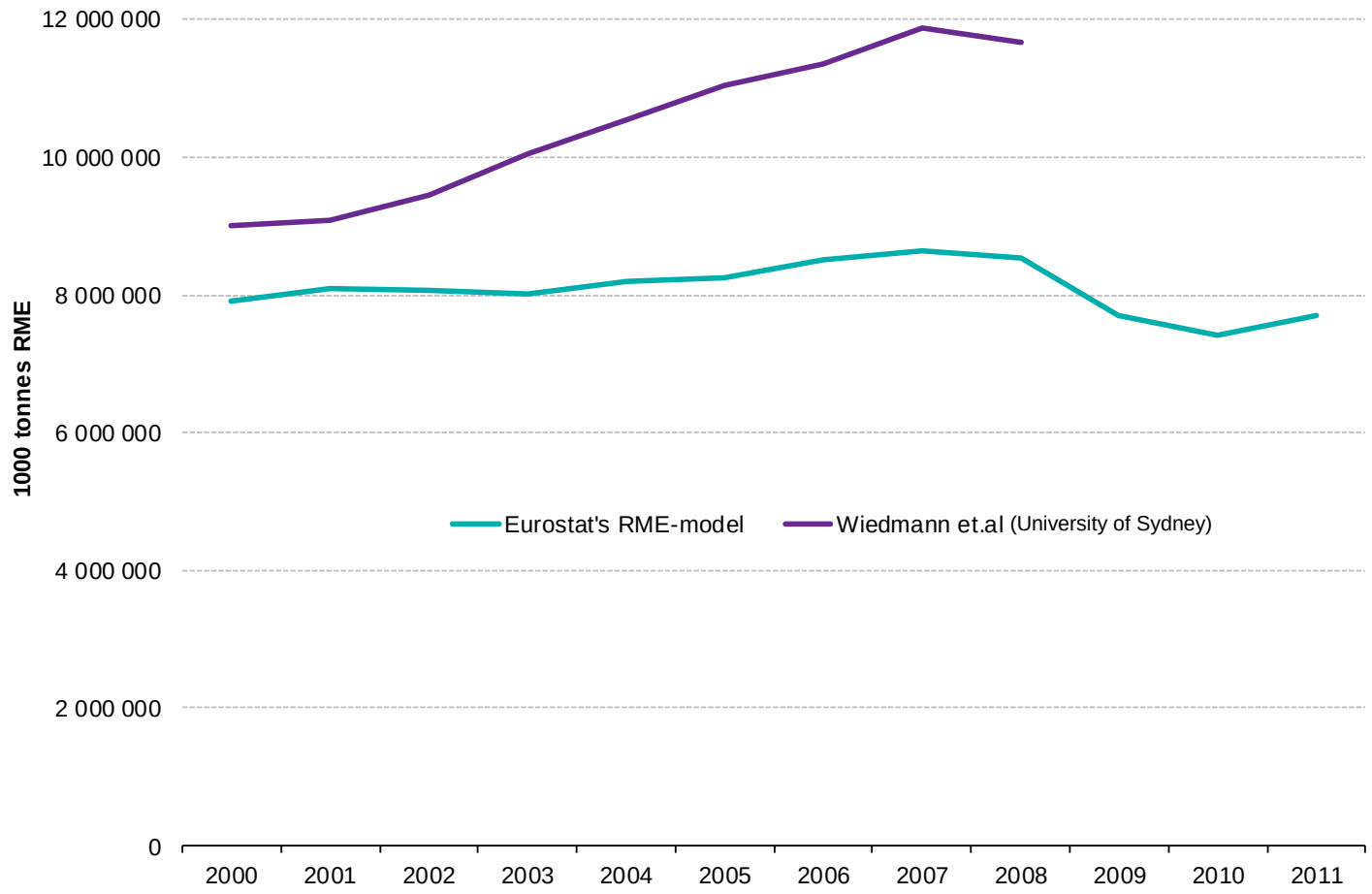
Extended Hybrid Input-Output model (single region)

- Eurostat's RME model: 17,5

Multiregional global Input-Output models

- WIOD (7th Framework Programme): 20.6
- EXIOBASE (6th Framework Programme): 21.2
- EORA (University of Sidney): 23.4

Comparison of RMC estimates for aggregated EU-27 economy



Data sources for RME accounts

- IMP_RME, EXP_RME, RMC, RMI:
  - EU27: Eurobase, Eurostat RME model, 2013
  - IT: personal communication Renato Marra, Feb 2014
  - FR: personal communication Jean-Louis Pasquier, Feb 2014 (French leaflet)
  - NL: personal communication Roel Delahaye, Feb 2014,
  - UK: UK Environmental Accounts, 2013 (excl. fossils)
  - DE: personal communication Sven Kaumanns, Jun 2014