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# Cross Border Trade of Used M1 and N1 Vehicles in the EU



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## Cross Border Trade of Used M1 and N1 Vehicles in the EU

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# Background and Aim of the Study

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The study has been commissioned by the EC with the aim to support

- better forecast of the national fleet composition and
- better modeling / forecast of emissions caused (or resources used) by M1 and N1 vehicles. (DG Climate Action) for instance for models like REMOVE and
- better understanding of the whereabouts of ELVs and the surprising low numbers of ELVs/CoDs reported (DG.ENV)

# Sources

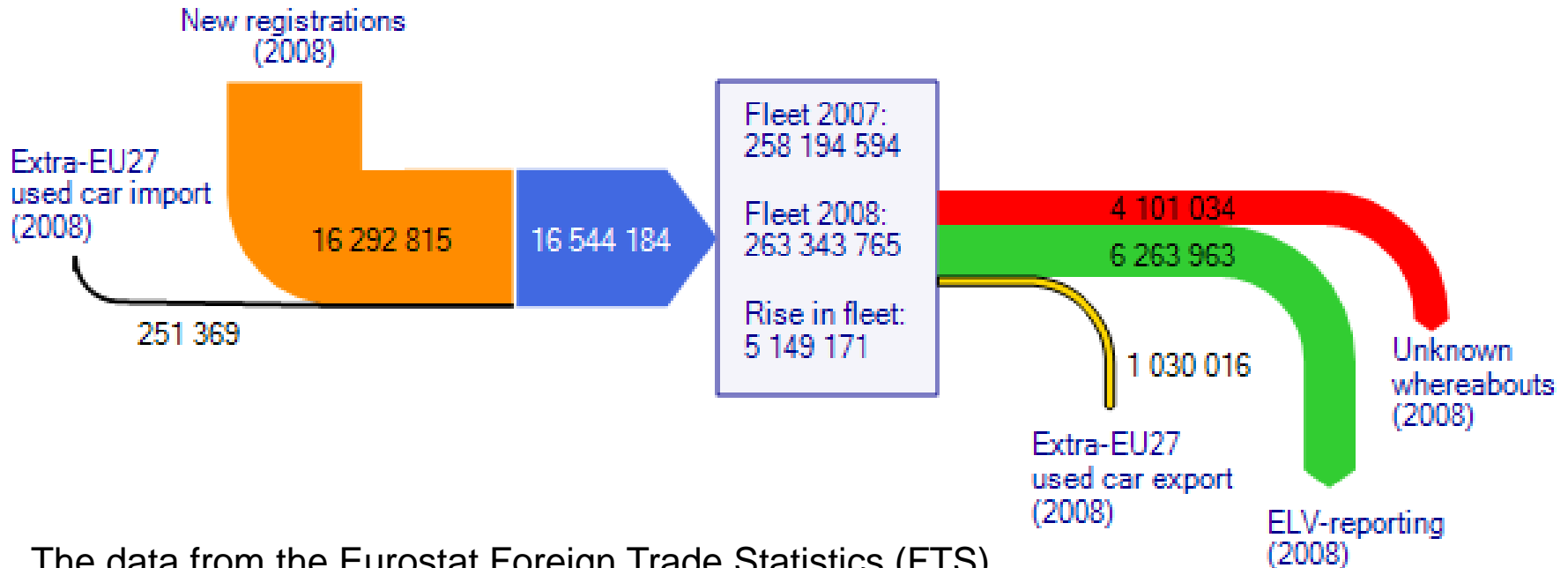
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- International Sources as Eurostat or ACEA
  - Extra EU-Trade
  - Intra EU Trade
- National Sources
- Commercial Sources as for instance POLK

# Extra EU Trade: Balance 2006 - 2007

	2005	2006	2007	2008	Source
FLEET (as per end of year)					
M1	220 223 000	224 676 000	229 764 000	234 081 000	1)
N1	26 862 088	27 740 738	28 430 594	29 262 765	2)
<b>Sum</b>	<b>247 085 088</b>	<b>252 416 738</b>	<b>258 194 594</b>	<b>263 343 765</b>	
Change in fleet (t-t <sub>1</sub> )					
<b>M1 + N1</b>		<b>5 331 650</b>	<b>5 777 856</b>	<b>5 149 171</b>	
EXPORT - extra-EU27					
M1	721 636	899 835	1 155 614	892 739	3)
N1	138 272	163 958	143 019	137 277	4)
<b>Sum</b>	<b>859 908</b>	<b>1 063 793</b>	<b>1 298 633</b>	<b>1 030 016</b>	
IMPORT - extra-EU27					
M1	189 336	229 938	227 112	241 408	3)
N1	8 084	9 416	10 001	9 961	4)
<b>Sum</b>	<b>197 420</b>	<b>239 354</b>	<b>237 113</b>	<b>251 369</b>	
New Registrations					
M1	15 148 700	15 450 400	15 605 000	14 361 600	1)
N1	2 014 240	2 021 116	2 151 202	1 931 215	5)
<b>Sum</b>		<b>17 471 516</b>	<b>17 756 202</b>	<b>16 292 815</b>	
ELV - reporting					
<b>ELV (M1 + N1)</b>		<b>5 972 591</b>	<b>6 495 167</b>	<b>6 263 963</b>	6)
UNKNOWN whereabouts					
Unknown (M1 + N1) ( new Reg + Imp. - Exp. - Fleet Change - ELV )		<b>5 342 836</b>	<b>4 421 659</b>	<b>4 101 034</b>	

# Extra EU Trade: Flow chart for 2008



The data from the Eurostat Foreign Trade Statistics (FTS) for extra-EU 27 trade is identified as a reliable source.

An analysis of the data showed that the majority of the “unknown whereabouts” should be considered as scrapped or hoarded within EU 27 and that only a minority of “unknown whereabouts” is exported as used vehicles or exported as ELV used for spare parts.

Details of exported cars (fuel, motor size, value, destination) might be extracted from FTS

# Intra EU Trade: Foreign Trade Statistics (FTS)

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- Intra-EU 27 trade for used vehicles are imports and exports between the EU Member States.
- FTS for intra-EU 27 trade is unsuitable for describing the cross-border trade of used vehicles, because it is reported by economic operators beyond high thresholds only.
- Thus the data does not cover the entire market and displays numbers far below reality.



# Intra EU Trade: Foreign Trade Statistics (FTS)

Exemption thresholds  
in € exempted from  
reporting for intra-EU  
trade (Eurostat, 2009)

MEMBER	Exemption threshold in €	
	Arrivals	Dispatches
Belgium	400 000	1 000 000
Bulgaria	76 694	51 129
Czech Republic	65 000	130 000
Denmark	242 000	630 000
Germany	300 000	300 000
Estonia	127 823	127 823
Ireland	191 000	635 000
Greece	55 000	55 000
Spain	200 000	200 000
France	150 000	150 000
Italy	180 000	250 000
Cyprus	52 147	52 147
Latvia	69 721	115 253
Lithuania	72 405	101 367
Luxembourg	150 000	150 000
Hungary	240 000	400 000
Malta	700	700
Netherlands	400 000	400 000
Austria	300 000	300 000
Poland	127 166	203 626
Portugal	70 000	110 000
Romania	85 000	250 000
Slovenia	85 000	200 000
Slovakia	132 749	265 498
Finland	100 000	200 000
Sweden	238 000	484 000

# National Sources

To get access to national stakeholders and sources a comprehensive online survey has been conducted in Summer 2010.

## Cross border trade of used cars and their characteristics

Total import of used M1 +N1 vehicles by year

Total export of used M1 +N1 vehicles by year

Break down by:

Vehicle type (M1 / N1)

Destination / origin

Age

Mileage

Type of fuel and size of engine

Purchase price

## Usage patterns of used cars

→ not of interest for this presentation

## Policies, regulations and measures influencing the car market

→ not of interest for this presentation

# National Sources

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- Contributions from 14 MS
- Only a minority provided detailed figures (break down by origin / destination, age, mileage, fuel & size of engine, value).
- Germany<sup>1)</sup> was identified as the main exporter so that the German figures on destination and abroad re-registration provide the order of magnitude of the import for several other countries.

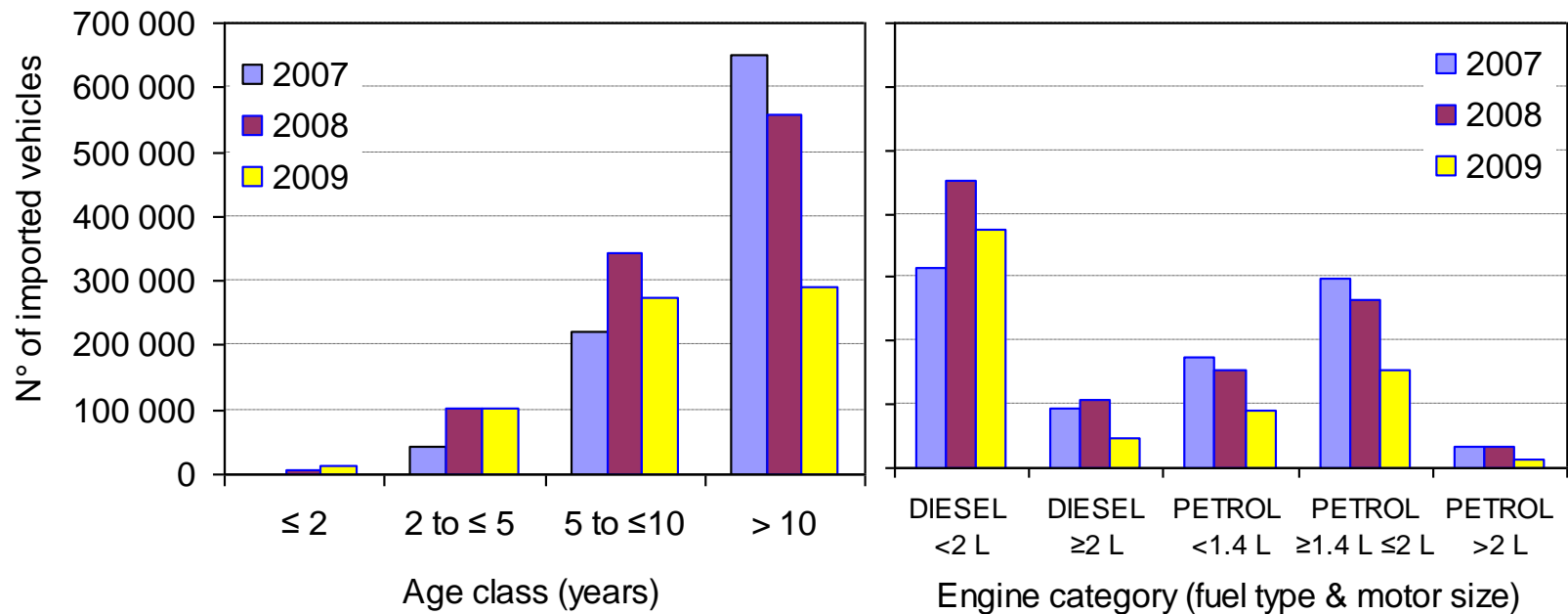
# National Sources: Re-registration reported by Germany

Country of re-registration	2005	2006	2007	2008	2009	01 - 06 2010
Poland	617 030	665 785	716 409	702 030	425 686	195 808
Romania	81	99 639	154 244	208 637	131 102	36 964
Czech Republic	3	15	144 993	171 657	82 993	29 783
Netherlands	33 255	49 133	61 149	57 564	53 268	31 644
Lithuania	295 023	277 579	106 743	60 531	36 473	20 779
Bulgaria		31	51 261	83 619	35 863	26 696
Belgium	22	16 437	24 728	22 791	28 212	11 580
Slovakia	7	5	3	27 316	26 585	5 933
Italy	35 591	38 662	32 256	25 755	22 988	9 368
Hungary	41 594	19 885	18 834	20 606	13 520	3 564
Finland	29 364	26 741	20 921	17 874	13 403	10 822
Denmark	1 942	9 802	15 513	10 937	12 864	5 142
Spain	40 495	43 066	43 283	23 847	10 421	5 269
Luxembourg	7 236	8 548	7 129	7 244	9 325	4 282
Latvia	59 413	54 673	48 946	35 996	7 520	3 749
Other EU 27	44 449	67 315	56 089	28 341	16 096	8 574
<b>EU 27</b>	<b>1 205 484</b>	<b>1 360 848</b>	<b>1 426 512</b>	<b>1 398 335</b>	<b>862 244</b>	<b>371 681</b>
<b>Extra-EU 27</b>	<b>3 080</b>	<b>1 200</b>	<b>748</b>	<b>95 106</b>	<b>10 576</b>	<b>17 522</b>

# National Sources:

## Break down by age and fuel and motor size for Poland

- Czech Republic, Hungary, Poland, Slovakia and Finland, (all net importing countries) provided more detailed data on the used vehicle characteristics for several consecutive years.
- Poland was identified as the largest importer by far in absolute numbers with more than 60 % of its imports coming from Germany.



# National Sources:

## Balance for national car parks

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Balance for two consecutive years and vehicle ages:

$$\text{PARC}_{\text{year } n}^{\text{age } m} = \text{PARC}_{\text{year } n-1}^{\text{age } m-1} - \text{SCRAPPAGE}_{\text{year } n}^{\text{age } m} + \text{IMPORTS}_{\text{year } n}^{\text{age } m} - \text{EXPORTS}_{\text{year } n}^{\text{age } m}$$

Scrappage refers to effective scrappage only, i.e. ELV due to breakdown or accident.

- Detailed balances were carried out for PL, SI and CZ to deduct scrappage rates from the data for the car park and the import / export data (broken down by age).
- Based on the data available, it is not possible to deduce reliable (national) scrappage rates as a function of the vehicle age.
- Such balance is an important tool to conduct evaluations of the car park data, the import / export data and the scrappage rates.
- Such evaluation might be possible for other characteristics (motor size / fuel etc.) as far as they are available by age as well.

# National Sources + FTS: Patterns for export and import (1/2)

Estimated relevance of imports and exports (M1 & N1) compared to new registrations (2008)

Country	Import (M1+ N1)		Export (M1 + N1)		Compared to new registrations		
	Minimum intra EU-27 (Estimate)	Extra EU-27 (FTS)	Minimum intra EU-27 (Estimate)	Extra EU-27 (FTS)	New registrations (M1 + N1) source (ACEA)	Import (intra + extra EU) / new registrations	Export (intra + extra EU) / new registrations
PL	1 105 615	38 418	6 777	33 127	375 936	304%	11%
BG	151 407	13 059	281	1 140	55 236	298%	3%
LV	40 734	2 790	987	1 634	21 872	199%	12%
GR	397 558	648	427	179	289 500	138%	0%
SK	101 191	2 757	1 023	160	96 940	107%	1%
CZ	203 926	2 530	3 256	5 800	202 823	102%	4%
CY	8 909	15 576	86	65	28 444	86%	1%
MT	887	3 298	112	14	5 666	74%	2%
RO	222 323	984	44 239	86	307 409	73%	14%
EE	14 844	2 210	2 168	2 886	27 555	62%	18%
IE	56 000	3 024	939	119	179 770	33%	1%
FI	24 622	2 630	1 266	618	156 006	17%	1%
HU	28 600	218	1 507	1 691	174 837	16%	2%
DK	42 106	894	51 670	3 330	183 746	23%	30%
LU	16 662	39	28 486	1 044	56 387	30%	52%
BE	168 092	5 277	196 118	221 482	603 493	29%	69%
SI	19 945	304	2 432	47 600	78 857	26%	63%
NL	92 000	8 171	283 636	77 308	584 572	17%	62%

The given figures for import and export needs to be considered as a minimum value and in reality more imports / exports are expected to occur.

# National Sources + FTS: Patterns for export and import (2/2)

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- Group 1: BG, CY, CZ, GR, LV, MT, PL, RO and SK: High relevance of imports ( $\geq 60\%$  compared with the annual registration of new cars) and low relevance ( $< 15\%$ ) of exports.
- Group 2: FI, HU, IE: Imports are of medium relevance ( $\geq 16\%$ ,  $\leq 33\%$ ) and exports of small relevance ( $\leq 2\%$ ).
- Group 3: DK has both medium imports and medium exports. It is not a typical importer or exporter but apparently is simply well integrated.
- Group 4: BE, NL and SI: Imports are of medium relevance ( $\geq 15\%$ ,  $< 30$ ) and exports of high relevance ( $\geq 60\%$ ;  $\geq 52\%$  in the case of LU).
- Group 5: AT, DE, ES, FR, IT, PT, SE and UK: Imports are of low relevance ( $< 15\%$ ). Germany, with its high share of exports (55%), is somewhat an exception in this group.
- Group 6: LT is seemingly an exception as it appears to be a shipment centre with high imports from EU 27 and high exports to extra-EU countries; in terms of net imports (around 155%) it is in the range of LV and GR.

The given figures for import and export need to be considered as a minimum value and in reality more imports / exports are expected to occur.

More details on sources and estimations are provided in the main report and Annex 5 (see slide references).



# First conclusions (1/2)

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- Extra EU 27 trade seems less relevant (for most countries) compared to the intra EU 27 trade.
- Data on intra EU 27 trade of used cars is limited, some experts explicitly state to have no information at all (e.g. Austria). A number of other countries did not contribute to the survey.
- However it is obvious that the order of magnitude of the cross border trade effects the composition of many national car parks, with the effect that importing countries stick to have old car parks with highemissions and exporting countries have newer car parks.
- Detailed information on motor type/size, kilometres, emission class and economic value of used vehicles is comparatively rare. Should the situation not improve, we recommend relying on vehicle age as an indicator for emission classes and other characteristics.

## First conclusions (2/2)

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- Eurostat's data refers to age classes (<2 ys, 2 <5ys, 5 <10ys, 10ys and older). Such age classes are not appropriate for a detailed evaluation of the car park evolution and the derivation of scrappage rates, respectively fleet exit rates.
- In particular the aggregate for older vehicles referring simply to “≥ 10 years” is not appropriate as for some countries the majority of the car park (and the imported cars) are older.
- In consequence we recommend establishing a database / collection with a breakdown of at least 16 age classes (a breakdown by single years of age up to <15 years and one class ≥15 years).
- According to our experience, such a detailed breakdown is available to the national registration authorities (even backwards) so that it is a question of aggregation and data management rather than a question of data collection.
- We recommend to conduct balance evaluations of the car park data in combination with import / export and scrappage data.

# Commercial Sources

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- For the calculation of a European scrappage rate a data set has been purchased for 23 Member States for the years 2004 to 2009, providing for each year a detailed break down by age (up to the age of 14 ys) but excluding BG, RO, MT, CY. <sup>1)</sup>
- The general idea of the model is that by aggregating all relevant countries, imports and exports will net out, and total exits in one age group from one year to the next year will be an “average European scrappage rate”
- The effects of the extra EU trade and the missing countries have been estimated.
- Based on this calculations an estimate on the net import (including a break down by age) has been calculated for the 23 Member states.

# Scrappage function: Methodology

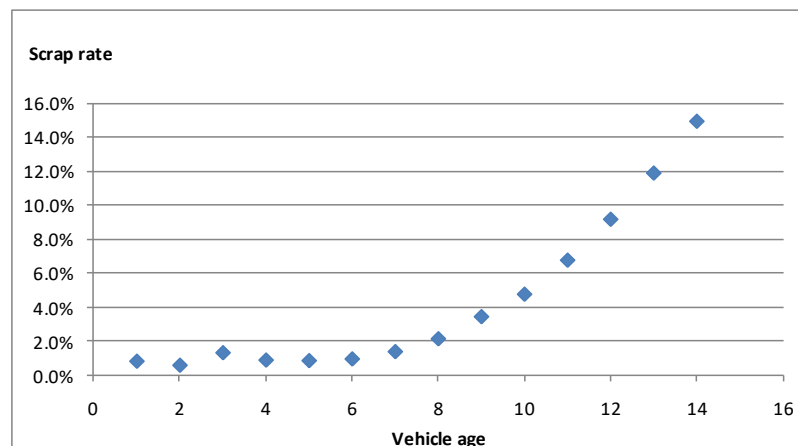
Sum of vehicles (M1 + N1), 2004 - 2009 by age group.

	2004	2005	2006	2007	2008	2009
Age ≤ 1	16,904,617	16,823,323	17,032,676	16,911,659	15,513,113	15,064,772
1 < Age ≤ 2	16,431,329	16,810,376	16,755,368	16,631,520	16,775,757	15,484,302
2 < Age ≤ 3	16,423,504	16,275,301	16,681,887	16,407,995	16,658,047	16,859,527
3 < Age ≤ 4	16,643,236	16,261,997	16,158,455	16,237,911	16,182,433	16,481,700
4 < Age ≤ 5	16,562,425	16,486,383	16,128,125	15,785,926	16,195,757	16,132,438
5 < Age ≤ 6	16,870,237	16,442,782	16,331,672	15,781,293	15,744,729	16,129,512
6 < Age ≤ 7	15,674,298	16,712,672	16,302,487	15,957,742	15,712,818	15,671,596
7 < Age ≤ 8	14,400,765	15,437,537	16,534,725	15,860,562	15,838,339	15,542,224
8 < Age ≤ 9	13,229,573	14,090,218	15,160,958	15,952,001	15,661,353	15,496,583
9 < Age ≤ 10	12,124,442	12,787,300	13,677,880	14,394,581	15,610,503	15,049,876
10 < Age ≤ 11	11,147,921	11,530,175	12,220,113	12,756,216	13,911,259	14,905,477
11 < Age ≤ 12	9,701,498	10,393,909	10,823,672	11,104,202	12,124,296	12,945,262
12 < Age ≤ 13	10,336,075	8,807,656	9,544,120	9,549,141	10,338,252	10,930,305
13 < Age ≤ 14	9,152,847	9,123,043	7,874,446	8,095,204	8,623,472	9,072,223
Age > 14	40,832,324	42,386,223	44,472,747	43,336,489	43,690,412	45,248,960
Total	236,435,091	240,368,895	245,699,331	244,762,442	248,580,540	251,014,757

Scrappage rates for EU (M1 + N1), 2005 - 2009.

Age	2005	2006	2007	2008	2009	Average
Age ≤ 1	-0.6%	-0.4%	-2.4%	-0.8%	-0.2%	-0.9%
1 < Age ≤ 2	-0.9%	-0.8%	-2.1%	0.2%	0.5%	-0.6%
2 < Age ≤ 3	-1.0%	-0.7%	-2.7%	-1.4%	-1.1%	-1.4%
3 < Age ≤ 4	-0.9%	-0.8%	-2.3%	-0.3%	-0.3%	-0.9%
4 < Age ≤ 5	-0.7%	-0.9%	-2.2%	-0.3%	-0.4%	-0.9%
5 < Age ≤ 6	-0.9%	-0.9%	-2.3%	-0.4%	-0.5%	-1.0%
6 < Age ≤ 7	-1.5%	-1.1%	-2.7%	-0.7%	-1.1%	-1.4%
7 < Age ≤ 8	-2.2%	-1.8%	-3.5%	-1.3%	-2.2%	-2.2%
8 < Age ≤ 9	-3.3%	-2.9%	-5.1%	-2.1%	-3.9%	-3.5%
9 < Age ≤ 10	-4.9%	-4.4%	-6.7%	-3.4%	-4.5%	-4.8%
10 < Age ≤ 11	-6.8%	-6.1%	-9.1%	-5.0%	-6.9%	-6.8%
11 < Age ≤ 12	-9.2%	-8.2%	-11.8%	-6.9%	-9.8%	-9.2%
12 < Age ≤ 13	-11.7%	-10.6%	-15.2%	-9.7%	-12.2%	-11.9%
Age > 13	-15.2%	-13.7%	-17.2%	-15.1%	-13.5%	-14.9%

Average scrappage rates for EU (M1 + N1), 2005 - 2009.



# Scrappage function: Adjustments

Romania, Bulgaria, Malta and Cyprus and extra EU countries are not included in the POLK database and therefore not included in the calculations above.

Based on other sources the net exports to these countries are estimated to be at least:

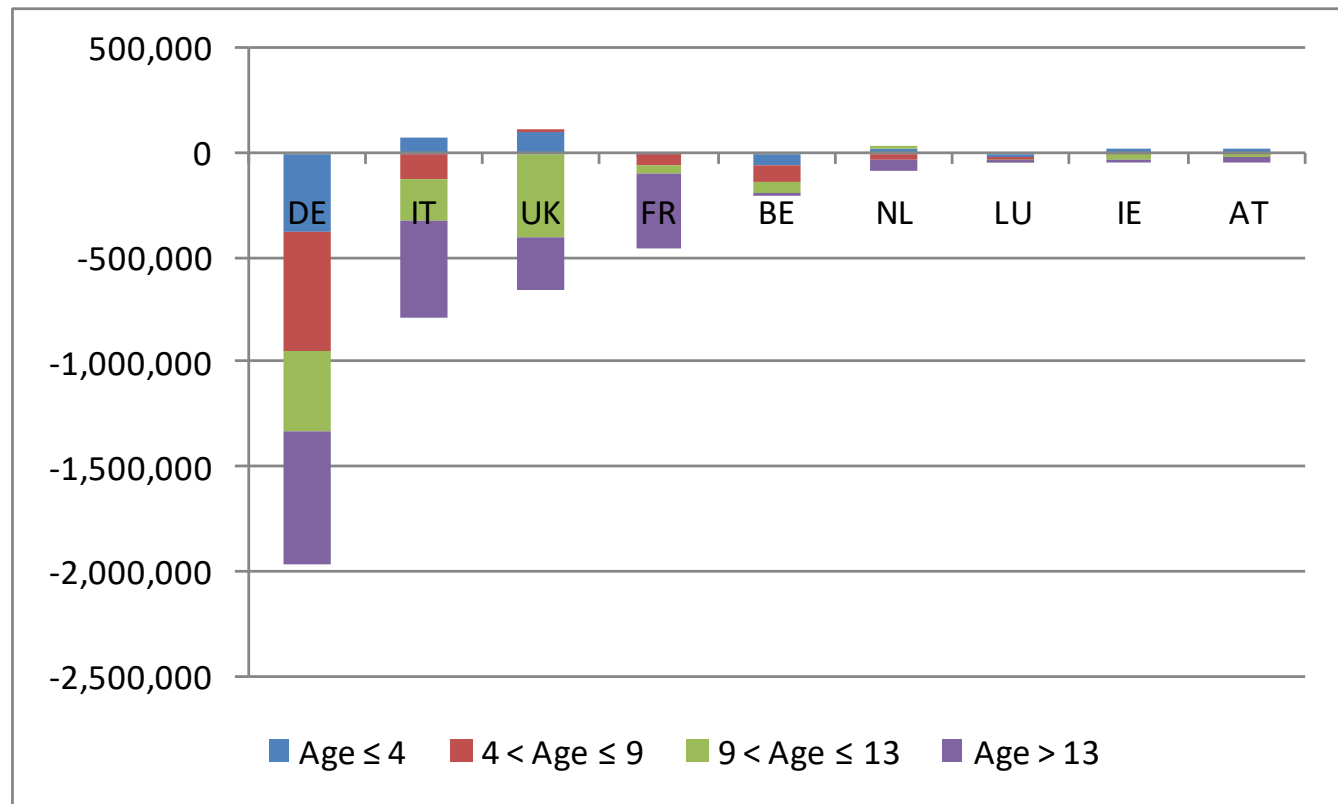
- 150 000 vehicles to Bulgaria,
- 180 000 vehicles to Romania,
- 720 000 vehicles to countries outside EU (all M1+N1).

Adjusting for these exports reduces the scrappage rates and increase exports from EU countries.



# Generic net import

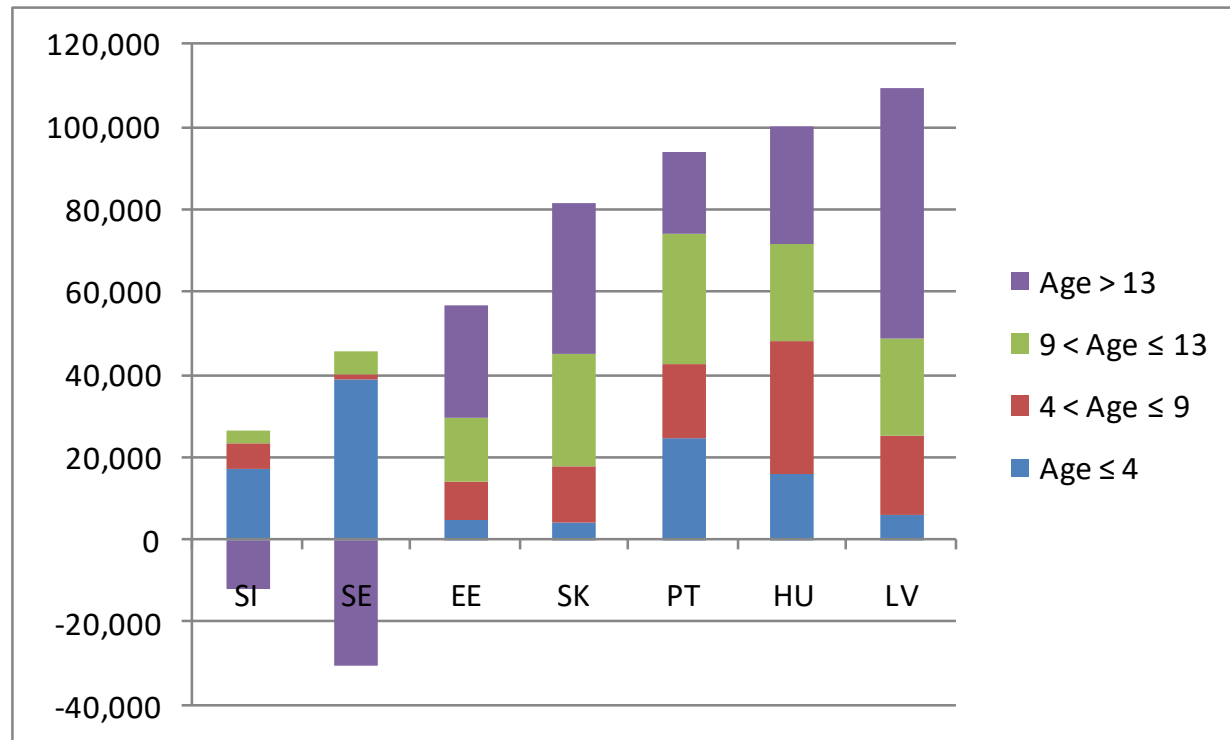
Net exporters of vehicles (M1+N1), average number of vehicles 2004 - 2009



Note: Export reported as negative figures, import reported as positive figures; adjusted for additional export.

# Generic net export

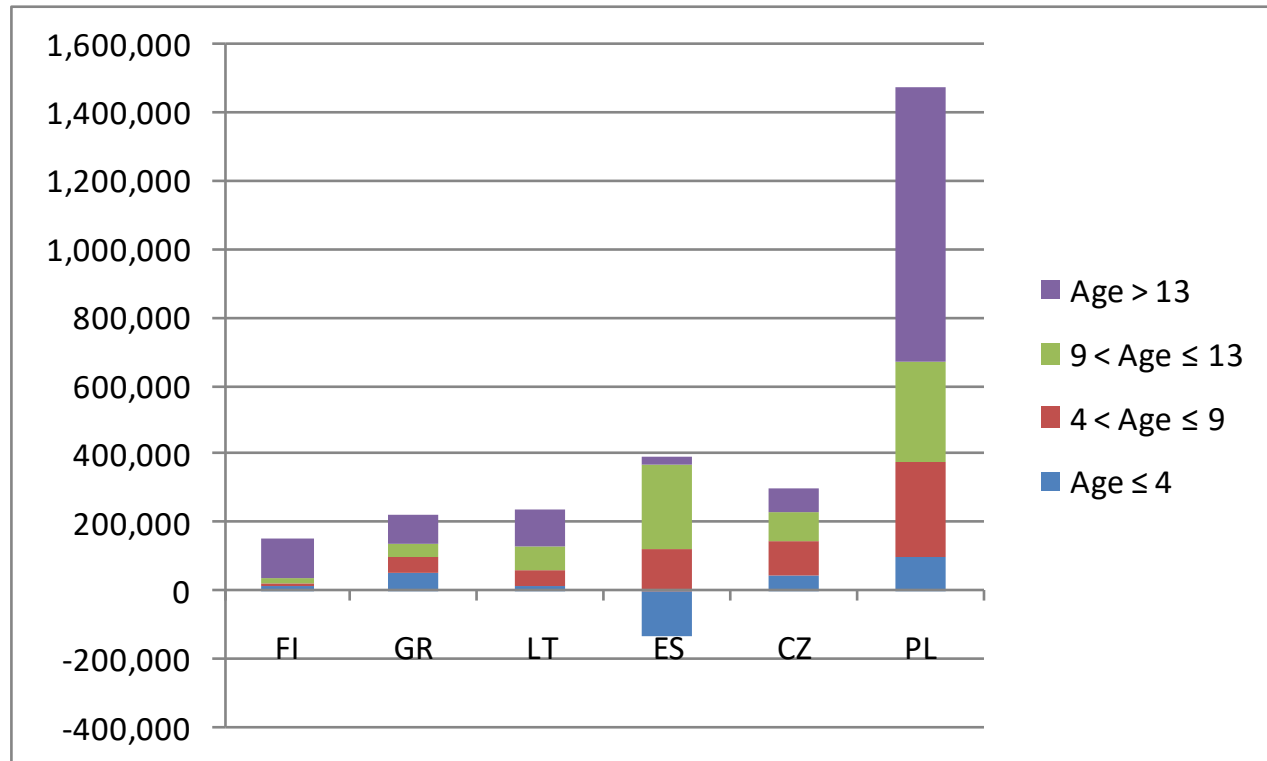
Net importers of vehicles (M1+N1), average number of vehicles 2004 - 2009



Note: Export reported as negative figures, import reported as positive figures; adjusted for additional export.

# Generic net export

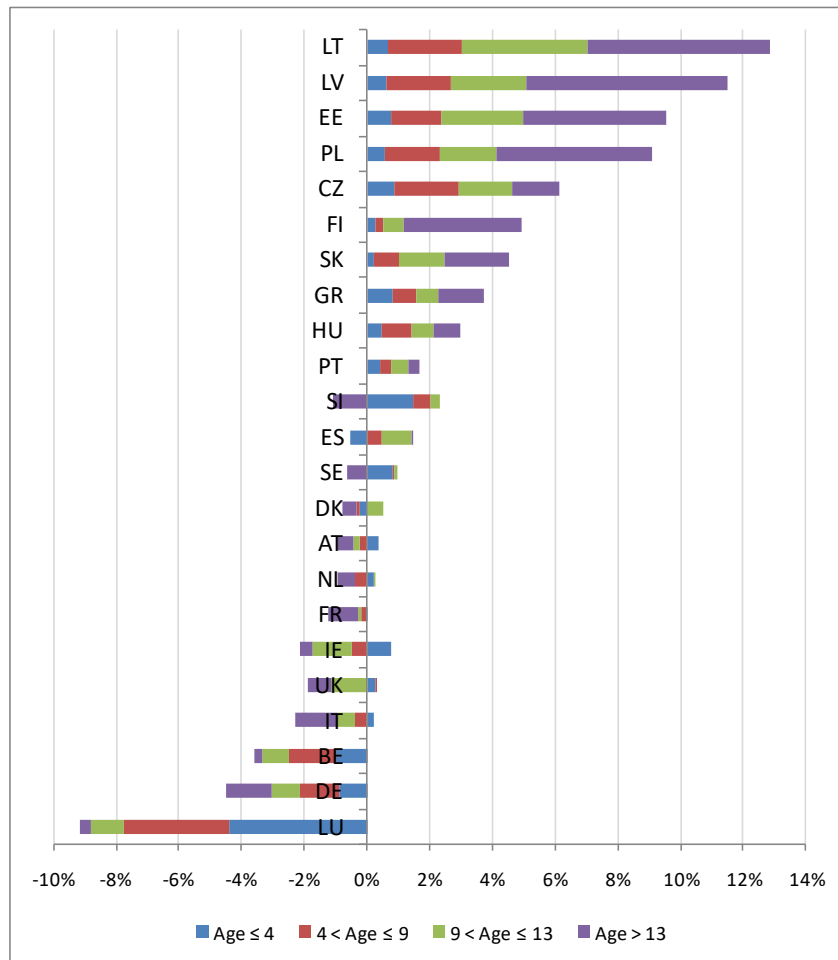
Large net importers of vehicles (M1+N1), average number of vehicles 2004 - 2009



Note: Export reported as negative figures, import reported as positive figures; adjusted for additional export.



# Generic net export

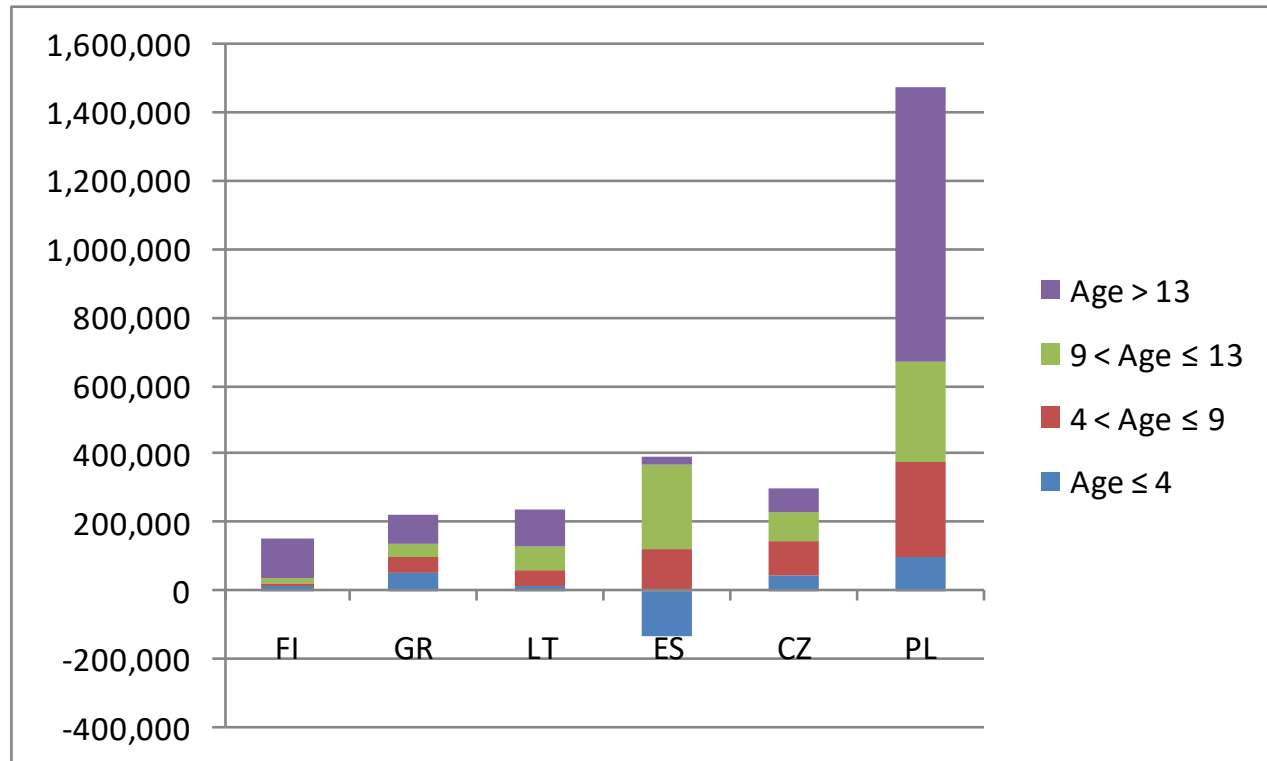


Net vehicle imports (M1+N1) in percentage of the total car park, average 2004 - 2009

Note: Export reported as negative figures, import reported as positive figures; adjusted for additional export.

# Generic net export

Large net importers of vehicles (M1+N1), average number of vehicles 2004 - 2009



Note: Export reported as negative figures, import reported as positive figures; adjusted for additional export.

## Generic net export

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- The analysis gives robust information on the internal imports and exports in the EU.
- Cross checks with other sources confirmed the order of magnitude.
- The assumption of similar scrappage rates in the same age group in all countries may not be correct:
  - In countries with heavily taxed cars or other economic conditions, it may be argued that repair costs are lower compared with the capital cost leading to lower scrap rates.
- It is recommended to take the calculations as a first estimate only, where national sources are required to provide more evidence.

# Second conclusions (1/2)

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- For modelling purposes it is strongly recommended to separate the real “scrappage rate” from the “net import/export rate”.
- We recommend applying the following definitions:
  - “fleet exit rate” including scrappage and net import / export
  - “scrappage rate” considering effective scrappage only (i.e. ELV due to breakdown or accident).
- To model scrappage, we recommend – with respect to the current (incomplete) data situation – to use the generic European scrappage rate which was demonstrated to yield probable results.
- To model / forecast import / export, economic drives have been (unsuccessfully) tested. Thus the only opportunity is to apply the (generic) calculated import / export rates as derived from the commercial data.
- As the data coverage and reliability is still weak, the intervals between model updates with empirical data should be reduced. A delay of five years and more is not appropriate.

## Second conclusions (2/2)

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- However it should be the aim to improve the availability of coherent data on car park, import / export and scrappage.
- Regarding data on the national fleets the freely available international sources are found to be of limited reliability in particular when a breakdown by age is required.
- Hence, reference to national sources is recommended to ensure appropriate quality.
- Commercially available fleet data might be an additional source but licensing practices may limit their free use.
- Once the data situation on the national fleets and exports/imports as a function of age is more complete, detailed balances on the national level can be used to verify the underlying assumption of a constant scrappage rate for all Member States.

# Reference

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The study has been commissioned in 2010 by the European Commission, DG Climate Action, in cooperation with DG Environment and Eurostat with the contract number 07.0307/2009/549021/SER/C5

The full report, prepared jointly by Öko-Institut e.V. (Germany), TML (Belgium) and COWI (Denmark) is called:

“European second-hand car market analysis”

Report, including an executive summary of 10 pages at the very beginning (1 MB)

[http://ec.europa.eu/clima/studies/transport/vehicles/docs/2010\\_2nd\\_hand\\_car\\_en.pdf](http://ec.europa.eu/clima/studies/transport/vehicles/docs/2010_2nd_hand_car_en.pdf)

or

<http://www.oeko.de/oekodoc/1114/2011-005-en.pdf>

Data, excluding the data commercially available only (5 MB)

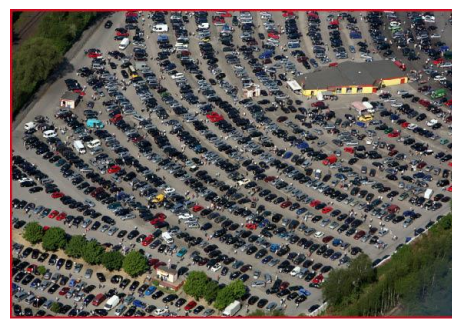
[http://ec.europa.eu/clima/studies/transport/vehicles/docs/2010\\_2nd\\_hand\\_car\\_data\\_en.zip](http://ec.europa.eu/clima/studies/transport/vehicles/docs/2010_2nd_hand_car_data_en.zip)

or

<http://www.oeko.de/oekodoc/1116/2011-006-en.zip>

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# Thank you for your attention!



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