



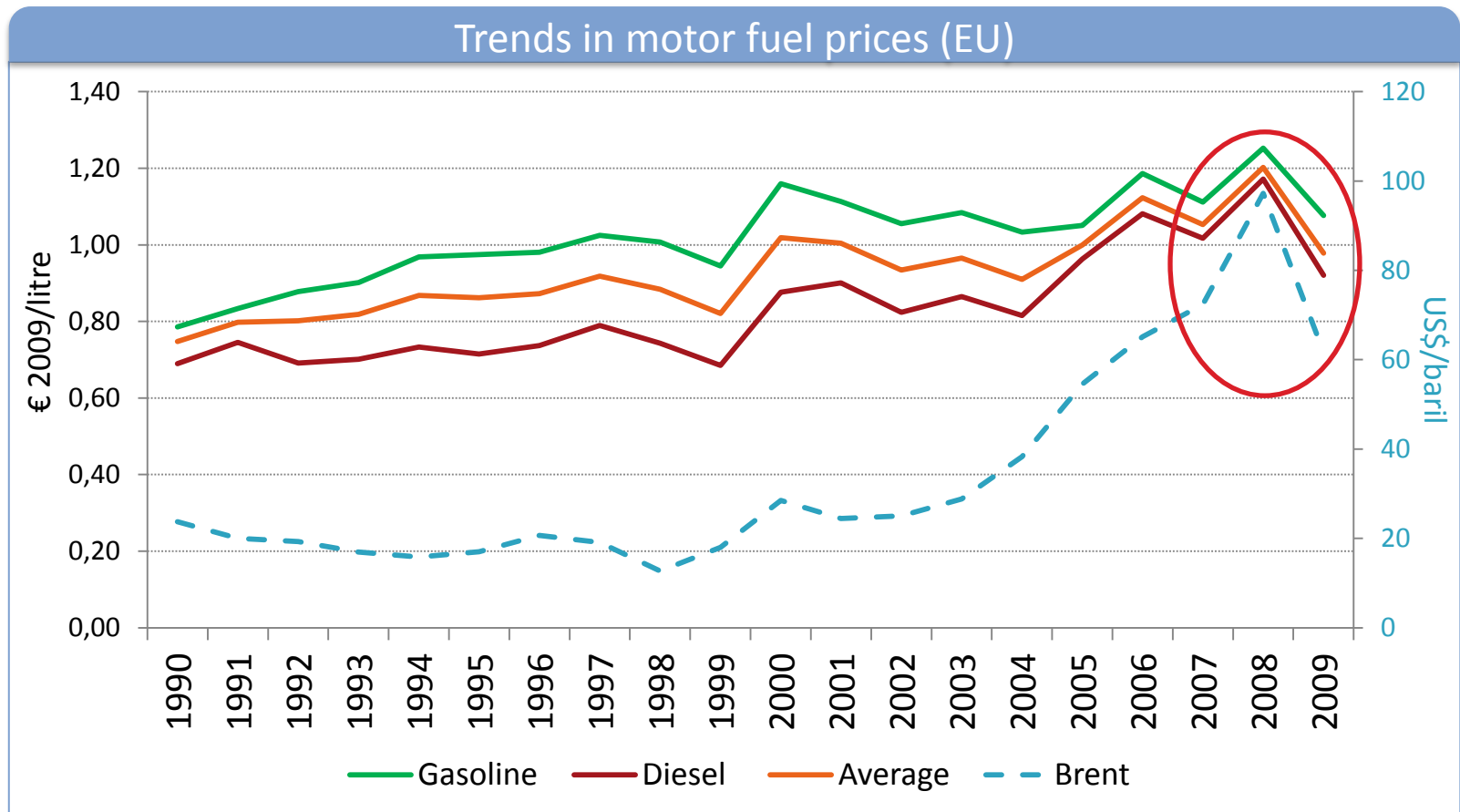
Energy Efficiency Trends in Transport in the EU, Norway and Croatia

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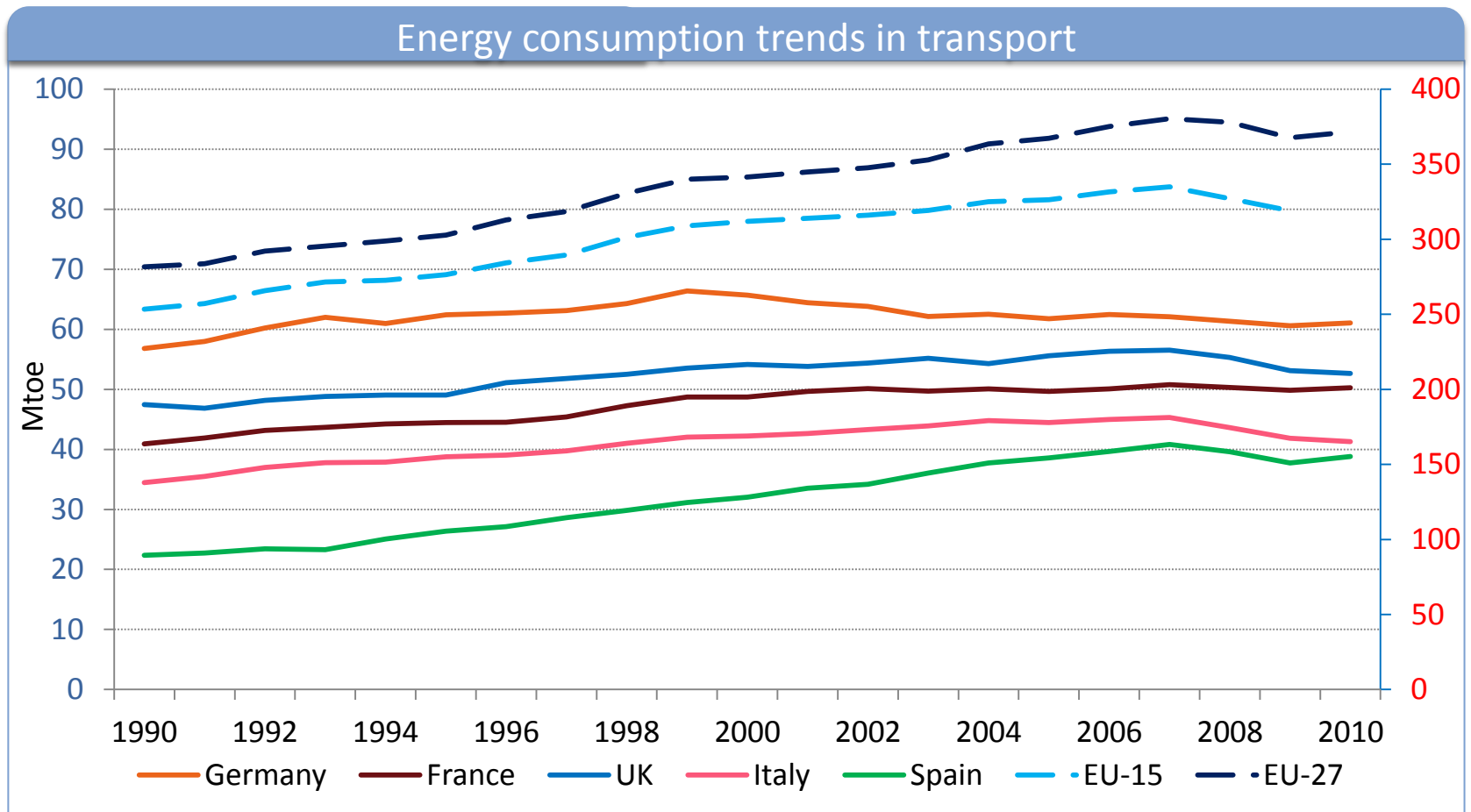
- ▶ **1. Overall trends**
- 2. Road transport
- 3. New cars
- 4. Car stock
- 5. Road transport of goods
- 6. Energy efficiency trends
- 7. Modal shift for transport of goods and passengers
- 8. CO2 emissions

- Real prices were 31% higher in 2009 than in 1990 (+37% for gasoline and 33% for diesel)
- Strong increase between 2004 and 2008 (+32% on average and 44% for diesel)
- Significant drop in 2009 (-19%)



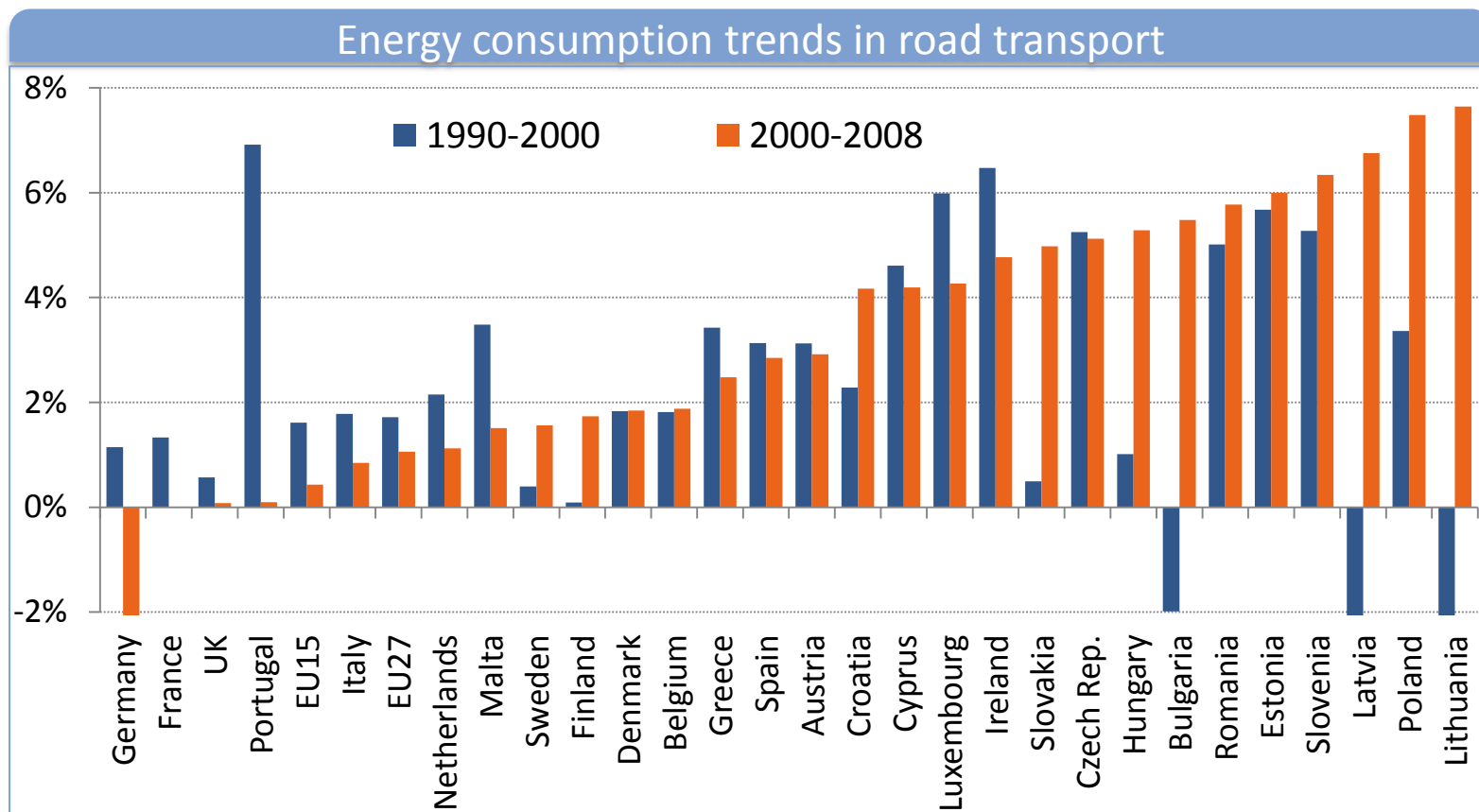
Source: ENERDATA from Eurostat/IEA; weighted average of diesel and gasoline; real prices corrected for inflation

- Slow down after 2000 in most EU-15 countries except Spain: impact of the sharp increase in oil price in 2000 (+80% compared to 1999) and of national measures in some countries (fuel tax increase in Germany and UK, enforcement of speed controls in France...).
- Rapid growth in New member countries (EU-12) between 2000 and 2008 (~6%/yr)
- Drop in consumption in 2009 due to the crisis: -2.5% at EU level



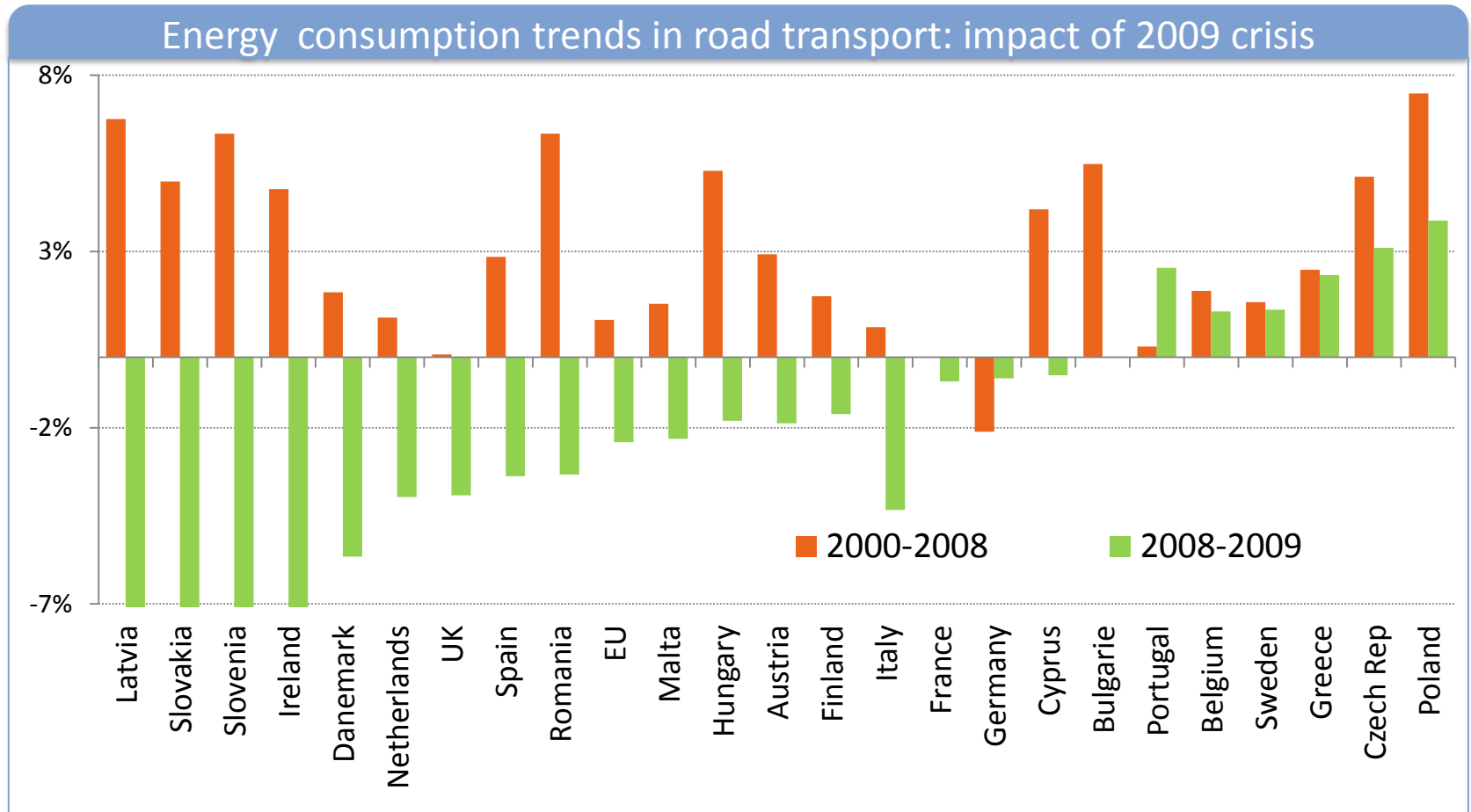
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- Slow down after 2000 in most EU-15 countries, except Sweden, Denmark, Belgium Finland and decrease in Germany (-2.1%/year); impact of the sharp increase in oil price in 2000 and national measures in some countries
- High growth in new member countries since 2000, between 4 and 8%/yr



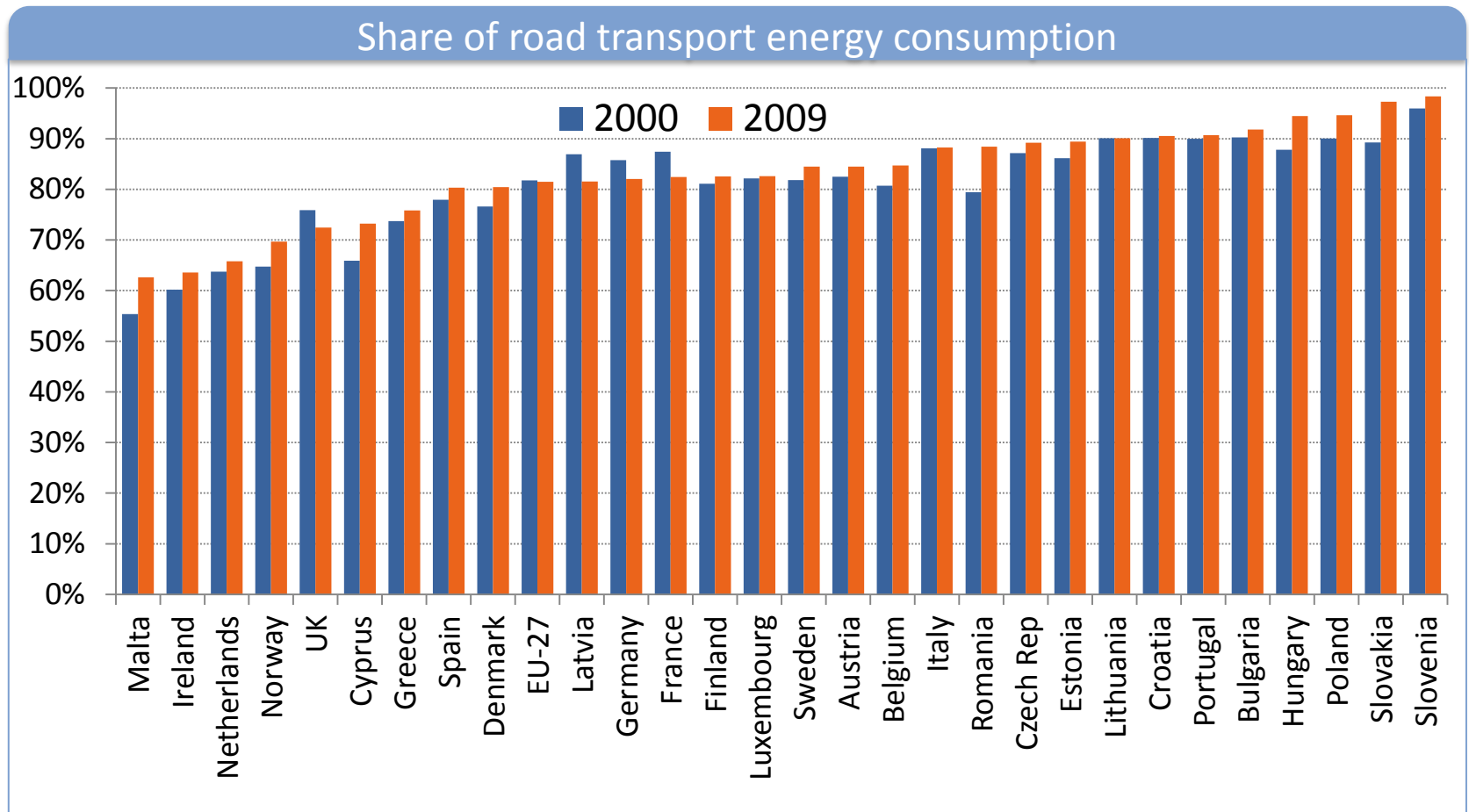
*1991-2000 for Cyprus and Slovenia
 *1992-2000 for Estonia and Romania
 *2000-2007 for Estonia and Lithuania

- Strong decrease of the energy consumption of road transport in most EU countries in 2009 with the economic recession (-4% for the EU as a whole)
- Strong contrast with the trend prevailing before 2009, except in France, Italy or Sweden; in Germany slower reduction ; in Portugal higher progression



2008/2009 variation : estimate from Enerdata data base for Finland, Greece, Romania, Slovakia, Slovenia and Sweden

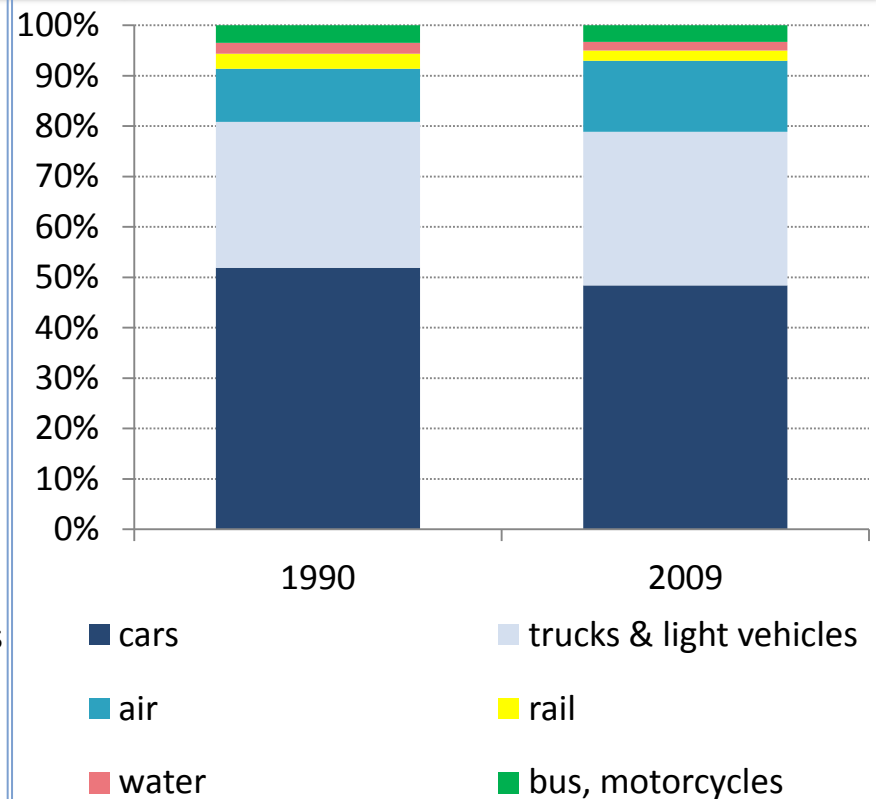
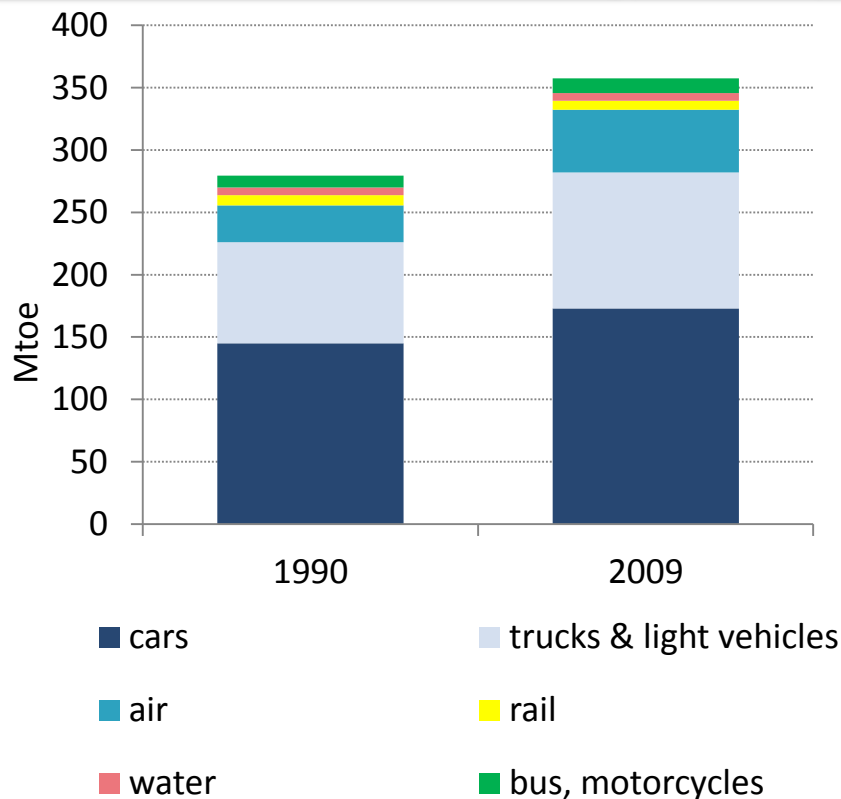
Road transport absorbs on average 81% of the total energy consumption of transport in the EU (range of 36-98%); in about half of the countries and in the EU as a whole, the share of road is slightly decreasing (by 3 points for EU-27) due to a growing importance of air .



- About 100 Mtoe increase since 1990 in total transport (of which 45% coming from cars, 1/3 from trucks & light vehicles, and ~20% from air (domestic and international))

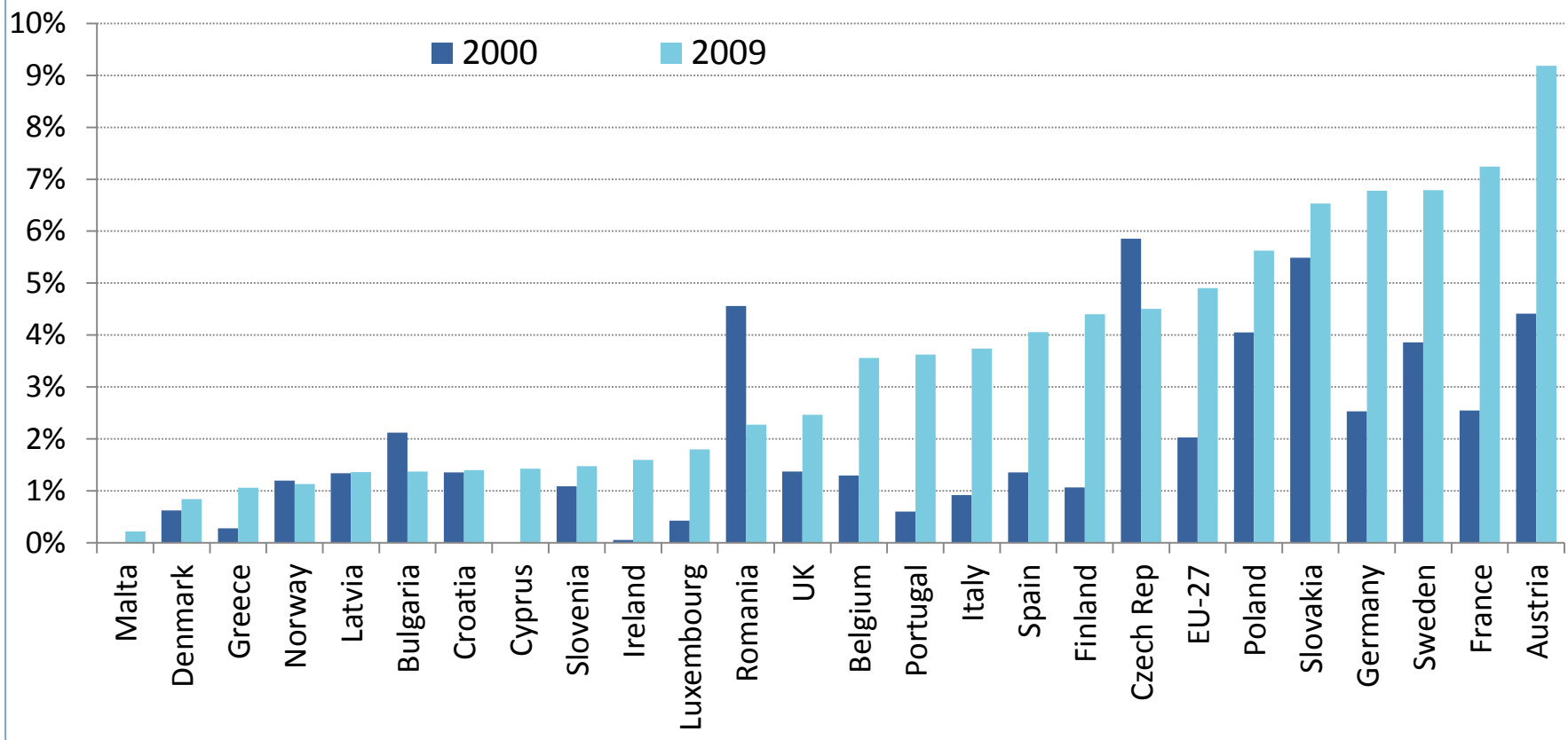
- Cars represent about half of total consumption but declining from 52 % in 1990 to 48% in 2009;
- Increasing share of trucks & light vehicles (from 29% to 30%) and air transport from 10% to 14%.

Energy consumption by mode (EU)



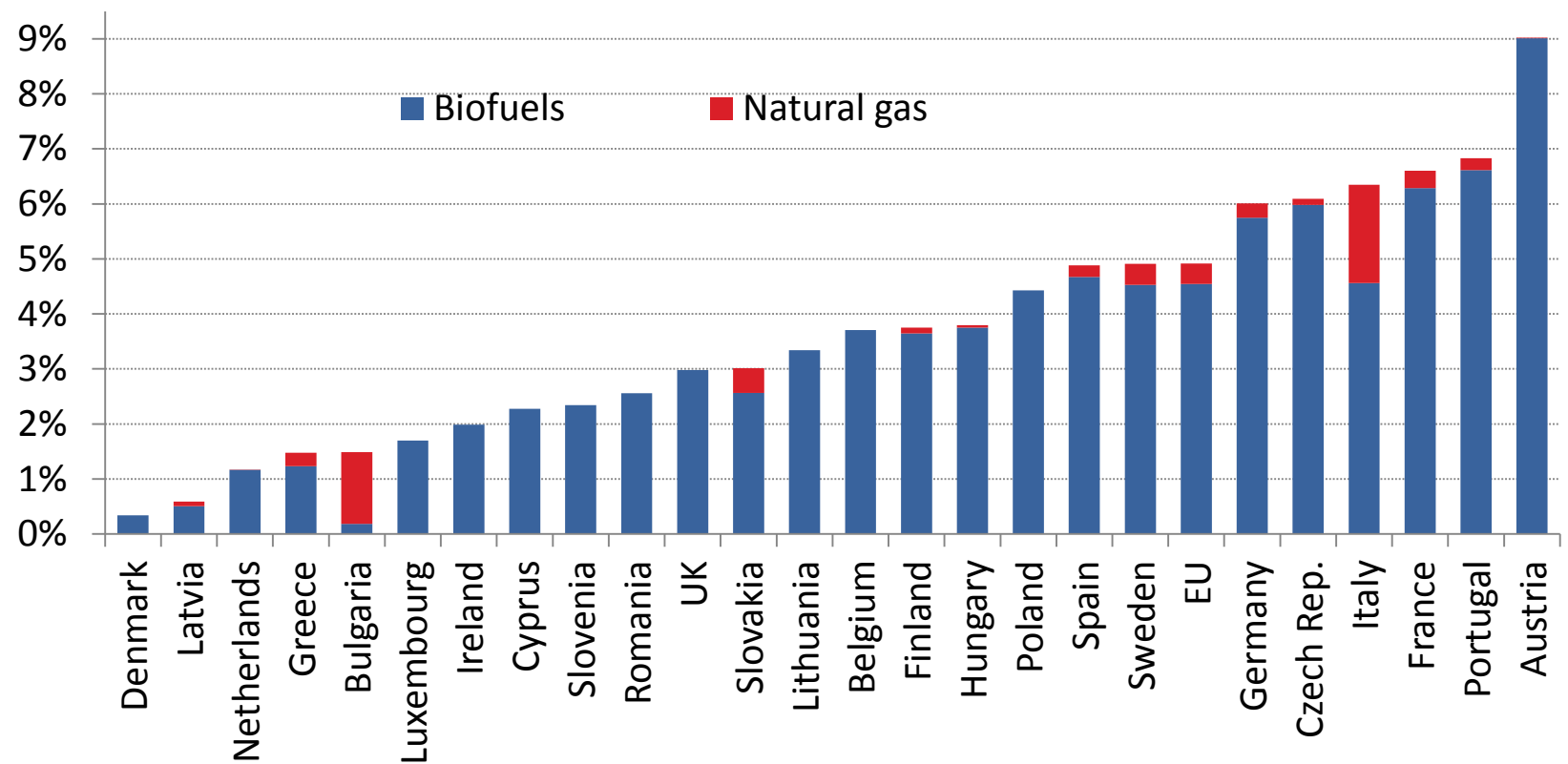
- Alternative fuels (electricity, natural gas and biofuels) supplied 4.9% of the consumption of transport in the EU.
- Austria, France, Germany and Sweden have the highest share of alternative fuels (between 6.5% and 9.5%).

Share of alternative fuels to oil in total transport consumption



- Alternative fuels (natural gas and biofuels) supplied 5% of the consumption of road transport in the EU.
- Portugal, France and Austria have the highest share of alternative fuels (between 6% and 9%).

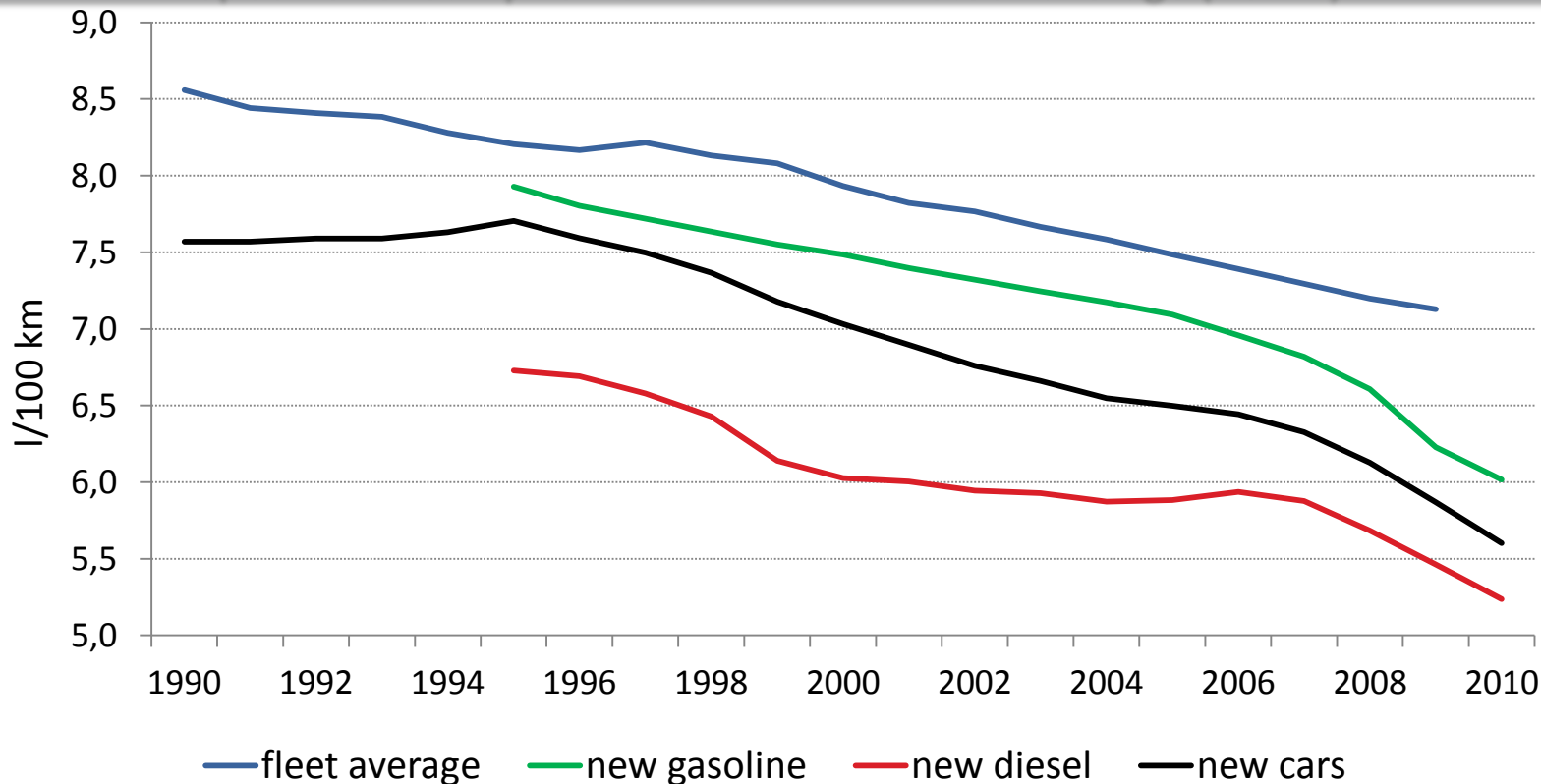
Share of alternative fuels to oil in road transport (2010)



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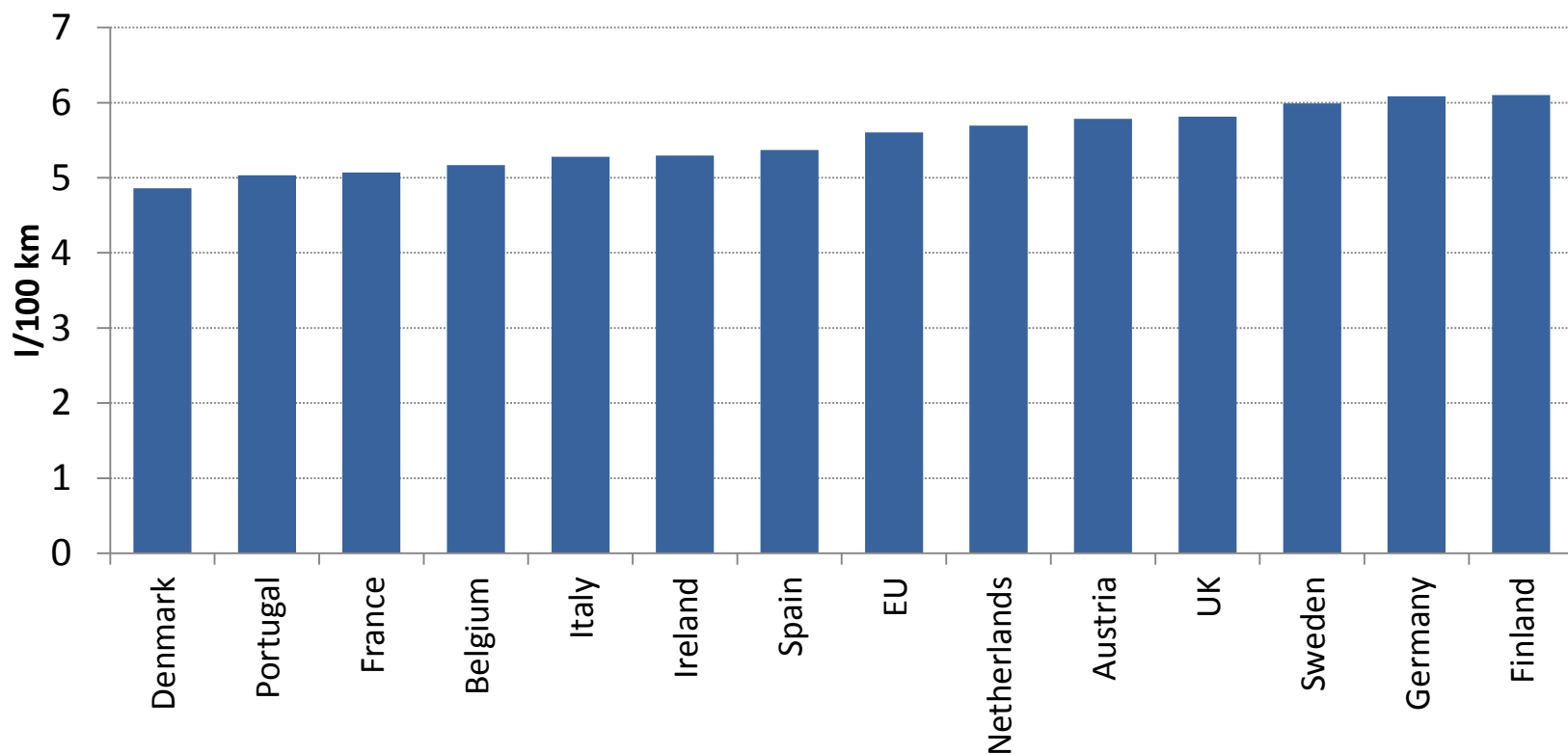
- Regular decrease for the car stock from 8.6 l/100km in 1990 to 7.1 l/100km presently.
- For new cars rapid reduction by 1.4 l/100km since 1995 (from 7.5 to 6.1 l/100km);
- Slower reduction between 2001 and 2006 due to a saturation for new diesel cars (1.1%/year, which is twice slower than between 1995 and 2001)
- Acceleration since 2006: 3.4%/year between 2006 and 2010 with national policies and higher fuel prices

Specific consumption of new cars and stock average (EU-27)



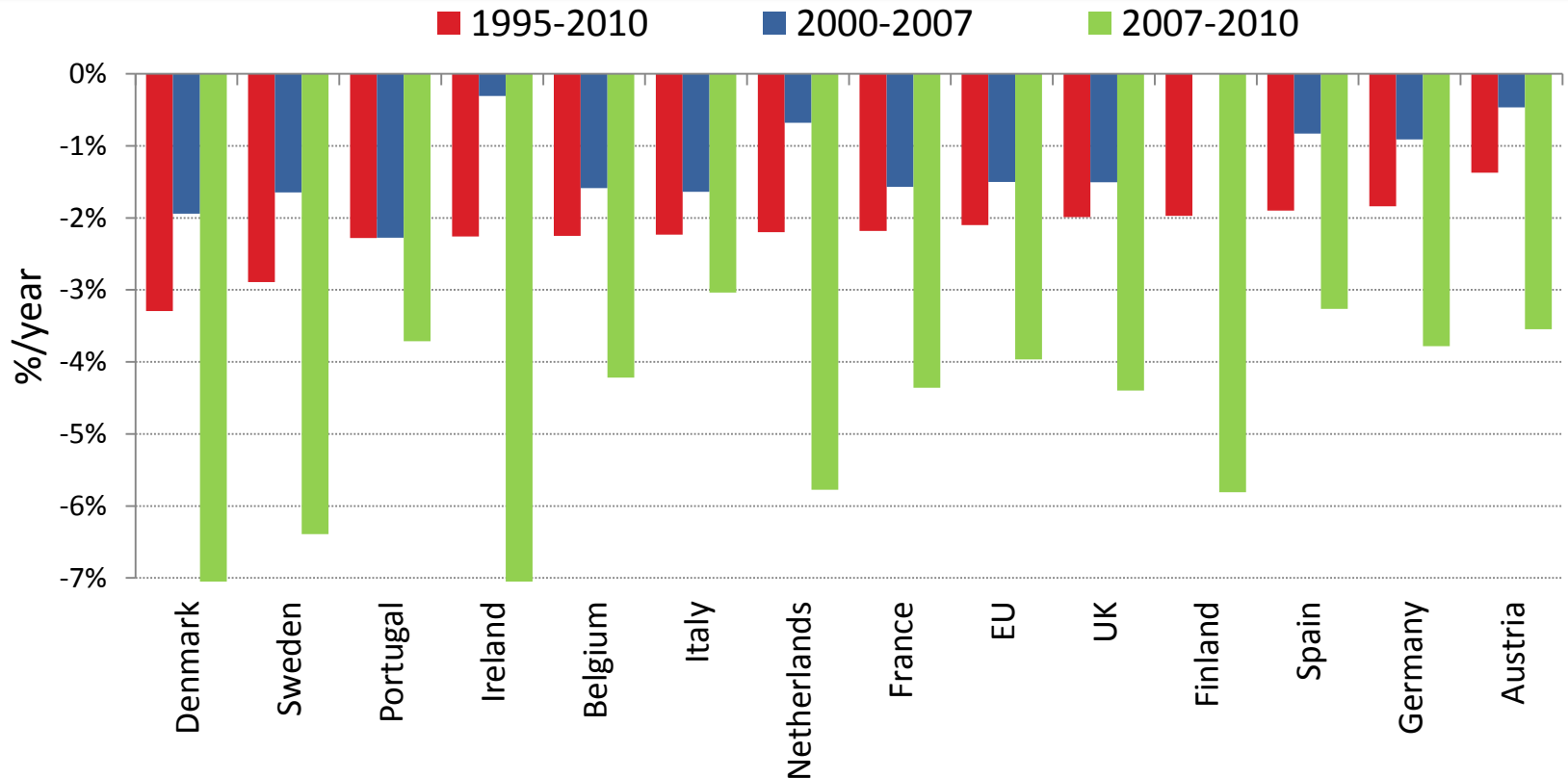
Large discrepancy in the specific consumption of new cars among countries: difference between extremes values narrowing from 2 l/100 km in 2008 to 1 l/100 km in 2010 : Denmark, France or Portugal in the lower range (~5 l/100km) and Finland, Sweden, or Germany (~6 l/100km) in the upper range

Specific consumption of new cars (2010)

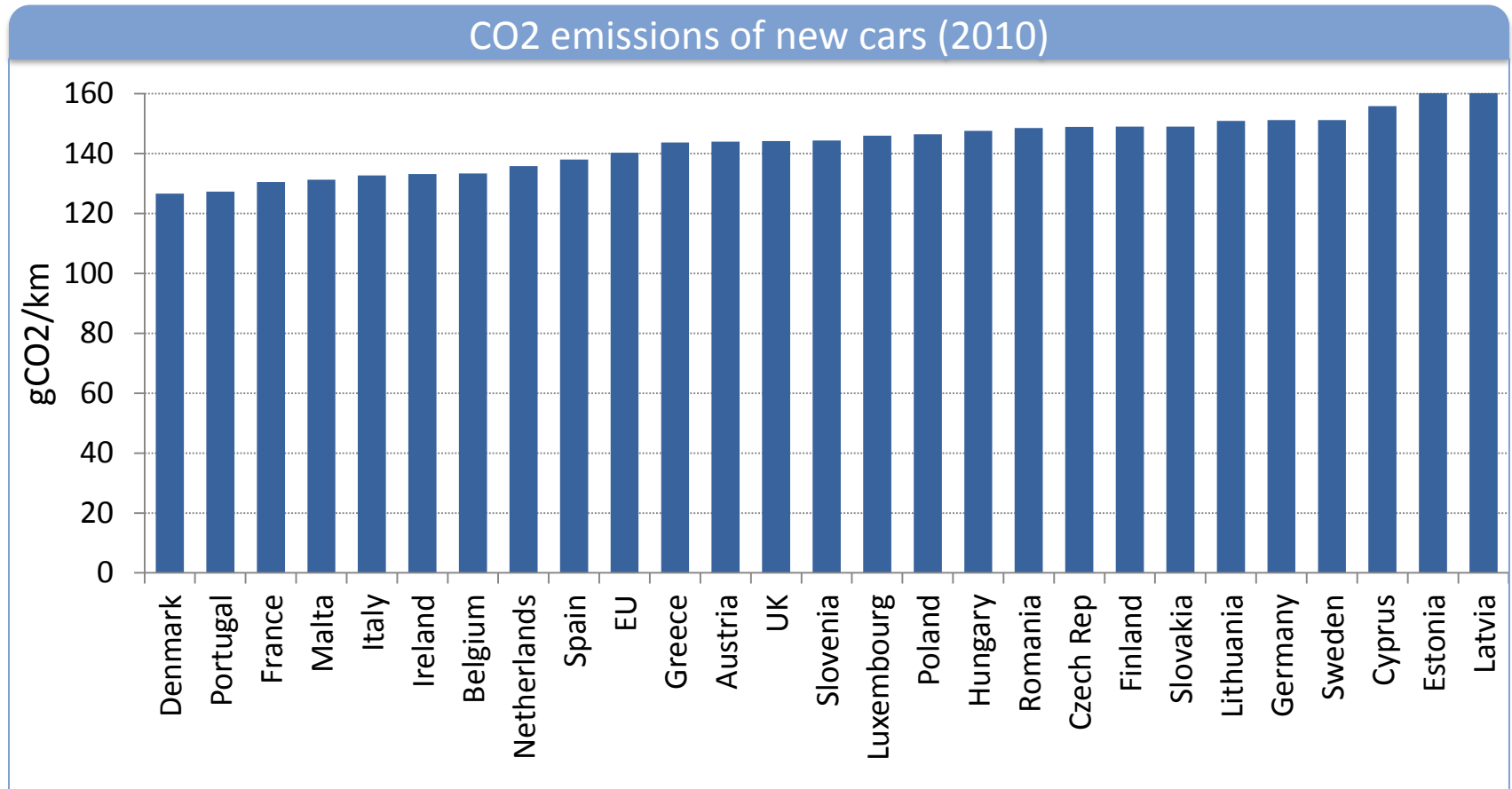


- Rapid reduction in the specific consumption of new cars: 2%/year on average for the EU;
- Slower trends in early 2000's, mainly due to a saturation for new diesel cars.
- Strong improvement since 2007 in all countries (4 to 7%/year)

Trends in the specific consumption of new cars by country



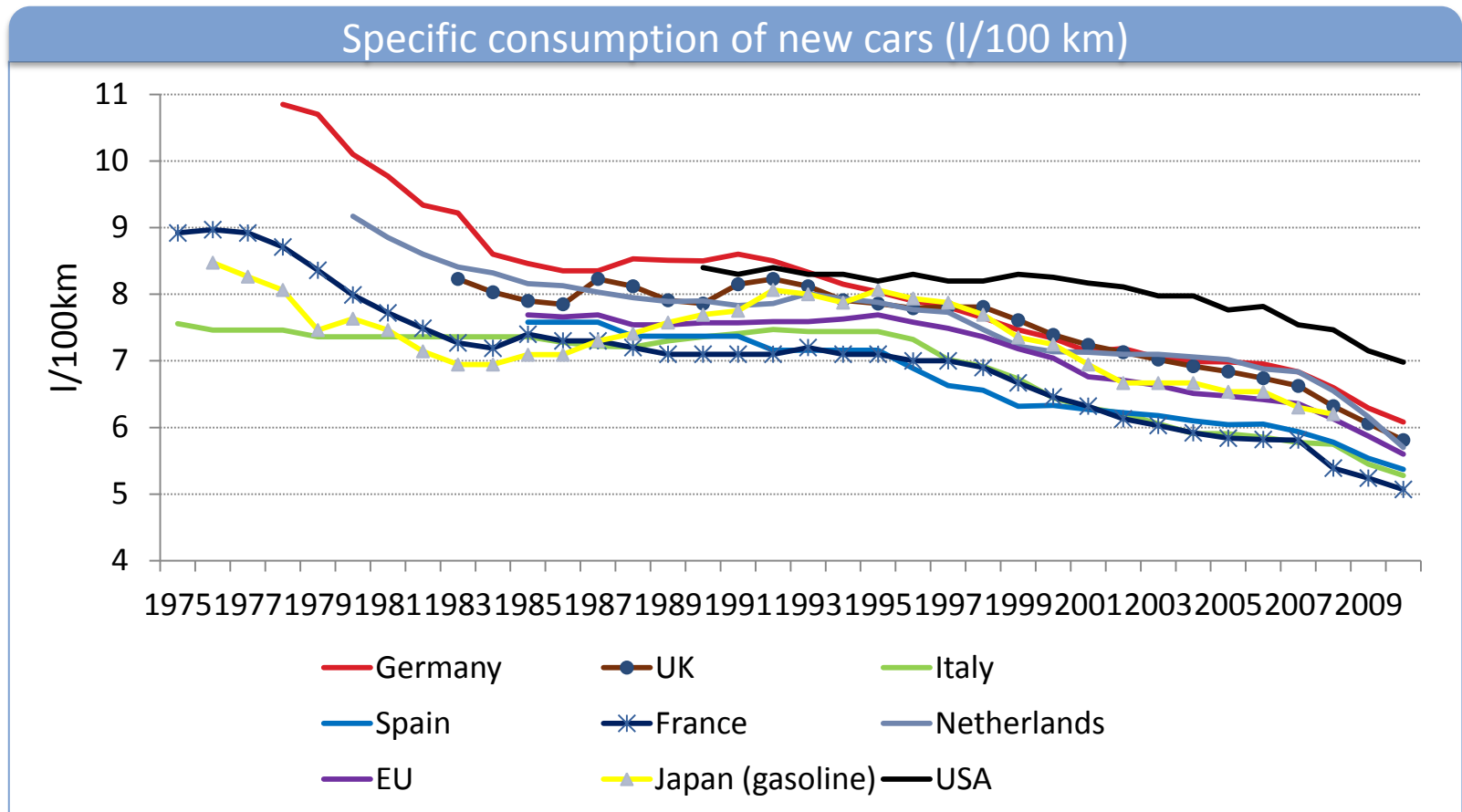
- Large discrepancy in the specific emission of new cars among countries;
- Lower difference however as for the specific fuel consumption: range of 22% for CO₂ between Denmark and Latvia compared to 40% for the fuel consumption; 10 countries below 140 g CO₂/km and 6 above 150 g CO₂/km.



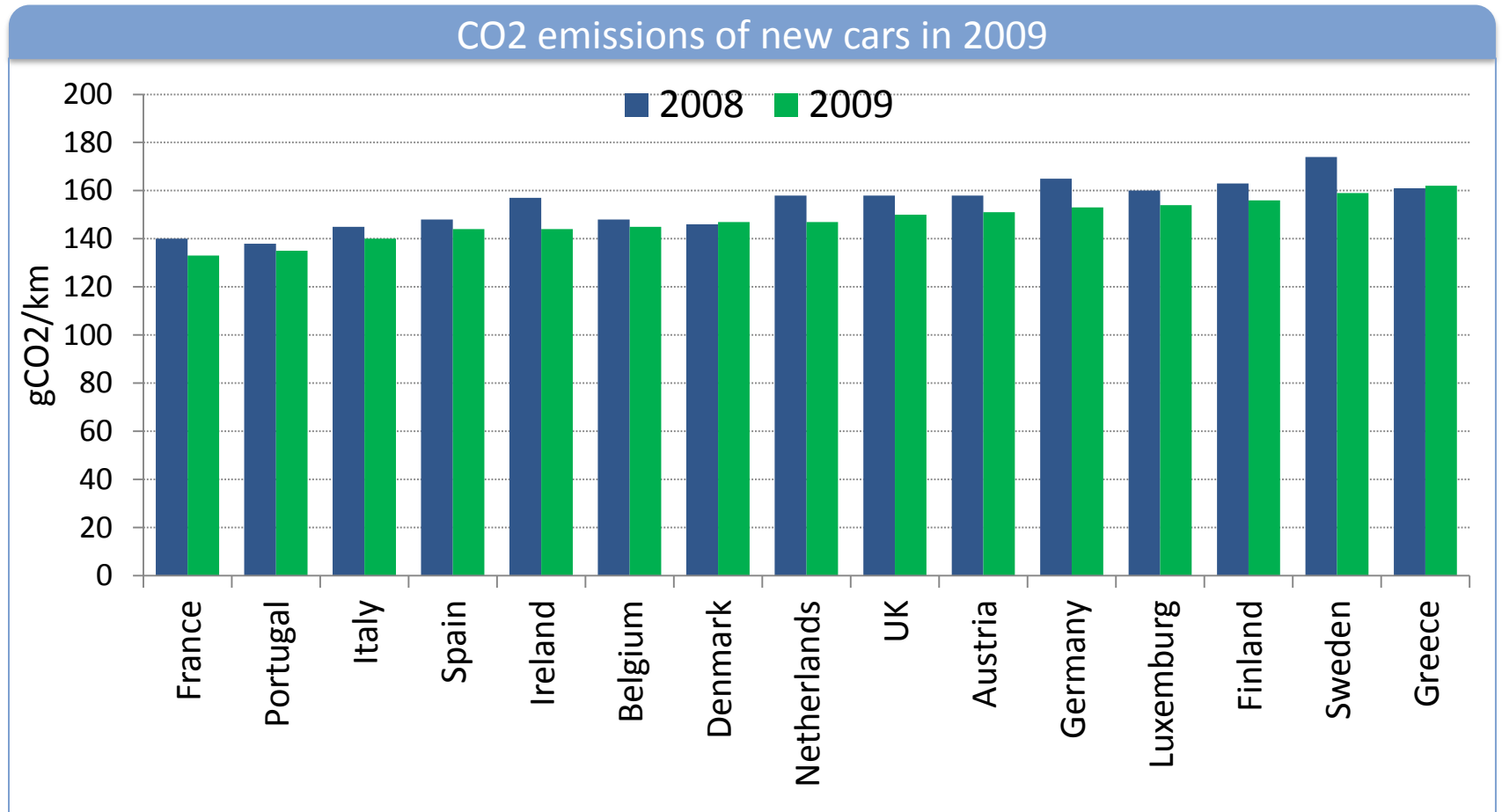
Source: EU Commission

2008 for Cyprus, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Czech Rep., Romania, Slovenia, Slovakia and E-27

- Regular decrease since 1995 in all countries => ACEA, JAMA & KAMA agreement
- No real convergence: the reduction has been stronger in the countries with the lowest values (France, Italy and Spain)

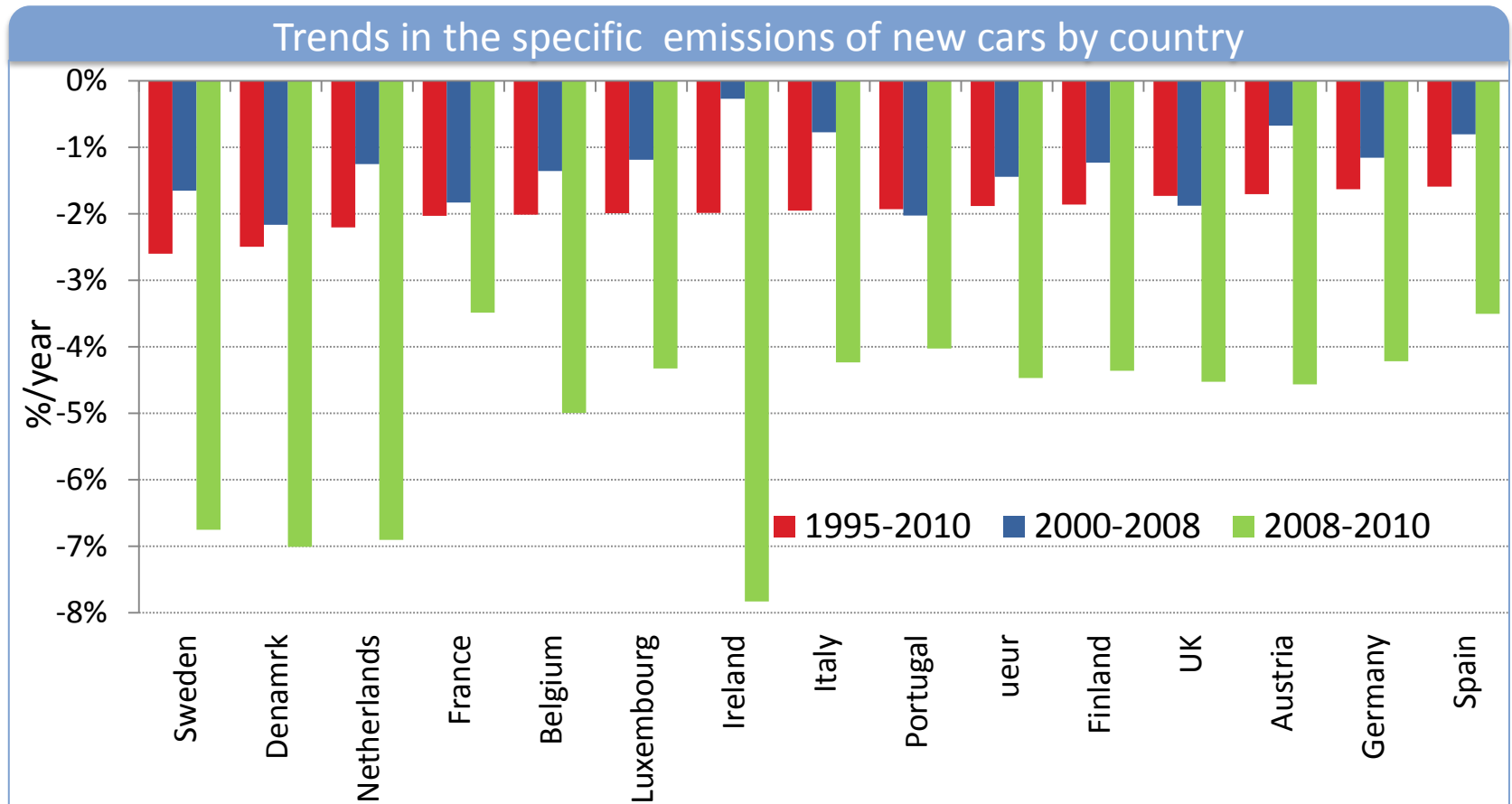


- In 2009 3 countries below 140gCO₂/km: France, Portugal and Italy
- 7 countries above 150 gCO₂/km: e.g. Sweden decrease by 9% its CO₂ emission of new cars between 2008 and 2009



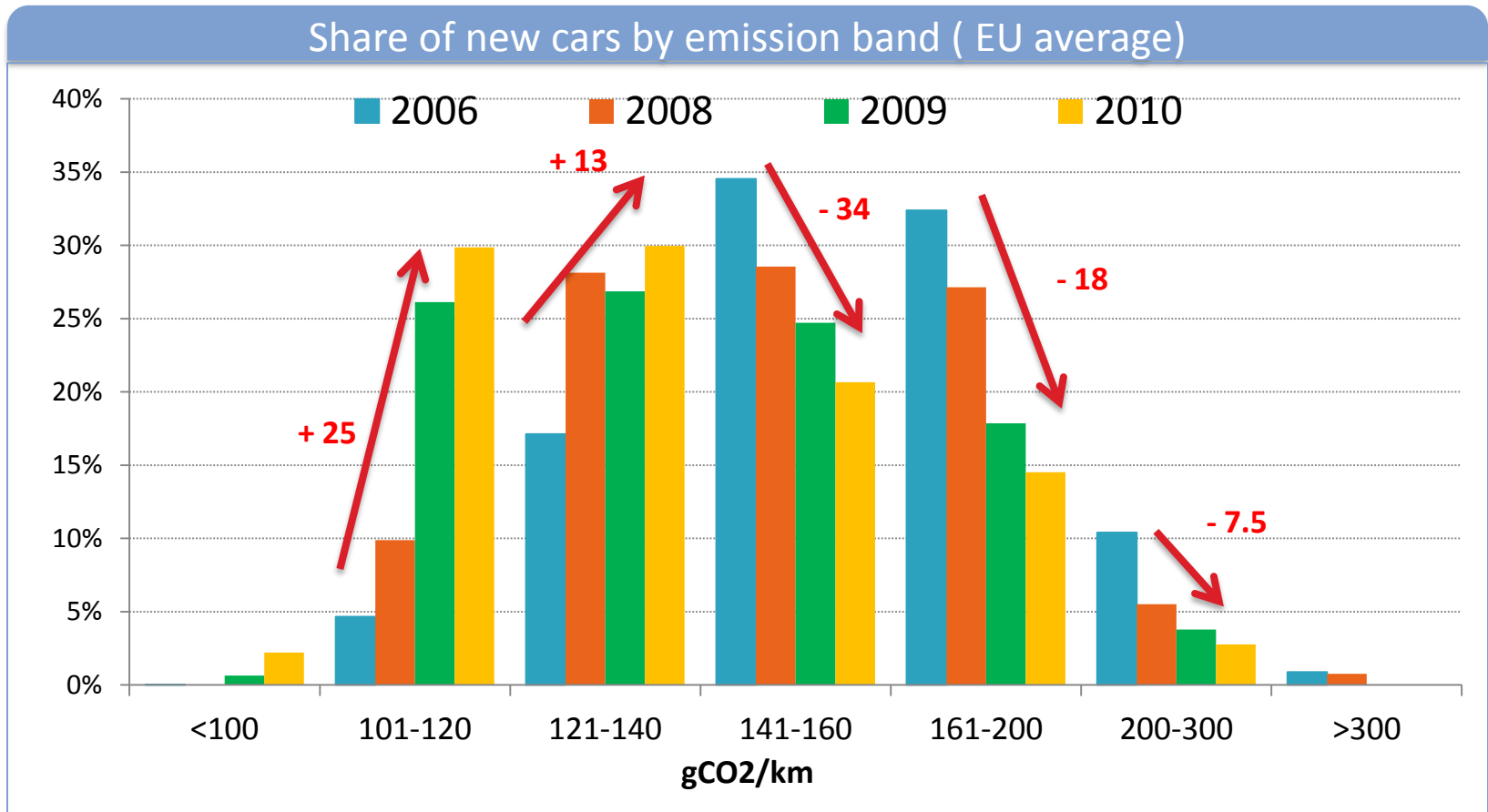
Source: EU Commission updated with ADEME/AAA

- Rapid reduction in the specific emission of new cars since 2006 and especially in 2008-2010 (almost 3.2% on average in 2008) ; slower trends in most countries between 2000 and 2006

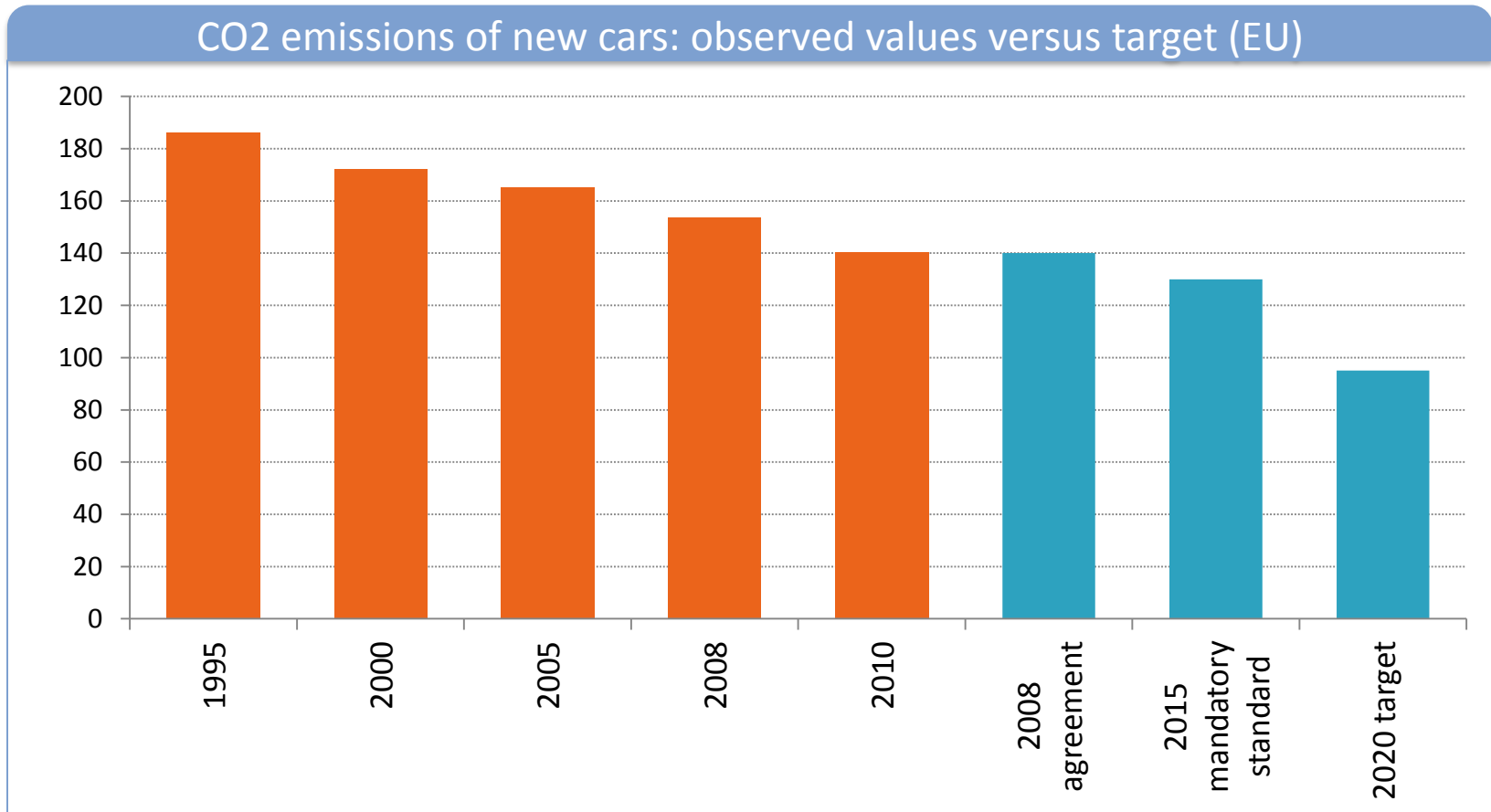


Source: Ademe

- Increasing share of new cars emitting less than 140gCO₂/km between 2006 and 2010
 - +13 points for new cars emitting between 121 and 140gCO₂
 - +25 points for cars emitting between 101 and 120gCO₂

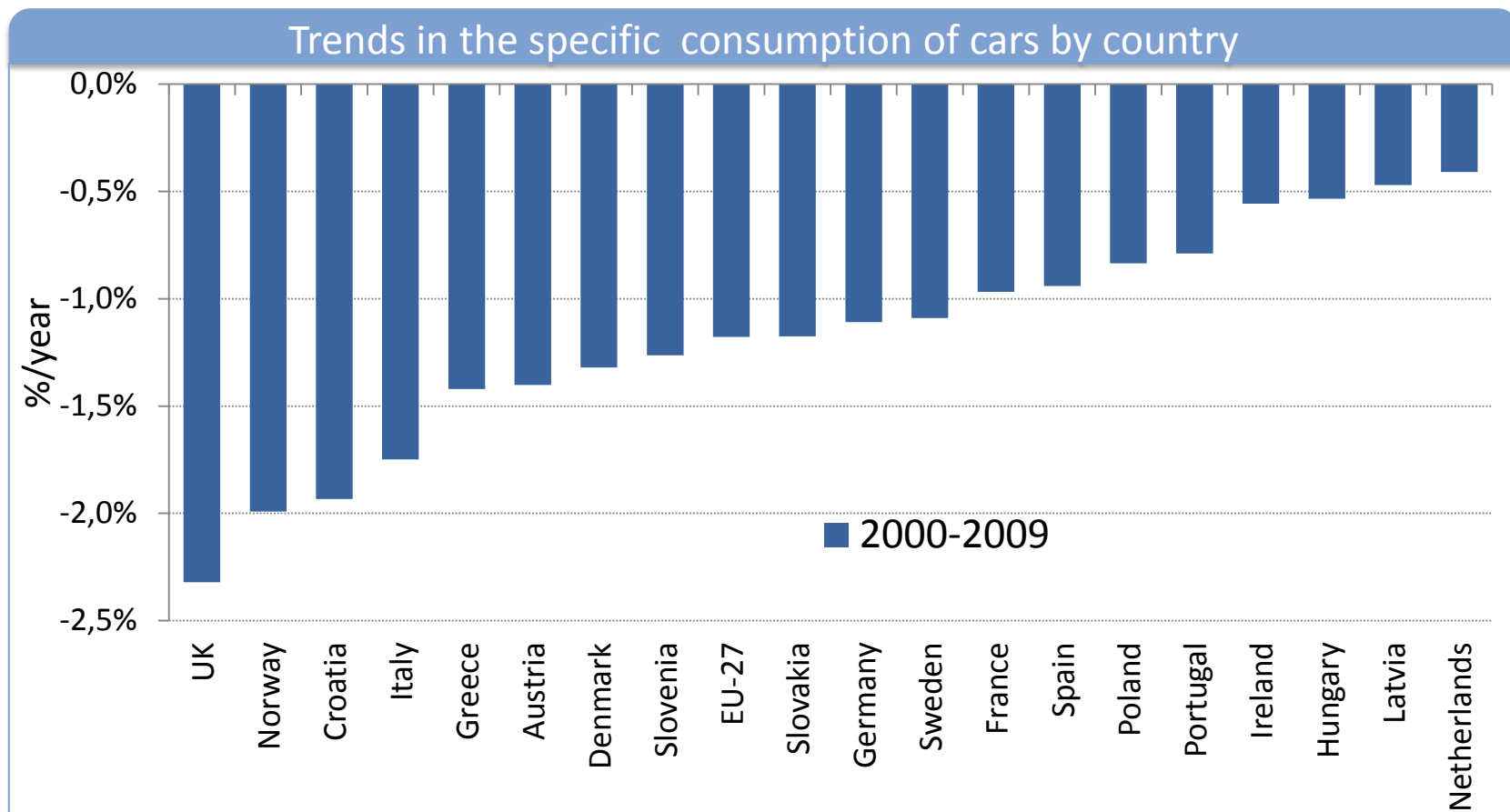


- The observed CO2 emissions of new cars (2010) corresponds to the 2008 agreement.
- To reach the 2015 mandatory standard, the CO2 emissions of new cars have to decreased by 1.5%/year and by 3.8%/year to reach the 2020 target (it has decreased by 1.4%/year between 1995 and 2010)



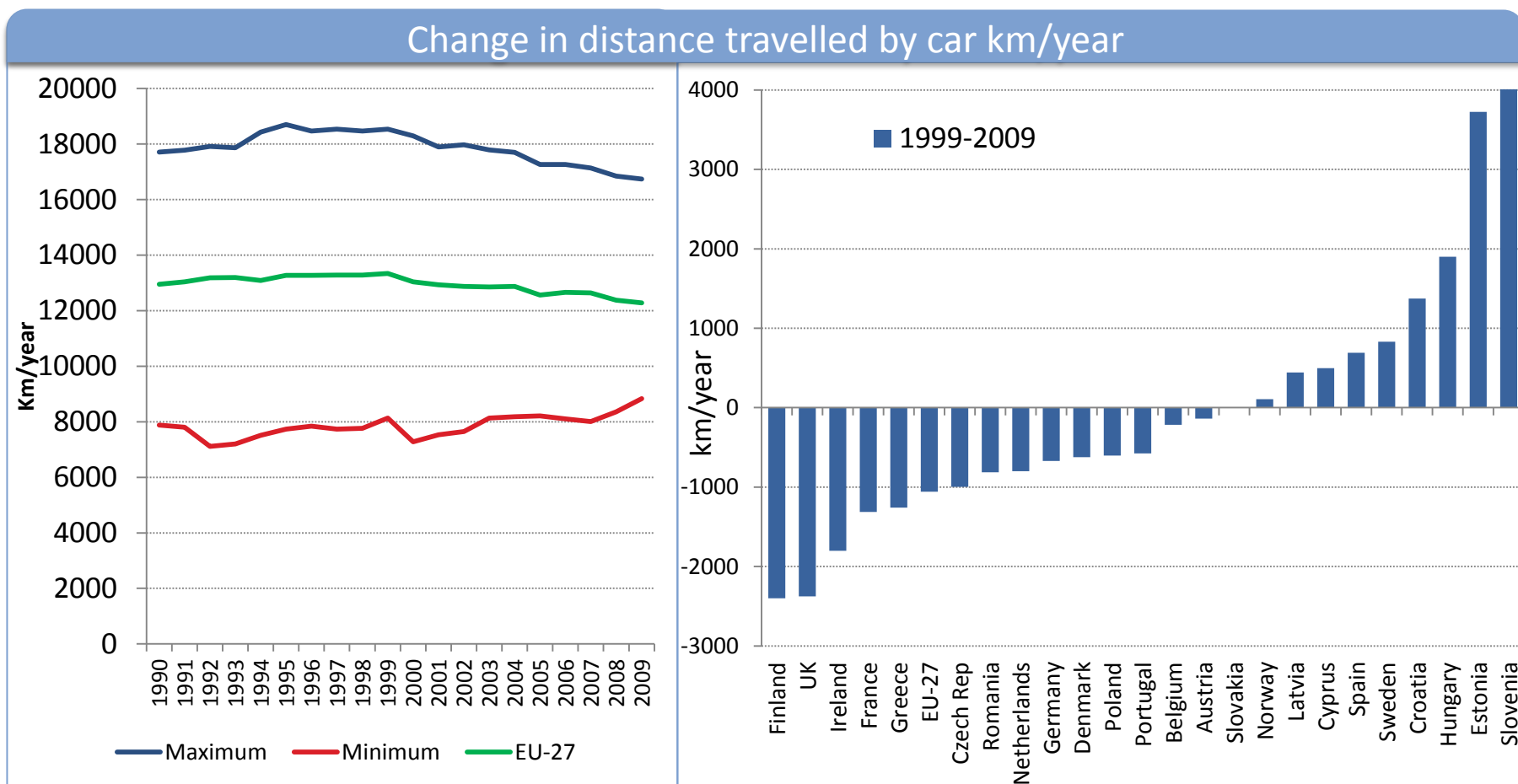
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- Decrease of the average specific consumption of the car stock (l/100km) in all countries
- Different trends across countries and -1.2%/year on average for the EU-27



Source: Ademe

- Large discrepancy between countries, on average 12 300 km/year for the EU
- Decrease in almost all EU-15 countries since 1999, as a result of the sharp increase in motor fuels prices (- 1 060 km for EU-27). However progression in Spain and almost all new member countries.



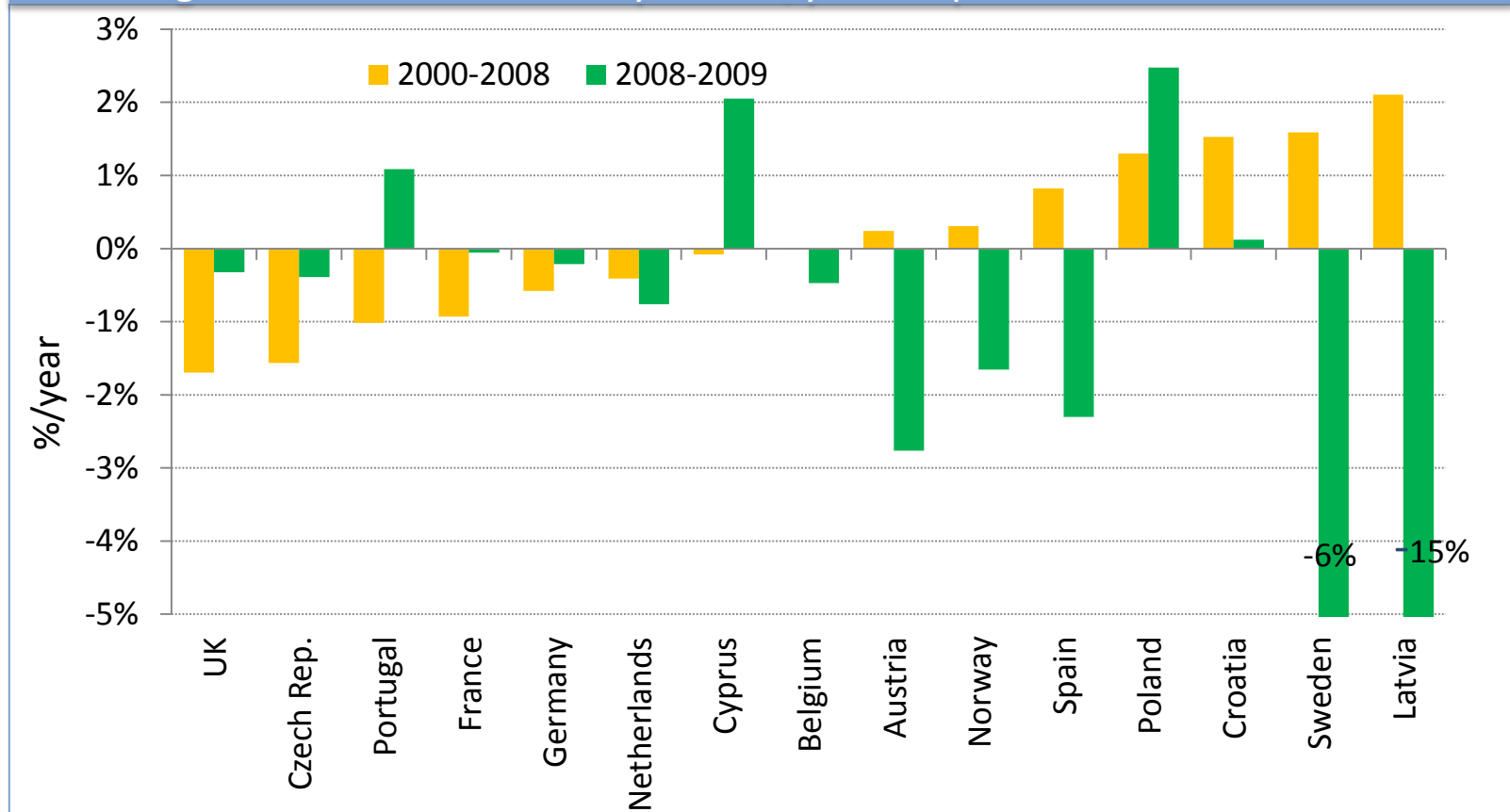
1999-2008 for Greece, Ireland, Romania and Slovenia

Strong reduction in the annual distance travelled by car in UK, Czech Rep, Portugal and France between 2000 and 2008

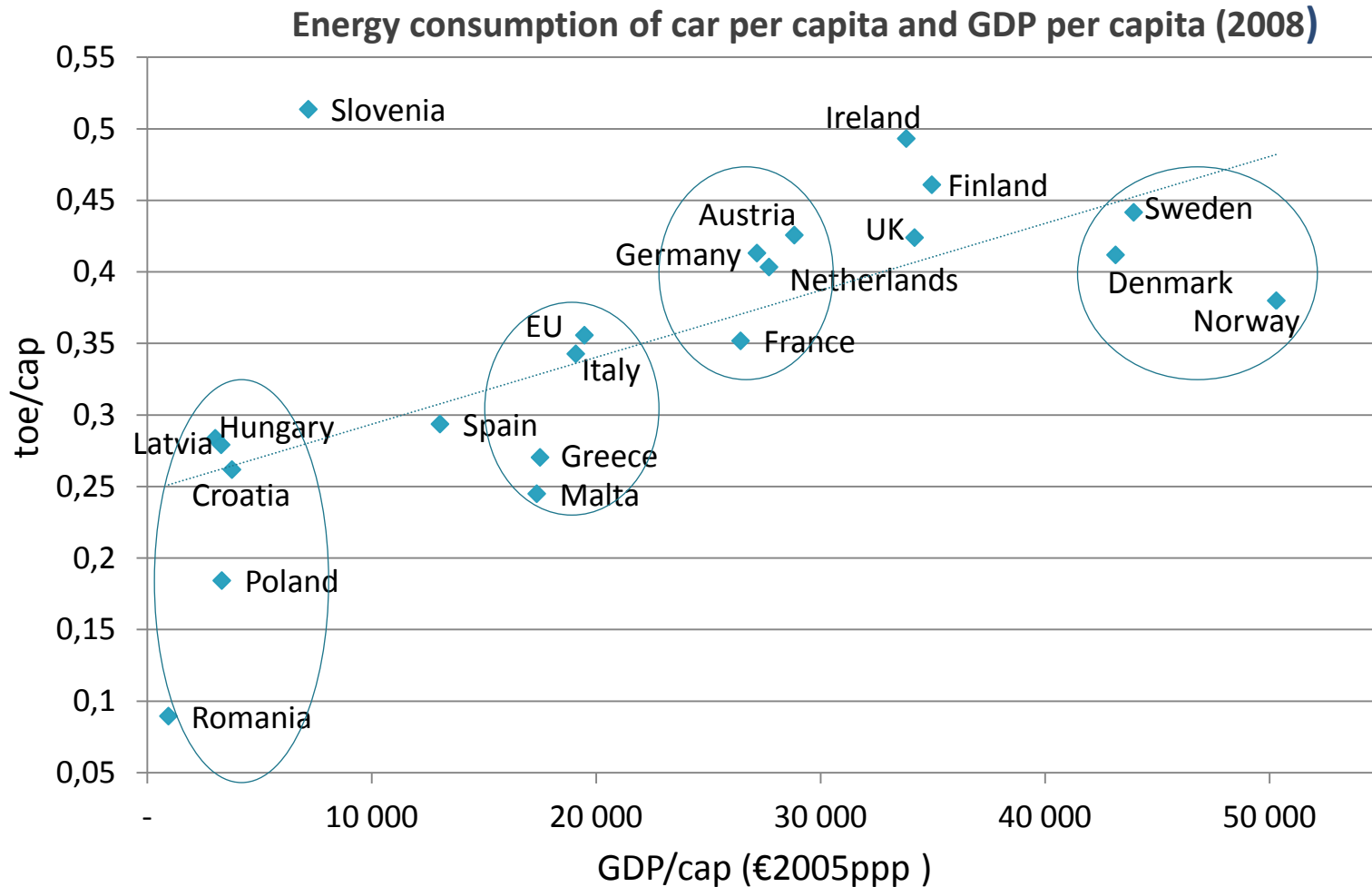
No real impact of the economic crisis in 2009 except in Spain, Austria, Norway Sweden and Latvia

Reverse trend in Cyprus and Portugal with an increase in the distance travelled

Change in distance travelled by car km/year: impact of the economic crisis

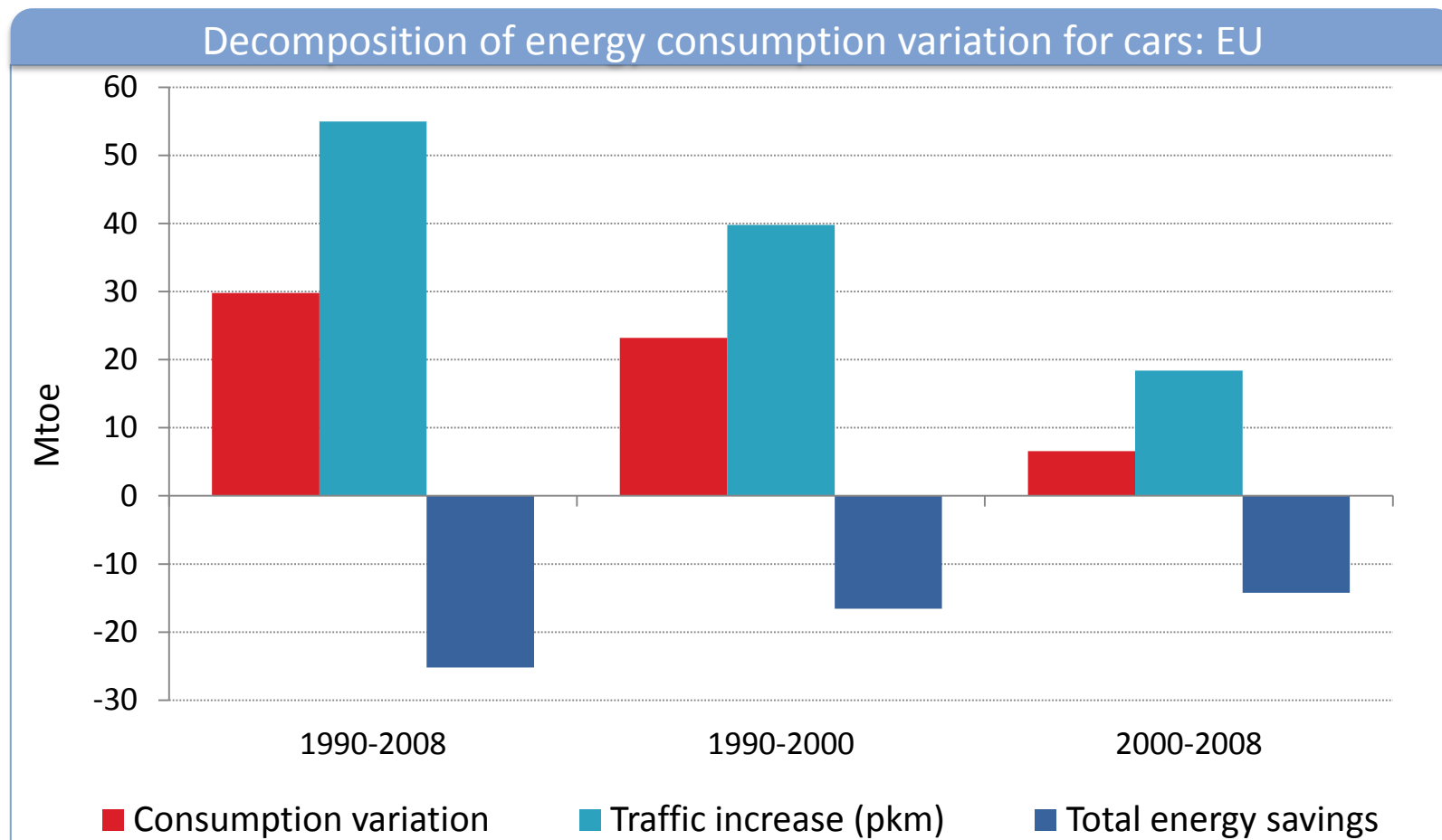


- For a given level of income, range of 20 to 40% in the average consumption of cars, reflecting differences in the fuel efficiency of cars, in the distance travelled and the car ownership

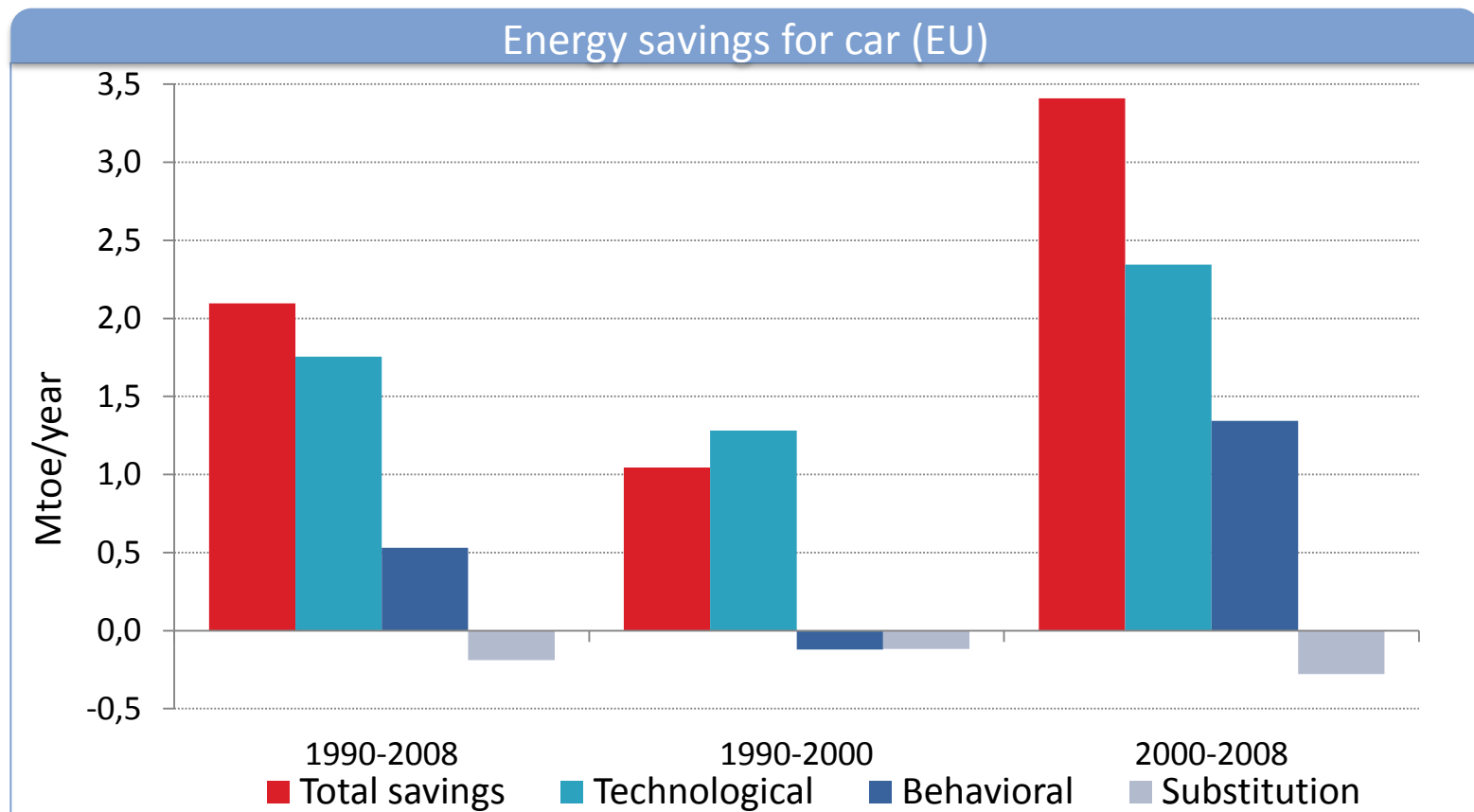


- The increase in car traffic should have raised the energy consumption of cars by 55 Mtoe (27%) between 1990 and 2008. This effect has been partially offset by a reduction in the energy consumption per pkm (-25 Mtoe) resulting in a net increase of the energy consumption of cars of only 29 Mtoe

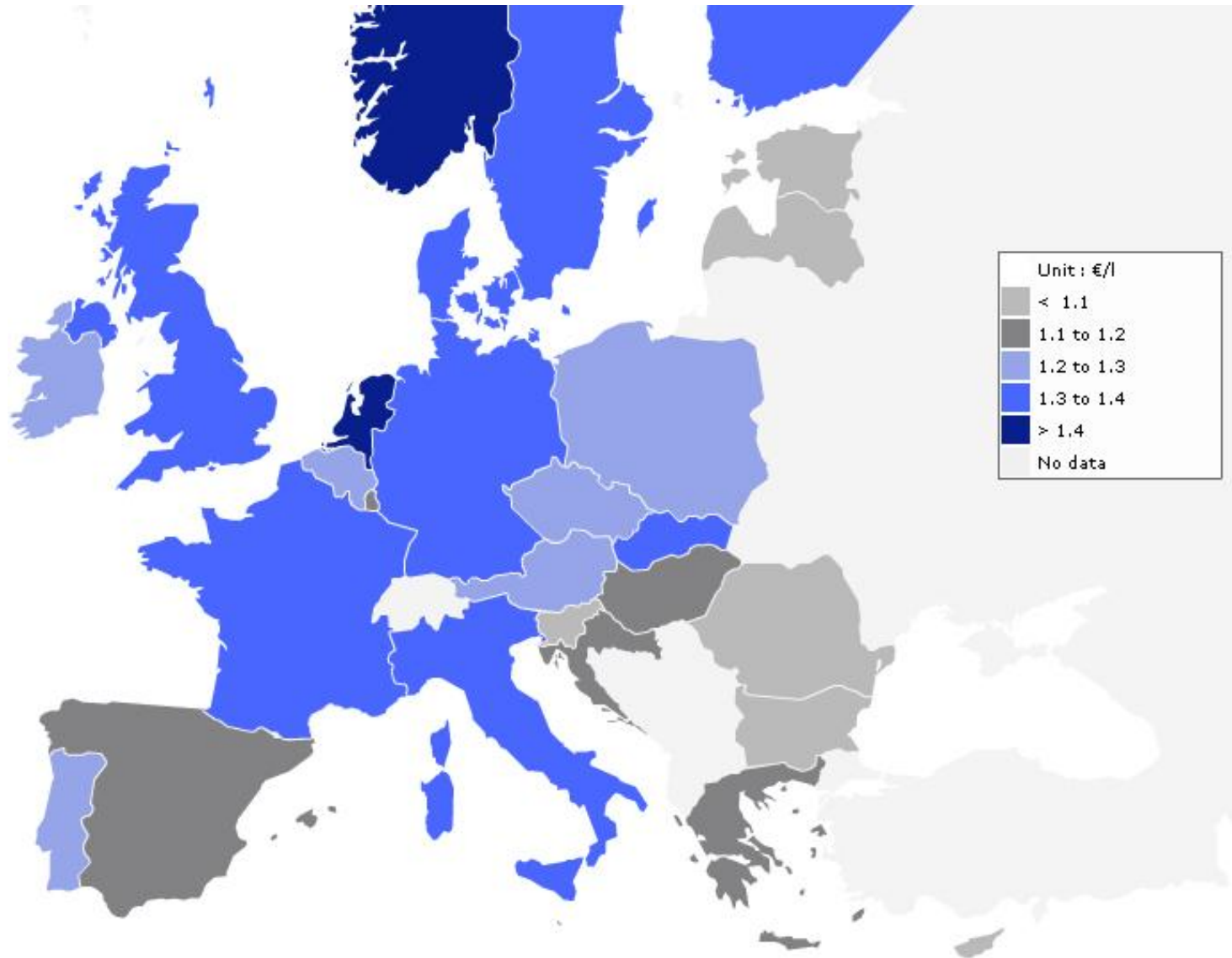
- Slow down in energy savings since 2000 (0.5 Mtoe/year against 1.4 Mtoe/year before)



- Total energy savings for cars can be decomposed into 2 types of savings:
 - ✓ Savings due to the reduction in the specific consumption in l/100km: mainly technological (also include change in driving behaviour and car size); these technological savings are increasing (almost 2.5 Mtoe/yr since 2000 up from 1 Mtoe/yr before).
 - ✓ Savings linked the reduction in the distance travelled (km/car/yr): very large since 2000
- These savings are offset by fuel substitutions from gasoline to diesel and biofuels that increase the average heat content of one litre of motor fuel; increasing since 2000



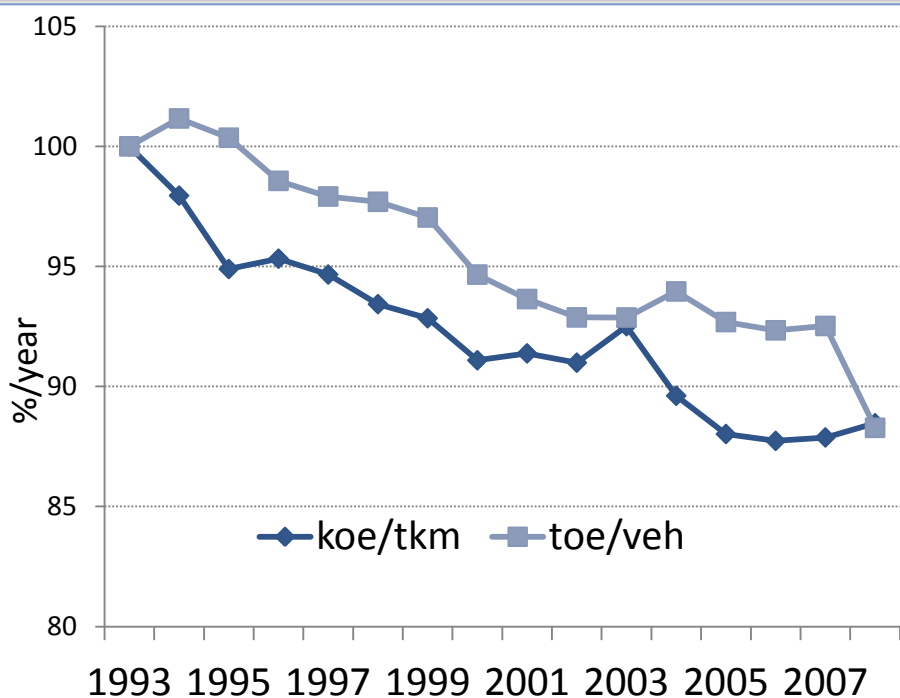
Weighted average price for car users



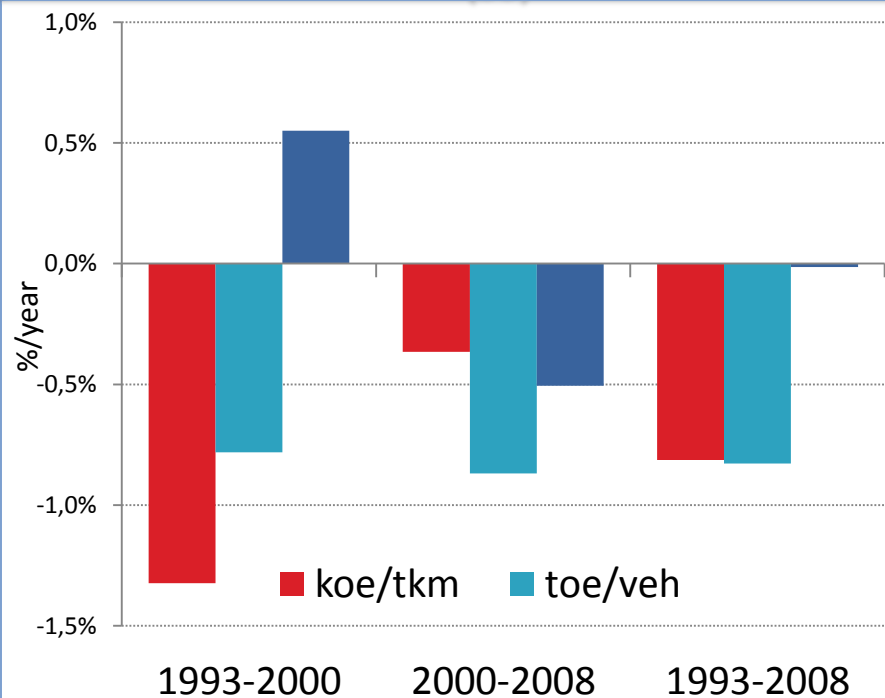
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- Reduction of the average energy consumption per tonne-km at about 0.8%/yr over 1993-2008; slower trend since 2000 due to a decrease in the load factor (tkm/veh) ; between 1993 and 2000 on the opposite faster decrease because of a better management (increase in ton-km/veh)

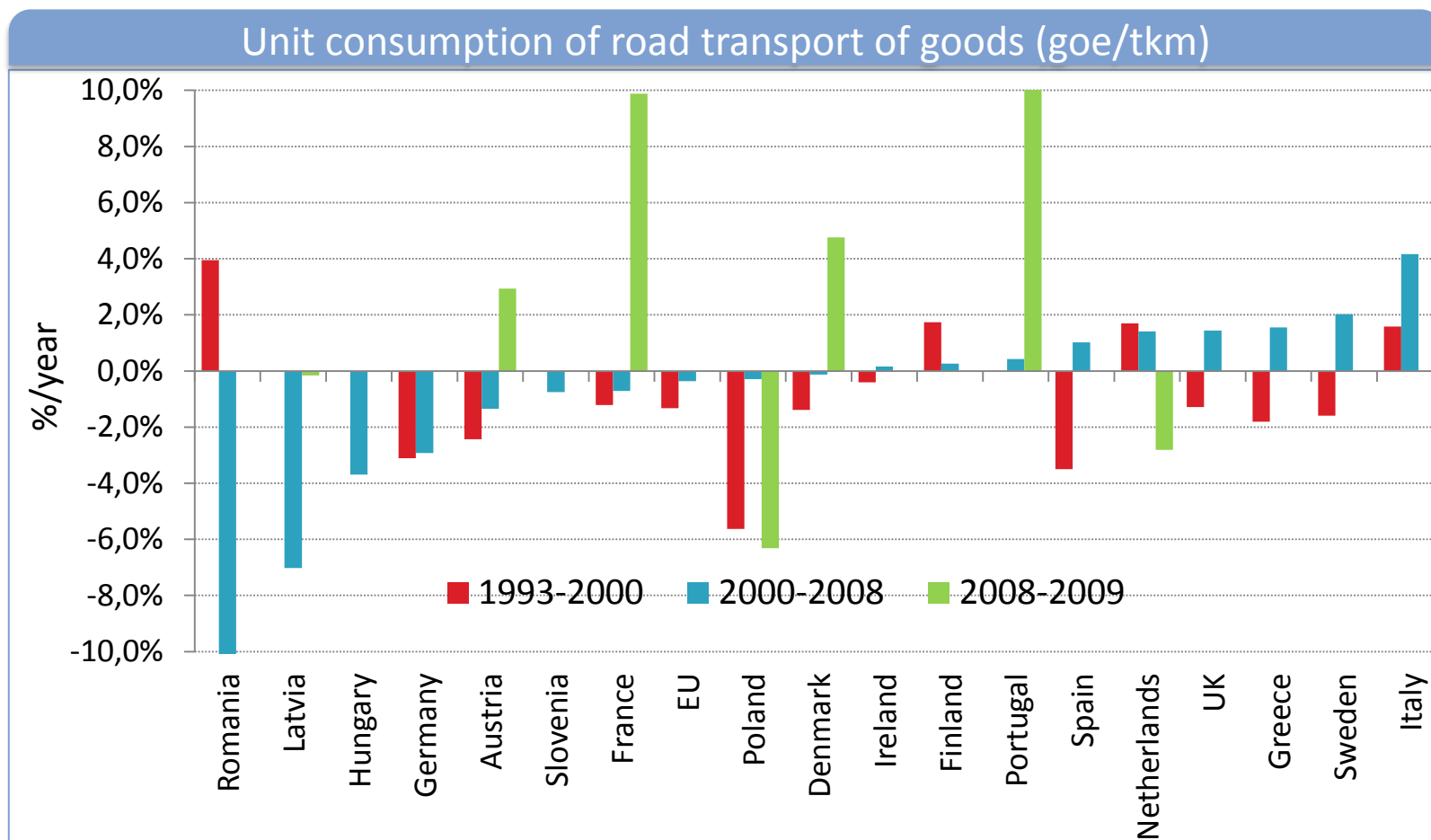
Trends in unit consumption of road transport of goods (EU)



Variation of unit consumption of road transport of goods (EU)

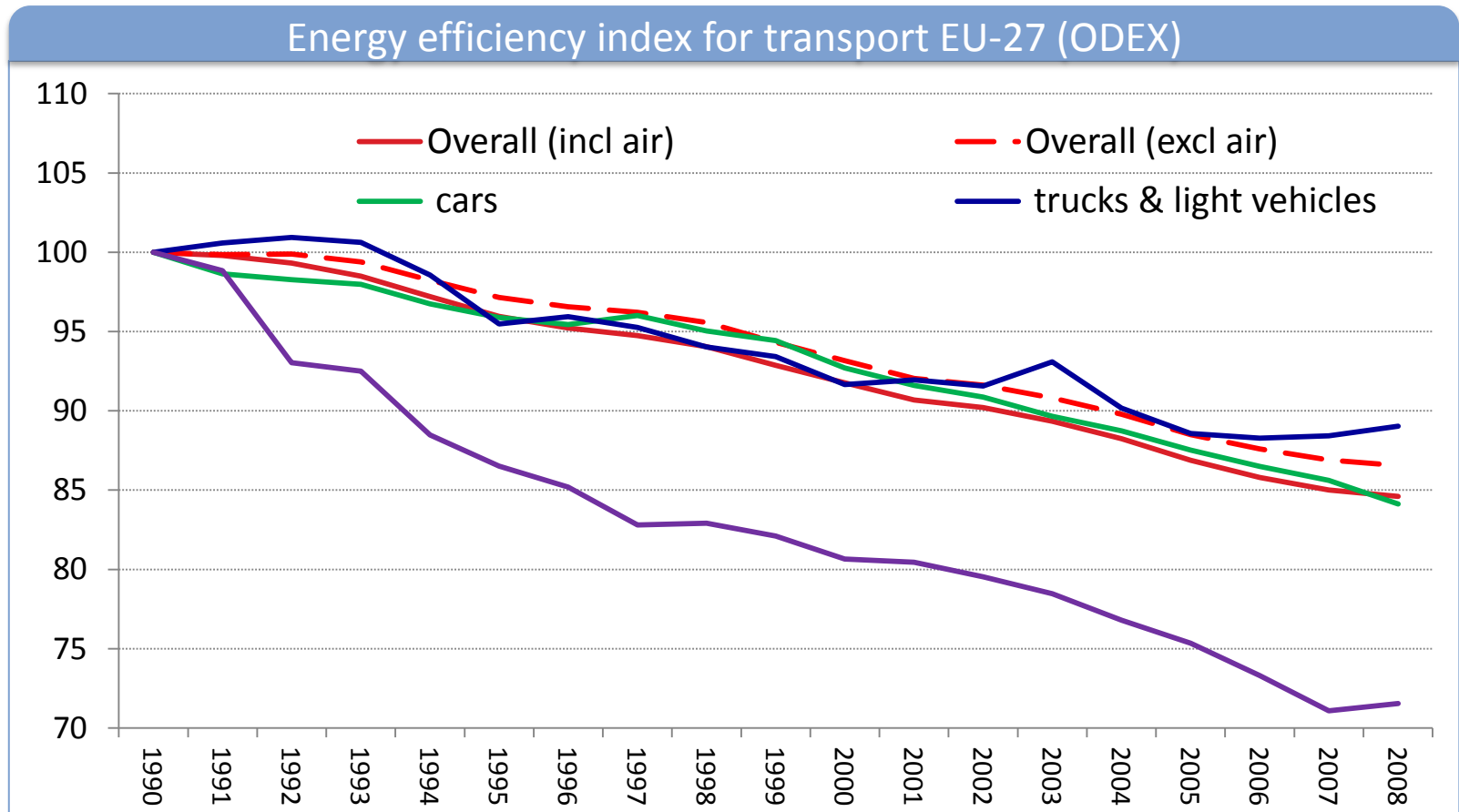


- Since 2000 decrease of the consumption per ton-km in about half the countries corresponding to energy efficiency improvements (both technical and from better management (increase in ton-km/veh);
- Significant impact of the 2009 economic crisis in France, Portugal, Denmark, Austria, with a sharp increase in the ratio corresponding to negative savings ; in The Netherlands and Poland, increased savings in 2009



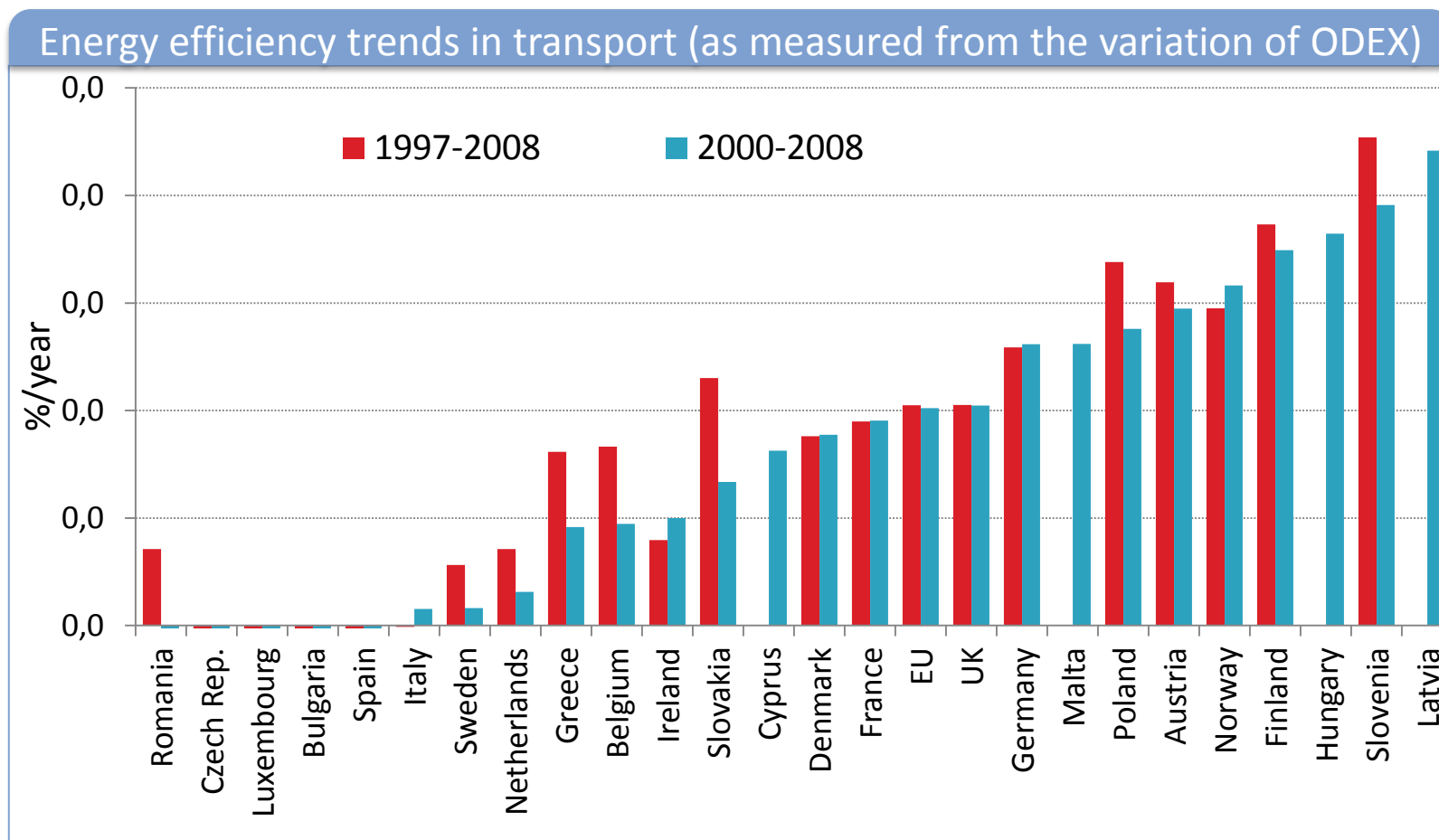
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- ▶ 6. **Energy efficiency trends**
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- Regular improvement of the energy efficiency of transport since 1990: by 15% including air transport and 13% without
- Slow down in efficiency of trucks and light vehicles since 2000



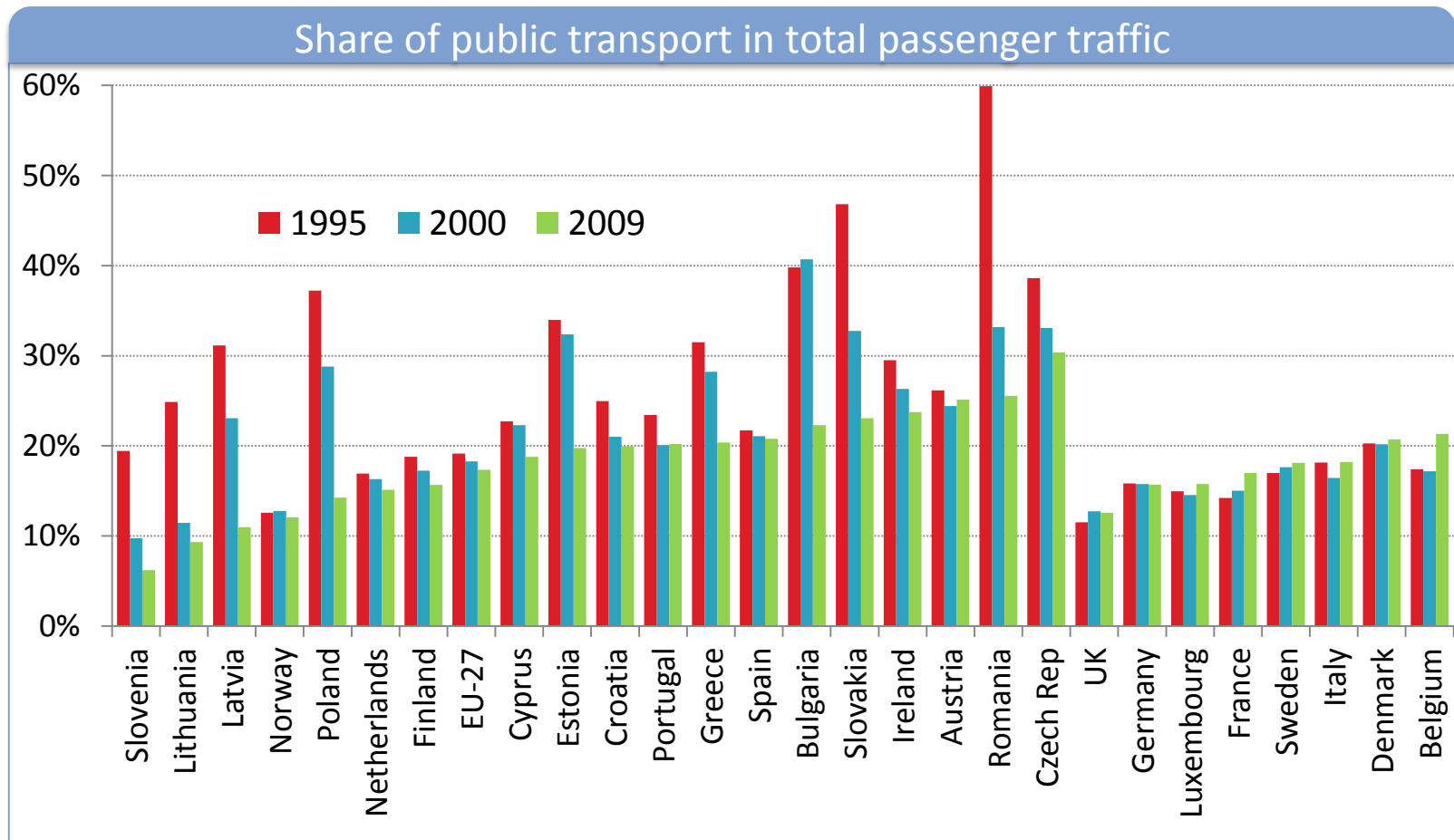
ODEX calculated on 7 modes: cars (litres/km), trucks & light vehicles (toe per tkm), air (toe per passenger); rail, water (toe/ tkm or pkm); motorcycles, buses (toe/vehicle)

- Improvement in energy efficiency in almost all the countries, except for 5 countries where transport of goods by road is less efficient



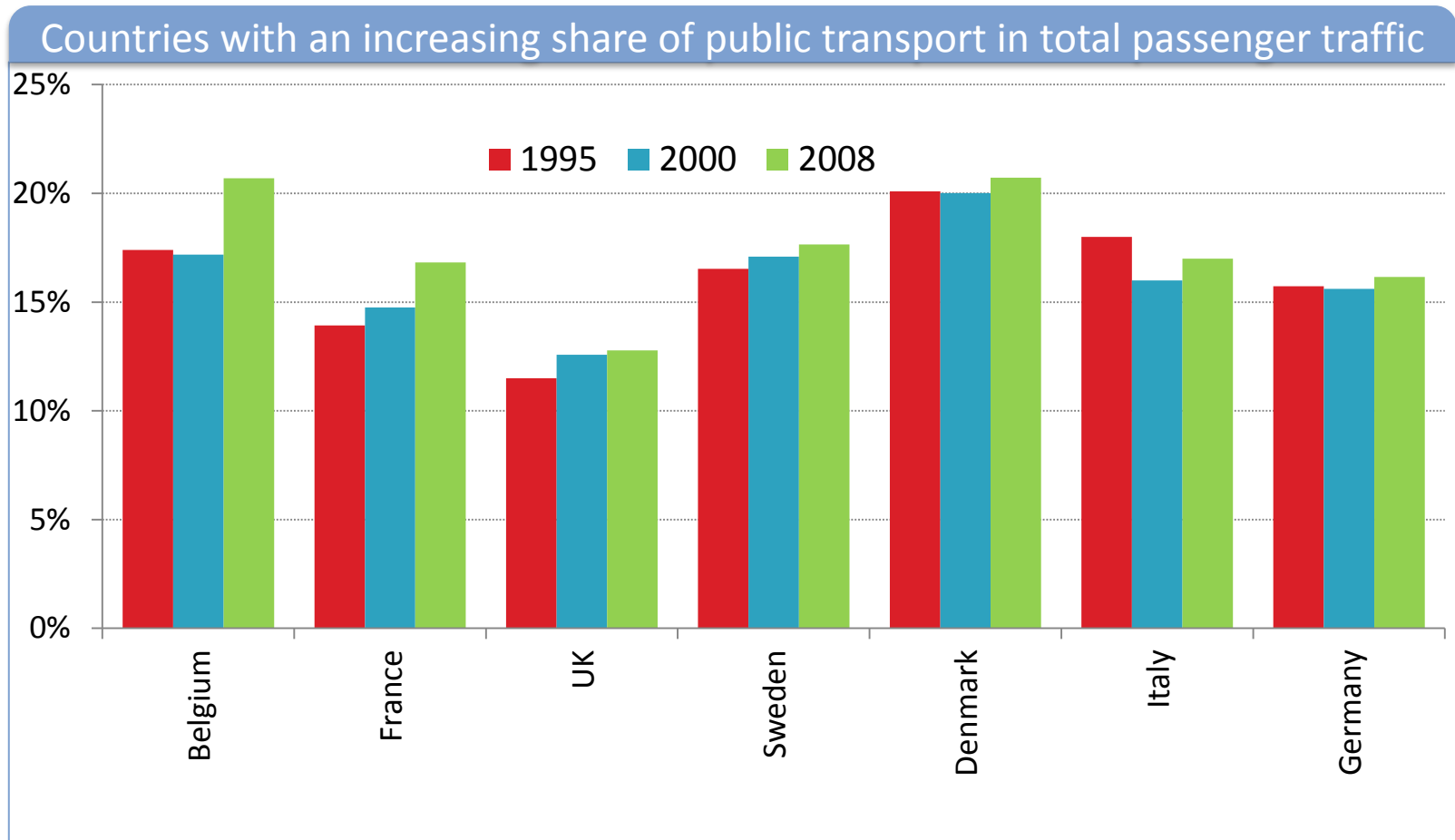
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- Decreasing share of public transport in passenger traffic in most countries, except in 8 countries (UK, Germany, France, Italy, Sweden, Belgium, Luxembourg and Denmark). Rapid reduction in new member countries, where public transport used to be dominant (especially in Poland, Latvia and Slovakia)

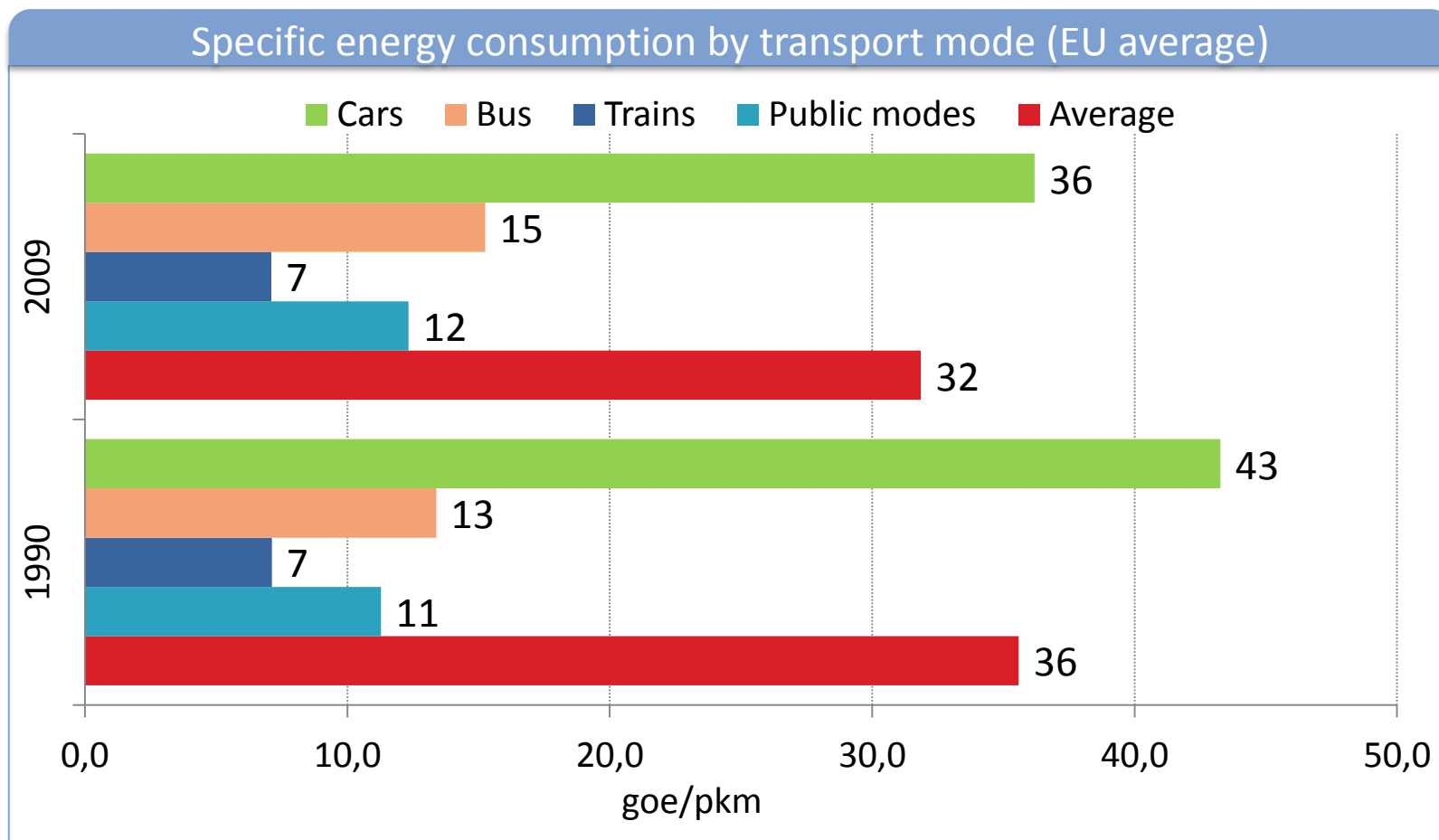


Increasing share of public transport in passenger traffic in 6 countries

Benchmark: Belgium with highest share of public transport and highest progression
Denmark high and stable share and France: strong progression

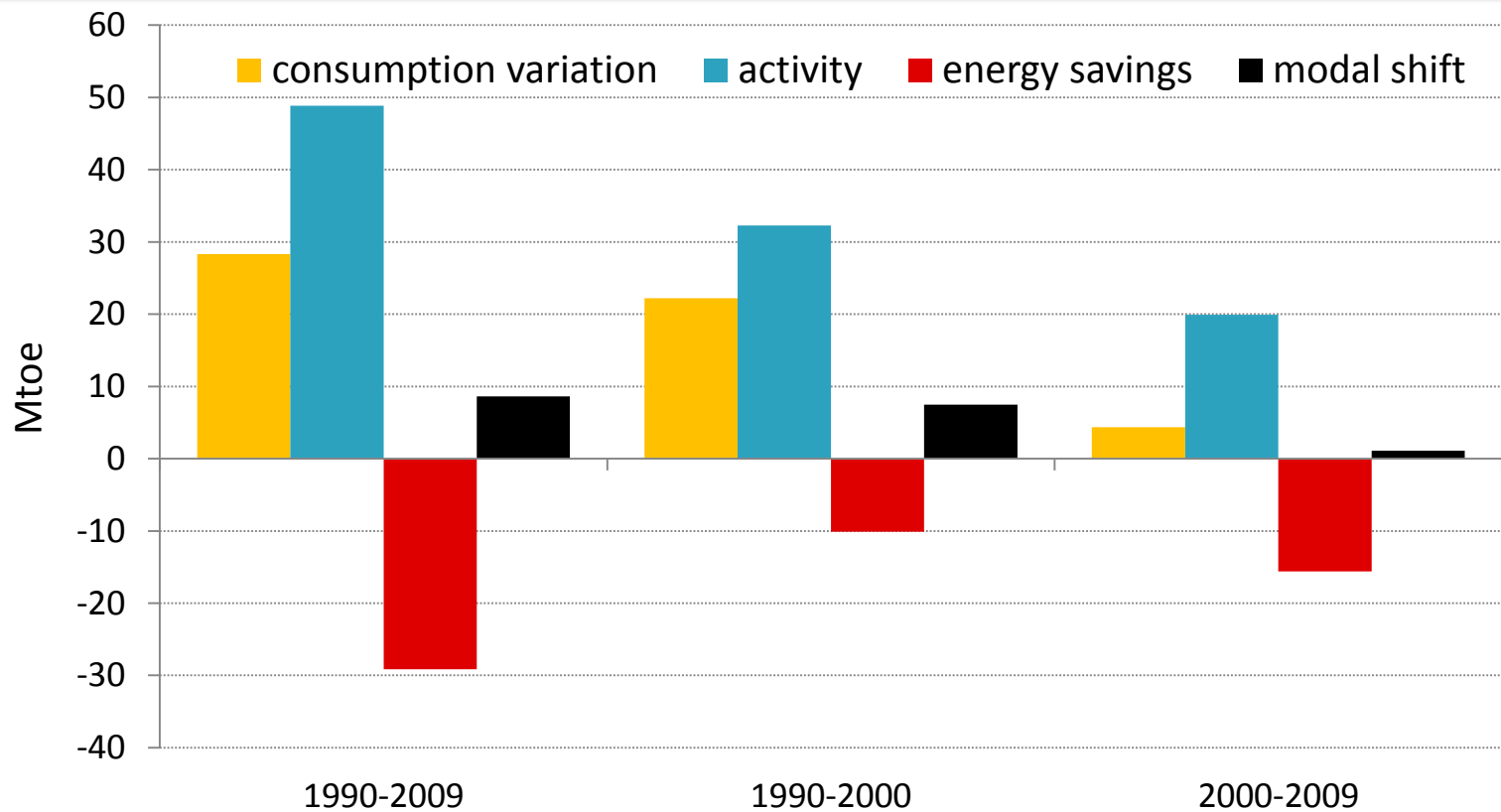


On average, cars require 4 times more energy to transport one passenger-km than public transport (rail transport and buses), and 5 times more than rail transport alone (trains, metro and tramways)

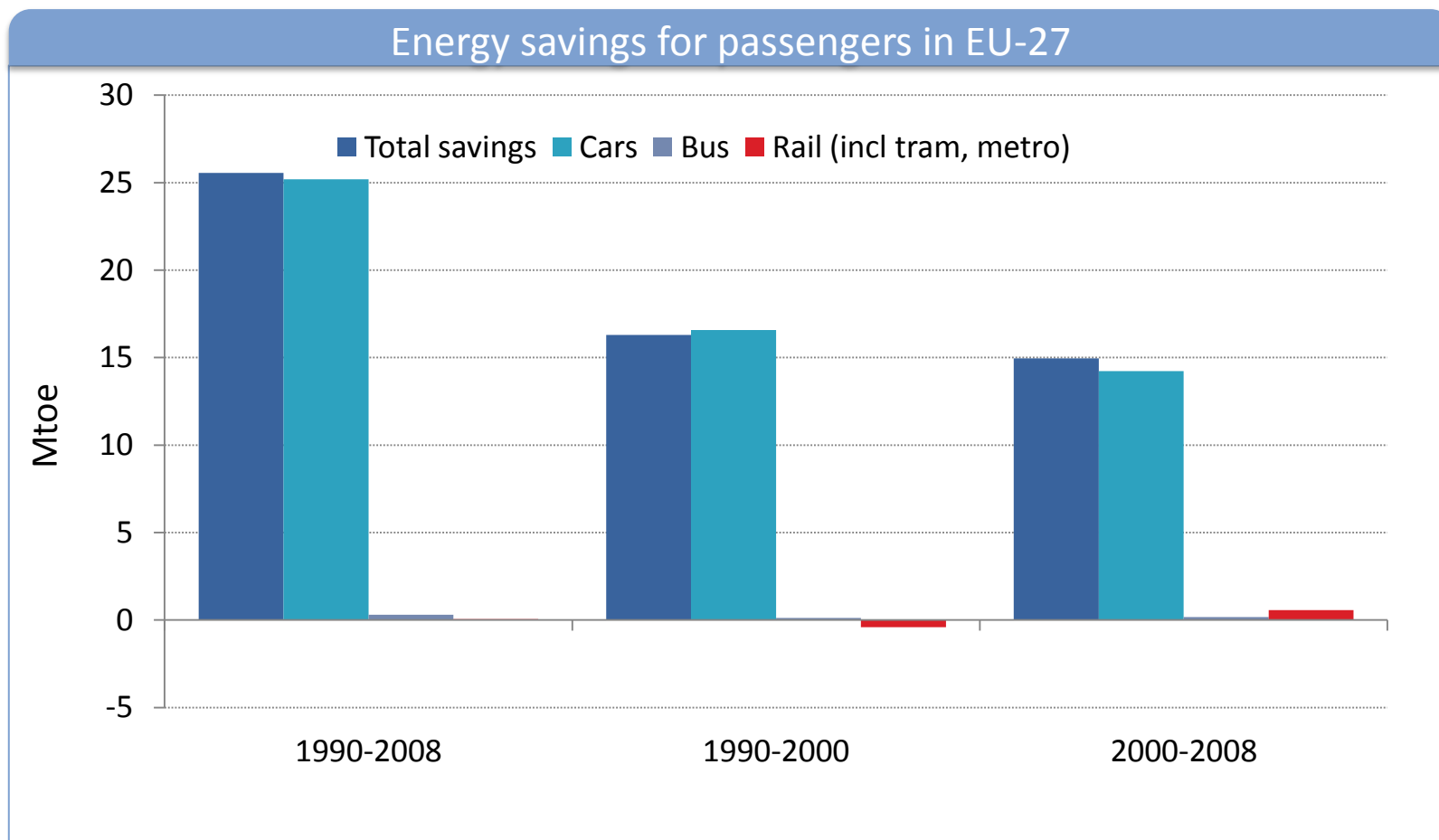


- Increasing energy consumption for passenger is mainly due to a growth of activity (more road vehicles and increasing passenger traffic). Modal shift have a negative impact due to a decreasing share of public transport in passenger traffic (or a shift from public transport to car) and contribute to increase the consumption. Energy savings (change in specific consumption per unit of traffic) offset the activity effect and limit the progression of energy consumption

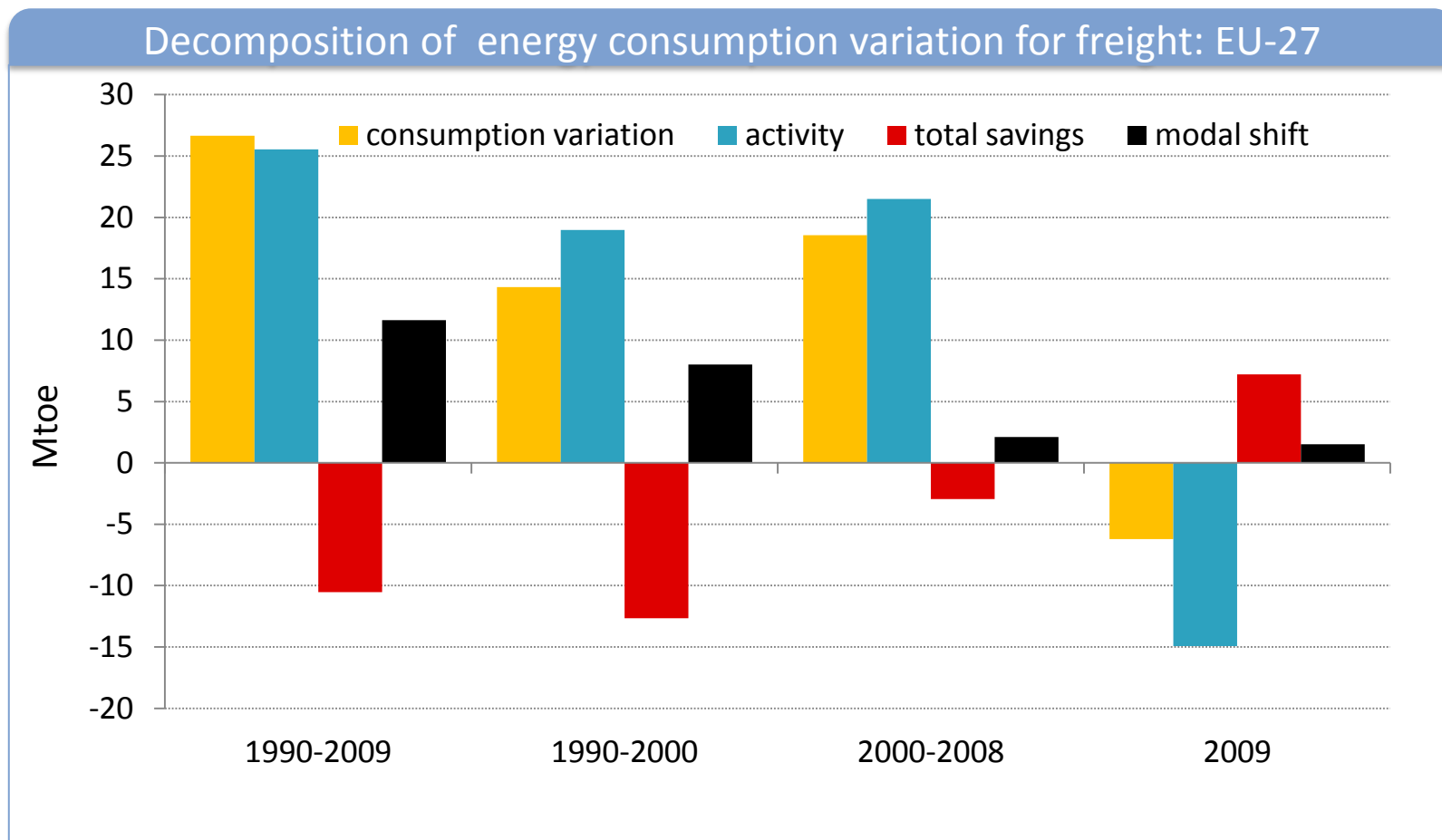
Decomposition of energy consumption for passengers: EU-27



Energy savings for passengers (25 Mtoe in to 2008 compared to 2000) are only due to cars due to a technological effect (decrease in specific consumption in liter/100km) and a reduction in the annual distance travelled per car. Since 2000, slow down in energy savings for all modes, except for rail.



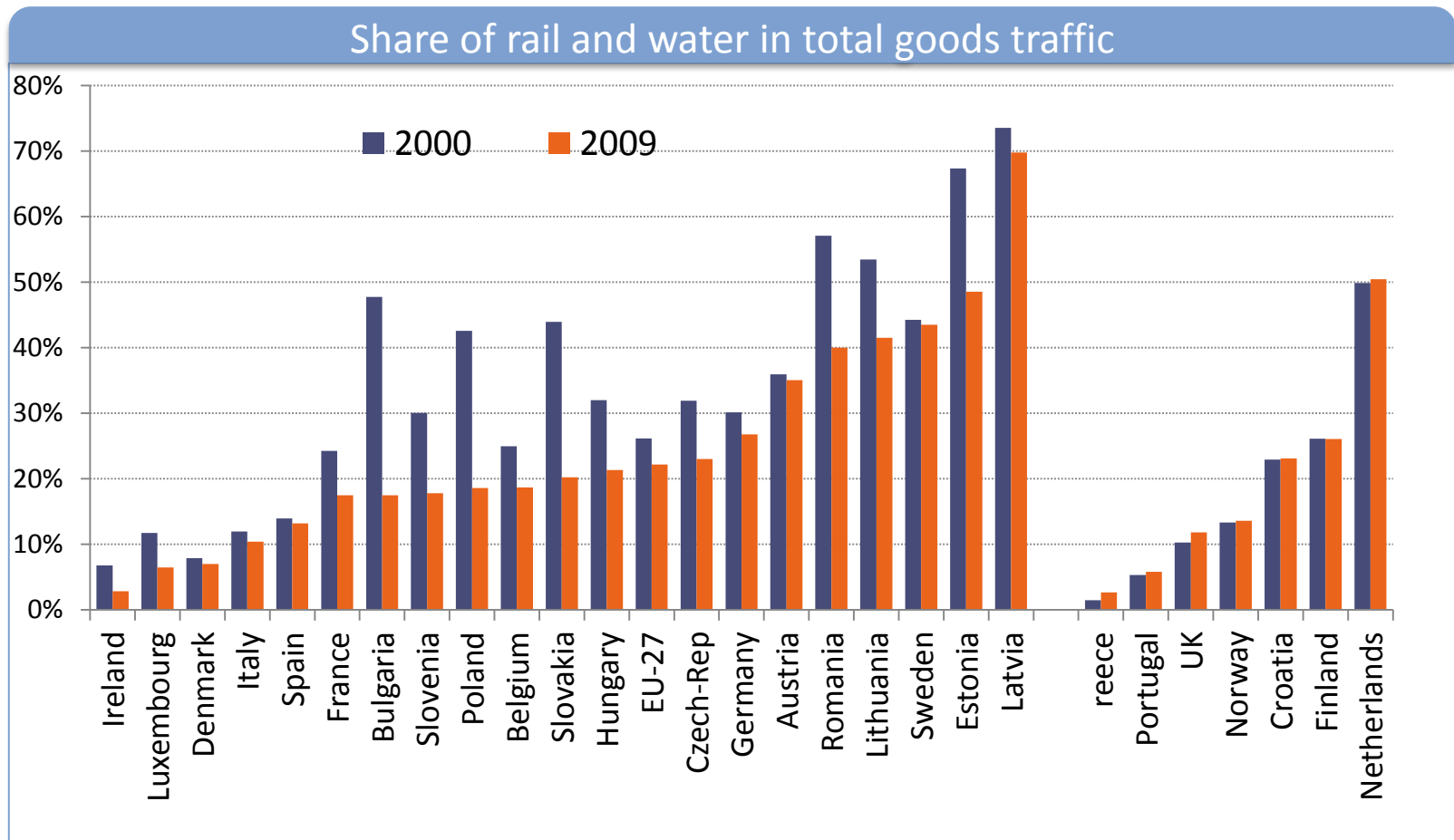
Energy consumption of freight transport has increased by 26 Mtoe since 1990 due to an increase in the traffic in ton-km. Energy savings have limited this activity effect; modal shift had a negative impact due to an increasing share of road goods transport. In 2008-2009, opposite trend: activity decreased and implied a reduction in total consumption, while energy savings reversed because of an increase in the energy consumed per tonne-km, as explained above for road.



Decreasing share of non-road goods traffic in almost all the countries

Large discrepancies between countries

Increasing share of rail and water for 7 countries since 2000 (Netherlands, UK, Finland, Croatia, Norway, Portugal and Greece)

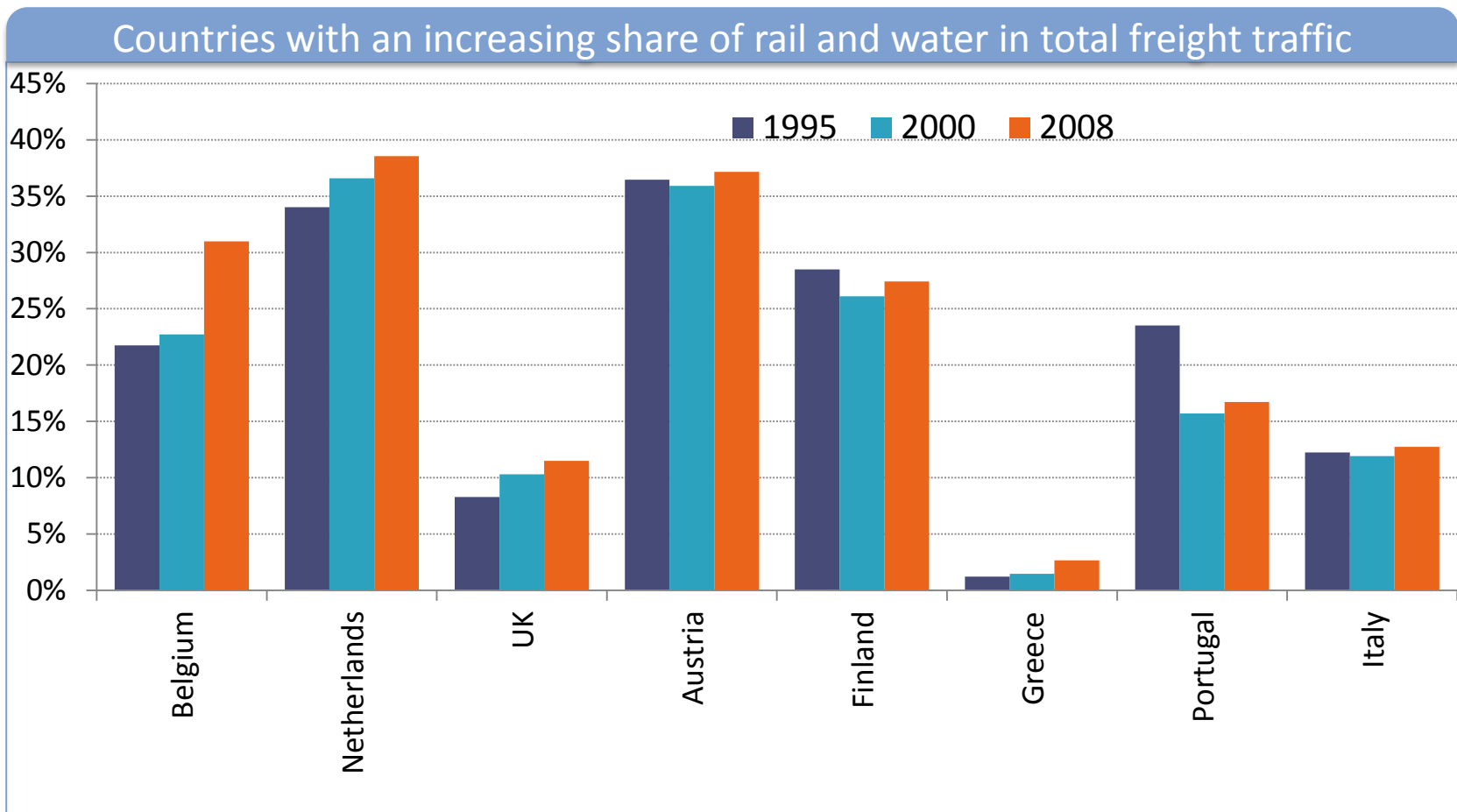


Increasing share of rail and water in freight traffic in 8 countries

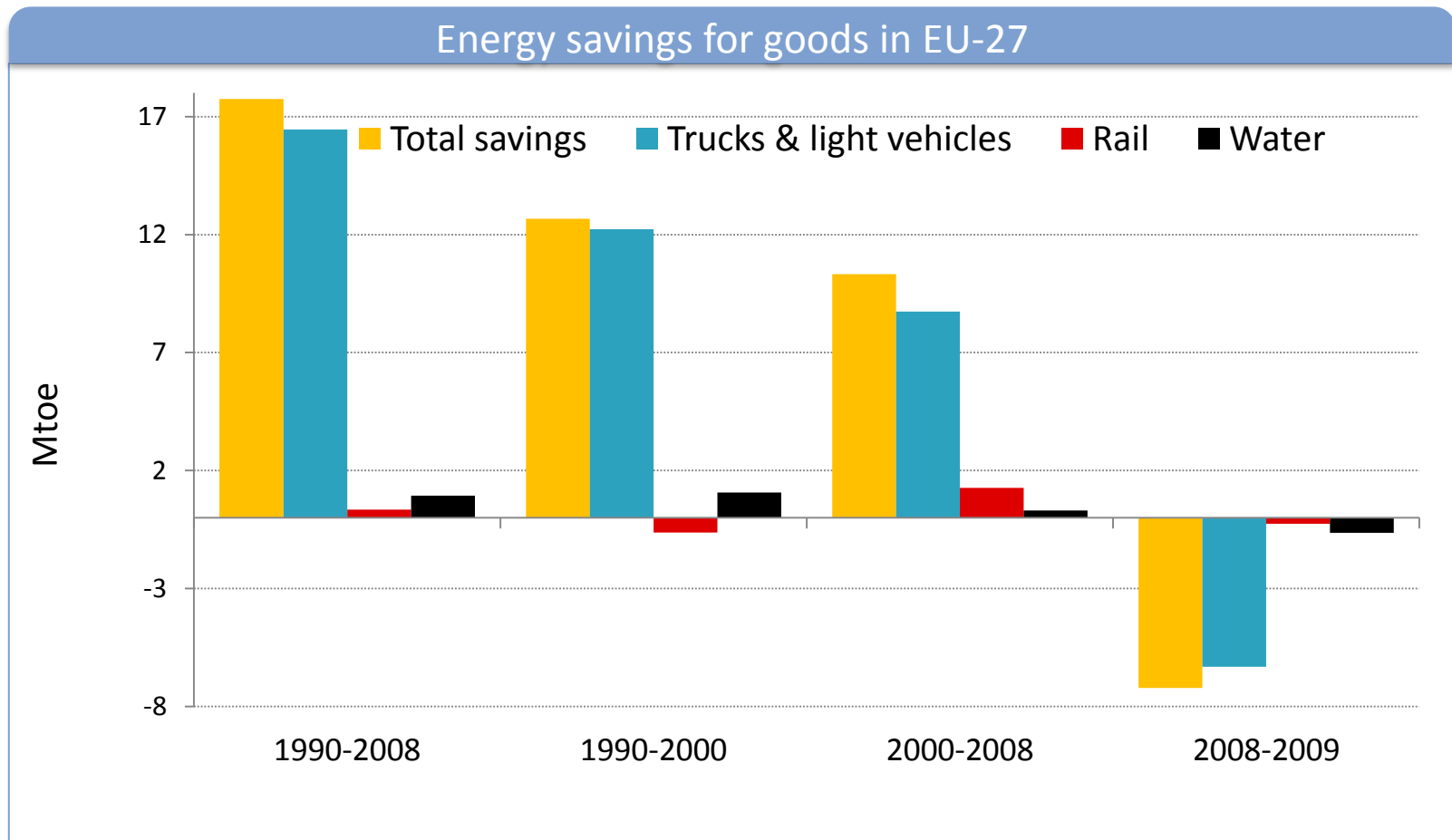
Benchmark: The Netherlands with highest share and a good progression

Followed by Belgium with highest progression (+ 9 points between 1995 and 2008)

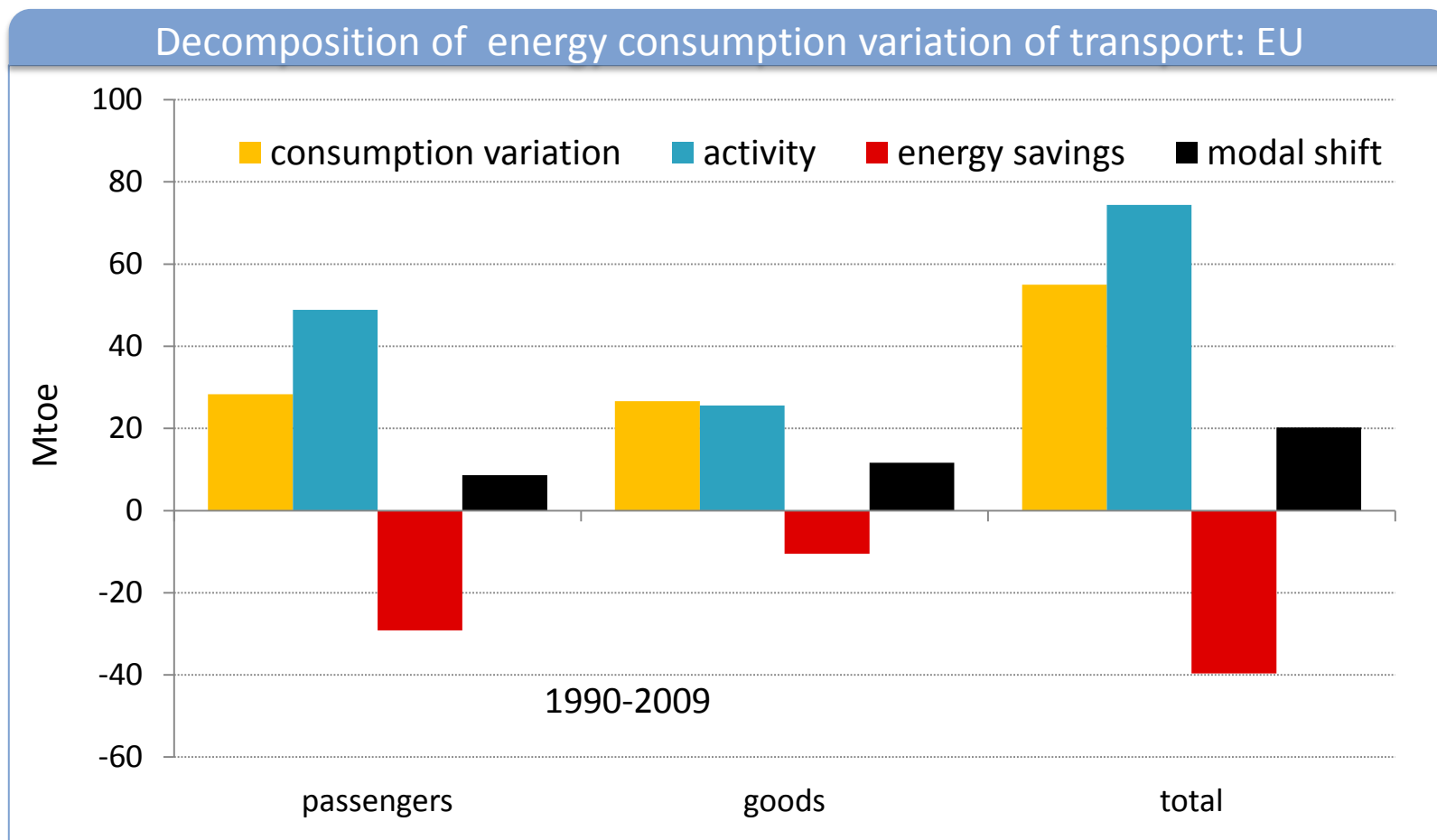
In 5 countries increasing share since 2000 (Austria, Finland, Greece, Portugal & Italy)



- Energy savings for goods (17 Mtoe in 2008 or 0.9 Mtoe/yr from 1990 to 2008) are mainly due to savings from trucks and light vehicles due to a decrease in specific consumption per tonne_kilometre.



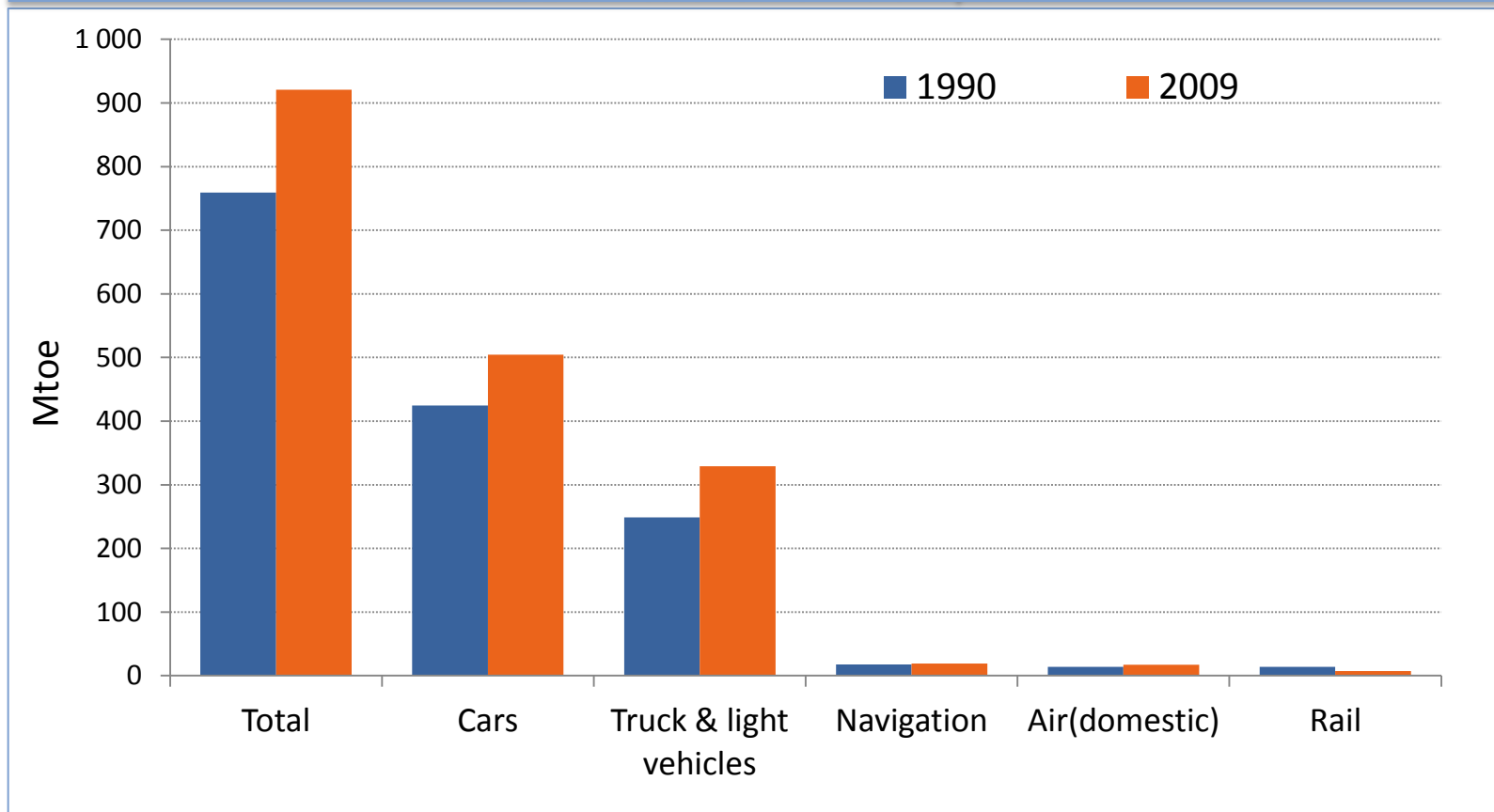
Increase in freight and passenger traffic and modal shift to cars and trucks contributed to increase the energy consumption of land transport;
 Energy savings from more efficient vehicles have limited the total increase



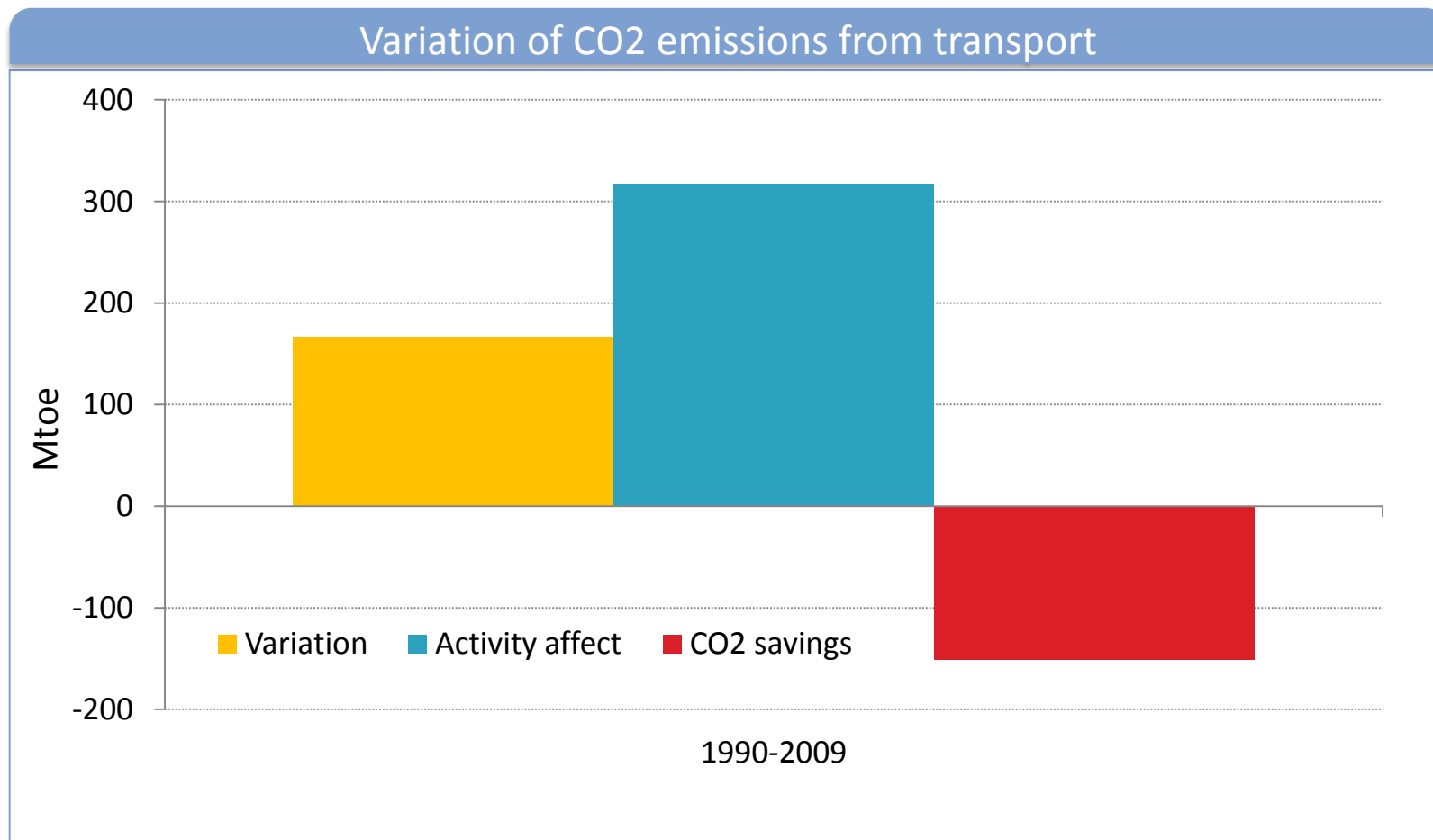
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- CO2 emissions in the transport sector have increased by 21% since 1990. Transport represents a growing share of the total emission of final consumers: 43.5% in 2009 compared to 32% in 1990. Since 2000, the increase of transport emissions has slowed down (0.3%/year compared to 1.7%/year over 1990-2000).

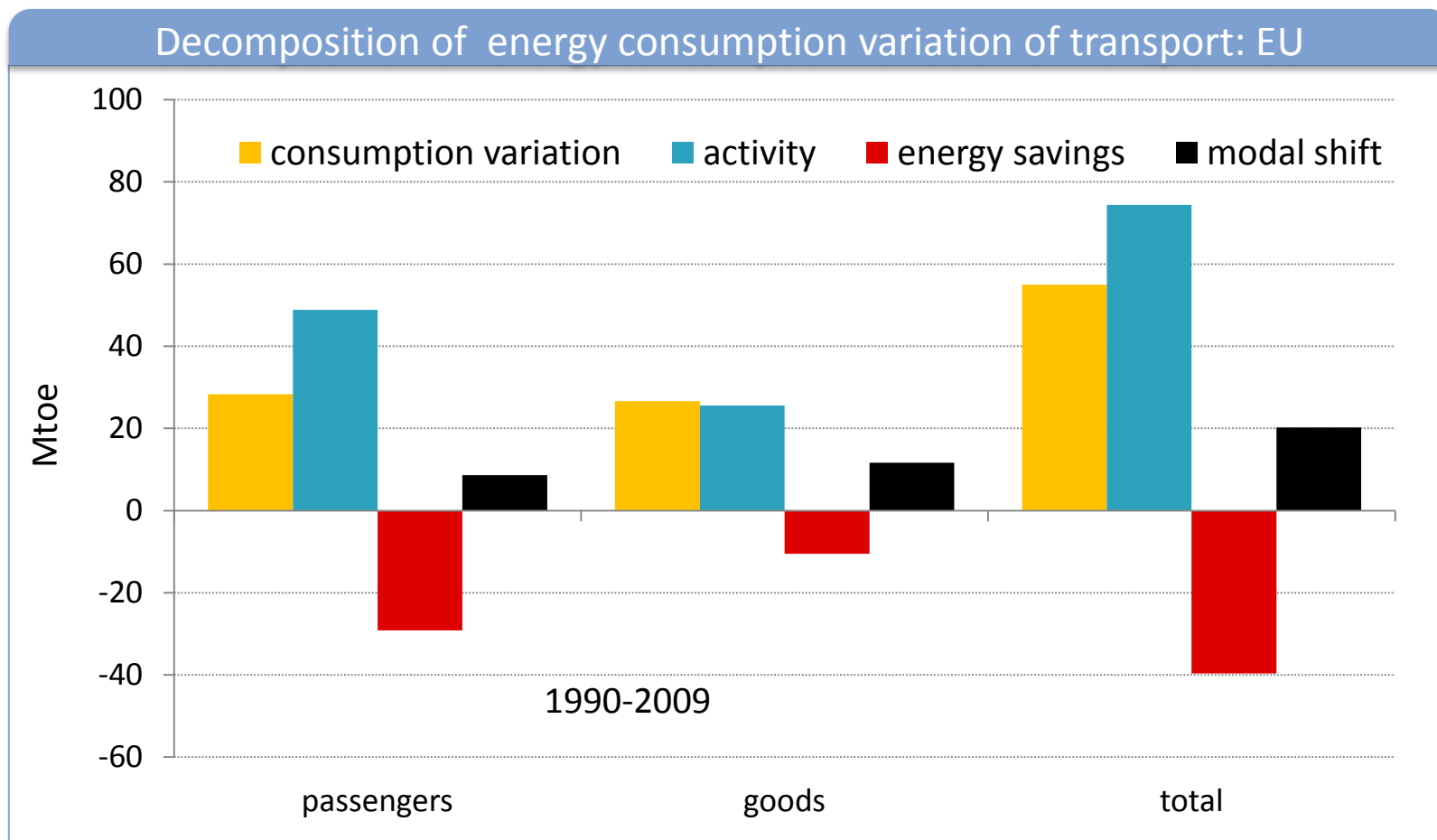
CO2 emissions from transport



- Around 150 Mt CO2 avoided in 2009, which has offset almost half of the increase in CO2 emissions due to the increase in traffic (activity effect) since 1990



Increase in freight and passenger traffic and modal shift to cars and trucks contributed to increase the energy consumption of land transport;
 Energy savings from more efficient vehicles have limited the total increase



Conclusions

- Strong impact of the economic crisis for transport of goods; less impact for cars
- Acceleration of energy efficiency progress since 2006 for new cars with new policies on car taxation and higher energy prices; this will continue in 2009 and 2010 with the high oil price and the car scrappage schemes
- Modal shift continue to favour cars and truck, except in a few countries, a trend opposed to the aspiration of policies