



# What future for individual mobility?

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## Who is and what does FEBIAC ?

- Belgian Automobile and Two-wheeler federation
- Official representative of car, van, truck, bus & motorcycle makes in Belgium
- Mission:
  - promote a favorable business environment for our members
  - contribute to reliable, comfortable, environmental friendly and safe transportation by road
- Activities:
  - Organisation of the “European Motor Shows Brussels”
  - Belgian vehicle market & vehicle parc statistics and analysis
  - Develops & promotes sector’s interests & positions in product-related issues on:  
economy, environment, mobility, road safety, taxation, technical issues...  
... on regional, federal, European and international level  
... in a complex, volatile and competitive environment





## Automotive industry challenges – get next decade's mobility:

### 1) ...Safer: 50% less road casualties 2000-2010, another 30% by 2020

- Vehicles: passive and active safety – human-machine interaction
- Solid road network that allows safe traffic with acceptable congestion levels

### 2) ...Greener: 20% less emissions & 20% more renewable energy by 2020

- Transport & CO<sub>2</sub>: climate concerns, oil dependency & rising global energy demand
- Transport & air quality: citizen's health concern
- Many stakeholders involved: industries, authorities & drivers

### 3) ...Smarter: fit in growing transport demand in a sustainable society

- Future transport demand: +20% for persons and +50% for goods in 2020
- Develop sustainable transport services that meet the expectations of companies and citizens

### 4) At a 'smarter' price:

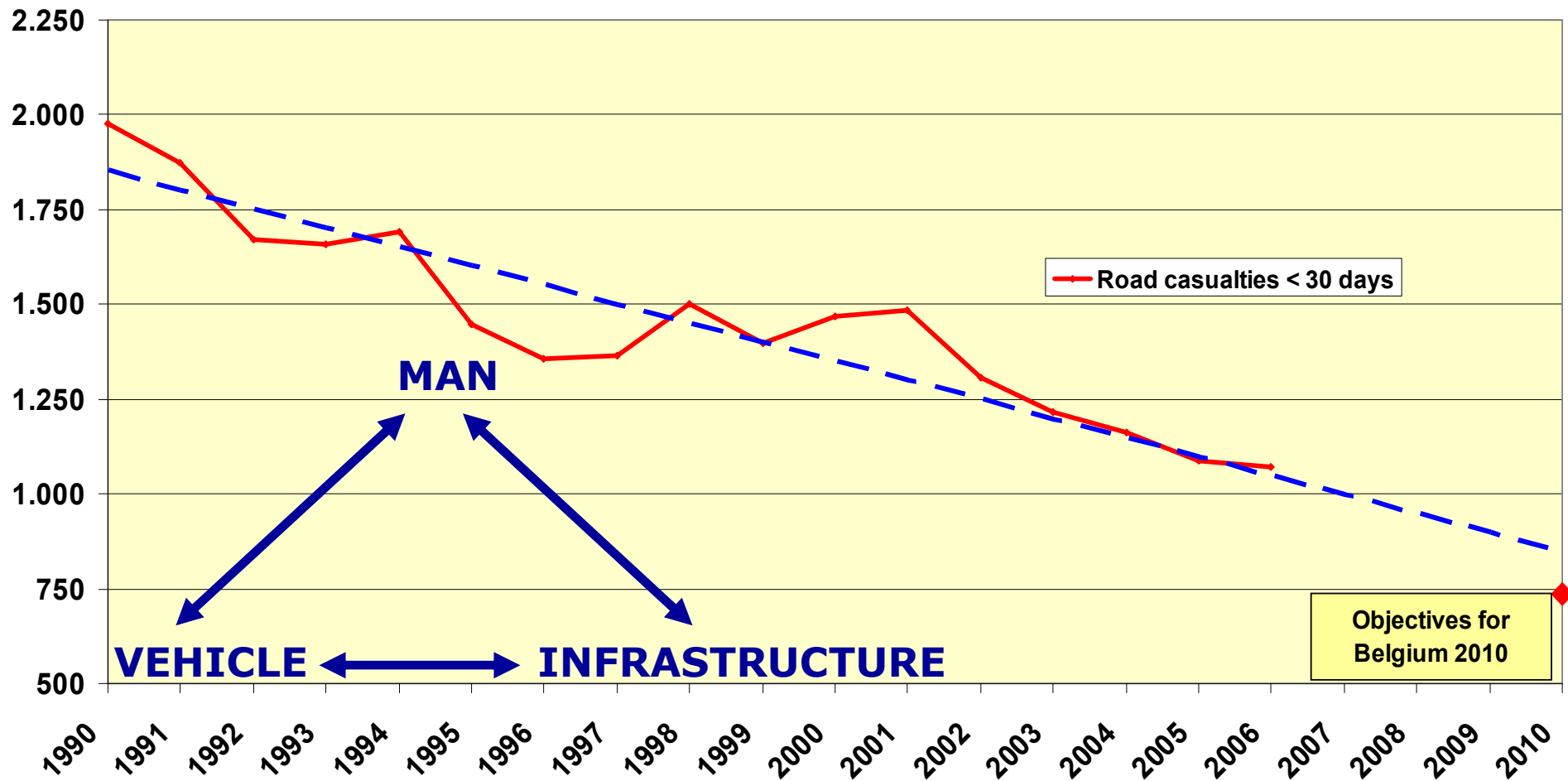
- Rethink vehicle taxation principles: owner pays -> polluter pays -> user pays
- New opportunities to develop sustainable transportation services?

➤ **Biggest challenge: finding compromises in the diversity of – sometimes conflicting - objectives**



# 1) Road safety: everyone's concern !

Evolution of the number of road casualties in Belgium 1990-2010





# 1) Road Safety – infrastructure & man:

## Infrastructure: a determinant factor in 1 out of 3 accidents

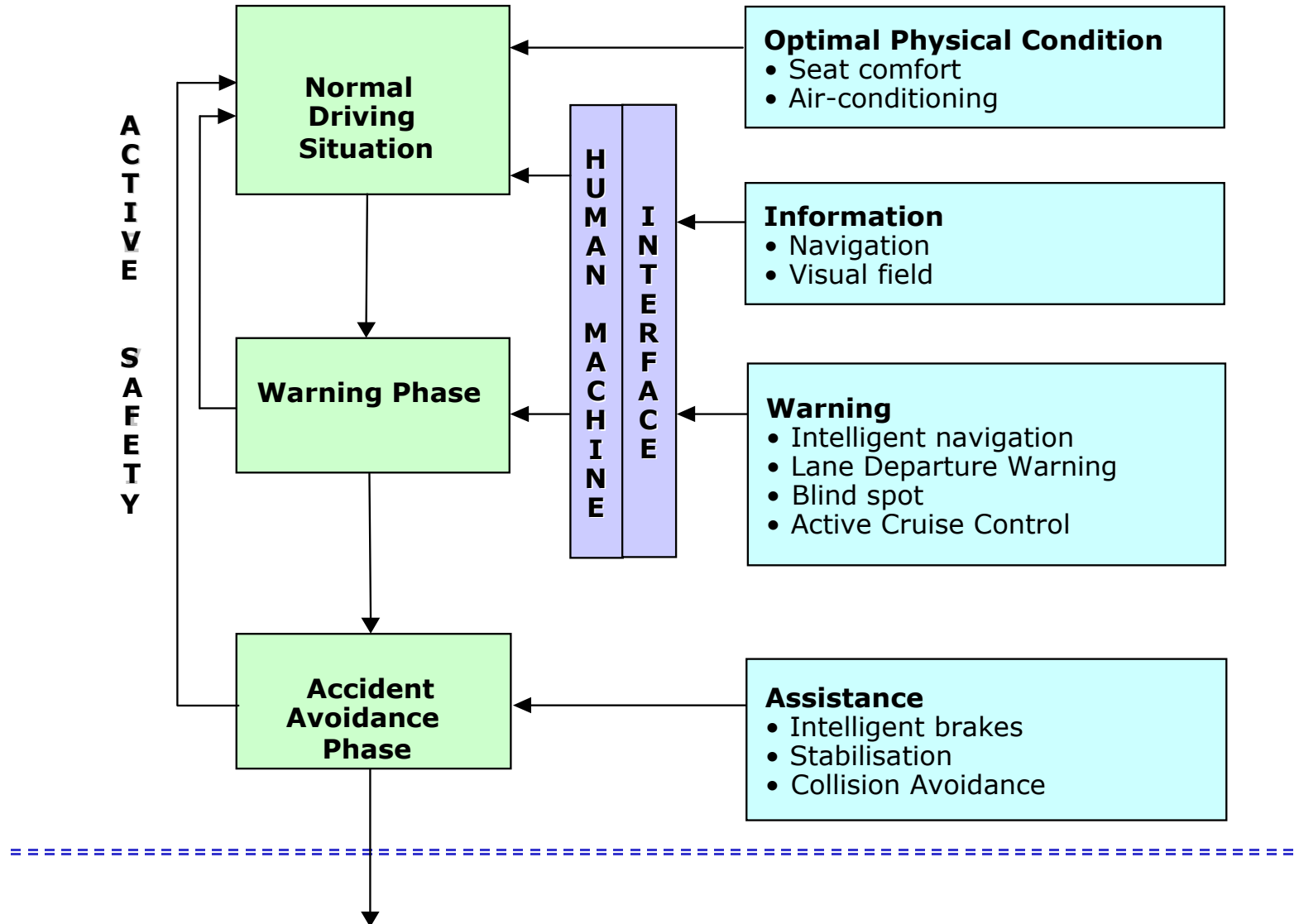
- **To make the road network safer...**
  - by matching type, function and design of roads in the road network
  - concept of self-explaining, forgiving roads
- **... and to keep it that way:**
  - maintenance & inspection of road marking & sign quality
  - elimination of black spots and zones
  - accident analysis & safety audits

## Human error: cause in 90-95% of the accidents

- **Traffic training, traffic rules, control & enforcement:**
  - start education as early as possible, adapted to type & age of road user
  - focus controls on dangerous, drug & drink driving, at black spots/zones & in weekends
  - faster settlement of traffic offences and fines
  - more acceptance through alternative sanctions and reward desired behaviour

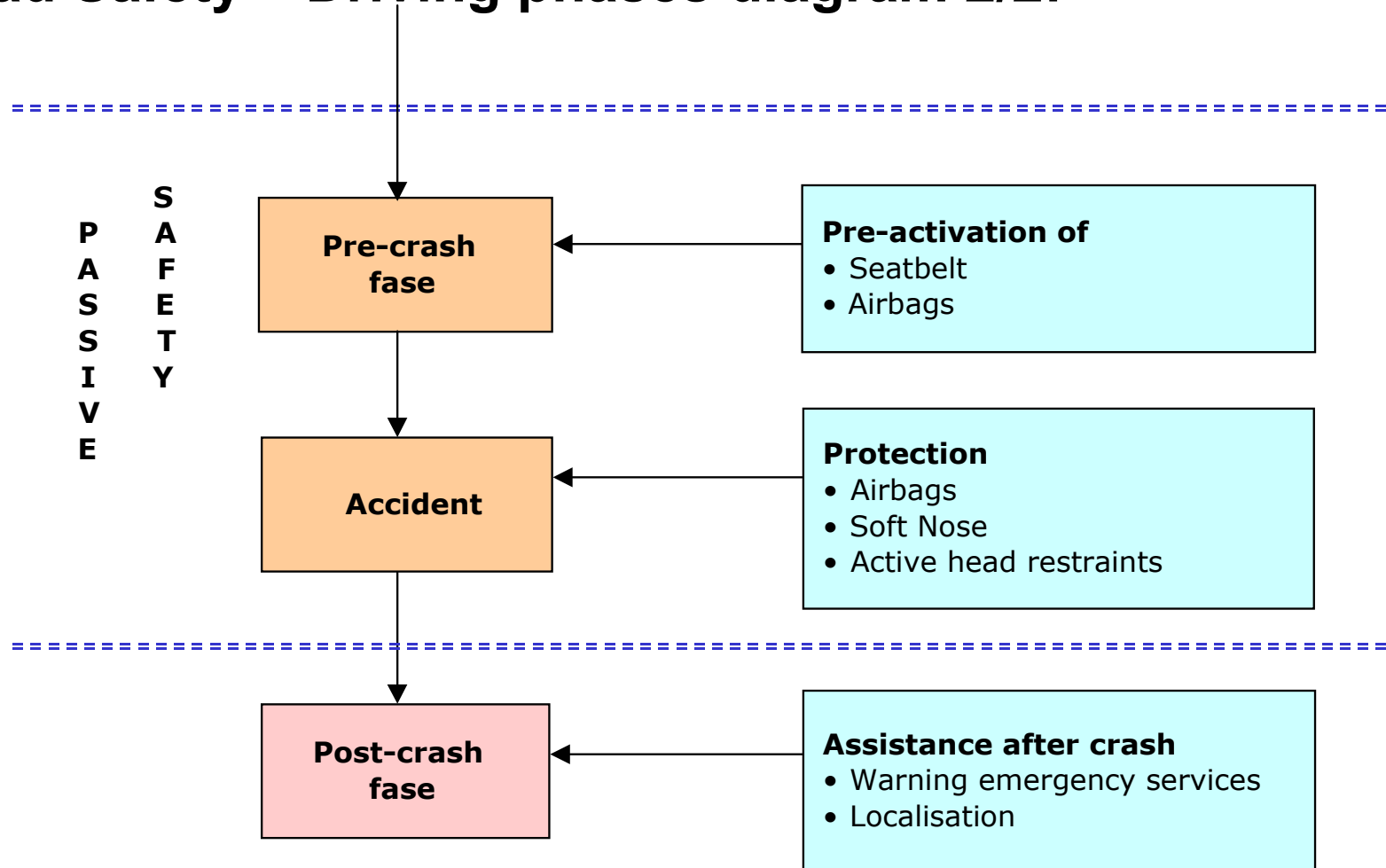


# 1) Road Safety – Driving phases diagram 1/2:





# 1) Road Safety – Driving phases diagram 2/2:



- **Technology has to be effective, reliable, accepted and affordable**
- **Technologies inform & assist; the driver remains responsible**



## 2) Environment – a double problem:

### The difference between (local) air pollution and (global) climate issue:

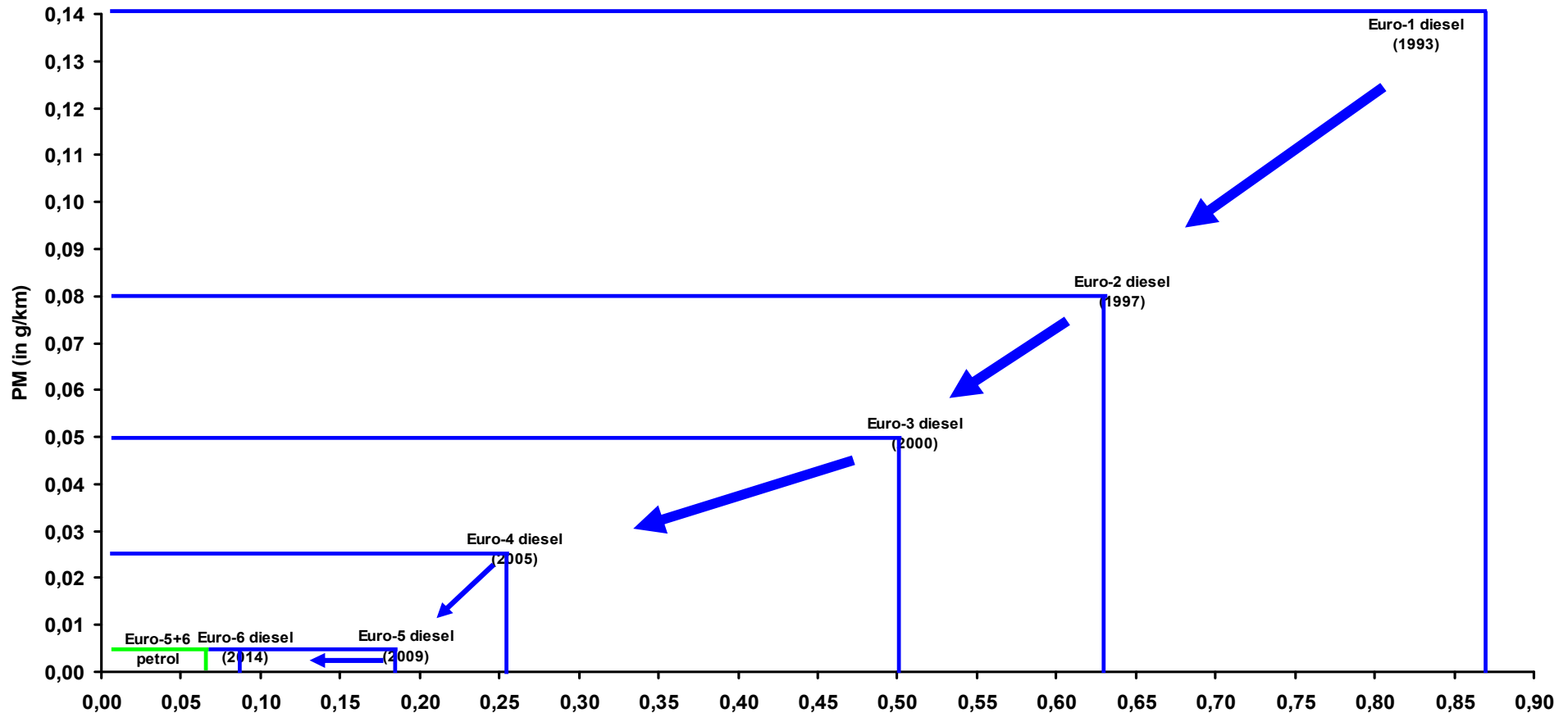
- Pollutant: dangerous substance, toxic for man, animal or plant.
- E.g.: PM, NO<sub>x</sub>, CO, SO<sub>2</sub>
- Has to be present in sufficient concentration to cause damage to man
- Pollutants are a result of an incomplete combustion in engines
- Pollutant can be eliminated by filters & catalysts
- Regulated on EU level (Euro-norms)
- Greenhouse gas: not toxic to man, animal or plant. Causes global warming.
- E.g.: CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O
- Its presence in the atmosphere is enough to contribute to the greenhouse effect
- CO<sub>2</sub> is an inevitable product of any carbon combustion
- No CO<sub>2</sub>-eliminating technology available
- Not (yet) regulated for vehicles

- **Pollutants only dangerous when produced too close to man**
- **Greenhouse gasses have the same contribution to global warming, regardless the place where they are emitted**



## 2) Environment – Car exhaust emissions:

Evolution of NO<sub>x</sub> and PM limit values per Euro-norm for diesel cars



➤ Euro5 diesel won't emit more PM than Euro5 gasoline (09/2009)

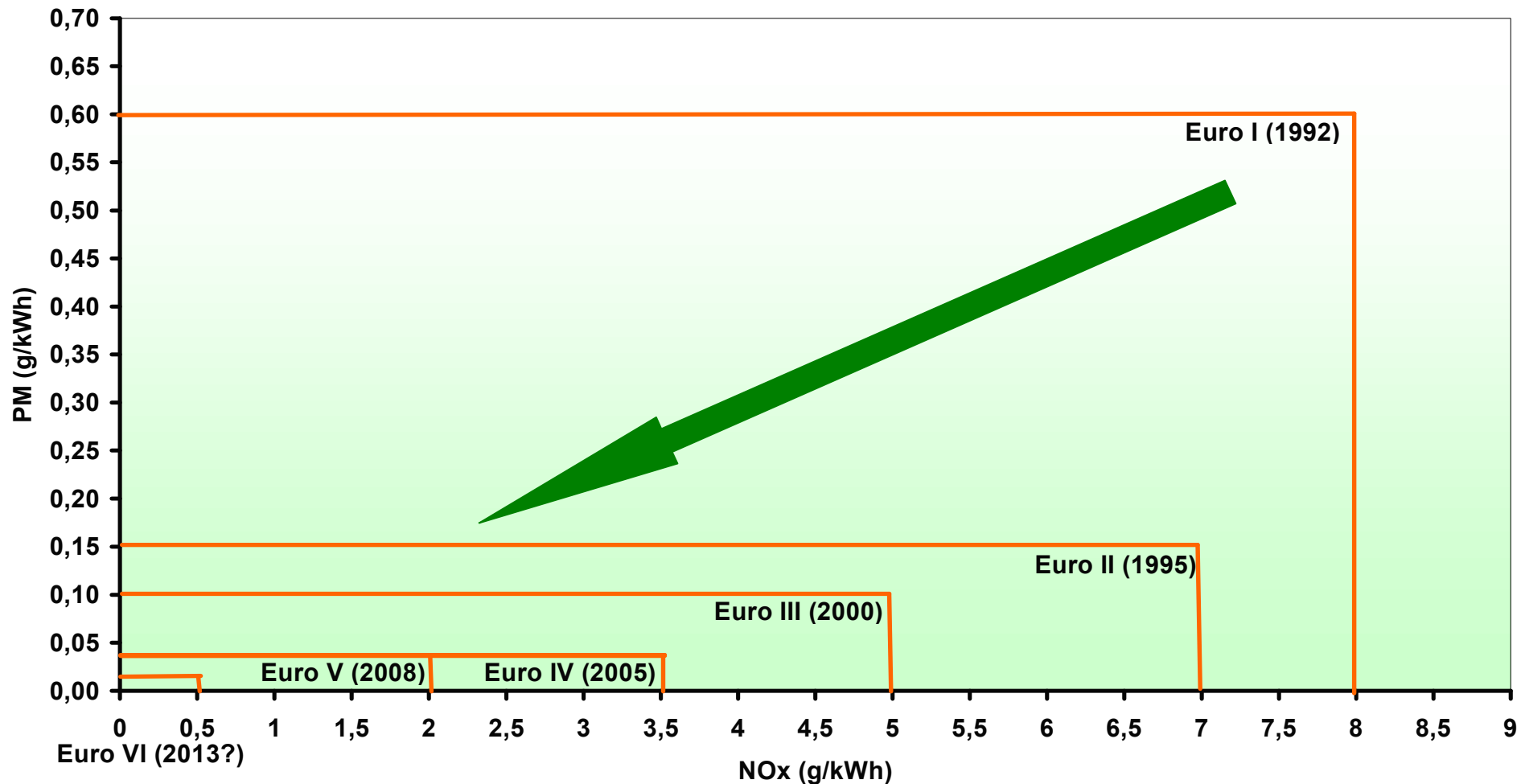
➤ Euro6 will bring diesel & gasoline almost at same level (2014)





## 2) Environment – Truck exhaust emissions:

Evolution of EU legislation of limit values for nitrogen oxides (NOx) and particulate matter (PM) of trucks

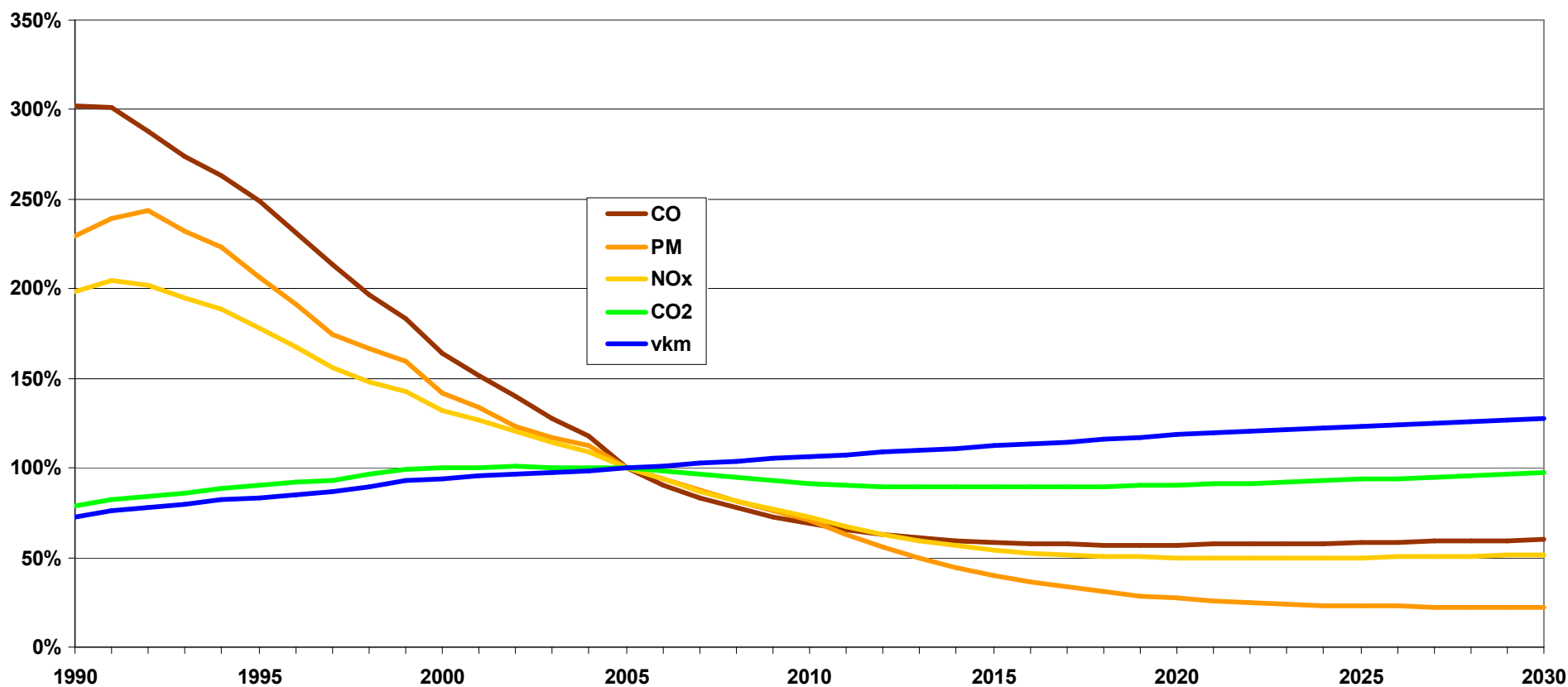


➤ Euro VI is in negotiation and will further cut NOx en PM emissions



## 2) Environment – impact emissions:

Evolution of the emissions of pollutants and CO<sub>2</sub> by road traffic in Belgium 1990 - 2030 (2005 = 100)



➤ Thanks to ambitious, feasible legislation and technology progress, air pollution is under control, even in a growing traffic scenario

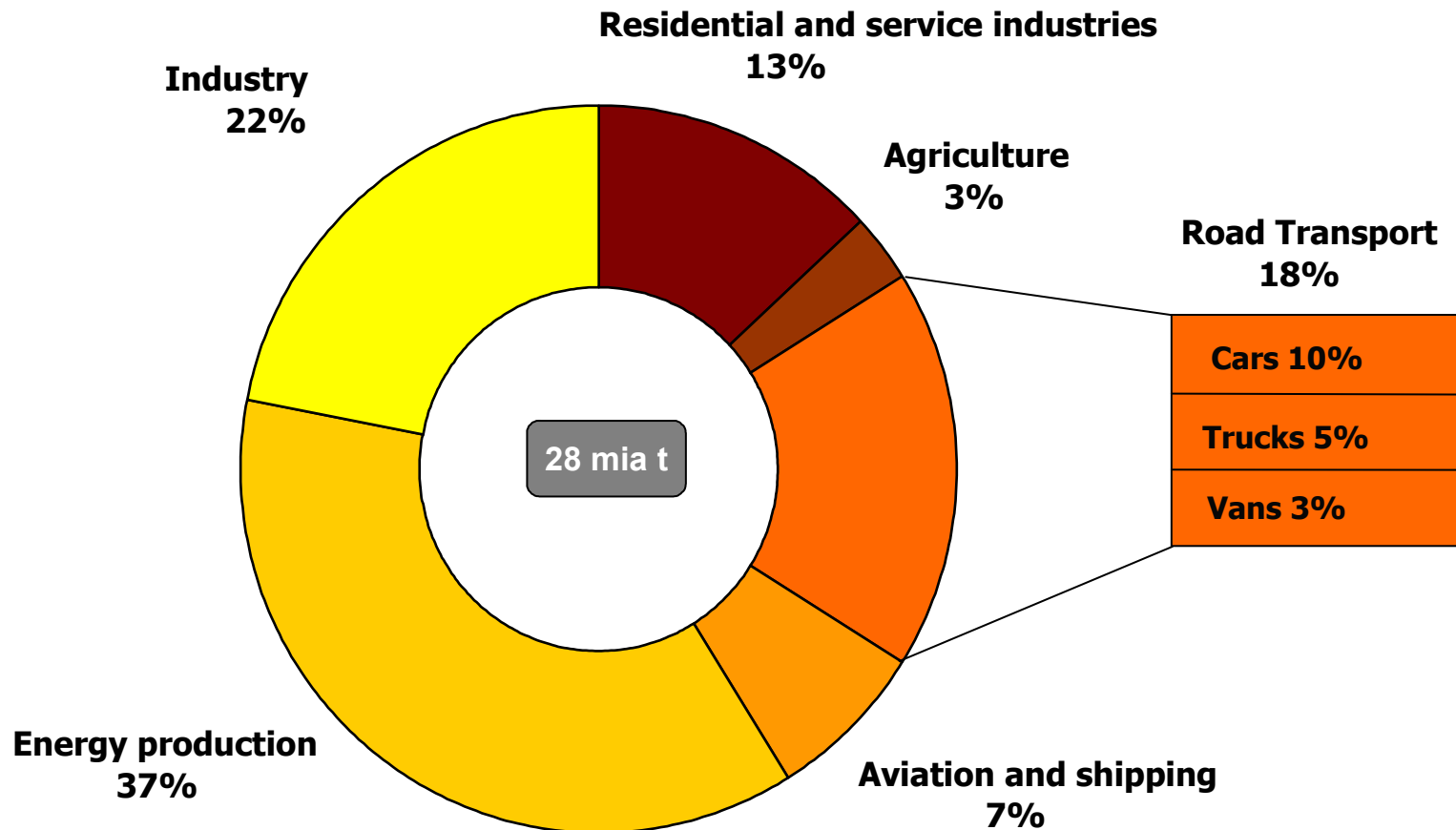
➤ CO<sub>2</sub> remains the environmental challenge for the future





## 2) Environment - CO<sub>2</sub> & road transport:

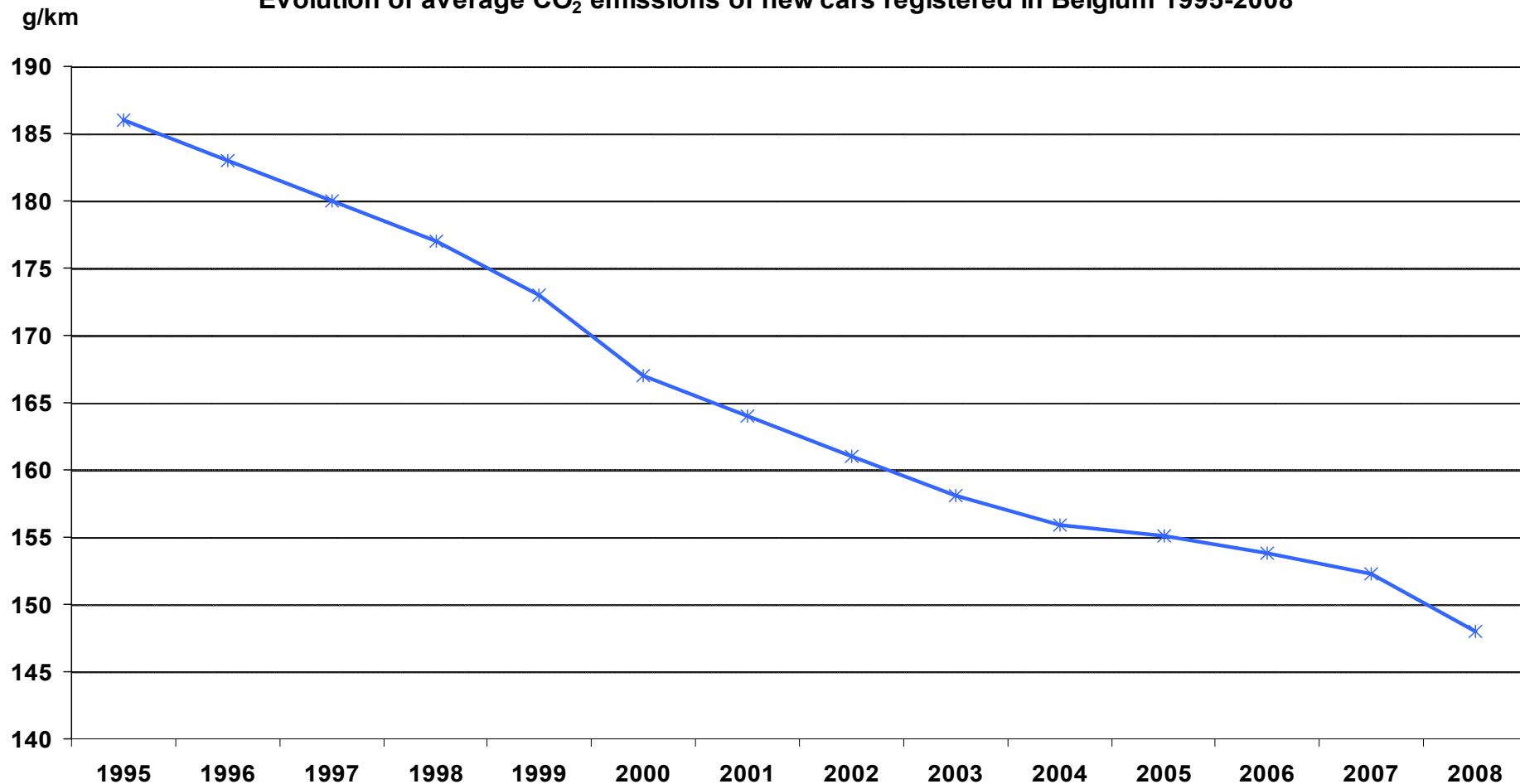
### Anthropogenic CO<sub>2</sub> emissions in the world





## 2) Environment – CO<sub>2</sub>-reduction to date:

Evolution of average CO<sub>2</sub> emissions of new cars registered in Belgium 1995-2008



Source: FEBIAC

➤ As a result of increasing share of diesel cars, Belgian new cars average CO<sub>2</sub> emissions are 148 g/km, well below EU average of 158 g/km





## 2) Environment - CO<sub>2</sub>-reduction problem:

- **CO<sub>2</sub> being an inevitable product of combustion without CO<sub>2</sub>-eliminating technologies, 3 tracks are technically possible to cut car's CO<sub>2</sub> emissions:**
  - Vehicle weight & design: light weight materials, streamline improvements
  - Existing engine's optimisation: turbo, direct injection, improved valve steering, clutch, gear
  - Alternative propulsion systems: micro-, serial & parallel, plug-in hybrids, electrical and fuel cells
- **Upcoming EU CO<sub>2</sub>-legislation only apply to new cars: 120g/km CO<sub>2</sub> by 2012/2015**
- **More and faster environmental benefits are possible with more costefficient measures applicable to all cars and all car users:**
  - Smart infrastructure => road authorities
  - Fuel quality & alternative fuels => fuel industries
  - Eco-driving education => driving schools, company fleets
  - Green Car Taxation Scheme => policy makers
- **Integrated approach needed, many stakeholders involved**



### 3) Mobility – growth trends in the EU:

- Economic & transport growth in old and new EU 1990-2030:

		Yearly transport growth and GDP-growth				Total growth
		1990-2000	2000-2010	2010-2020	2020-2030	Δ 2005-2030
GDP	EU-15	2,0%	2,4%	2,3%	2,2%	» + 80%
	New member states	1,7%	3,8%	3,6%	3,0%	
Passengers	EU-15	1,8%	1,5%	1,4%	1,2%	» + 50%
	New member states	0,2%	2,1%	2,8%	2,2%	
Goods	EU-15	2,7%	2,3%	2,1%	1,9%	» + 70%
	New member states	-1,7%	2,1%	2,7%	2,1%	

- EU15 passenger transport growth to be lower than GDP growth (time & spatial limits)
- Goods transport forecasts shows higher growth than GDP growth (East-EU markets)



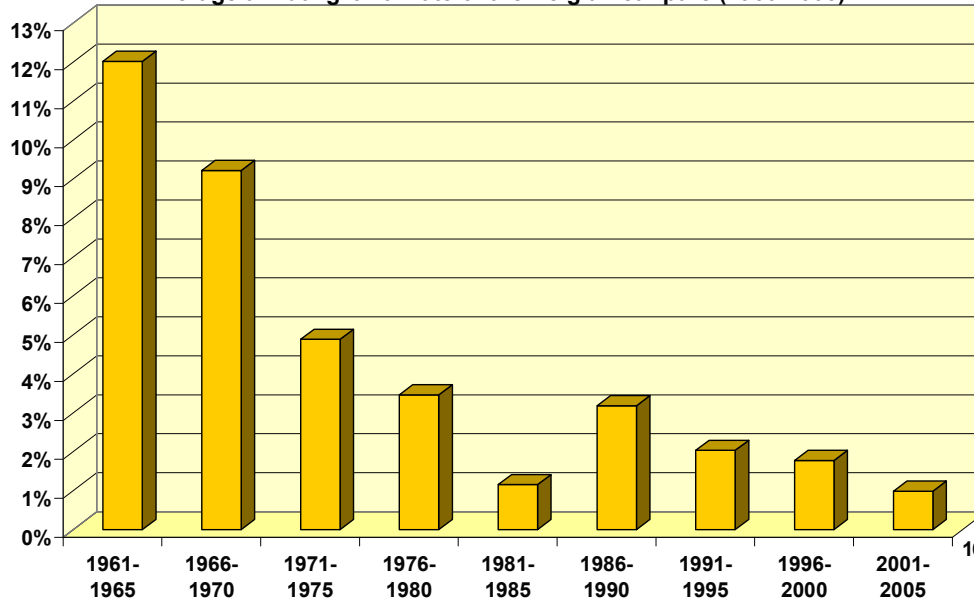
### 3) Mobility – explaining growth trends:

- **Mobility growth: focus often on factors like economic and demographic growth, spatial dispersion...**
- **Socio-cultural factors get less attention but make change behaviour difficult**
- **Society has become more and more car dependent because an increasing part of the population:**
  - goes out working
  - earns more
  - owns a car
  - lives in smaller households
  - has to combine work and housekeeping (and child care)
  - has a hectic time schedule
  - spends free time outdoors.
- **Changing life habits and styles led to car dependent travel patterns**



### 3) Mobility: growth trends in Belgium – passengers

Average annual growth rate of the Belgian car parc (1960-2005)

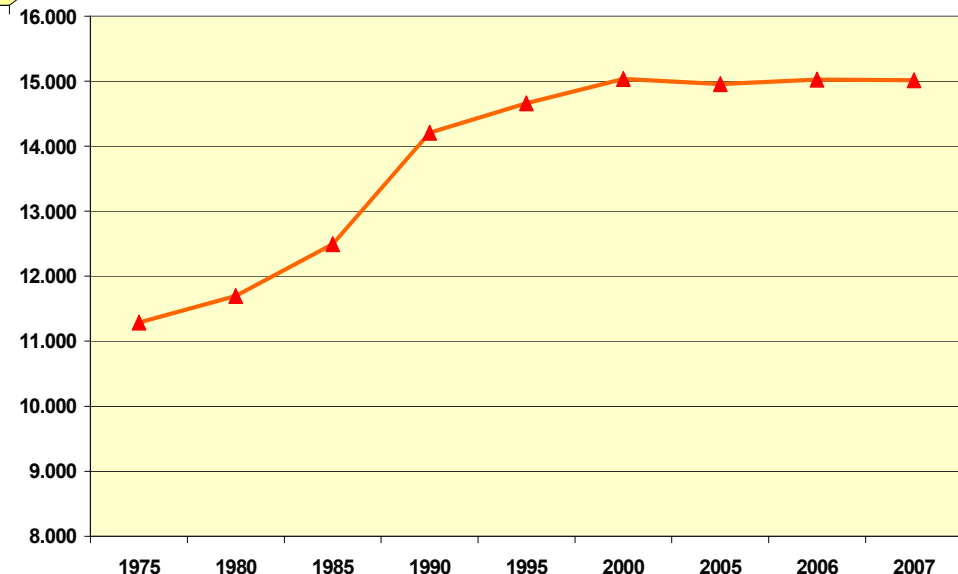


- Belgian car park's annual growth rate decreases and dropped to around 1% since the year 2000
- Average annual mileage per car remains stable since 2000

#### Forecasts:

- Belgian car parc is to grow from 5 mio in 2007 to of 5.7 mio units in 2020
- Due to time and spatial constraints, average car mileage to stabilize
- Car traffic to grow by 15% in 2020

Average annual mileage by Belgian cars in Belgium (1975-2007)





### 3) Mobility – key priorities for Belgium:

- **Role of private transport:**

- In almost 80% of households in Belgium there is a car, in 70% a bicycle, in 7% a motorcycle or scooter
- The number of households without a car has dropped with 5% in 10 years
- Car is a flexible, country-wide, full-time and door-to-door people & goods mover, meeting most 'basic mobility' needs

- **Role of public transport (PT):**

- Focus on mass transportation of people in cities and metropolitan areas
- Focus on congested areas, rather than offering a costly country-wide PT for "basic mobility" purposes

- **Towards more efficient public spending in private and public transport:**

- PT-subsidies amount to €4,5 billion, while PT meeting 10% of mobility needs
- Road infrastructure spending amounts to €1,5 billion, while road accounting for 90% of the mobility
- Little attention for inter- and multimodal transportation services
- PT has to be made more accessible to cars & vice versa





### 3) Mobility: growth trends in Belgium – freight

- Effect of modal shift from road to rail/inland navigation:

		business as usual		rail capacity: +100% inland navigation: +100%	
(x tonne-km)	2005	2020	2020/2005	2020	2020/2005
total	100	150	+50%	150	+50%
road	75	125	+70%	100	+25%
rail	15	15	0%	30	+100%
inland nav.	10	10	0%	20	+100%

- Rail, water and road must be integrated, but each of them should also be optimised
- Doubling freight transport by rail and inland navigation does not prevent that road transport will continue to grow by 25%
- Hence, a 'modal shift' is difficult to achieve, as well as decoupling transport growth from economic growth
- Decoupling externalities from transport growth is realistic and is happening !
- It will take many years before major infrastructure projects enter service

➤ **In het meantime: no other option than getting the best out of existing road network capacity and use**



### 3) Mobility – supply side solutions:

#### B. Guidelines and measures on supply side:

##### • Optimize transport capacity and its use:

- **Public transport network in metropolitan areas of Brussels-Antwerp-Ghent with sufficient, low-cost and safe transfer and parking facilities for 2- & 4-wheelers**
- **Deploy intelligent transport systems (ITS):** p.e. dynamic parking & traffic (light) signalling
- **Equip main road network with Real-Time-Traffic-Information & Management System:** p.e. Floating Car Data (FCD), Car-to-Car & Car-to-Infrastructure communication
- **Test longer vehicle combinations (LVC) on certain main roads and times of day:** p.e. 25.25m LVCs transport more with less trucks, less pollution and without extra safety risks
- **Peak time use of hard shoulders for buses & trucks, tidal flow principle**
- **Solve the missing links in the main road network: Brussels & Antwerp ring-roads**
- **Make ports and economic nodes trimodally accessible (freight railways, create dedicated truck lanes)**



### 3) Mobility – Demand side solutions:

#### A. Guidelines and measures on demand side:

##### • Reorganise activities in time and space:

- Stimulate time- and place-independent work (part-time tele- /homework)
- Make working hours in companies more flexible :
  - reshuffle working week from 5 to 4 longer working days
  - (more) flexible working hours
- Promote goods transportation and distribution at night
- Encourage clustering of companies and their suppliers

##### • Optimize the use of the existing vehicle parc:

- Stimulate carpooling and the use of (powered) two-wheelers in companies
- Group freight loads for the supply of cities and industrial areas
- Charge vehicles using green criteria in short term & km driven in long term





## 4) Car taxation today: mix of 'user & owner pays' principle

- Total fiscal revenues of cars today amount to €12.3 bn in 2007
- Main revenue sources within automobile taxation in 2007:
  - Registration tax (RT): €0,3 bn
  - Annual circulation tax (ACT): €1,3 bn
  - Fuel excise duties: €3,6 bn
  - VAT on fuels, sales, maintenance & repair: €5,8 bn
- Fiscal horsepower (cilinder capacity) and power (kW) are the basis for determining amount of RT and ACT => no correlation with environment
- RT reduces with age and promotes buying of older, more polluting cars
- ACT constant, regardless age of the car => rigid system

- +10 year old cars represent 30% of traffic, but up to 60% of air pollution
  - Green car taxation must reward cleaner, more fuel efficient cars





## 4) Car taxation tomorrow: 'user & polluter pays' principle

- Objectives of a car taxation reform in Belgium for the next 10 years:

- **Environmental concern:** new car taxation should contribute to effective reduction of CO<sub>2</sub> emissions and pollution by cars
- **Budgetary concern:** tax revenues must remain constant during transition to the new scheme (fiscal neutrality)
- **Social concern:** new tax levels should be socially / politically acceptable
- **Economic concern:** new car taxation should sustain / accelerate car renovation and guarantee non discrimination (technology neutral) against models and brands
- **Future-oriented:** compatible with future emission standards, in particular Euro 5, Euro 6
- **Easy to implement:** no additional administrative burdens for administrations, companies or citizens

- Principles:

- **1 unique, annual tax:** indicating to each car owner the environmental performance of its car (CO<sub>2</sub> & pollution)
- **Tax scheme to be periodically revised:** each time a new car generation (Euronorm) comes into the market

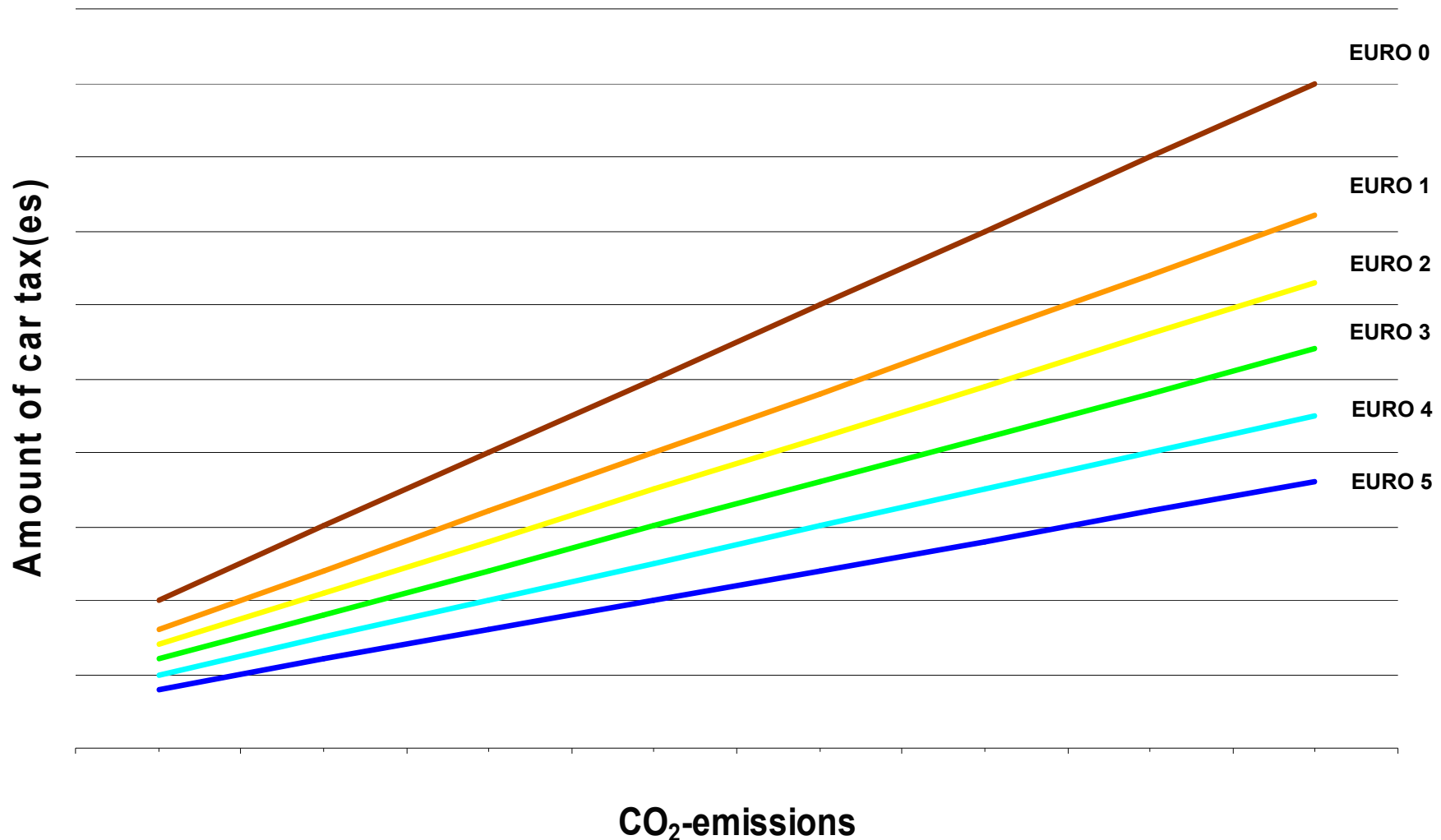
**In concrete:**

- **Abolish RT; integrate its revenue in existing annual circulation tax (ACT)**
- **Green ACT: (fixed  $p_1$  per Euronorm) + ( $p_2 \times \#$  grams of CO<sub>2</sub>)**
- **The more recent the Euronorm and the more economical the car, the cheaper ACT**



## 4) Car taxation tomorrow: 'polluter pays' principle

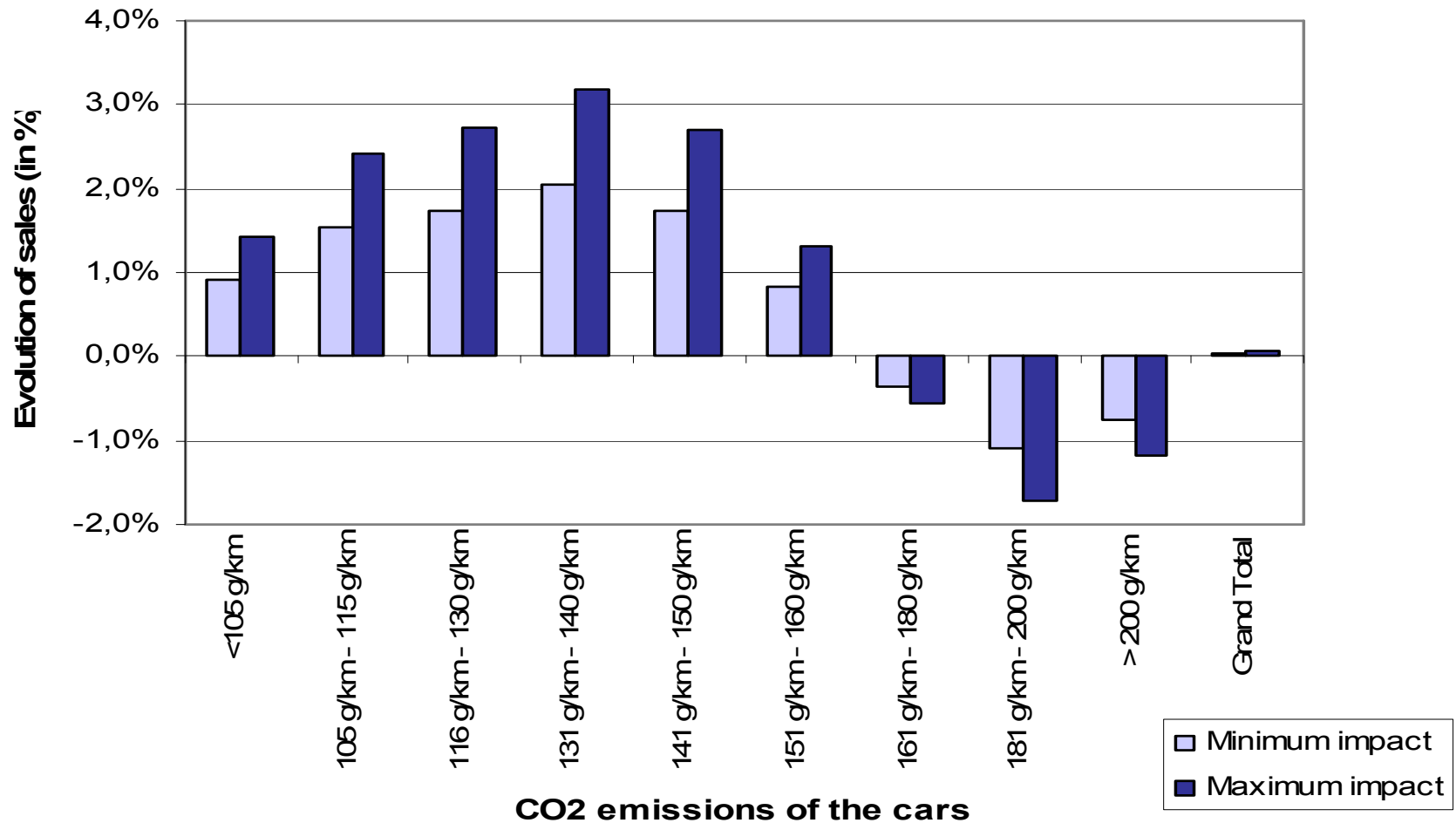
Visualisation of the principles of a green ACT:





## 4) Car taxation tomorrow – impact of CO<sub>2</sub> & Euronorm based ACT:

Impact on the sales of new cars due to the implementation of the new TC/VB





## 4) Car taxation tomorrow – impact of CO<sub>2</sub> & Euronorm based ACT:

Total emission of CO <sub>2</sub> in ton/year	Unaltered situation	New ACT (minimal impact)	New ACT (maximal impact)	Current tendency
Existing car fleet	11.727.436	11.593.722	11.525.866	
Variation (%)		-1%	-2%	+0,7%
New registered cars	1.181.114	1.047.400	979.544	
Variation (%)		-11%	-17%	-0,8%





## 4) Car taxation after-tomorrow (2015?): only 'user pays' principle

### •Objectives & principles of any future charging policy:

- **Meet society's economic, social and environmental needs:** balanced 3 pillar approach of sustainability
- **Charging principle should apply to all transportation modes**
- **Charge levels should be fair and based on scientifically measurable costs**
- **Charging systems should be simple, transparent & interoperable – charge levels predictable**
- **Revenue neutrality:** additional charges must be compensated via a reduction of existing taxes
- **Earmark revenues for road infrastructure:** as long as poor performance, quality & safety standards exist within existing road network, a lack of acceptance will subsist among users to pay twice for roads
- **Earmark congestion charges for speeding up inter- & multimodal transportation services**