11th UIC Sustainability Conference

Railways: Mobility for a sustainable future

Madrid, Spain
16-18 June 2010

SUSTAINABLE TRANSPORT MODELS OF TOMORROW

The role of rail in future transport scenarios

- ***“· LESSONS AFTER COPENHAGEN CONFERENCE”***
- ***Domingo Jiménez Beltran***

"Copenhagen target" is coming closer?

Copenhagen Accord

- ***In December 2009, an important United Nations Climate Change Conference took place in Copenhagen, Denmark.***
- ***This conference resulted in the Copenhagen Accord.***

- ***As part of this Accord.***

-the two-degree target was agreed/confirmed

-Industrilized countries were to submit and have submitted before 31st January greenhouse gas emission reduction targets for 2020

-industrialized countries would provide for a fast finance fund of 30 000M$ for CC programmes in developing countries for 2010-2012 aiming at 100 000M$/yearly for 2020 and after . What is now questioned

-developing countries woul submit and have submitted actions for reducing greenhouse gas emissions.

Lessons learned?

- ***COP 15 was not up to expectations. CC is too important to leave it to the politiciens.***

- ***A single ambitioux and legaly binding agreement based on Kioto Protocol is proving to be non feassible***

- ***A legal frame with some different binding and ambitioux legal agreements adding/hunging on Kioto (necessary while not enough) and other legal instruments seems the only way***

- ***The Mexico COP 16 will pave the way to this frame to be agreed at Sydafrica in 2011 at the latest to take over Kioto in 2012***

Lessons learned?

- ***The EU has to leed both processes and above all show the way by implementing unilateraly ambitioux targets also becouse it is on its own interest***

- ***The unsustainability of Transport is a main challenge for the EU to fulfill its aims and responsibilities.***

- ***Another EU is possible. CC mitigation is a challenge and opportunity.***

- ***More EU, no less, is needed.***

- ***New EU common policies needed***

-from CAP to CEP :Common Energy?, Economic and Fiscal? Policies

-and CTP :Common Transport, Territorial? policies

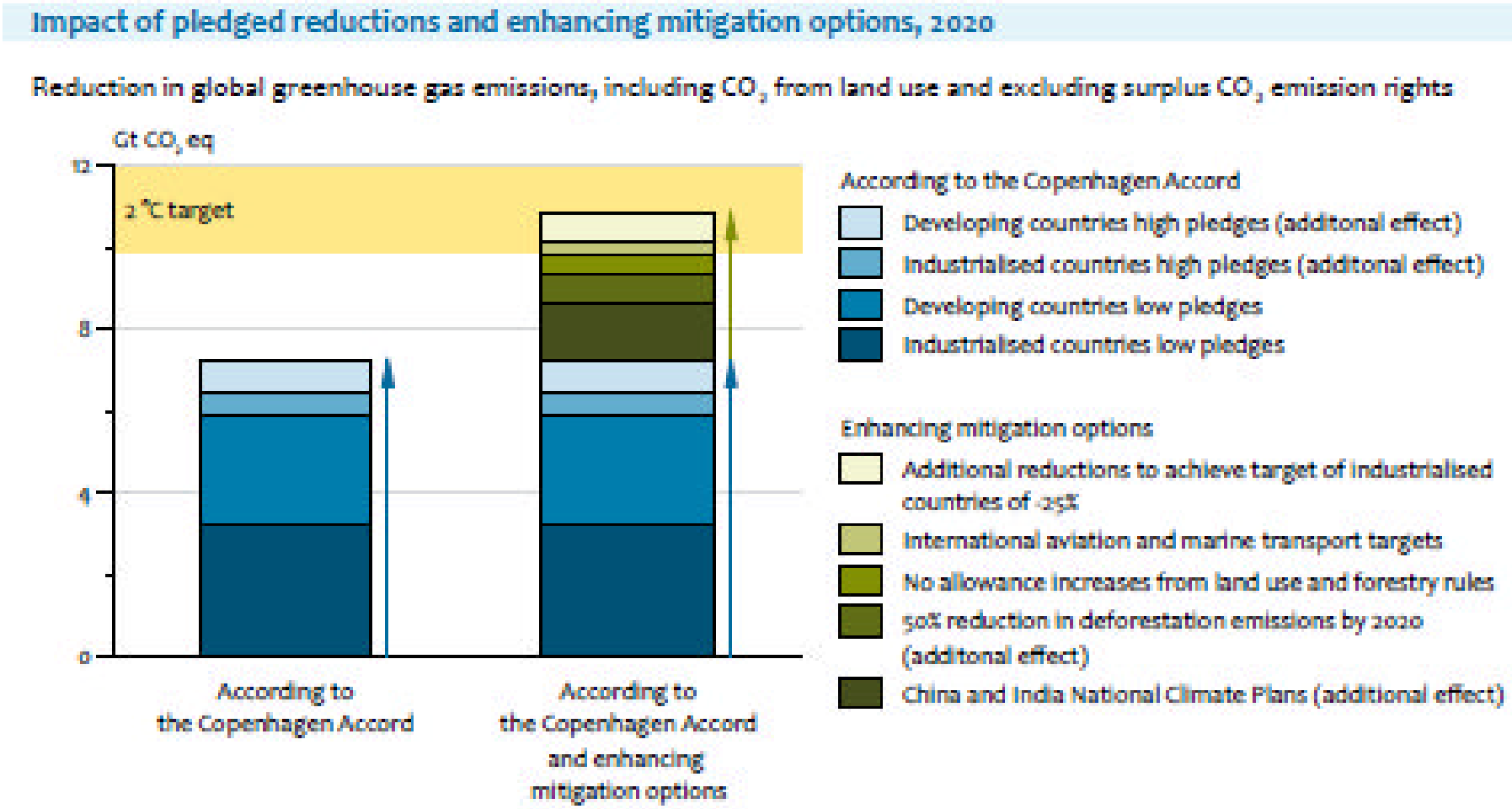
"Evaluation of the Copenhagen Accord: Chances and risks for the 2°C climate goal" www.pbl.nl/en

The Netherlands Environmental Assessment Agency May 2010

- ***"The NEAA calculated , the combined effect of the Copenhagen Accord pledges,***

- ***and concluded that it makes up sixty to seventy per cent of the emission reduction required for achieving the target of a maximum temperature rise of two degrees, globally"***

"Evaluation of the Copenhagen Accord: Chances and risks for the 2°C climate goal" www.pbl.nl/en)



"Evaluation of the Copenhagen Accord: Chances and risks for the 2°C climate goal" www.pbl.nl/en)

Chances

There are a number of measures that, added together, would suffice to bridge the gap:

- ***• Industrialised countries would have to be up their pledged reductions of 18 per cent to 25 per cent, compared to 1990 levels;***
- ***• Emissions would have to be reduced in international shipping and aviation sectors;***
- ***• Industrialised countries would be limited in including reforestation in their greenhouse gas reductions;***
- ***• Deforestation in developing countries would need to be halved;***
- ***• China and India would have to implement their national climate policy, which exceeds their international pledges.***

"Evaluation of the Copenhagen Accord: Chances and risks for the 2°C climate goal" www.pbl.nl/en)

Risks

There are also risks of pledged emission reductions turning out much lower, in actual practice. These risks include:

- *• The use of old surplus Russian and Ukrainian CO2 rights (hot air), which could lead to additional emissions of up to 1.5 billion tonnes;*
- *• The unstable political climate in the United States, where the Senate still needs to agree to a climate bill;*
- *• The financing required for the agreed to measures, which may not be realised.*

Acuerdo de Copenhague COP15-Dic 2009

-Con sombras que crecen con el tiempo

-Que no impiden que se adivinen oportunidades bajo la tesis que

"el CC nos ha cargado de razón para hacer lo que en cualquier caso habria que hacer

-Y algo se ha avanzado en Bonn (Junio 2010)

-Que mantiene abierta la esperanza de una accion ejemplarizante de la UE

-Que supere la "condicionalidad"

,adquiriendo compromisos mas ambiciosos unilateralmente

Que finalmente rompan el bloqueo politico-estrategico a nivel global

Que mantiene abierta la esperanza de una accion ejemplarizante de la UE

- ***1-La Comisión Europea establece una estrategia para revitalizar la acción mundial después de Copenhague (Bruselas, 9 Marzo 2010)***

-Manteniendo el objetivo de lograr un acuerdo internacional sólido y jurídicamente vinculante que conlleve la participación de todos los países

-Integrando el Acuerdo de Copenhague en las negociaciones de las Naciones Unidas y subsanando las deficiencias del Protocolo de Kioto.

-Y con el ejemplo, (no condicionado?) de la UE. Reducir EFEl solo tiene ventajas

«El cambio climático sólo podrá controlarse si los principales países emisores, sin excepción, toman medidas... La manera más convincente de demostrar el liderazgo de Europa es tomar medidas tangibles y decididas para convertirnos en la región del planeta más respetuosa con el clima, lo que también reforzará nuestra seguridad energética, impulsará un crecimiento económico más ecológico y contribuirá a la creación de nuevos puestos de trabajo.» CH

Que mantiene abierta la esperanza de una accion ejemplarizante de la UE

- *2-Posibilidades de que el compromiso de la UE sea de un 30% en 2020*

Bruselas (Comunicación de la CE Junio 2020)

- *Un análisis de los costes, beneficios y opciones que supone aumentar de un 20 % a un 30 % el objetivo de la Unión Europea de reducir de aquí a 2020 las EGEI las emisiones de gases de efecto invernadero con respecto a los niveles de 1990, cuando se cumplan las condiciones necesarias, lo que, por ahora, no sucede.*

- *Los esfuerzos necesarios en los distintos sectores principales para aumentar de un 20 % a un 30 % la reducción de las emisiones de gases de efecto invernadero, centrándose asimismo en el impacto de dichos esfuerzos y en las posibles opciones estratégicas que permiten concretarlos*

- *Las medidas adoptadas en apoyo de las industrias que hacen un uso intensivo de la energía, con respecto al riesgo de «fuga de carbono», tal como exige la Directiva relativa al régimen de comercio de derechos de emisión.*

Que mantiene abierta la esperanza de una accion ejemplarizante de la UE

Crecimiento con bajas emisiones de carbono

- ***Todos los países del mundo reconocen las posibilidades que ofrece el crecimiento con bajas emisiones de carbono a la hora de crear nuevos puestos de trabajo sostenibles y reforzar la seguridad energética.***

("Novo Nordisk ha recuperado algunas inversiones en un año".Likke Schmidt.)

- ***El liderazgo de Europa en esta revolución no puede considerarse tan obvio, ya que la competencia mundial es cada vez más reñida.***

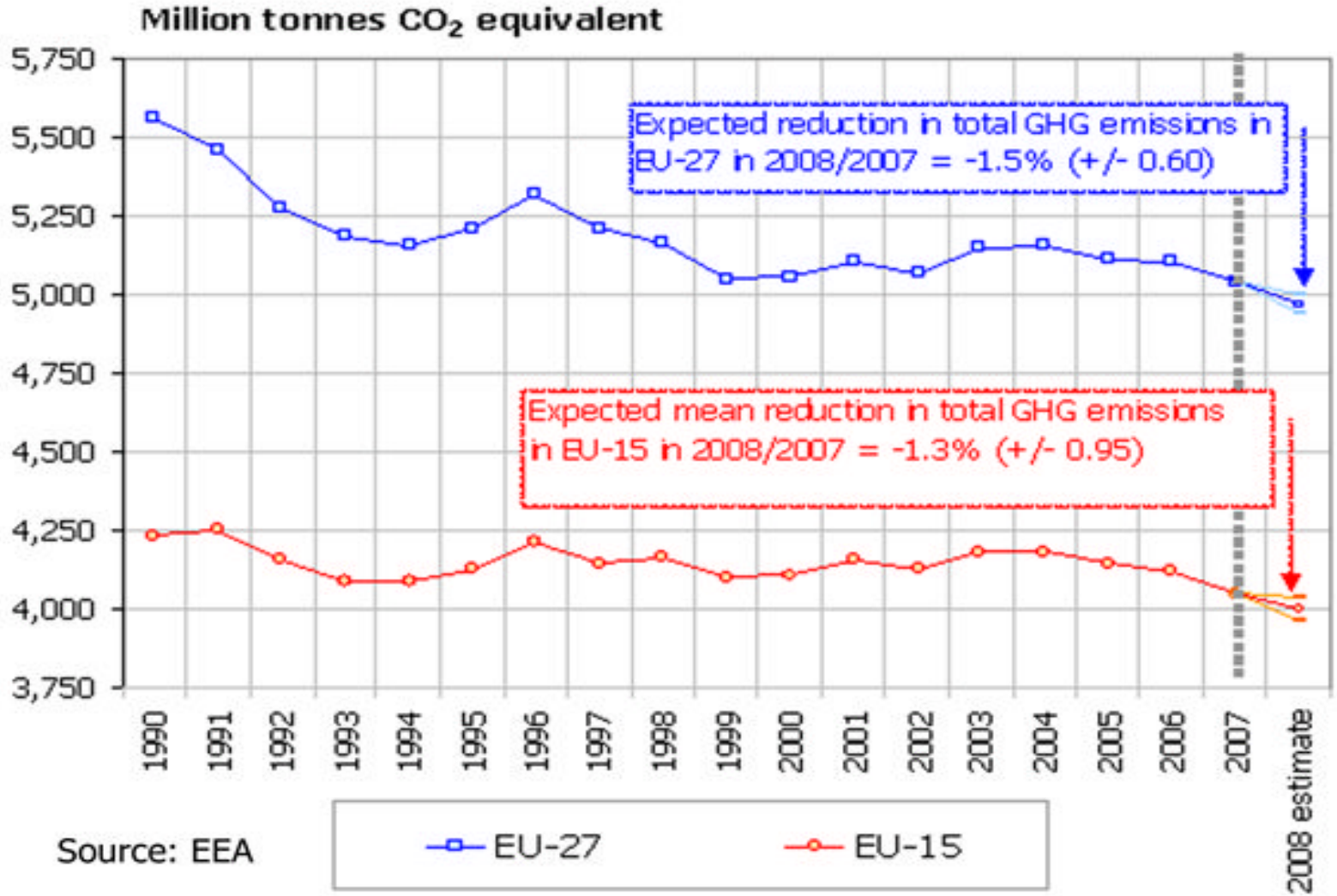
- ***El objetivo del 20 % ha sido considerado un motor fundamental de modernización de la economía de la Unión Europea.***

  Teniendo en cuenta el precio del carbono más bajo de lo previsto, dicho objetivo ha visto reducida su importancia como incentivo potencial de cambio e innovación.

- ***Por otro lado, Europa, como parte integrante del grupo de países desarrollados, debe elaborar sus objetivos a largo plazo de reducir sus emisiones entre un 80 % y un 95 % de aquí a 2050, a un coste óptimo***

Emisiones de GEI 1990-2008

4 265.5 Mt CO2 EQ 1990



Based on these estimates, the greenhouse gas emissions in 2008 stand approximately 6.2 % below the Kyoto base-year emissions for the EU-15, and 10.7 % below the 1990 level for the EU-27.

GHGE . Progress and trends in the EU (EEA 2010).Transport is a main chalenge

the base-year emissions for the EU-15 have been fixed to 4 265.5 Mt CO_2-equivalent.

Table ES.1 Overview of EU-27 and EU-15 source categories whose emissions increased or decreased by more than 20 million tonnes CO_2-equivalents in the period 1990–2008

Source category	EU-15	EU-27
	Million tonnes (CO_2-equivalent)	
Manufacturing industries (excl. iron and steel) (Energy-related CO_2 from 1A2 excl. 1A2a)	– 77.5	– 161.1
Solid waste disposal (CH_4 from 6A)	– 68.1	– 65.7
Adipic acid production (N_2O from 2B3)	– 50.3	– 51.3
Fugitive emmissions (CH_4 from 1B)	– 46.2	– 66.9
Manufacture of solid fuels (CO_2 from 1A1c)	– 42.6	– 42.9
Households and services (CO_2 from 1A4)	– 39.0	– 94.6
Agricultural soils (N_2O from 4D)	– 33.5	– 64.7
Iron and steel production (CO_2 from 1A2a+2C1)	– 32.2	– 55.2
Nitric acid production (N_2O from 2B2)	– 22.4	– 25.8
Production of halocarbons (HFC from 2E)	– 21.7	– 21.7
Enteric fermentation (CH_4 from 4A)	– 15.9	– 38.3
Public electricity and heat production (CO_2 from 1A1a)	9.1	– 135.7
Consumption of halocarbons (HFC from 2F)	60.2	66.6
Road transport (CO_2 from 1A3b)	134.9	185.0
Total	**– 274.2**	**– 627.3**

Note: As the table only presents sectors whose emissions increased or decreased by 20 million tonnes CO_2-equivalents, the sum for each country grouping EU-15/EU-27 does not neccsarily match the total change listed at the bottom of the table.

GHGE . Progress and trends in the EU . TRANSPORT (EEA 2009)

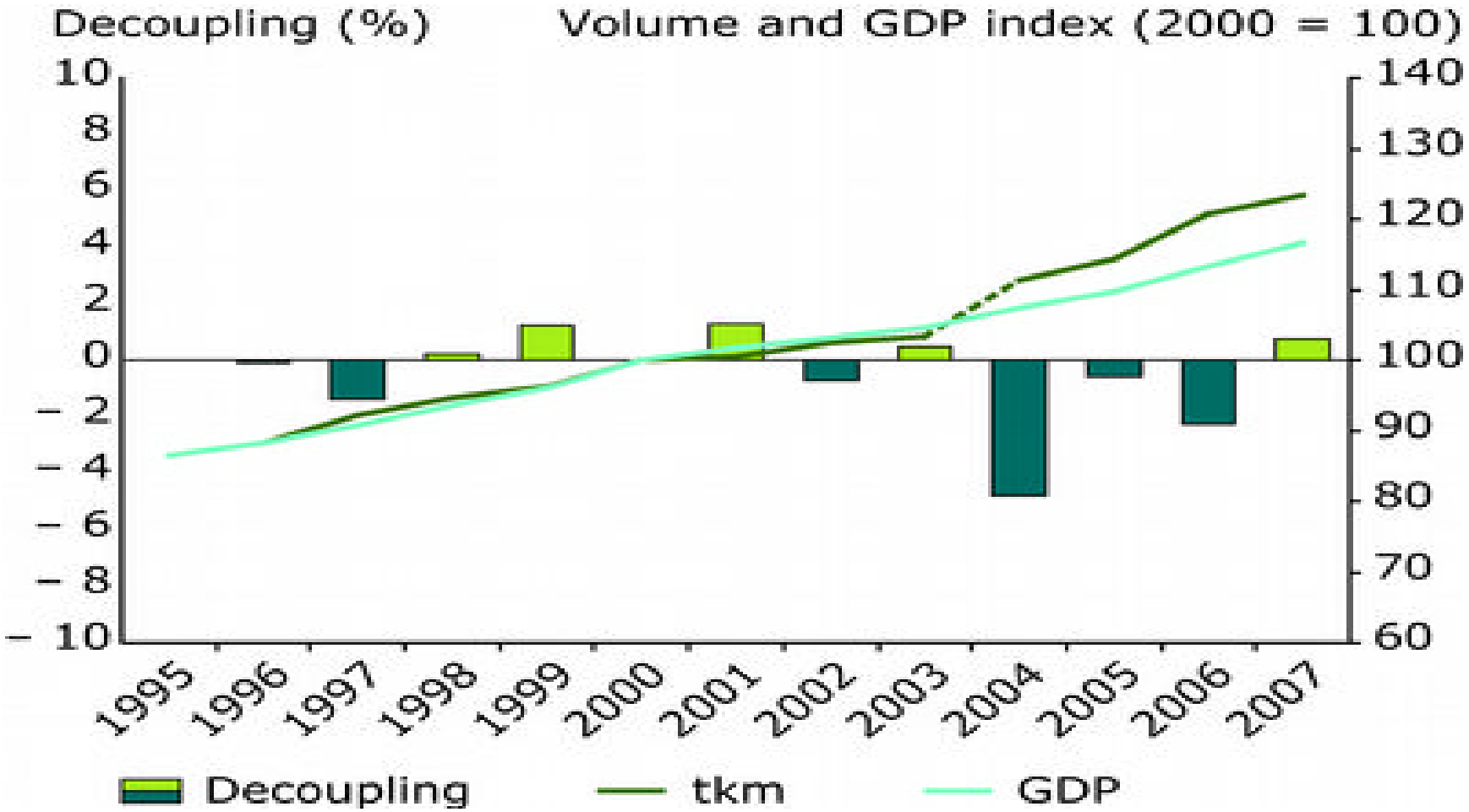
Towards a resource-efficient transport system

TERM 2009: indicators tracking transport and environment in the European Union

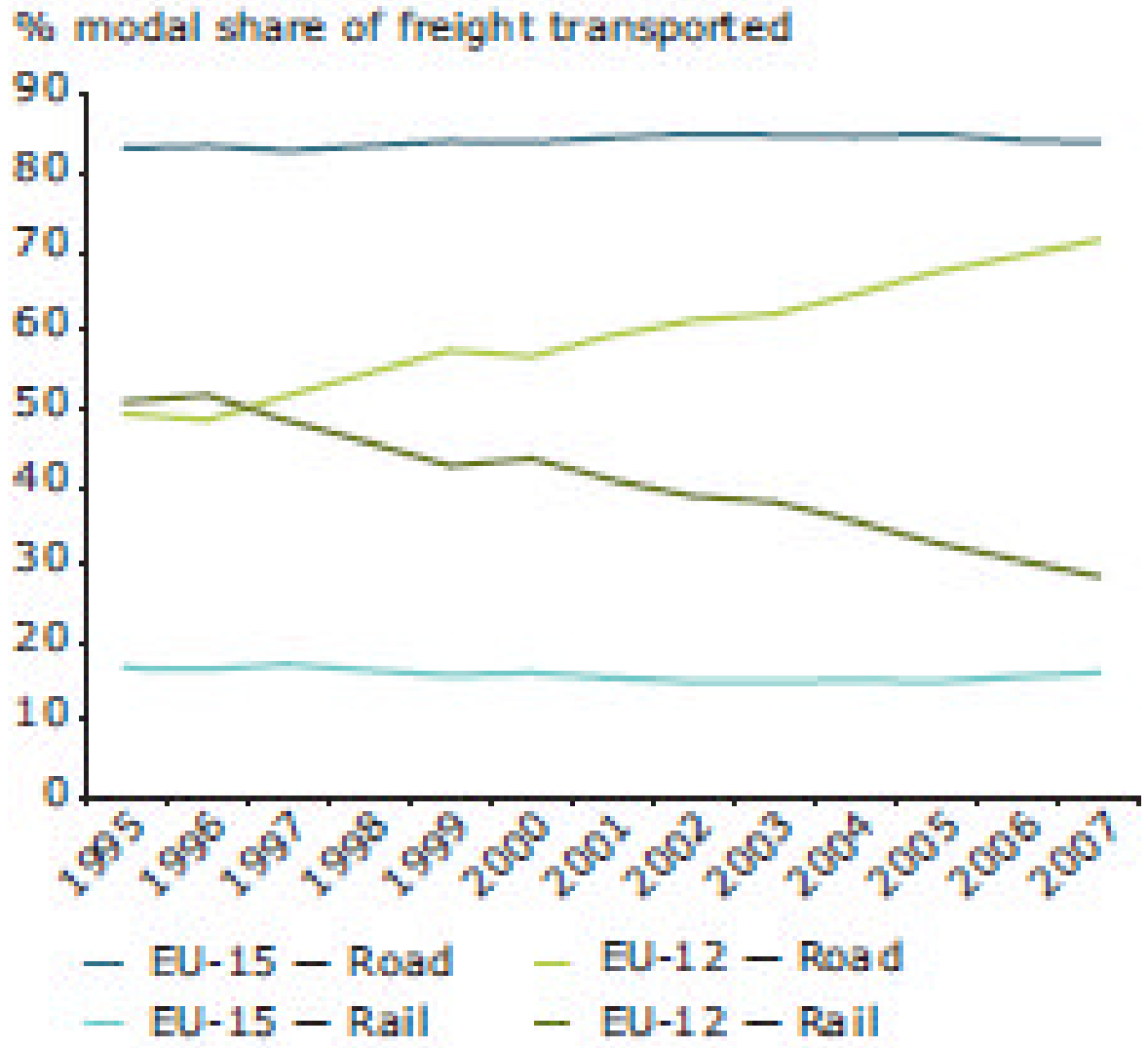
ISSN 1725-9177

European Environment Agency

Progress and trends in the EU .
Freight TRANSPORT
Grows alongside GDP(EEA 2009)

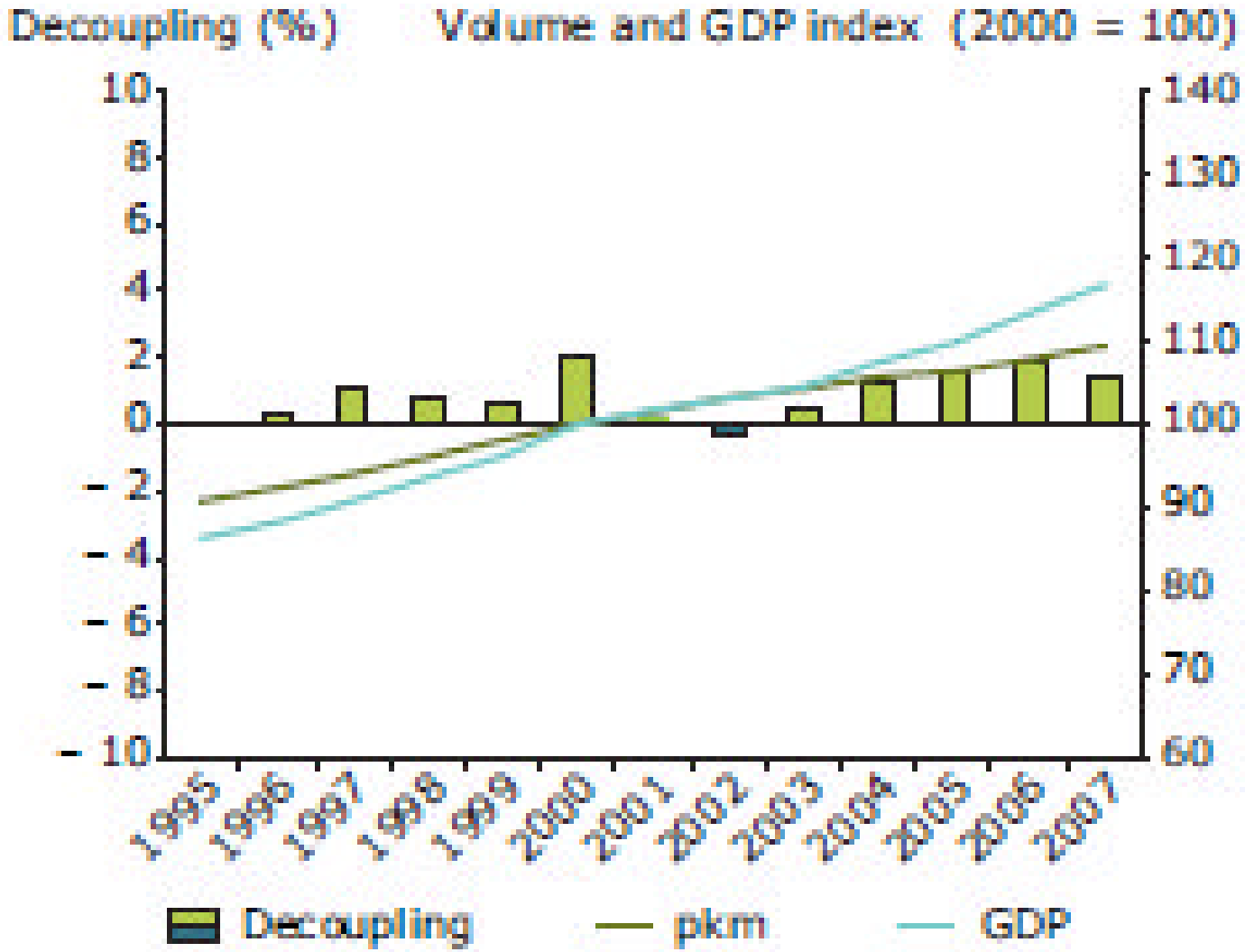


Progress and trends in the EU .
Road Transport´s market share increases strongly in EU 12 (EEA2009)

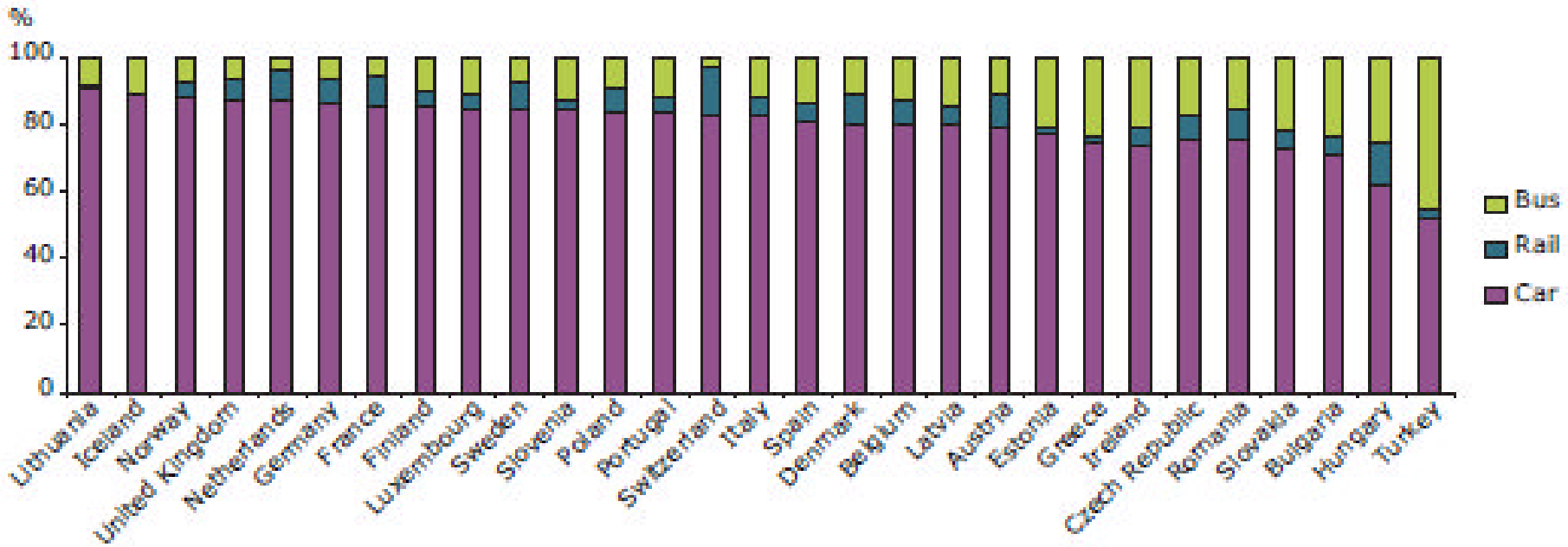


Source: Eurostat, 2009.

Trends in passenger transport demand and GDP



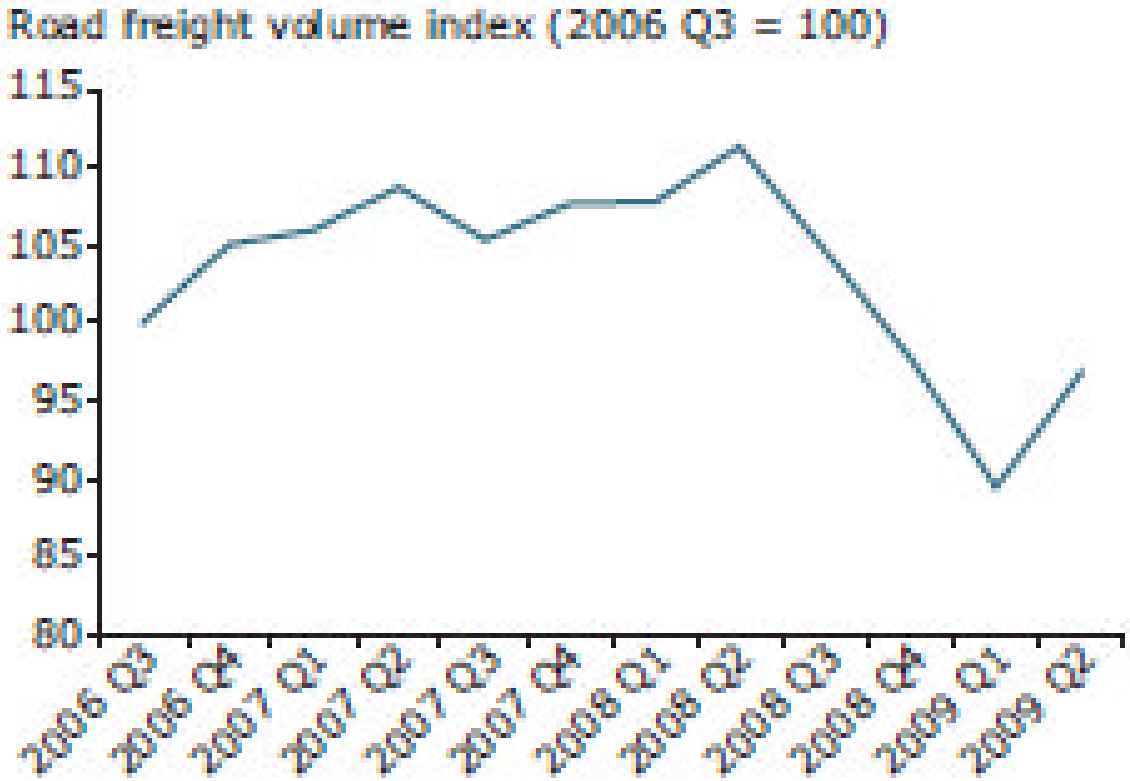
Passenger transport modal split (without sea and aviation, 2007)



Note: The Switzerland data are for 2005.

Source: Eurostat, 2009.

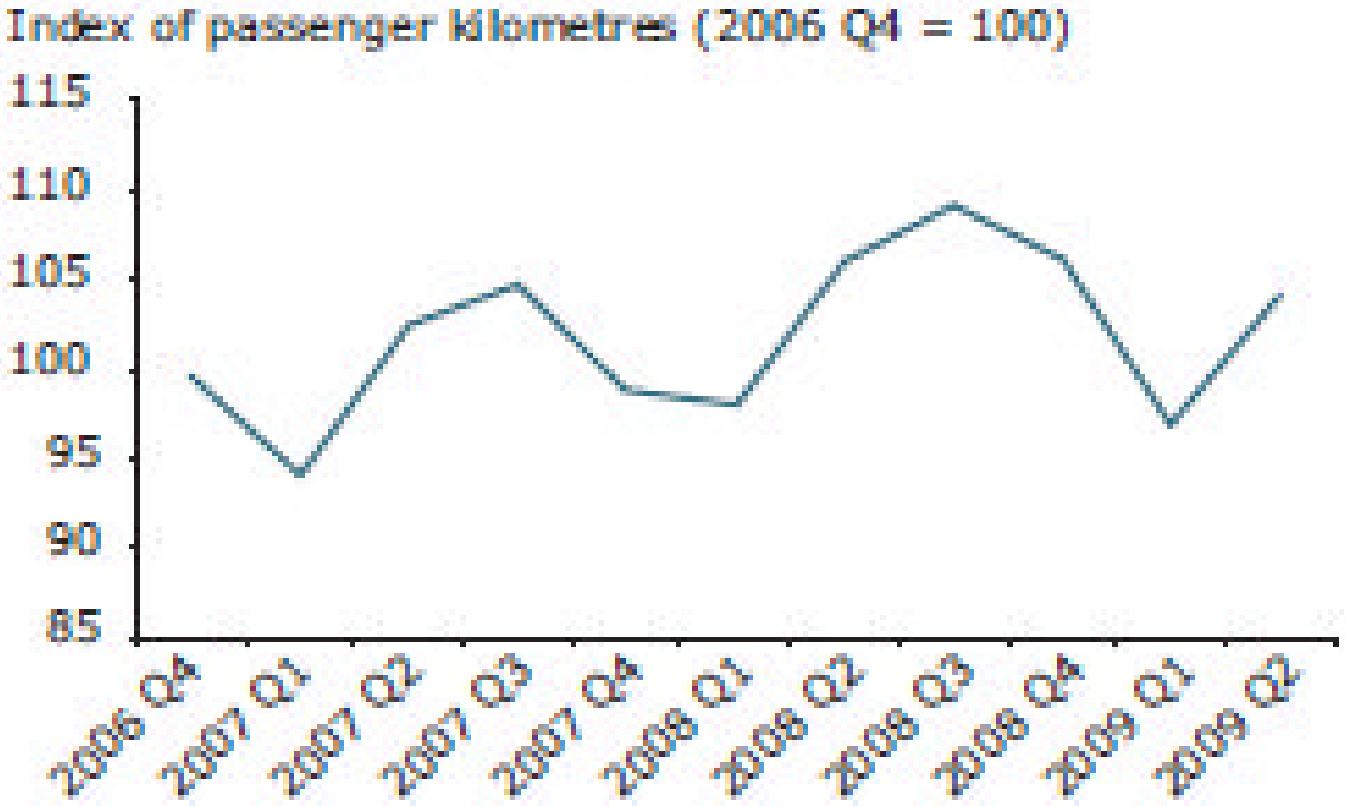
Impacts of the recession on road freight transport in selected countries



Note: Summary of quarterly road freight transport by type of operation and type of transport (mio tkm).

Source: Eurostat, 2009.

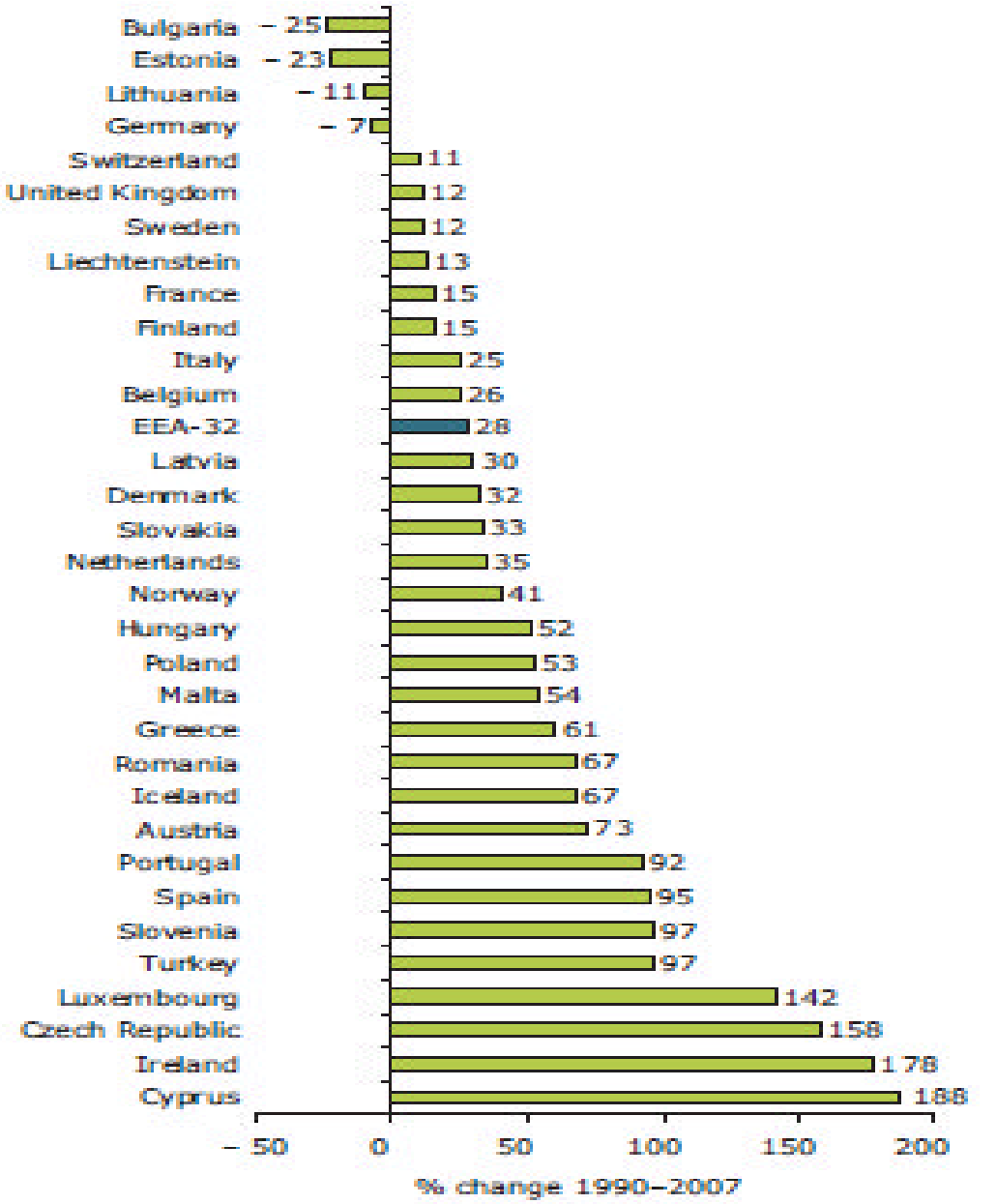
Impacts of the recession on rail transport in selected countries



Note: Summary of quarterly rail passenger transport.

Soruce: Eurostat, 2010

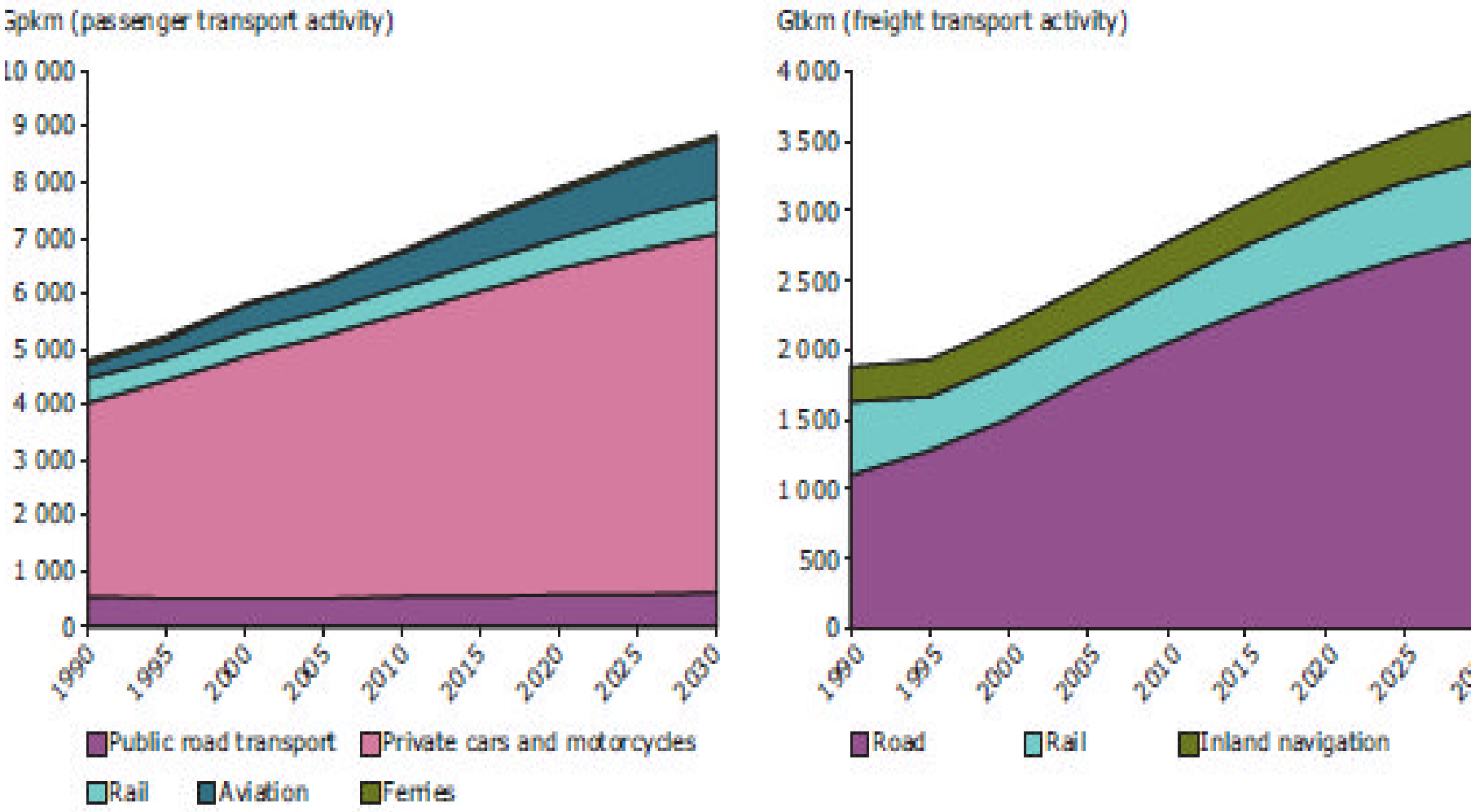
Trends in transport greenhouse gas emissions by country 1990–2007



Note: Excluding international aviation and maritime transport (according to Kyoto).

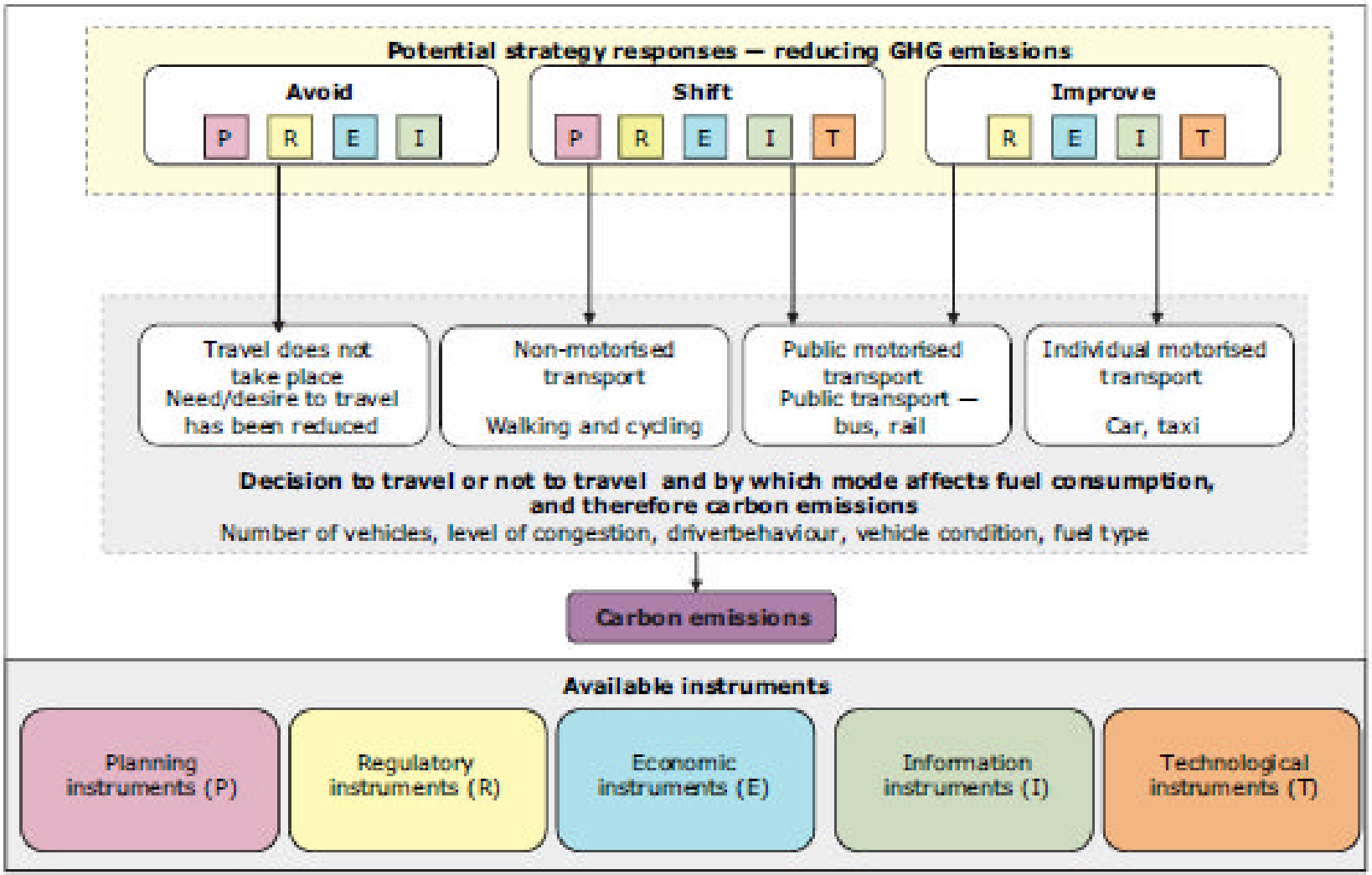
Source: European Topic Centre for Air and Climate Change, 2009.

Figure 8.1 Passenger and freight demand projections for the EU-25

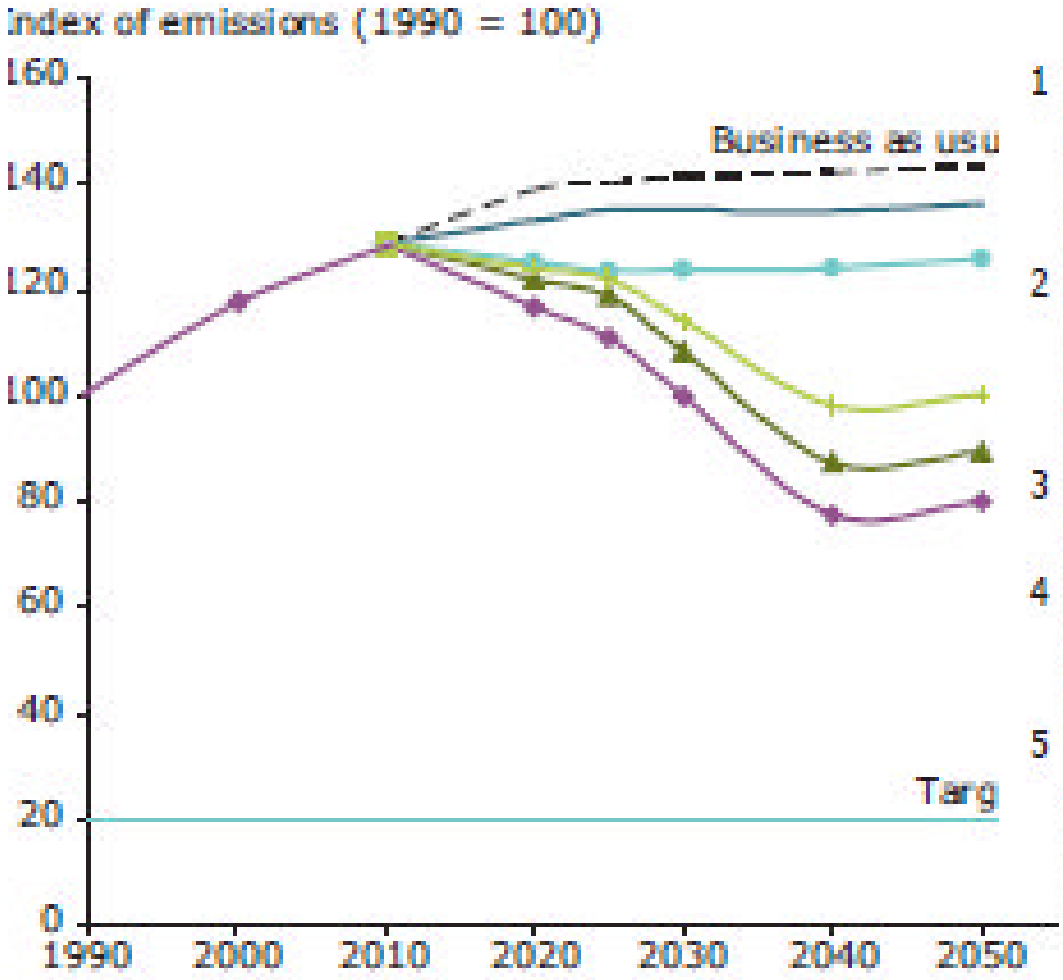


Source: EC, 2007.

Figure 8.2 Potential strategies for reducing GHG emissions — 'avoid', 'shift' and 'improve'



A mix of measures will be needed to curb down the GHGE 40% projected increase to a 40% decrease by 2050



1 Improved engine design: includes engine combustion improvements, hybrid trains and cars; electrification of trains. Estimated to lead to a 9 % reduction in CO_2 emissions from cars in 2050.

2 Improved vehicle design: including reducing vehicle weight, reducing aerodynamic drag, automatic tyre pressure adjustments. Estimated to lead to an 8 % reduction CO_2 emissions from all vehicles in 2050.

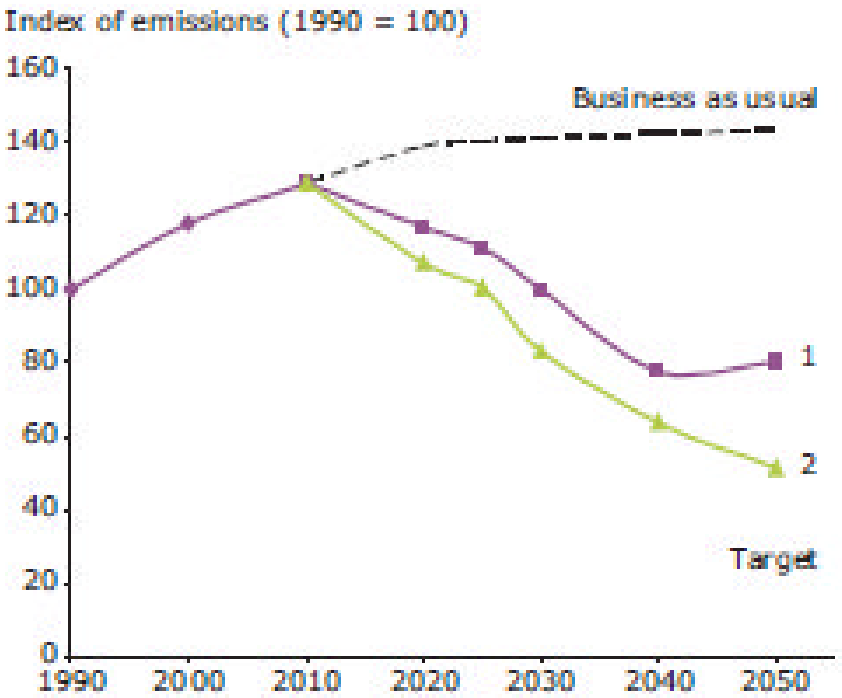
3 Electric cars (lead to a 35 % reduction in transport CO_2 emissions in 2050).

4 Low-carbon fuels: lead to a 4 % reduction in CO_2 emissions from cars and 12 % from HGVs and buse in 2050.

5 Technologies encouraging behavioural change: includinc speed limit enforcements and vehicle platooning. Estimated to lead to a 9 % reduction in CO_2 emissions from cars and 4 % from HGVs and buses in 2050.

A mix of measures will be needed to curb down the GHGE 40% projected increase to a 40% decrease by 2050

Figure 8.5 Effect of a combination of 'improve', 'avoid' and 'shift' measures



Each curve showes the additional effect of adding further instruments.

1 'Improve' package: improved engine and vehicle design, electric cars, low-carbon fuels and technologies encouraging behavioural change. These measures lead to a 44 % reduction in transport CO_2 emissions.

2 'Avoid and shift' package: road pricing, car clubs, increasing population density in cities, travel planning. These measures lead to a 20 % reduction in transport CO_2 emissions.

Final specific points:
There is a lot of open aspects on the role of the electric cars

Tanque-a-ruedas

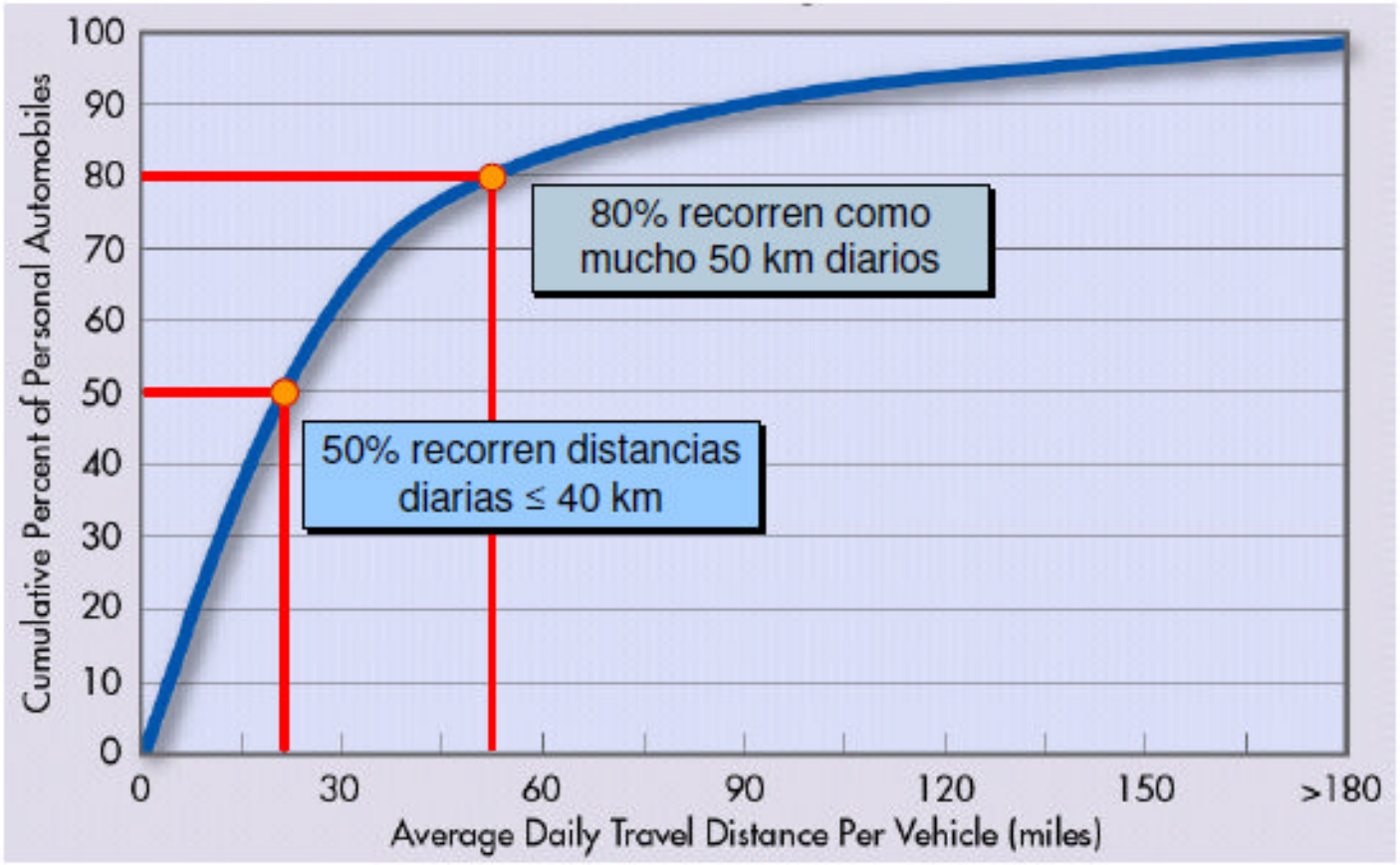
Tracción mecánica vs Tr. eléctrica

- La tracción mecánica es ineficiente:
  - Gasolina ICEV (Vehículo de motor de combustión interna) = 18%
  - Diesel ICEV = 23%

- La tracción eléctrica, por el contrario, es mucho más eficiente:
  - De 3 a 4 veces más eficiente que el sistema de tracción mecánica
  - Vehículo eléctrico (BEV) = 65-75%

- Ejemplos comparativos:
  - Toyota RAV4-EV 4,4 veces más eficiente que su equivalente ICEV
  - Ford Explorer USPS Electric 3,2 veces más eficiente

Autonomía BEVs: ¿Barrera mental?

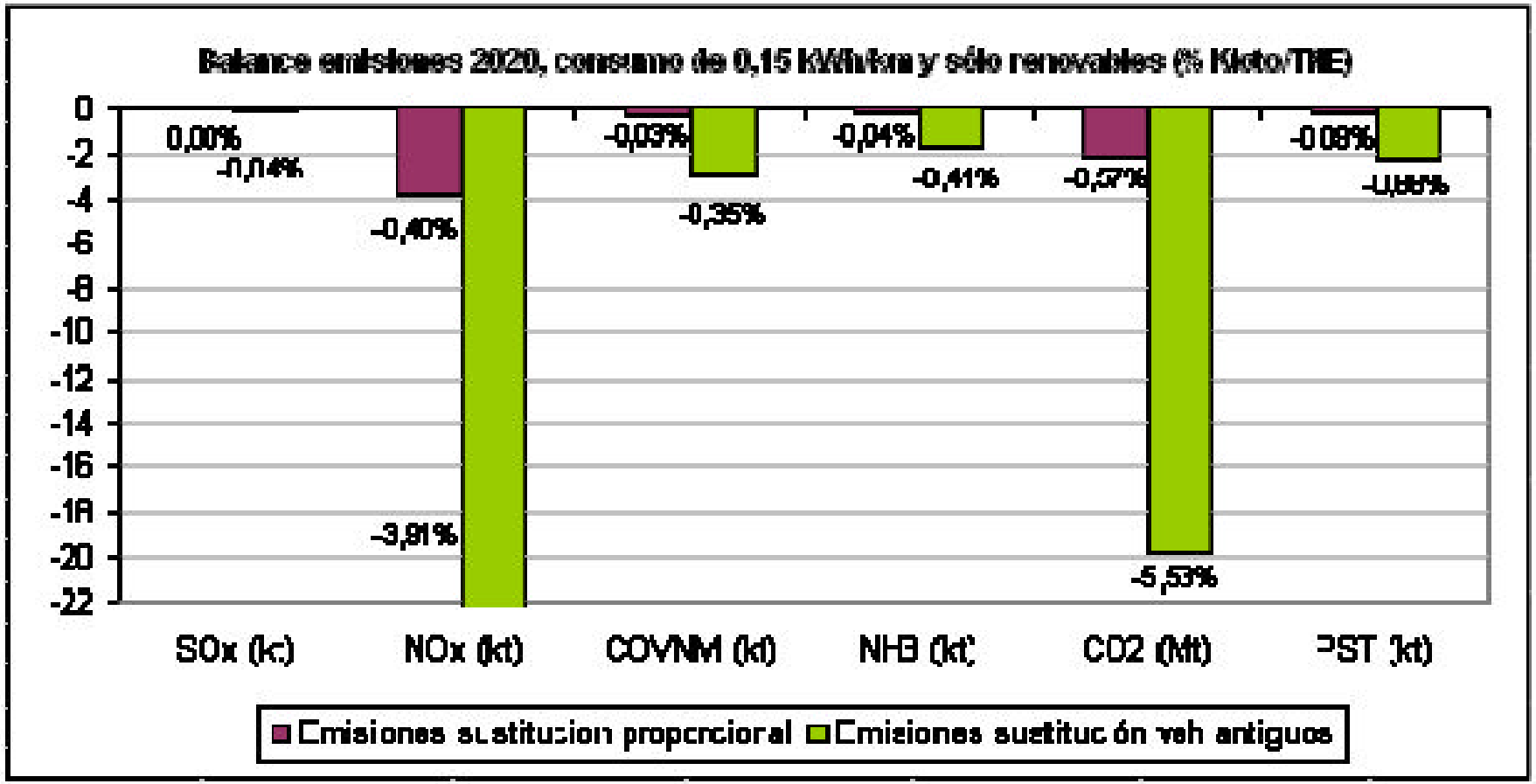


EPRI Journal, Fall 2005

Incidencia sobre curva demanda

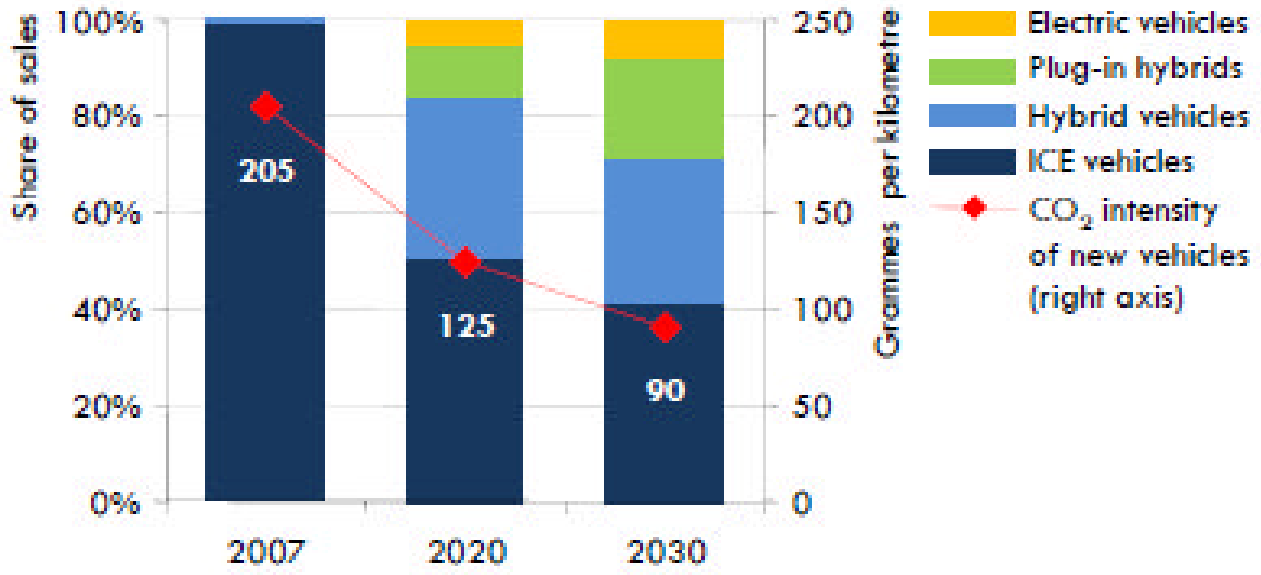
Efecto de la penetración de 1M BEV

- Balance de emisiones por introducción de vehículo eléctrico-2020 (carga sólo con energías renovables)



World Energy Outlook 2009

World passenger vehicle sales & average new vehicle CO_2 intensity in the 450 Scenario



Improvements to the internal combustion engine & the uptake of next-generation vehicles & biofuels lead to a 56% reduction in new-car emission intensity by 2030

© OECD/IEA - 2009

Sabemos lo suficiente para actuar....

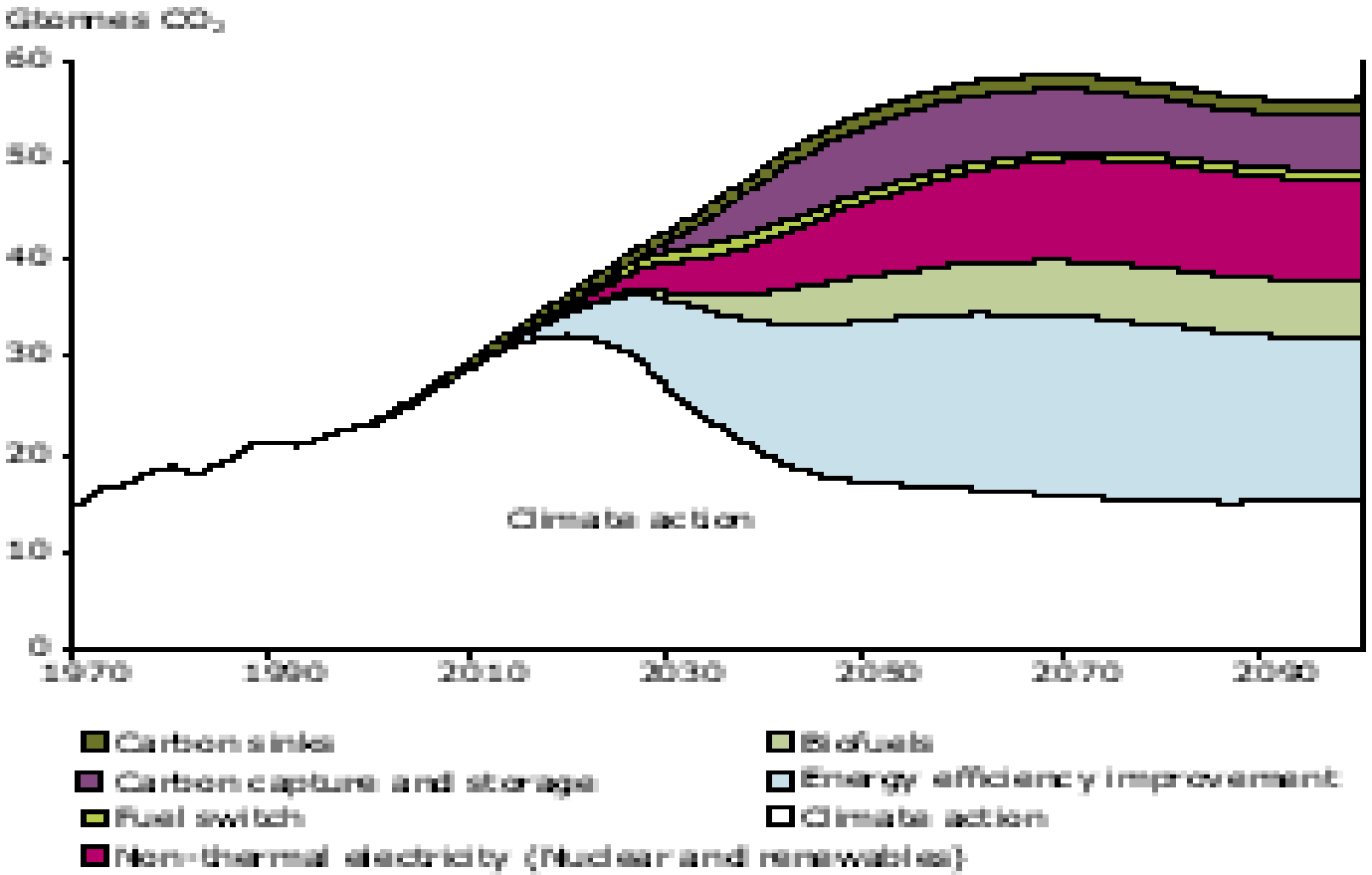
- *Tambien en materia de cambio Climático a nivel EU y en el contexto global*
- *El coste de actuar y de no actuar(IPCC,Stern..)*
- *Informe de la Agencia Europea de Medio Ambiente .Ag 2005*

  “Cambio Climático y Sistemas Energéticos bajos en Carbono”

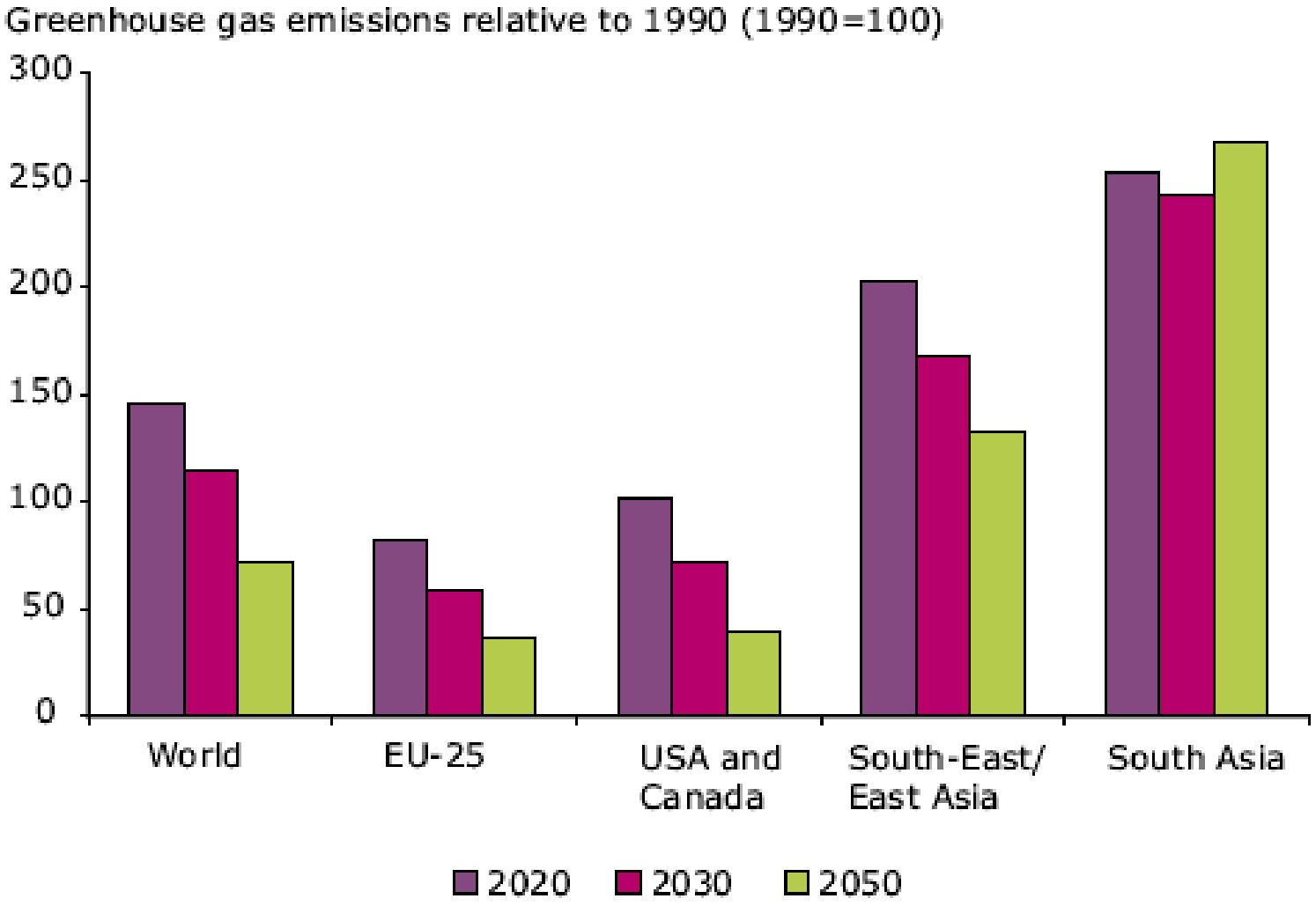
  ¡CONTRACCIÓN Y CONVERGENCIA!

¡CONTRACCIÓN.... Y reducción de EGEI!

Figure 4.2 Global emission reductions by mitigati
for the climate action scenario compar

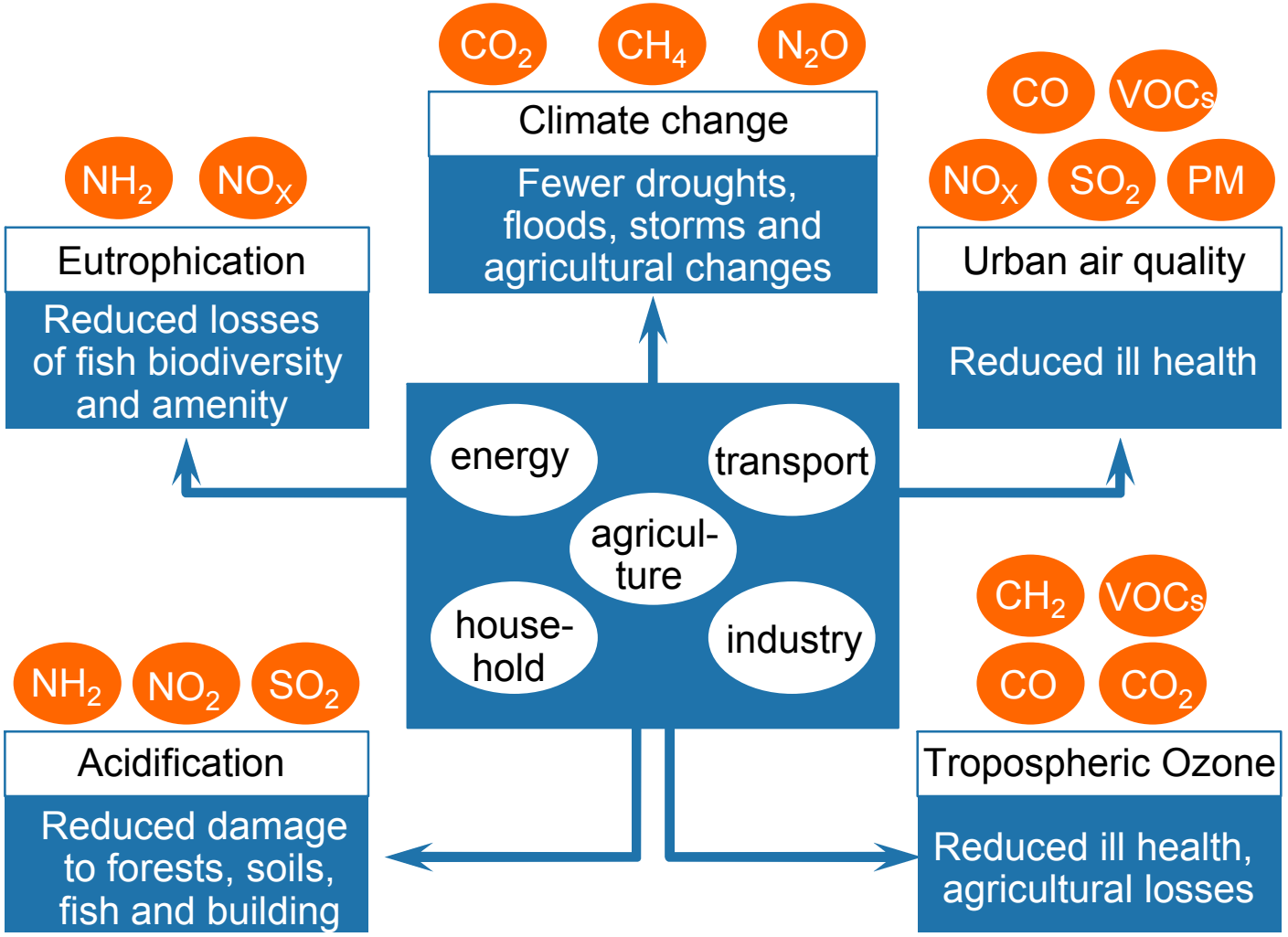


¡CONTRACCIÓN Y CONVERGENCIA (en todos los aspectos del desarrollo) Y reducción global de EGEI!



Los beneficios de la Integración de Políticas

Menores emisiones de GEI conllevan multiples beneficios ambientales



Tesis

- ***La clave es establecer progresivamente las condiciones para este cambio conveniente e inaplazable.***

("Sabemos lo que hay que hacer, aunque no estamos organizados para hacerlo…" Madrid 27 Abril 2009. Conferencia Ciudades Sostenibles)

- ***Se requieren nuevas políticas (para la Sostenibildad) y sobre todo nuevas formas de hacer política (para la Gobernabilidad).***

- ***¡Hay que repensarlo todo!.***

¿Es otro mundo necesario y posible?

"El mundo no evolucionará, no superará su situación normal de crisis usando la misma forma de pensar que creó la situación"

Albert Einstein

¿Y con los mismos que la crearon?¿Ejemplos?

En busca de una nueva lógica:
LA LÓGICA DE LA SOSTENIBILIDAD

Another EU is possible

Under the/ new EU Policy Framework
ESPON June 2010 Seminar

Main Policy Processes on the way

- *Europe 2020*
- *EU Budget*
- *Future Cohesion Policy*
- *Territorial Agenda*

Another EU is possible

Under the/ new EU Policy Framework
ESPON June 2010 Seminar

Main Policy Orientations

- *Crisis recovery*
- *Global Europe*
- *Smart, Sustainable and Inclusive Growth*
- *(knowledge, innovation, education, IT, resource efficiency, green economy, participation, skills and poverty)*
- *Competitiveness*
- *Cohesion*
- *Sustainable development*
- *Integration*

Another EU is possible

Under the/ new EU Policy Framework
ESPON June 2010 Seminar

Main Territorial Priorities

Harmonious territory
Territorial Cohesion
Specific types of regions
Territorial Cooperation
Polycentric Europe
Macro regions
Functional Areas
Rural
Multilevel Governance
Territorial Impact Assessment
Strategies

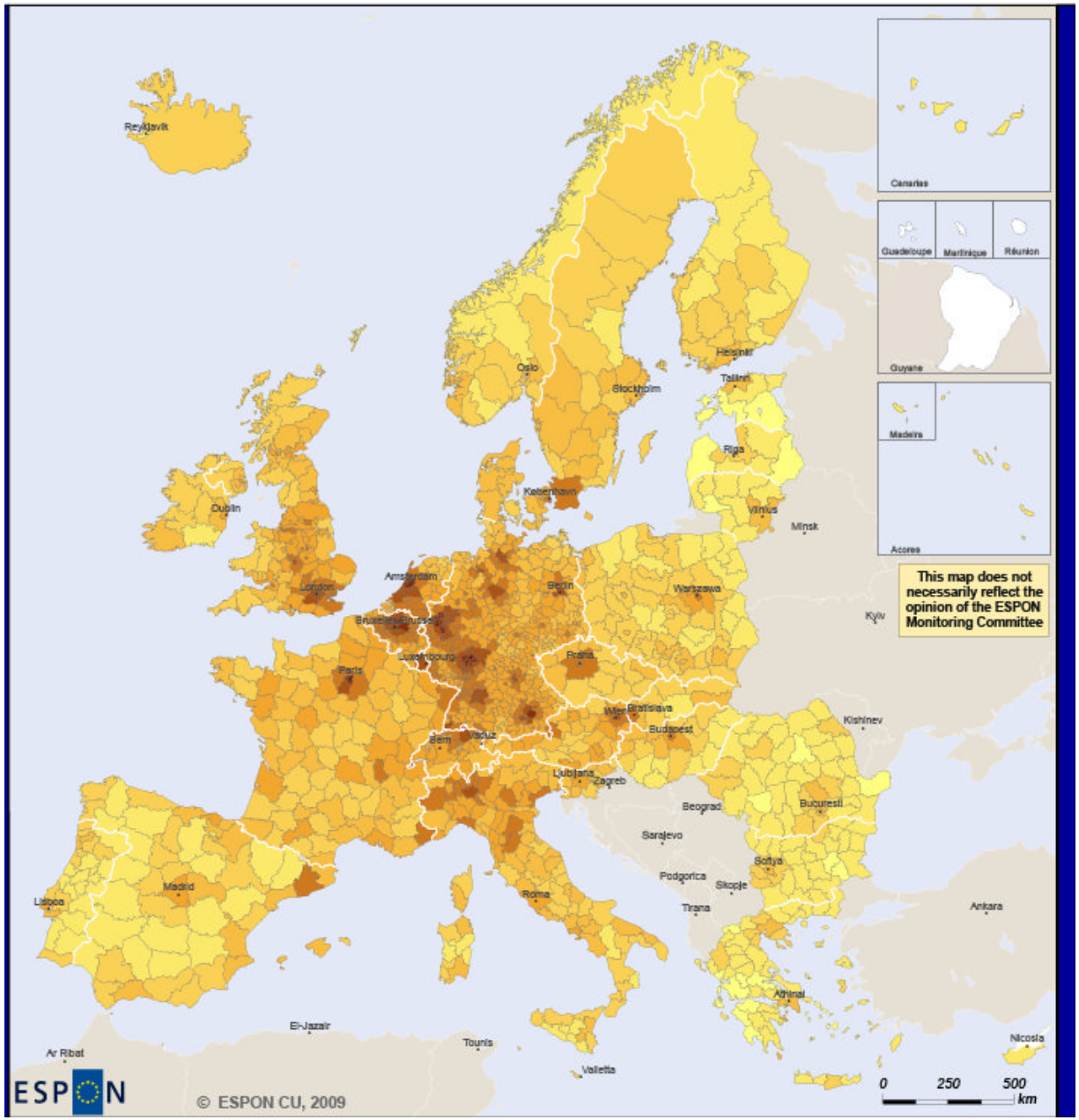
Another EU is possible

Under the/ new EU Policy Framework
ESPON June 2010 Seminar

Territorial Objectives

Stronger polycentric development and innovation through networking of cities

- *New forms of partnerships and territorial governance between urban and rural areas*
- *Promotion of regional clusters of competition and innovation in Europe*
- *Strengthening and extension of TENs*
- *Promotion of trans-European risk management, including the impacts of climate change*
- *Stronger ecological structures and cultural resources as added value for development*

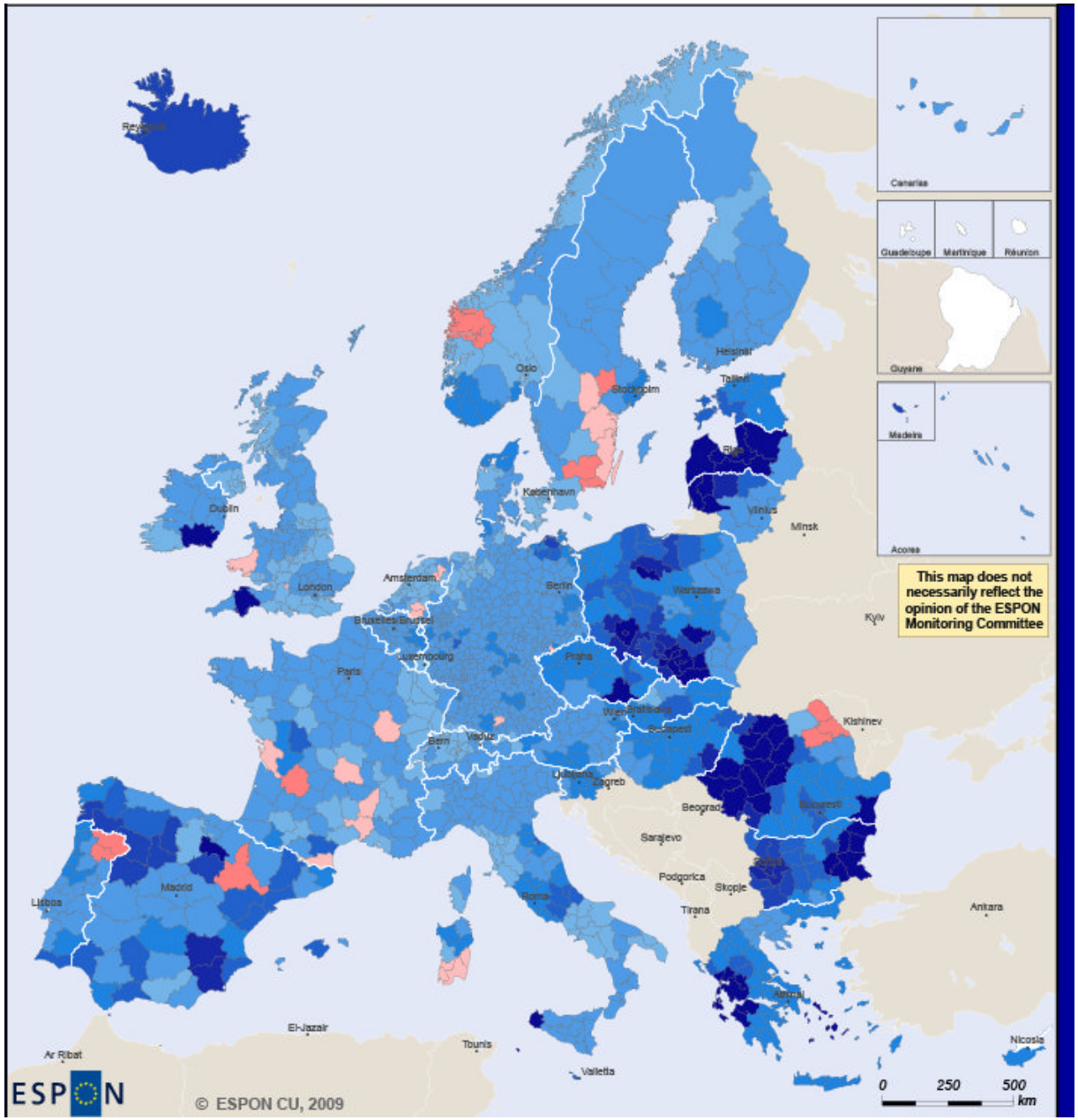


MULTI-MODAL

Potential Accessibility 2006

Index
(EU27=100)

- ... - 25,0
- 25,1 - 50,0
- 50,1 - 75,0
- 75,1 - 100,0
- 100,1 - 125,0
- 125,1 - 150,0
- 150,1 - 175,0
- 175,1 - 200,0
- 200,1 - ...
- No data



MULTI-MODAL

Potential Accessibility 2001-2006

EU27= 8.7%

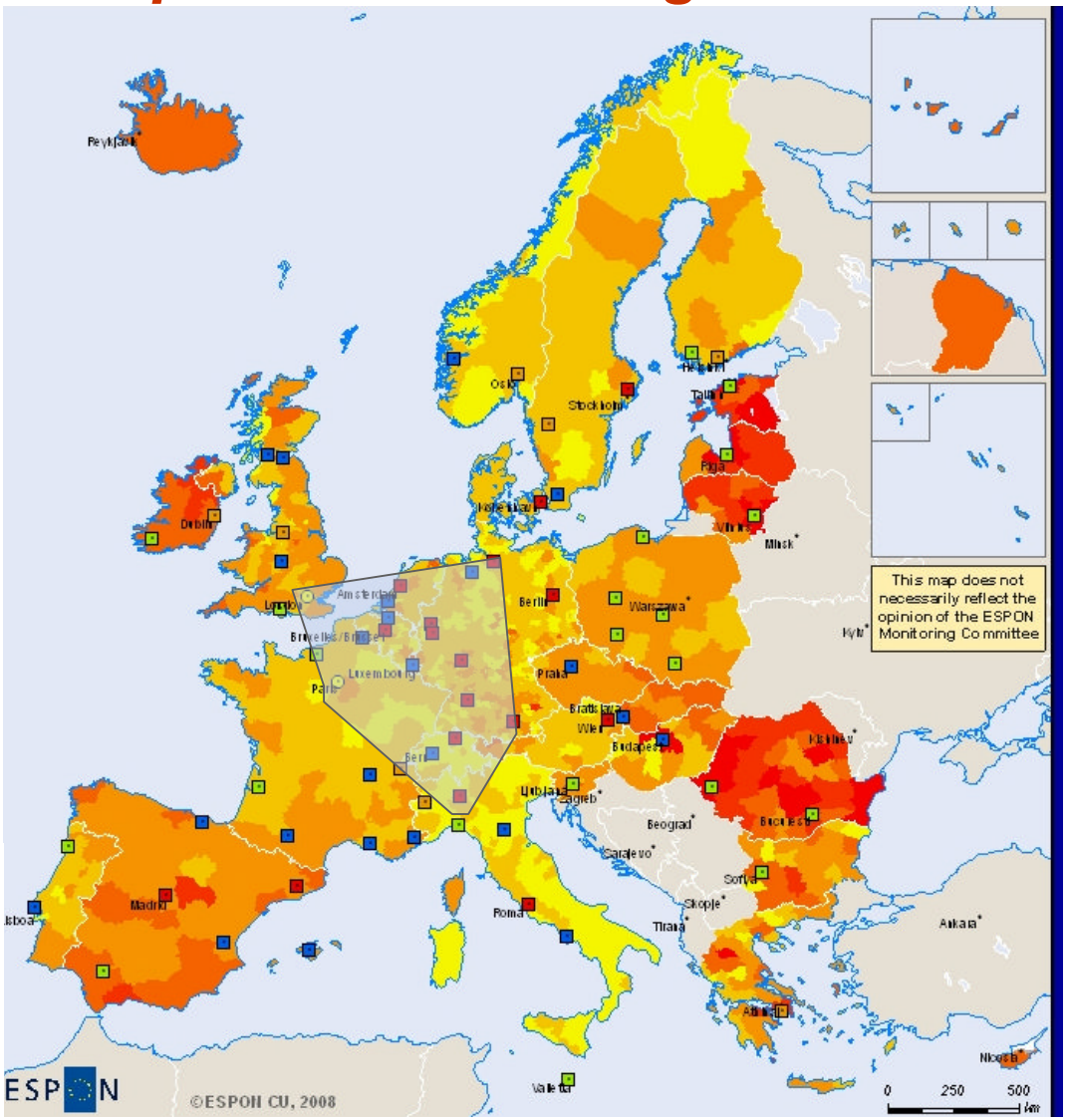
Relative change
(in %)

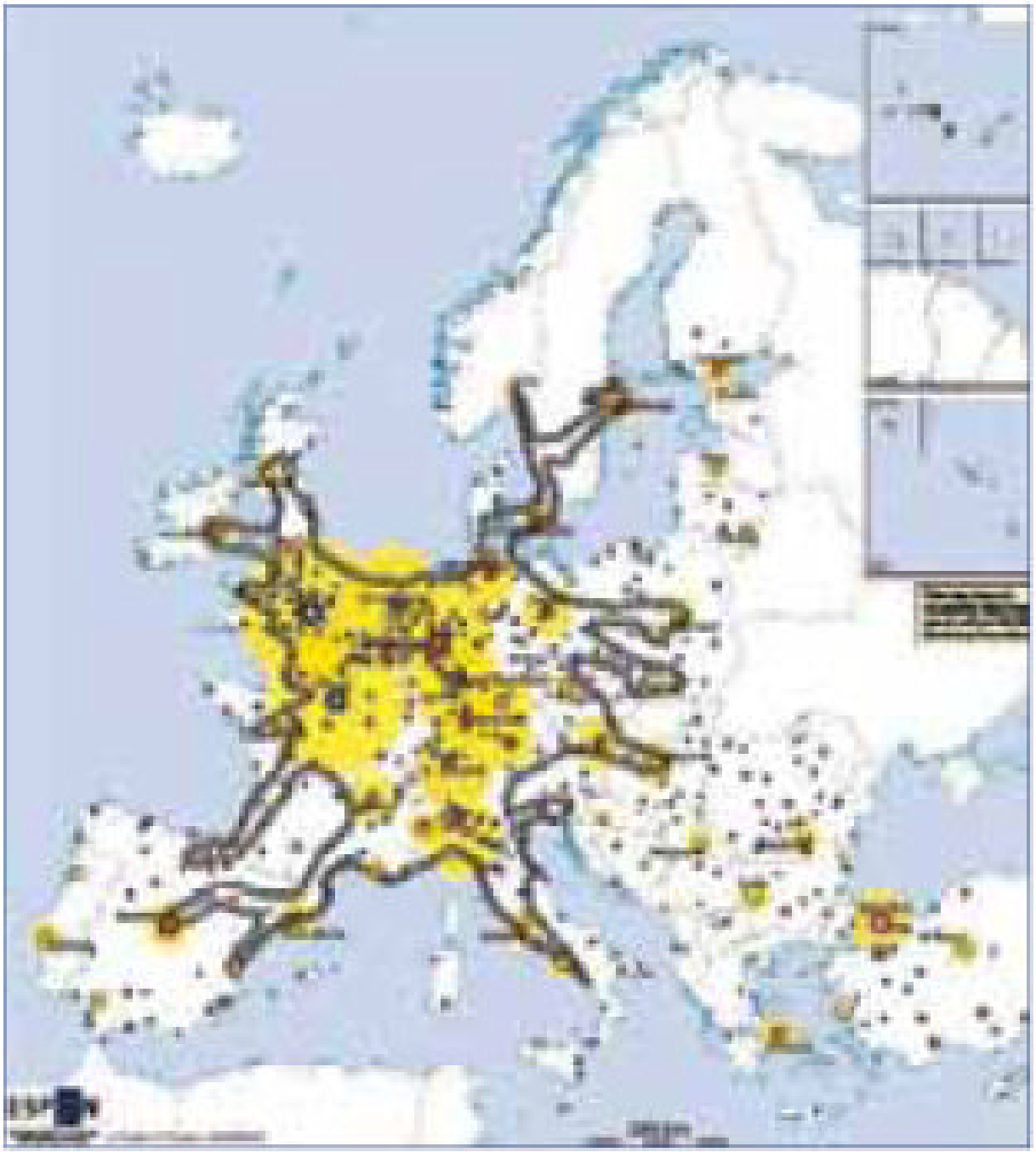
- ... - -10,0
- -9,9 - 0,0
- 0,1 - 5,0
- 5,1 - 10,0
- 10,1 - 15,0
- 15,1 - 20,0
- 20,1 - 25,0
- 25,1 - 30,0
- 30,1 - ...
- No data

Which ESPON 2006 results caught highest policy interest?

Main European Metropolitan Urban Regions

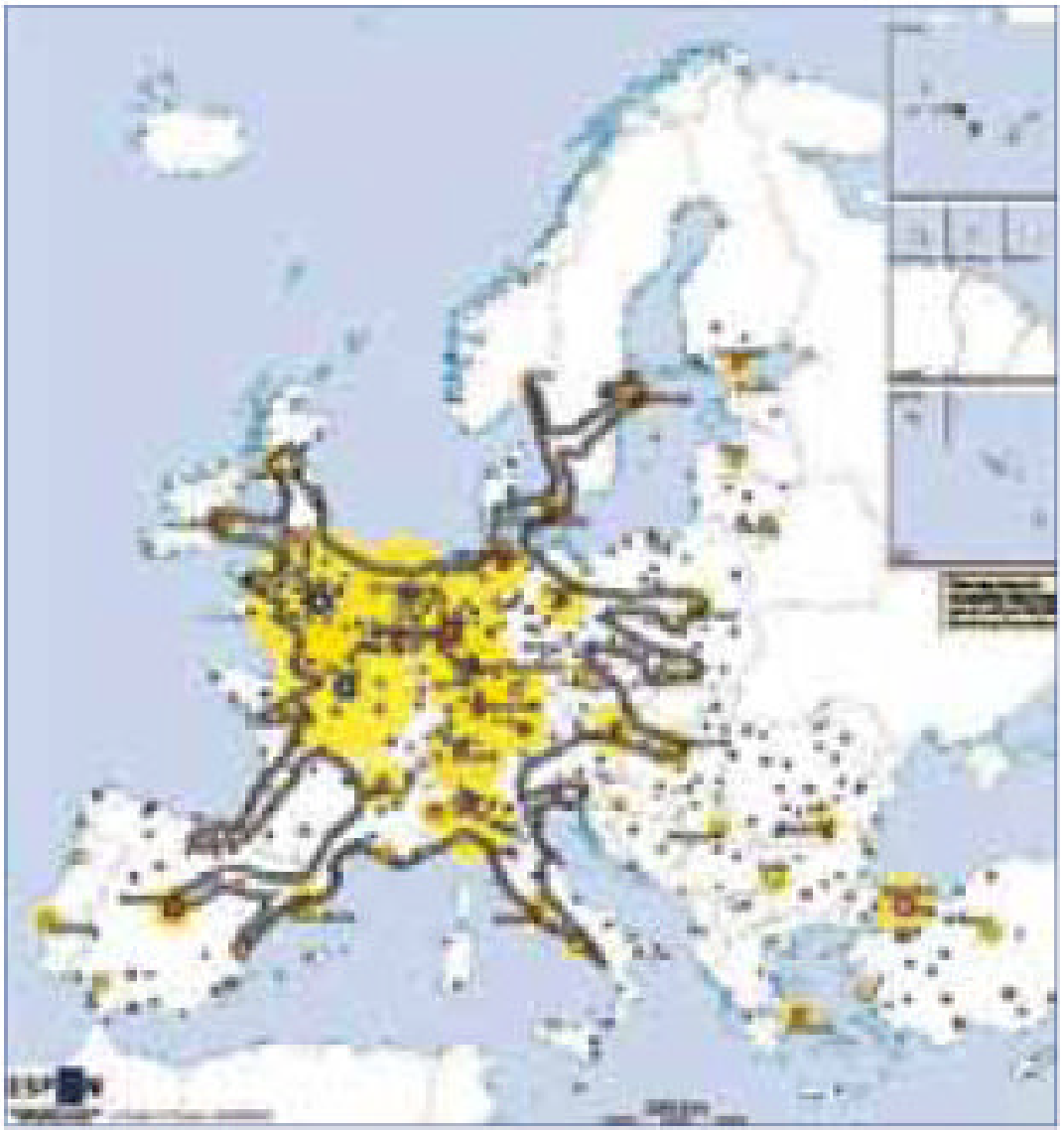
- Important for European economic performance and competitiveness in the global context
- Pentagon (14-32-46)
- High GDP growth 2000-2005 in areas with relatively lower GDP level
- Increasing importance of Metropolitan regions in proximity of and outside the core (Pentagon)





Trend scenario:, • *current policies, without major changes in direction*

the response would be insufficient to address the short and medium-term challenges (economy, infrastructure, technological investment);



Cohesion-oriented scenario (cohesion policy)

this will create significant added value in terms of territorial cohesion,

but will have less impact on economic growth and technological innovation

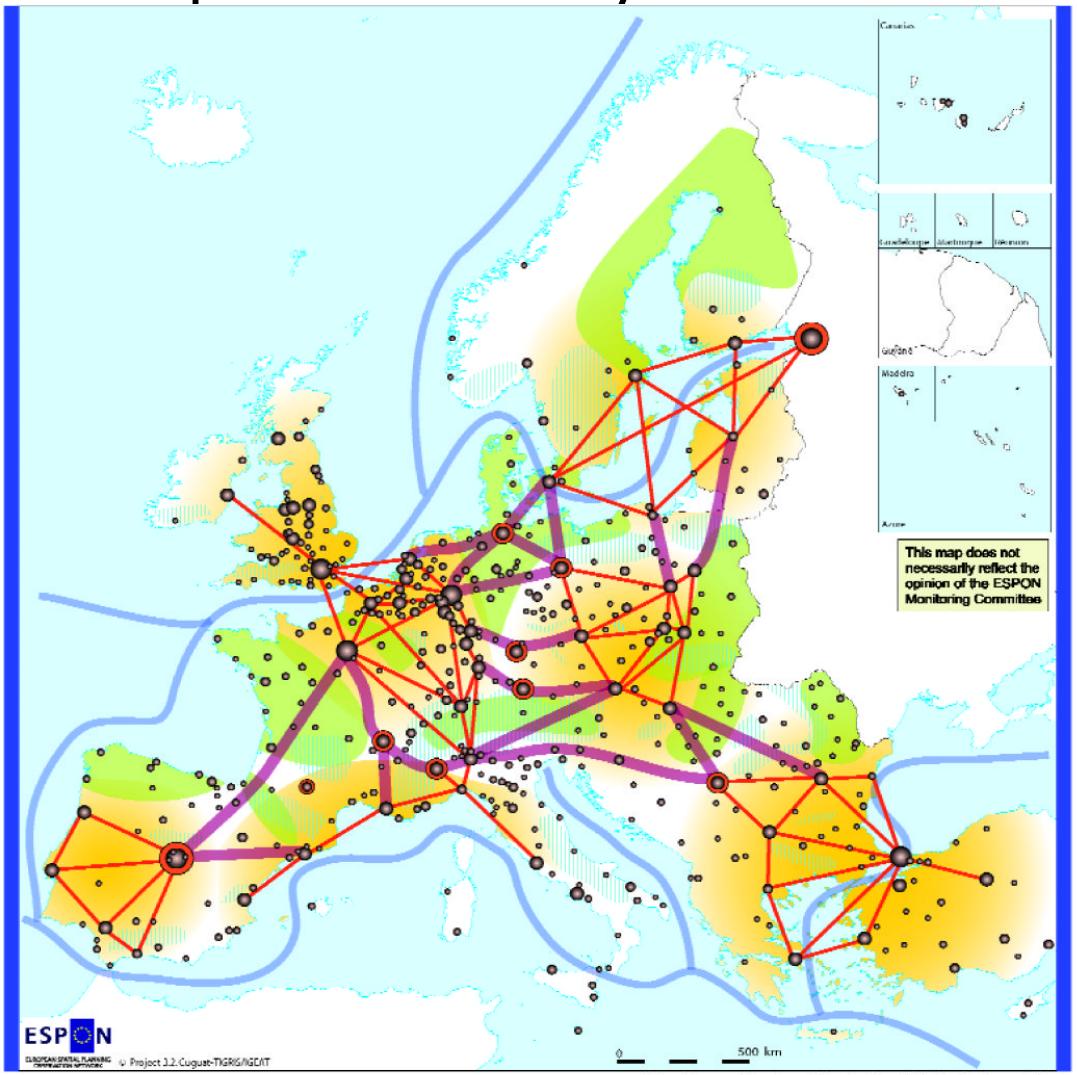
Competitiveness–oriented scenario (competitiveness policy)

this would generate significant economic growth and make the continent more Competitive

,

but would polarise economic activity and strengthen the role of the pentagon, thus depriving Europe of polycentrism.

European Territory 2030?



Area of economic integration

Major urban network

Link between areas of economic integration

Linking city

Major maritime freight route

Biomass production area

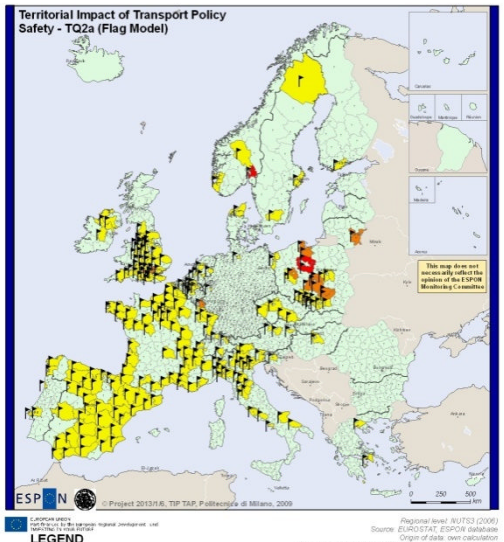
Area with dynamic residential economy

Appetizers from new ESPON results

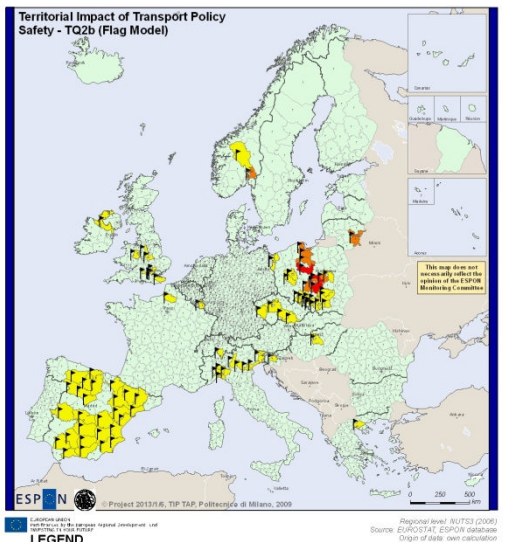
TIP TAP

Transport scenarios: Territorial distribution of excessive CO2 emissions (FLAGs warns where excessive impacts will occur)

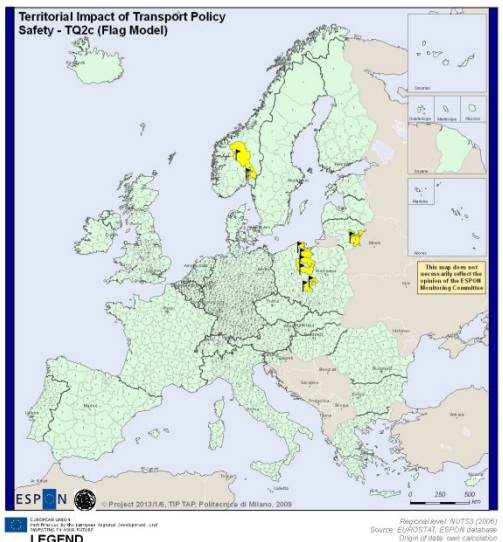
Baseline scenario



Infrastructure Scenario



Pricing Scenario



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Territorial cohesion
EECS Document -2009

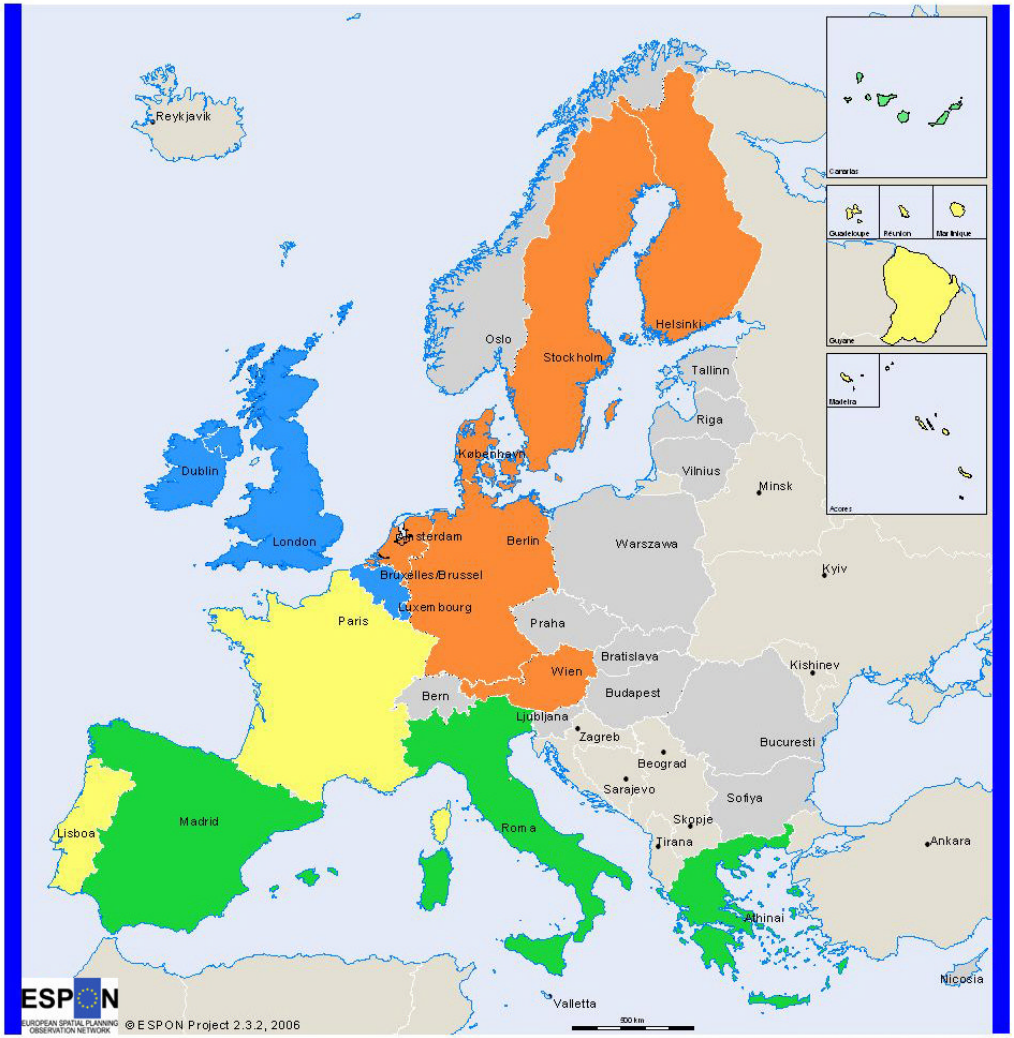
- ***"Spatial planning is the ideal instrument for implementing sustainable development at territorial level"***
  CEMAT (European Conference of Ministers responsiblefor Regional Planning) in 1994,

- ***"The challenges and risks aff ecting Europe's territory must be addressed by means of a European approach"***

- ***The added value of a shared vision of Europe's territory is undeniable and a sharedvision of this nature should be acknowledged to be a key strategic need.***

- ***Articles of the treaty currently in force should form a legal basis for drawing up a shared approach for Europe's territory, based on the principle that this is part of the European Union's remit***

Maps of Spatial planning Stvles (ECSP)



Regional Economic

Urbanism

Land Use

Comprehensive Integrated

Legal basis for drawing up a shared approach for Europe's territory, based on the principle that this is part of the European Union's remit ("Territorial Cohesion" EESC 2009

- • *Article 2 states that the Community shall have as its task «to promote throughout the Community a harmonious, balanced and sustainable development of economic activities»;*

- • *Article 16 &71 refers to social and territorial cohesion*

-in the context of services of general economic interest;

-in the context of a common transport policy;

- • *Article 158 states that «In order to promote its overall harmonious development, the Community shall develop and pursue its actions leading to the strengthening of its economic and social cohesion»;*

- • *Article 175(2)(b) states that the Council shall, on a proposal from the Commission, adopt measures affecting town and country planning*.

re-pensar

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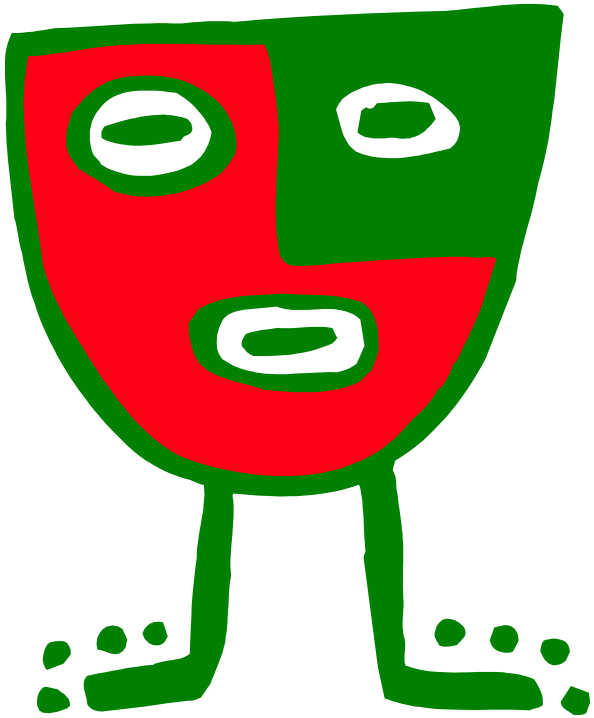
¿Escuchamos?

“Produce una enorme tristeza el pensar que mientras la naturaleza habla los seres humanos no escuchamos”

Victor Hugo

¡GRACIAS POR ESCUCHARME!