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
  - Industrialized 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 would 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 politicians.

• A single ambitious and legally binding agreement based on Kyoto Protocol is proving to be non feasible.

• A legal frame with some different binding and ambitious legal agreements adding/hunging on Kyoto (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 Sydafrika in 2011 at the latest to take over Kyoto in 2012.
Lessons learned?

- The EU has to lead both processes and above all show the way by implementing unilaterally ambitious targets also because it is in 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”

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 percent 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

Impact of pledged reductions and enhancing mitigation options, 2020

- Reduction in global greenhouse gas emissions, including CO₂ from land use and excluding surplus CO₂ emission rights

- According to the Copenhagen Accord
  - Developing countries high pledges (additional effect)
  - Industrialised countries high pledges (additional effect)
  - Developing countries low pledges
  - Industrialised countries low pledges

- Enhancing mitigation options
  - Additional reductions to achieve target of industrialised countries of -25%
  - International aviation and marine transport targets
  - No allowance increases from land use and forestry rules
  - 50% reduction in deforestation emissions by 2020 (additional effect)
  - China and India National Climate Plans (additional effect)
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.
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 habría que hacer

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

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

- Que supere la “condicionalidad”, adquiriendo compromisos más ambiciosos unilateralmente
  Que finalmente rompan el bloqueo político-estratégico a nivel global
Que mantiene abierta la esperanza de una acción 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 EFEI 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 acción 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 acción 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
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.
The base-year emissions for the EU-15 have been fixed to 4.265 Mt CO₂-equivalent.

Table ES.1  Overview of EU-27 and EU-15 source categories whose emissions increased or decreased by more than 20 million tonnes CO₂-equivalents in the period 1990–2008

<table>
<thead>
<tr>
<th>Source category</th>
<th>EU-15</th>
<th>EU-27</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacturing industries (excl. iron and steel)</td>
<td>- 77.5</td>
<td>- 161.1</td>
</tr>
<tr>
<td>(Energy-related CO₂ from 1A2 excl. 1A2a)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Solid waste disposal (CH₄ from 6A)</td>
<td>- 68.1</td>
<td>- 65.7</td>
</tr>
<tr>
<td>Adipic acid production (N₂O from 2B3)</td>
<td>- 50.3</td>
<td>- 51.3</td>
</tr>
<tr>
<td>Fugitive emissions (CH₄ from 1B)</td>
<td>- 46.2</td>
<td>- 66.9</td>
</tr>
<tr>
<td>Manufacture of solid fuels (CO₂ from 1A1c)</td>
<td>- 42.6</td>
<td>- 42.9</td>
</tr>
<tr>
<td>Households and services (CO₂ from 1A4)</td>
<td>- 39.0</td>
<td>- 94.6</td>
</tr>
<tr>
<td>Agricultural soils (N₂O from 4D)</td>
<td>- 33.5</td>
<td>- 64.7</td>
</tr>
<tr>
<td>Iron and steel production (CO₂ from 1A2a+2C1)</td>
<td>- 32.2</td>
<td>- 55.2</td>
</tr>
<tr>
<td>Nitric acid production (N₂O from 2B2)</td>
<td>- 22.4</td>
<td>- 25.8</td>
</tr>
<tr>
<td>Production of halocarbons (HFC from 2E)</td>
<td>- 21.7</td>
<td>- 21.7</td>
</tr>
<tr>
<td>Enteric fermentation (CH₄ from 4A)</td>
<td>- 15.9</td>
<td>- 38.3</td>
</tr>
<tr>
<td>Public electricity and heat production (CO₂ from 1A1a)</td>
<td>9.1</td>
<td>- 135.7</td>
</tr>
<tr>
<td>Consumption of halocarbons (HFC from 2F)</td>
<td>60.2</td>
<td>66.6</td>
</tr>
<tr>
<td>Road transport (CO₂ from 1A3b)</td>
<td>134.9</td>
<td>185.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>- 274.2</strong></td>
<td><strong>- 627.3</strong></td>
</tr>
</tbody>
</table>

Note: As the table only presents sectors whose emissions increased or decreased by 20 million tonnes CO₂-equivalents, the sum for each country grouping EU-15/EU-27 does not necessarily 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
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)

Trends in passenger transport demand and GDP

Decoupling (%)

Volume and GDP index (2000 = 100)

-10  -5  0  5  10


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

Note: The Switzerland data are for 2005.

Impacts of the recession on road freight transport in selected countries

Road freight volume index (2006 Q3 = 100)

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

Impacts of the recession on rail transport in selected countries

Index of passenger kilometres (2006 Q4 = 100)

Note: Summary of quarterly rail passenger transport.

Source: 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

Spkm (passenger transport activity)

Gtkm (freight transport activity)

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

- **Avoid**
  - P: Planning instruments
  - R: Regulatory instruments
  - E: Economic instruments
  - I: Information instruments

- **Shift**
  - P: Planning instruments
  - R: Regulatory instruments
  - E: Economic instruments
  - I: Information instruments
  - T: Technological instruments

- **Improve**
  - R: Regulatory instruments
  - E: Economic instruments
  - I: Information instruments
  - T: Technological instruments

**Potential strategy responses — reducing GHG emissions**

- **Avoid**
  - Travel does not take place
  - Need/desire to travel has been reduced

- **Shift**
  - Non-motorised transport
  - Walking and cycling
  - Public motorised transport
  - Public transport — bus, rail

- **Improve**
  - Individual motorised transport
  - Car, taxi

**Decision to travel or not to travel and by which mode affects fuel consumption, and therefore carbon emissions**

- Number of vehicles, level of congestion, driver behaviour, vehicle condition, fuel type

**Carbon emissions**

**Available instruments**

- Planning instruments (P)
- Regulatory instruments (R)
- Economic instruments (E)
- Information instruments (I)
- Technological instruments (T)
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 CO₂ 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 CO₂ emissions from all vehicles in 2050.

3. Electric cars (lead to a 35% reduction in transport CO₂ emissions in 2050).

4. Low-carbon fuels: lead to a 4% reduction in CO₂ emissions from cars and 12% from HGVs and buse in 2050.

5. Technologies encouraging behavioural change: including speed limit enforcements and vehicle platooning. Estimated to lead to a 9% reduction in CO₂ 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 shows 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 CO₂ 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 CO₂ 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?

80% recorren como mucho 50 km diarios

50% recorren distancias diarias ≤ 40 km
Incidencia sobre curva demanda

De 10 pm a 8 am: tiempo de recarga básico

Tiempo de recarga extraordinario
Efecto de la penetración de 1M BEV

Balance de emisiones por introducción de vehículo eléctrico-2020 (carga sólo con energías renovables)
World passenger vehicle sales & average new vehicle CO₂ 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
Sabemos lo suficiente para actuar....

- También 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!
¡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 múltiples beneficios ambientales

Reduced damage to forests, soils, fish and building

Reduced ill health, agricultural losses

Reduced ill health, agricultural losses

Reduced ill health

Fewer droughts, floods, storms and agricultural changes

Climate change

Urban air quality

Eutrophication

Reduced losses of fish biodiversity and amenity

Acidification

Reduced damage to forests, soils, fish and building

NH₂

NO₂

SO₂

NH₂

NOₓ

CO₂

CH₄

N₂O

CO

VOCs

NOₓ

SO₂

PM

CO

VOCs

CH₂

CO

CO₂

energy

transport

agriculture

household

industry

Tropospheric Ozone

Reduced ill health, agricultural losses

Energy

Agriculture

Transport

Household

Industry

Eutrophication

Reduced losses of fish biodiversity and amenity

Acidification

Reduced damage to forests, soils, fish and building

Climate change

Fewer droughts, floods, storms and agricultural changes

Urban air quality

Reduced ill health

Reduced ill health, agricultural losses

Energy

Transport

Agriculture

Household

Industry
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 Sostenibilidad) 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
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?

[Map of Europe with various areas marked, including:
- 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
Territorial cohesion
EECS Document -2009

• “Spatial planning is the ideal instrument for implementing sustainable development at territorial level”
  CEMAT (European Conference of Ministers responsible for Regional Planning) in 1994,

• “The challenges and risks affecting 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 shared vision 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 Styles (ECSP)
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
København CO₂-neutral i 2025

MILJØ METROPOLEN
¿Escuchamos?

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

Victor Hugo

¡GRACIAS POR ESCUCHARME!