Environmental impact of transport

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Dr. Peder Jensen
Head of Energy and Transport Group, EEA
Environmental impacts

- Impact of greenhouse gas emissions
- Air quality and air pollutant emissions
- Biodiversity impacts
- Noise impacts
## EEA reporting on transport

<table>
<thead>
<tr>
<th>Target</th>
<th>Deadline</th>
<th>Source</th>
<th>Indicator</th>
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<td>Transport GHG: 54–67% reduction (1990)</td>
<td>2050</td>
<td>2050 Roadmap</td>
<td>TERM02</td>
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<td>Conv. Fuelled cars reduced in urban traffic: 50% / 100%</td>
<td>2030 / 2050</td>
<td>Transport White Paper</td>
<td>TERM34</td>
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<td>ETC.</td>
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The clima challenge

EU-27 Total and transport emissions (Kyoto base + bunkers)

Total EU-27 GHG emissions (incl. bunkers)

EU-27 20% and 30% emission reduction target range

Linear trajectories toward 80% and 95% reduction targets

Transport emission growth 1.61% p.a. (avg 1990-2008)

Source: EEA, 2011
The clima challenge
latest numbers (7.10.2011)

Figure ES.1  Trends in total greenhouse gas emissions excluding LULUCF in the EU-15 and the EU-27

Million tonnes CO₂-equivalent

Expected increase in total GHG emissions in EU-27 in 2009/2010 = 2.3 % (± 0.3)

Expected increase in total GHG emissions in EU-15 in 2009/2010 = 2.4 % (± 0.7)

Source: EEA European Topic Centre for Air Pollution and Climate Change Mitigation (ETC/ACM), based on the 2011 EU greenhouse gas inventory submitted to the UNFCCC for the years 1990–2009 and early estimates for 2010.
Energy consumption and greenhouse gas emissions

Source: EEA, 2011
Air emissions and air quality

Source: EEA, 2011
NO$_x$ emissions by different source sectors

- Transport: 46.2%
- Energy sector: 14.1%
- E-PRTR: 22.2%
- Industry (point-source): 9.6%
- Others (not considered): 15.2%
- Agriculture (diffuse): 1.6%
- Small combustion: 5.2%

Specific sectors:
- Residential: 3.7%
- Aviation: 0.4%
- National navigation: 4.1%
- Intern. navigation: 6.5%
- Road Transport: 35.2%
- Animal: 0.1%
- Other agriculture: 1.5%
- Commercial: 1.5%
National emission totals for road transport divided by vehicle type

Country and pollutant specific split factors derived from TREMOVE

<table>
<thead>
<tr>
<th>Highways</th>
<th>Emissions rural roads</th>
<th>Emissions residential roads</th>
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<tbody>
<tr>
<td></td>
<td><strong>50%</strong></td>
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<td>Roads covered Trans-Tools</td>
<td>Rural line source</td>
<td>Rural area source</td>
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<tr>
<td></td>
<td>70%</td>
<td>30%</td>
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<tr>
<td>Road network TT</td>
<td>Traffic volume TT</td>
<td>Road network Secondary and local</td>
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<td>Urbanisation (Class C)</td>
<td>Population</td>
<td>Urbanisation (Class C)</td>
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<tr>
<td>Urbanisation (Class A+B)</td>
<td>Population</td>
<td>Urbanisation (Class A+B)</td>
</tr>
</tbody>
</table>

Emissions per grid cell divided by road, vehicle type, line and area source

*Trans-Tools covers major rural roads*
NOx emissions (5x5 km)
NOx emissions (1x1 km)
International shipping
Biodiversity - fragmentation

Source: EEA, 2011
Fragmentation by country

Source: EEA, 2011
Noise – Annoyance

Source: EEA, 2011
Conclusion

- Transport has significant impact on the environment.
- Air pollutant emissions is the only success story.
- Impacts from greenhouse gases, noise and on biodiversity are increasing, albeit the data on the latter two is somewhat sketchy.
Transport Fuels - biofuel production in EU MSs (2009)

Intercity traffic – feeder lines

Source: www.ing.dk, 2010
Example: Alps crossing

Heavy goods vehicles, change between 1990 and 2008

- Orange line: Change in net tonnes, 2000=100
- Gray line: Change in journeys, 2000=100

HGV fee introduced

Source: Swiss NGO, 2009
Thank you
Extra slides methods and examples

- Scenario studies
- Transport demand and modal split analysis
- Biofuels
- Accessibility
- User charging
- Technology
Scenario studies

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.
Imagine a Jet-Free Europe

By ELISABETH ROSENTHAL

On April 15, the European Environment Agency in Copenhagen convened a two-day workshop on how to move toward a more sustainable transport system on the Continent by 2050. Since flying is by far the most highly emitting form of transportation, the central question was “How would Europe look and function without aviation or with much less aviation than we have now?” as Peder Jensen, the agency’s transportation expert and the event’s organizer, put it.

Perfect timing. As participants from all over Europe gathered, a cloud of volcanic ash was spreading eastward from Iceland and by day’s end had grounded flights from Britain to Germany. “On Thursday morning [the 15th] the participants couldn’t imagine Europe without aviation; by Friday night they were living it — I just got the last person home yesterday, to Spain, by rail,” Dr. Jensen said in a telephone interview on Thursday.

“It takes something like a giant ash cloud to get people to imagine something different,” he said.

To reduce Europe’s emissions, the agency is looking hard at whether high-speed rail could partly — or mostly — replace aviation on a Continent that is highly interconnected by fleets of planes...
Local level policy tools

- Teleworking, etc.
  - Possible better work/life balance, but only relevant in some jobs

- Carbon pricing
  - Revenue stream for investment, but may cause social inequality

- Car use/ownership restrictions
  - Improved equality in access to transport, but loss of individual choice

- Urban planning
  - Improved accessibility, but reduced living space
Freight transport - growing faster than the economy

- Transport volume growth follows growth in GDP
- No clear signs of decoupling of transport volume from economic growth

Source: EEA, 2011
Quarterly road freight statistics

Road freight volume index (2006 Q3 = 100)

Financial crisis impact clear

Source: EEA, 2010
Freight transport
road transport dominates the inland market

- Road transport has a 77% market share

- Road transport share has grown at the expense of rail and inland waterway transport

- In the EU-10 road transport’s share reached 70% in 2007 at the expense of rail transport

Source: EEA, 2011.
Spatial and transport planning: matching transport demand to the needs of access?

Number of jobs accessible in one hour travel time in NL (2000)

 acceso by car

Access by public transport

-source: EEA, 2004

Accessibility low for those without a car
Example: Alps crossing

Transalpine freight traffic: Changes in rail transport 1990 to 2008
2000 = 100, in net tonnes

Source: Swiss NGO, 2009
Example: Alps crossing

Freight traffic crossing the Swiss Alps (total): percentage change in market share, 1990 to 2008

Source: Swiss NGO, 2009