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EU Transport GHG: Routes to 2050?

Economic Instruments and Emission Trading

Non-Road Transport Modes

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Introduction

Overview

- of economic policy instruments that can affect the emission of GHG
- of the non-road transport modes
- Taking into account, as far as possible:
 - Current legislation
 - Examples of implementation
 - Current barriers to broader implementation
 - Expected impact
 - Advantages/disadvantages of policy instruments

Non-road transport modes

- Aviation
- Maritime shipping
- Inland navigation
- Rail transport

Introduction

Economic instruments

- Emission trading
- Fuel/energy tax
- Infrastructure charges (rails, inland waterways, port, airports)
- Ticket/departure tax (aviation)
- VAT for transport service (aviation)
- Subsidies

Aviation – Emissions Trading

From 2012 on, flights from, to and within EU are included into EU ETS.

- Advantages of policy instrument
 - Emissions are reduced cost effectively
 - Total amount of emissions can be limited
 - Technological and operational measures are stimulated
 - Revenues can be created
- Disadvantages of policy instrument
 - Emission price varies over time → uncertainty for long term investments
 - Costs for administration higher than for fuel tax

Aviation – Kerosene Tax

- Current European legislation
 - Fuel for domestic aviation can be taxed
 - Default: International and intra-Community transport exempted.
 - Option: International and intra-Community transport can be taxed if there is bilateral agreement btw. Member States.
- Current situation
 - Tax exemptions established in bilateral Air Service Agreements
- Examples of implementation
 - Kerosene tax for domestic flights in e.g. Netherlands, Norway and several non-European countries.
- Barriers to broader implementation
 - Tax exemptions established in bilateral Air Service Agreements
 - If two Member States enter a bilateral agreement, fuel used by non-EU airline cannot be taxed.
 - Tax exemption for fuel in tanks of aircrafts arriving at a Community airport (Chicago Convention)
 - Mandatory tax requires unanimity in EU Council of Ministers

Aviation – Kerosene Tax

- Expected impact
 - CO2 reduction potential (CE Delft et al. 2002)

Fuel tax rate (€/litre)	Reduction w.r.t BaU
0.04	1.9%
0.12	5.9%
0.19	9.3%

- Tankering (if not globally applied)

Aviation – Kerosene Tax

- Advantages of policy instrument
 - Polluter Pays Principle followed
 - Technological and operational measures are stimulated
 - Fixed emission price (tax rate) gives certainty for long-term investments
 - Tax revenues are created
- Disadvantages of policy instrument
 - Total emissions are not limited
 - Rebound effect possible

Aviation – Airport Charge

- **Current legislation:**
 - Airport charges can be modulated in MSs for issues of public and general interest, including environmental issues
 - Airport charges have to be cost-related
- **Examples of implementation**
 - Differentiated airport charges w.r.t. local environmental problems (noise, LTO-NOx), at e.g. Zürich and Stockholm airport
- **Expected impact: unclear**
- **Advantages of policy instrument**
 - Administration is in place
 - All operators can be captured
 - Air pollution emission factors can also be taken into account
- **Disadvantages of policy instrument**
 - Might provide only small incentive: port dues constitute small part of total costs
 - Airports might engage in “race to the bottom”

Aviation – Ticket/Departure Tax

- Current legislation/examples for implementation
 - Levied in some EU countries (UK, France, Denmark)
 - In UK and Netherlands tax has been upheld in courts
- Barriers to broader implementation
 - Mandatory tax on EU level requires unanimity in EU Council of Ministers
- Expected impact
 - Can lead to lower demand for air transport and limit expected growth
 - Regional taxation may lead to relocation of demand
 - Low cost airlines affected the most
 - Estimation of impact of tax in the Netherlands (Significance & SEO 2007)
 - Rate: 23 Euro (airfare rises with 2% - 14%)
 - 10 – 12% reduction in passengers (half: no flight, half: evading to other airports)

Aviation – Ticket/Departure Tax

- Advantages of policy instrument
 - Passengers of all operators can be captured
- Disadvantages of policy instrument
 - Less differentiated instrument than emission trading or fuel tax
 - No incentive for energy-efficiency improvements.
 - Polluter Pays Principle not followed.

Aviation – VAT

- Current situation
 - International air transport is remitted from VAT in most countries due to Art. 15 of Chicago Convention
 - On tickets for intra-Community air traffic no VAT is levied: exemption is based on a system of de facto reciprocity in which all Member States participate.
- Examples of implementation
 - Some MS levy VAT on tickets for domestic flights.
- Barrier to broader implementation
 - Differences in VAT rates for transport btw. Member States
- Expected impact
 - Could lower demand and limit expected growth.
 - Tax payment is general higher than under departure tax; impact thus stronger

Aviation - VAT

- Advantages of policy instrument
 - Levying VAT leads to level playing field with transport modes that have to pay VAT for transport service
- Disadvantages of policy instrument
 - Instrument aims primarily at generating revenues
 - Tax level cannot be linked to environmental aspects
 - No incentive for energy-efficiency improvements
 - Polluter Pays Principle not followed

Aviation - Subsidies

1. Subsidy paid for reduction of GHG emissions
 - As efficient as an emission tax
 - Polluter Pays Principle not followed
 - High public expenditures
 - Total emissions not limited
 - Rebound effect possible

2. Subsidy paid for purchasing GHG emission reducing technologies
 - Not directly related to external effect of GHG emissions
 - less efficient than emission trading and fuel tax
 - no operational measures are stimulated
 - Total emissions not limited
 - Rebound effect possible
 - Risk of encouraging not most efficient technologies
 - Risk of free-riding
 - Could constitute state aid if paid on national level

Aviation - Subsidies

3. Subsidy paid for development of GHG emission reducing technologies
 - Not directly related to external effect of GHG emissions – less efficient than emission trading and fuel tax
 - Risk of encouraging not most efficient technologies
 - Risk of free-riding
 - Legitimate if no perfect protection of patent rights

Aviation

- GHG-emissions:
 - CO₂ emissions
 - NO_x-emissions emitted at certain altitude
- Trade-off between CO₂ and NO_x emissions for existing engine technology

Maritime Shipping – Fuel Tax

- Current legislation w.r.t. fuel for navigation in Community Waters
 - Analogue to legislation for aviation
 - Fuel for domestic navigation can be taxed.
 - Default: international and intra-Community transport are exempted
 - Option: International and intra-Community transport can be taxed if there is bilateral agreements btw. Member States.
- Current situation
 - Fuel for international navigation not taxed
- Expected impact:
 - Tankering if not globally implemented (see California 1992)

Maritime Shipping – Emissions Trading

- Ideally implemented on global level but also feasible on European level.
- Evasion by tankering not possible.
- Example: Sulphur Emissions Trading Pilot Project 2005 by SeAaT

Maritime Shipping – Port Charges

- Analogue to airport charges for aviation
- Example for implementation
 - E.g. Sweden: voluntarily system of differentiated port charges (SO_x and/or NO_x emissions)
- Differentiation of port charges can be based on indexes developed by IMO:
 - Energy Efficiency Operational Index
 - Energy Efficiency Design Index

Inland Shipping – Emissions Trading

- Feasible option on European level
- Restricted cabotage makes emissions trading for inland shipping less complex than for maritime shipping
- Expected impact:
 - unclear (CO2 emissions from European inland shipping not inventorised)

Inland Shipping – Fuel Tax

- Current legislation
 - Member States have option to tax the fuel used for inland waterway transport
 - Most Member States grant tax relief
- Barriers to broader implementation
 - Signatory states of Mannheim Convention agreed not to levy charges on gasoil used by ships on the Rhine and its tributaries.
- Expected impact:
 - Tankering if not harmonized on European level

Inland Shipping – Infrastructure Charge

- Current situation
 - A few MS have infrastructure charges for inland waterways, e.g. France, but charges are not environmentally differentiated.
- Barriers for broader implementation:
 - Infrastructure charge as such not broadly established
 - Signatory States of the Mannheim Convention agreed thereupon that ‘no duty based solely on navigation may be levied on vessels or their cargoes ... navigating on the Rhine or its tributaries.’

Inland Shipping - Subsidies

- Subsidies for purchasing GHG emission reducing technologies
legitimate: majority are small-sized enterprises

Rail Transport – Energy Tax

Tax basis: electricity consumption

- Electricity Consumption taxed in Member States
- Electricity Production captured by EU ETS
- Additional financial incentives should be part of overall electricity taxation strategy

Tax basis: diesel consumption

- Existing regulation:
 - Taxation differs per Member State (no EU wide overview)
 - Tax rates mostly lower than for road transport
- Expected impact:
 - Shift to electric trains
 - Further electrification
 - Reduction potential small due to relatively low GHG emissions of rail transport

Rail Transport – Infrastructure Charge

- Current legislation/situation
 - Member States have to charge variable railway infrastructure costs to train operators
 - External costs can be charged (if applied to other transport modes too)
 - Some Member States charge even full infrastructure costs but GHG emissions are not taken into account
- Expected Impact
 - Reduction potential small due to relatively small GHG emissions associated with rail transport

Conclusions

- Policy instruments that are directly related to external effects of GHG are most efficient:
 - Fuel tax
 - Emission trading
 - Subsidy for emission reduction
 - Environmentally differentiated infrastructure charges
- Emission trading
 - Environmentally very effective by limiting total emissions
 - Uncertainty for long term investments due to varying emission price
- Fuel tax
 - Certainty for long term investments due to fixed emission price
 - Total emissions are not limited
 - Environmental efficiency depends on geographic scope of introduction

Conclusions

- **Susidy for emission reduction:**
 - High public expenditures
 - Polluter Pays Principle not followed
- **Differentiated infrastructure charges:**
 - Administration in place at (air)ports and for rail transport
 - Air pollution could be tackled at the same time.
 - Legal barriers for inland waterways
 - Incentive may be relatively small

Conclusions

- Instruments not directly related to external costs of GHG emissions could flank above mentioned instruments:
 - Subsidy for purchasing/developing emission reducing technologies
 - Ticket/departure tax and VAT for transport service
 - Subsidy for purchasing/developing emission reducing technologies
 - Free-riding
 - Rebound effect
 - Ticket/departure tax and VAT for transport service
 - Can reduce demand and limit growth of aviation sector.
 - Do not provide incentives for efficiency improvements
 - Current barriers may not be relevant in 2050 anymore
- E.g. possible gradual implementation of kerosene tax on EU level:
- Introduce mandatory tax for intra-Community and domestic flights
 - Temporarily exempt routes where non-EU carrier operate
 - Renegotiate Air Service Agreements

Discussion

1. Which economic instrument do you think should preferable be implemented per transport mode by 2050?
2. Which economic instruments do you think are feasible to implement per transport mode by 2050?
3. How can current barriers be overcome?
4. Which barriers do you think cannot be overcome by 2050?
5. Which further aspects have to be taken into account when assessing the instruments?