



The project is funded by the European Commission's
Directorate-General Environment



EU Transport GHG: Routes to 2050?

Principles and impacts of transport pricing in
relation to GHG emission reduction

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Focus Group Meeting

2 October 2009, European Commission

Partners

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Overview of presentation

1. Aims of transport pricing
2. Principles of transport pricing
3. Overview of economic instruments
4. Relation with GHG reduction options
5. Price sensitivity of transport
6. Transport subsidies
7. Conclusions
8. Discussion/questions

Aims of transport pricing

- **Influencing behaviour to:**
 - reduce environmental impacts
 - reduce congestion
- **Generate revenues for:**
 - Infrastructure investment and/or operation, maintenance and management
 - Mitigation measures
 - General budget
- **Increase fairness:**
 - Polluter/|User pays Principle
 - Level playing field
 - With respect to income distribution

Pricing principles

- Marginal social cost pricing - internalisation of external cost:
 - Pigou
 - For consequences not taken into account by transport users there is no well functioning market
 - Can be solved by taxes/charges at the level of marginal social cost
 - Taxes/charges should be linked to cost drivers: both levels and structures important (often differentiations needed): complex!
 - Optimal in a (theoretical) first best world
 - For internalising GHG emissions: carbon tax or emission trading
- Target oriented pricing
 - Baumol
 - Set taxes/charges at levels that environmental objectives are achieved
More pragmatic
- Combination of the two

Main types of economic instruments: levy points and incentive base

- Fuel (Fuel consumption, carbon content of the fuel)
- Electricity (electric power used, GHG emissions per energy source)
- Infrastructure use (Kilometres driven, (air)port visits, fuel efficiency of the vehicle)
- Parking (parking hours, fuel efficiency of the vehicle)
- Vehicle purchase (price or mass of the vehicle, fuel efficiency of the vehicle)
- Vehicle ownership (engine or mass of the vehicle, fuel efficiency of the vehicle)

Incentives for GHG reduction

	Reduced car-ownership	More fuel efficient vehicles	Shift to low-carbon energy carriers	Fuel efficient driving/sailing/flying	Reduced vkms due to higher vehicle utilisation	Modal shift to low-carbon modes	Limiting overall transport growth
Fuel or energy tax	↓	↓		↓	↓	↓/↑	↓
Carbon content differentiated fuel tax			↓			↓/↑	
Flat infrastructure charges					↓	↓/↑	↓
Infrastructure charges differentiated to fuel efficiency		↓			↓	↓/↑	↓
Variabilisation: from fixed charges to km-charges	↑				↓	↓/↑	↓
Vehicle taxes or parking fees	↓					↓/↑	↓
Fuel efficiency differentiation of vehicle taxes or parking fees		↓					
Fuel efficiency differentiation of company car taxation		↓					
Subsidies on fuel efficient vehicles	↓/↑	↓				↓/↑	↑
Cap&trade emission trading or fuel tax	↓	↓	↓	↓	↓	↓	↓

Price sensitivity of transport

- Defined by *price elasticity*
- Many studies on this
- Results depend heavily on:
 - Definitions
 - Response mechanisms included
 - Market conditions (e.g. current price levels, available alternatives)
- Fuel price elasticity on fuel consumption for road transport:
 - on average -0.6: 10% **real** price => 6% lower fuel consumption
 - for HGV elasticity lower (about -0.4)
 - Main impact on vehicles and (smaller) on vehicle-kms
- Also other modes have modest but significant price sensitivities

Transport subsidies

- Various type of subsidies with environmental objectives:
 - Low carbon fuels or biofuels
 - Fuel efficient vehicles or technologies (infra charges, vehicle taxes, parking fees)
- Can be effective in (temporally) stimulating reduction options
- Drawbacks:
 - Does not make the polluter pay
 - Risk of rebound effects: transport growth
 - Can frustrate fair competition between technologies and/or modes
 - Risk of free-riders (low cost effectiveness)
- No single definition, related to overall pricing strategy
- No reliable estimates
- Total amount of transport subsidies significant
- No estimates for overall GHG reduction potential of new subsidies or abolishing existing subsidies

Main conclusions/Issues for discussion

- Transport pricing serves various aims:
 - Influencing behaviour
 - Generate revenues
 - Increase fairness
- Main principles:
 - Marginal social cost pricing (MSCP, internalisation)
 - Target oriented pricing
 - Combination
- Carbon-based fuel tax or emission trading optimal from perspective of MSCP
- Other types of instruments particularly relevant for:
 - shift to fuel efficient vehicles and energy carriers (by tax/charge differentiations)
 - Limiting transport growth (variable infrastructure charges)
- Subsidies can be effective in (temporally) stimulating reduction options, but always second best and with important drawbacks