OVERVIEW: APPLYING POLICY INSTRUMENTS
FOR THE DOMESTIC TRANSPORT SECTOR

Andreas Kopp
Department for Transport, Water and ICT
**Outline**

- Transport plays a minor role in global mitigation policies despite the agreed prospect to become the biggest emitter
  - Scenarios
  - Project allocations
- Climate policies in transport depend on a broad policy agenda
  - Carbon pricing alone does not lead to change
  - Synergies with other external transport costs lead to a greater policy intensity and make mitigation in transport effective.
Outline

- Limits to emission trading in domestic transport
- Limits to crediting mechanisms
- Charges for external costs and financing the transition to low-emission transport
Transport as the Prospective Biggest Emitter: BAU
Policy scenario I: Technical Standards, IEA

- Technical standards will do the transition
  - Assumed global agreement on technical standards in engine technologies
  - Corresponds to a policy preference for technical standards, potentially conflicting with market instruments not only in transport
  - Based on an engine technology optimism
SHORT RUN SCENARIO, IEA
LONG RUN SCENARIO, IPCC

Graph showing emissions (Gt CO₂-eq) from 2000 to 2050. The graph compares different scenarios:

1. Diesels (LDVs)
2. Hybrids (LDVs + MDTs)
3. Biofuels (80% low GHG sources)
4. Fuel Cells (fossil hydrogen)
5. Fuel Cells (80% low-GHG H₂)
6. Mix shifting (10% fuel efficiency improvement)
7. 10% vehicle travel reduction (all road vehicles)
Absolute emissions will increase even under technology optimism.

*Includes rail, pipeline, domestic navigation, international marine bunkers and other non-specified transport.
OUTCOMES OF REGULATORY POLICY REGIME

⇒ reduction of fossil fuel use by 30 per cent in 2030

⇒ fleet renewal costs at estimated $ 4.1 trillion (IEA), meaning high transport costs in DCs.

⇒ Very high demand for road infrastructure.
Policy Scenario II: Stabilization by Implementing a Carbon Price, PNNL

Stabilization to 2° world, depending on electricity production
Policy Scenario II: Stabilization by Implementing a Carbon Price

Transport as largest emitter: emission reduction scenario < 2°, with CCS; conventional fuel use will increase by 45 percent by 2050.
Carbon Price alone will not lead to much change

- Current price on carbon markets < $10 t/CO
- Carbon price derived from expected damages are derived from Integrated Assessment Models
  - differ not in climate scenario but in discounting
  - median price estimate about $50 t/CO
  - in absence of discounting (Stern review) $300 t/CO.
- Implementation of ‘Stern price’ leads to a gasoline price change of about 70 cents/gallon.
Synergies with other external transport costs lead to a greater policy intensity and make mitigation in transport effective.

• Neglected external costs:
  – Congestion costs
  – Health costs of local air pollution
  – Accident costs, road safety
  – *On top of* Climate change effects
• A broad reform agenda changes the picture.
• With a broad reform agenda the transition to a low-carbon sector is no longer more expensive than in other sectors.
SYNERGIES WITH OTHER EXTERNAL TRANSPORT COSTS LEAD TO A GREATER POLICY INTENSITY AND MAKE MITIGATION IN TRANSPORT EFFECTIVE.

Summary of External Costs in Transport, Washington Example

Marginal external costs

<table>
<thead>
<tr>
<th></th>
<th>Fuel-related costs</th>
<th>cents/gallon</th>
<th>cents/mile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Greenhouse warming</td>
<td>6</td>
<td>0.3</td>
<td></td>
</tr>
<tr>
<td>Oil dependency</td>
<td>12</td>
<td>0.6</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Distance-related costs</th>
<th>cents/gallon</th>
<th>cents/mile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local pollution</td>
<td>42</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Congestion</td>
<td>105</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Accidents</td>
<td>63</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

Source: Parry et al. 2007 (RFF)
LIMITS TO EMISSION TRADING IN DOMESTIC TRANSPORT

• High transaction costs: A high share of the consumers are “producers” of transport services, and potential emission traders

• Markets multiply with inclusion of “co-benefits”, with small geographical scope

• Demand volatility may lead to high price volatility
  – High annual volatility of demand
  – High sensitivity to business cycles

• Political preference for technical standards threatens the functioning of trading systems
LIMITS TO CREDITING SYSTEMS IN DOMESTIC TRANSPORT

• Supply-side action does not change behavior, risks a mismatch of supply and demand

• Demand side intervention is perceived as uncertain and risks duplication of policies

• Crediting favors narrow agendas (only one dimension of pollution reduction counts), and transport mitigation looks costly
LIMITS TO CARBON CHARGES IN DOMESTIC TRANSPORT

- Policy aversion: Existing fuel taxes perceived as existing carbon pricing
- Revenue use subject to policy biases
- Earmarking helps acceptability as ‘fee for service’, but may involve risk of misallocation of public funds
- But
  - provides less uncertainty for innovation and adoption of new technologies,
  - provides opportunities for financing the transition and tax reform.
Summary

• Mitigation action in domestic transport is important to avoid transport’s emission to grow dramatically.

• Market based mechanisms in transport suffer from policy preference for technical standards.

• Emission trading has severe limitations in sectors with an atomistic supply structure.

• Implementing fiscal measures based on charges for all external costs generates local benefits, a local fiscal surplus and avoids a mismatch of supply and demand.
Thank you!