CEPS Task Force Meeting
Incentives to Promote Low Carbon Transport

Stephen Perkins
# When to Intervene

## Rationale

<table>
<thead>
<tr>
<th>Rationale</th>
<th>Instruments</th>
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</table>
| **Un-priced external cost** | • Carbon tax  
• Fuel Excise Duty  
• Tradable Emissions Permits |
| **Undervaluation of fuel savings** | • Emissions/Fuel economy standards  
• Differentiated vehicle taxes (bonus/malus, feebate) |
| **Innovation:**  
• scale economies  
• knowledge spillovers | • Public procurement  
• Start-up subsidies  
• Vehicle tax exemptions  
• Subsidies for research |
External Costs: CO2 emissions €/t

<table>
<thead>
<tr>
<th>ETS Market Price</th>
<th>Stern Estimate</th>
<th>Equivalent or European Auto Fuel Excise Taxes</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>60</td>
<td>200</td>
</tr>
</tbody>
</table>

Emissions Trading
- Replace auto fuel excise (Sweden), not add
- Aviation – in place of CO2 departure taxes
- End grandfathering – ETS will reinforce distortions in aviation from slots at hub airports
- Competition authorities must supervise

Auto fuel tax revenues
- 20% down as a result of Euro CO2 regulations
- Circulation taxes up? More km charges?
Passenger Car Fuel Economy/CO₂ Targets

- Historical performance
- Enacted targets
- Proposed targets
- Unannounced proposal
- Uncertain targets

US-3%[1]
US-6%[2]
California
Canada
EU
Japan
China[3]
S. Korea

Liters per 100km, normalized to NEDC

2005 2010 2015 2020 2025

[1] Based on 3% annual fleet GHG emissions reduction between 2017 and 2025 in the September 30th NOI.
[2] Based on 6% annual fleet GHG emissions reduction between 2017 and 2025 in the September 30th NOI.
[3] China's target reflects gasoline fleet scenario. If including other fuel types, the target will be lower.

Source: March 2011
Harmonise vehicle CO2 incentives

Diesel-driven vehicles

The calculations assume that each vehicle is driven 200 000 km over its lifetime.
Supporting low-C innovation

• Spillovers – public funding for fundamental research & innovation

• Subsidies for scaling up but ...
  – Picking winners
  – Lock in
  – Risk of money drying up
  – Risks worth it if climate change risk bigger
  – Niche markets for unsubsidised electric vehicles
## Electric Vehicle ICE Comparisons

<table>
<thead>
<tr>
<th>Model</th>
<th>Total lifetime usage cost (€)</th>
<th>Additional cost to consumer (veh. life)</th>
<th>Additional cost to consumer (3 yrs)*</th>
<th>Additional cost to society (veh. life)</th>
<th>CO₂ reduction (Tonnes)</th>
<th>Cost per Tonne CO₂ reduced (€/t)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>5-door Compact</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Zoe ZE (electric) 18g CO₂/km</td>
<td>28814</td>
<td>4919</td>
<td>1859</td>
<td>11491</td>
<td>13.4</td>
<td>860</td>
</tr>
<tr>
<td>Clio dCi 75 eco2 (diesel) 104g CO₂/km</td>
<td>23896</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>2-seat Compact Van</strong></td>
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<td></td>
</tr>
<tr>
<td>Kangoo Maxi Z.E 24g CO₂/km</td>
<td>33709</td>
<td>-4189</td>
<td>-718</td>
<td>5642</td>
<td>37.8</td>
<td>149</td>
</tr>
<tr>
<td>Kangoo Maxi dCi 85 (diesel) 138g CO₂/km</td>
<td>37898</td>
<td></td>
<td></td>
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</tbody>
</table>
## Subsidised additional CO2 emissions

<table>
<thead>
<tr>
<th></th>
<th>Emissions from electricity (g CO2/kWh)</th>
<th>Tailpipe emissions (g CO2/km)</th>
<th>CO2 emissions avoided [or added]</th>
<th>Cost per ton CO2 avoided [or added]</th>
<th>Subsidy per ton CO2 avoided [or added]</th>
</tr>
</thead>
<tbody>
<tr>
<td>ICE Sedan</td>
<td>-</td>
<td>117</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>BEV Sedan</td>
<td>300</td>
<td>68</td>
<td>10 t</td>
<td>€ 1221</td>
<td>€ 500</td>
</tr>
<tr>
<td></td>
<td>850</td>
<td>191</td>
<td>[11 t]</td>
<td>[€ 1065]</td>
<td>[€ 455]</td>
</tr>
</tbody>
</table>
Conclusions: instrument mix

• Fuel excise / carbon tax
  – Gasoline – diesel carbon equivalence

• Emissions trading
  – Upstream refining as now
  – Aviation – instead of departure carbon tax
  – Avoids excess emissions from EV subsidies (lost efficiency)

• Carbon differentiated vehicle taxes
  – Harmonise
  – Linear function for differentiation

• Subsidies
  – EVs – care with risks
  – Fundamental research and innovation
Thank you

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