Für Mensch & Umwelt

5TH FLORENCE INTERMODAL FORUM.
INTERNALISING THE EXTERNAL COSTS OF TRANSPORT

The Polluter-pays Principle and Environmental Costs

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Polluter pays?

Costs arising from environmental effects tend to be external costs, i.e., not borne by the polluter but by society.

→ This results in market distortions and inefficient allocations.

Environmental costs provide the basis for internalizing damage from environmental effects.

→ Polluter pays;
→ Reduction of market distortion;
→ Effizient allocation.
Which environmental cost concept for polluter-pays?

**Social costs / Damage costs:**
- denote the overall loss of welfare that arises from an environmental effect (GHG emission, land use change, emission of air pollutants etc.);
- permit an evaluation of the welfare effect of mitigation measures;
- provide the basis for identifying external effects.

**Abatement costs / Mitigation costs:**
- denote the costs of avoiding an environmental effect (GHG mitigation, air filtration etc.);
- depend on setting a mitigation target and on specifying a mitigation pathway, i.e., a set of mitigation measures;
- do not permit the evaluation of measures, as mitigation measures have to be specified beforehand.

The polluter-pays principle can only be based on social costs / damage costs, not on abatement costs.
Is it unrealistic to base taxes on social costs?

At least not for those who have to endure more of the future of our climate than we here in the room:

Demand of German „Fridays for Future“:

“A tax on all GHG-emissions. Within a short time period, the rate has to increase to a level that reflects the costs that we and future generations have to bear. According to UBA [German Environment Agency] these are 180 €/tCO₂.“
Is it unrealistic to make business account for social costs?

At least not for some who talk to business every day:

In its methodological papers on the assessment of environmental costs, PwC states that it bases its climate cost rates purely on social-cost-of-carbon models.
### UBA Climate Cost Rate – Social Costs of Carbon

<table>
<thead>
<tr>
<th>1% Pure Rate of Time Preference</th>
<th>0% Pure Rate of Time Preference</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>2016</strong></td>
<td><strong>640</strong></td>
</tr>
<tr>
<td><strong>2030</strong></td>
<td><strong>670</strong></td>
</tr>
<tr>
<td><strong>2050</strong></td>
<td><strong>730</strong></td>
</tr>
</tbody>
</table>

Social costs of carbon in €\(_{2016}\) / t CO\(_2\)\(_{eq}\) for 2016, 2030, and 2050 under 1% and 0% Pure Rate of Time Preference.

For 2019 this results in SCC of ca. 190€\(_{2019}\)/t and 660€\(_{2019}\)/t.

**Pure Rate of Time Preference:**

- weighs the welfare of present vs. future generations;
- 0% → equal weight;
- 1% → less weight to welfare of future generations.

Values are based on the SCC-IAM FUND 3.0 using western European equity weighting.
# Social Cost Rates for Air Pollutants

<table>
<thead>
<tr>
<th>€2016/t Emission</th>
<th>Health costs</th>
<th>Loss of Biodiversity</th>
<th>Crop loss</th>
<th>Material damage</th>
<th>Sum</th>
</tr>
</thead>
<tbody>
<tr>
<td>PM$_{2.5}$</td>
<td>58.400</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>58.400</td>
</tr>
<tr>
<td>PM$_{\text{coarse}}$</td>
<td>960</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>960</td>
</tr>
<tr>
<td>NO(_{X})</td>
<td>14.400</td>
<td>2.600</td>
<td>800</td>
<td>130</td>
<td>17.930</td>
</tr>
<tr>
<td>SO(_{2})</td>
<td>13.600</td>
<td>1000</td>
<td>-160</td>
<td>600</td>
<td>15.040</td>
</tr>
<tr>
<td>NMVOC</td>
<td>1.100</td>
<td>0</td>
<td>950</td>
<td>0</td>
<td>2.050</td>
</tr>
<tr>
<td>NH$_{3}$</td>
<td>21.700</td>
<td>10.400</td>
<td>-100</td>
<td>0</td>
<td>32.000</td>
</tr>
</tbody>
</table>

Results are based on EcoSenseWeb, NEEDS and EU Clean Air Package.
Social Costs of Transport (Ct. / passenger-km, 2016)

Results are based on UBA social cost rates for GHG and air pollutants and on emission factors from HBEFA v3.3, Tremod, Ecoinvent 3.3 und Mobitool.
Thank you for your attention!

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