Towards global carbon pricing: Direct and indirect linking of carbon markets

Presentation for the International Energy Workshop
Stockholm, 21 June 2010

Rob Dellink, OECD Environment Directorate
rob.dellink@oecd.org; www.oecd.org/env/cc/econ
Outline of the presentation

How to achieve ambitious mitigation policy?
  ! Gradual development towards global carbon pricing.

Will linking carbon markets help?
  ! Yes, to some extent.

To what extent can a well-functioning crediting mechanism reduce costs?
  ! Cost-savings can be very large.

What practical issues are raised by linking?
  ! Environmental integrity, spreading design features, problems with current CDM.
Doing nothing is not an option

Baseline emissions (MtCO$_2$e)
Ambitious action is affordable

- Ambitious action is economically rational
  - Not cheap, but affordable compared with cost of inaction
- The economic crisis is not an excuse to delay action
  - Postpones the inevitable, requiring larger cuts later
  - Crisis is an opportunity for structural reform, and for re-directing investment
- “Green growth” is about managing the restructuring the economy
  - Climate policy is a major part of a green growth strategy
Putting action into perspective

- **Index 2005 = 100**
- **World Gross Domestic Product**
- **World Greenhouse Gas Emissions**

**BAU Stabilisation Policy**
- Gap in 2050 = 4%
- Reduction in 2050 = 63%
Achieving ambitious mitigation policy objectives requires...

• ...the adoption of a cost-effective policy mix anchored on global carbon pricing

• ...a broad coverage of the policy mix across gases, sectors and countries

• ...fostering a gradual development of a global carbon market
  – Setting up ETSs / carbon taxes in as many countries as possible
  – Linking ETSs
  – Developing a well-functioning crediting mechanism
Tool for analysis: the ENV-LINKAGES model

- Computable General Equilibrium Model
- Recursive dynamic structure (horizon: 2005-2050) with vintages of capital (putty / semi-putty)
- 12 countries/regions
- 22 sectors (+ 5 electricity technologies)
- GHGs: CO$_2$, CH$_4$, N$_2$O, HFCs, PFCs & SF$_6$ (LULUCF emissions not yet included)
- Climate policies implemented:
  - ETSs: emission trading schemes (linked or not linked)
  - crediting mechanism
Costs and GHG effects of climate policies differ across countries.

GHG emissions % change relative to 1990 levels

GDP deviation from baseline (%)

Australia & New Zealand
Japan
Canada
USA
EU(27) + EFTA
Tax 25 USD/tCO2 eq
Tax 50 USD/tCO2 eq
Tax 100 USD/tCO2 eq
Tax 150 USD/tCO2 eq
Tax 200 USD/tCO2 eq

Year 2020
Linking leads to price convergence across ETSs

Prices under a 50% cut by 2050 relative to 1990 levels in each Annex I region prior to linking and a 50% cut in Annex I as a whole after linking (2050)

**Carbon prices before linking**

- Russia
- United States
- Non-EU East Europe
- EU27+EFTA
- Japan
- Aust. - NZ
- Canada

**Carbon price after linking**

- Annex I

Carbon price $US/CO₂ eq
Linking reduces the costs of mitigation

Mitigation cost (income equivalent variation relative to baseline, in %)

2050

With linking
Without linking

Non-EU Eastern European countries
Russia
Canada
Australia & New Zealand
Annex I
EU27 & EFTA
United States
Japan

… but may not be beneficial to all sectors in all countries
Direct linking affects competitiveness

... but reduces EII output losses for the group of countries
Indirect linking: common crediting

Baseline & crediting:
- Puts an opportunity cost on carbon in developing countries
- Lowers mitigation costs for Annex I
- Crediting vs. caps: no penalty if emissions turn out to be higher in crediting system

Current CDM has obstacles & additionality issues, but these can to some extent be addressed:
- Sectoral crediting or programmatic CDM (e.g. EIs, electricity sector)
- Ensuring non-credited action in host countries by setting baselines below BAU
- Graduation towards binding caps (e.g. sectoral)
A well-functioning crediting mechanism can cut mitigation costs for Annex I

Mitigation policy costs under a 50% emission cut by 2050 in each Annex I region separately, with and without crediting mechanisms (2020)

... and provides a means for financial transfers to non-Annex I countries
A well-functioning crediting mechanism leads to partial price harmonisation

Panel B. 2050

Without crediting mechanism
With crediting mechanism, 20% cap on use of offset credits
With crediting mechanism, 50% cap on use of offset credits
Benefits of direct linking of carbon markets that are already indirectly linked

Panel B. 2050

Mitigation cost (income equivalent variation relative to baseline, in %)

Indirect linking through the crediting mechanism and no direct linking

Full linking and access to the crediting mechanism

Australia & New Zealand
Canada
EU27 & EFTA
Japan
Non-EU Eastern European countries
Russia
United States
Brazil
China
India
Oil-exporting countries
Rest of the world
Total all regions
Linking can reduce competitiveness concerns

Output of energy-intensive industries, year 2020

Annex I countries vs. non-Annex I countries

Output of EISs (relative to baseline, in %)

<table>
<thead>
<tr>
<th>No linking</th>
<th>Direct linking</th>
<th>Indirect linking</th>
<th>Direct and indirect linking</th>
</tr>
</thead>
<tbody>
<tr>
<td>-3.0%</td>
<td>-2.5%</td>
<td>-2.0%</td>
<td>-1.5%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>No linking</th>
<th>Direct linking</th>
<th>Indirect linking</th>
<th>Direct and indirect linking</th>
</tr>
</thead>
<tbody>
<tr>
<td>-3.0%</td>
<td>-2.5%</td>
<td>-2.0%</td>
<td>-1.5%</td>
</tr>
</tbody>
</table>

Annex I countries

- No linking: -3.0%
- Direct linking: -2.5%
- Indirect linking: -2.0%
- Direct and indirect linking: -1.5%

non-Annex I countries

- No linking: -3.0%
- Direct linking: -2.5%
- Indirect linking: -2.0%
- Direct and indirect linking: -1.5%
Practical issues raised by linking

• Environmental integrity
  – Risk of ex-ante race to the bottom
  – Potential entry of lower quality offsets into system

• Unwanted spreading of design features
  – Weak compliance regulations
  – Safety valves
  – Banking and borrowing provisions

• Distributional issues
  – Linking affects who wins and loses

• Concerns with current CDM
Conclusions

• Direct linking can help keeping the costs of international mitigation actions as low as possible
  – Overall costs are lower, but not everybody gains

• A well-functioning crediting mechanism can lead to very large cost reductions
  – Many low-cost options are in non-Annex I countries
  – Direct linking is less important when countries are already indirectly linked

• Partial harmonisation is essential but can be politically challenging

• Setting up ETSs can generate substantial proceeds from auctioning