LEVELING THE CARBON PLAYING FIELD
INTERNATIONAL COMPETITION AND US CLIMATE POLICY DESIGN

Peterson Institute for International Economics
May 21, 2008
US Manufacturing under Pressure
Economic output and employment from manufacturing sector

Source: BEA and BLS. Employment refers to all non-farm labor.
China Looms Large in Trade Debate

US trade deficit and China's share

Source: UN Comtrade
Industry Exposure to Climate Costs

Carbon-intensity and trade exposure

Source: BEA, EIA and CSA estimates. Circle size indicates 2002 US CO2 emissions
# US Imports by Origin

## 2005

<table>
<thead>
<tr>
<th>Rank</th>
<th>Steel Source</th>
<th>Steel Share</th>
<th>Aluminum Source</th>
<th>Aluminum Share</th>
<th>Chemicals Source</th>
<th>Chemicals Share</th>
<th>Paper Source</th>
<th>Paper Share</th>
<th>Cement Source</th>
<th>Cement Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Canada</td>
<td>18.56%</td>
<td>Canada</td>
<td>51.02%</td>
<td>Trinidad</td>
<td>41.58%</td>
<td>Canada</td>
<td>66.89%</td>
<td>Canada</td>
<td>16.06%</td>
</tr>
<tr>
<td>2</td>
<td>EU</td>
<td>17.25%</td>
<td>Russia</td>
<td>17.08%</td>
<td>Canada</td>
<td>19.30%</td>
<td>EU</td>
<td>16.82%</td>
<td>China</td>
<td>14.04%</td>
</tr>
<tr>
<td>3</td>
<td>Mexico</td>
<td>13.08%</td>
<td>EU</td>
<td>6.24%</td>
<td>Ukraine</td>
<td>7.34%</td>
<td>China</td>
<td>3.53%</td>
<td>EU</td>
<td>13.87%</td>
</tr>
<tr>
<td>4</td>
<td>Brazil</td>
<td>8.24%</td>
<td>OPEC</td>
<td>5.10%</td>
<td>OPEC</td>
<td>6.60%</td>
<td>Korea</td>
<td>2.24%</td>
<td>OPEC</td>
<td>9.97%</td>
</tr>
<tr>
<td>5</td>
<td>China</td>
<td>7.11%</td>
<td>Brazil</td>
<td>3.79%</td>
<td>EU</td>
<td>4.49%</td>
<td>Mexico</td>
<td>2.20%</td>
<td>Thailand</td>
<td>8.60%</td>
</tr>
<tr>
<td>6</td>
<td>Korea</td>
<td>5.67%</td>
<td>China</td>
<td>3.07%</td>
<td>Korea</td>
<td>4.36%</td>
<td>Brazil</td>
<td>1.84%</td>
<td>Greece</td>
<td>8.28%</td>
</tr>
<tr>
<td>7</td>
<td>Russia</td>
<td>5.12%</td>
<td>S. Africa</td>
<td>2.50%</td>
<td>Brazil</td>
<td>3.79%</td>
<td>Chile</td>
<td>1.50%</td>
<td>Korea</td>
<td>7.94%</td>
</tr>
<tr>
<td>8</td>
<td>Turkey</td>
<td>4.16%</td>
<td>Tajikistan</td>
<td>2.43%</td>
<td>Russia</td>
<td>3.19%</td>
<td>Japan</td>
<td>0.96%</td>
<td>Mexico</td>
<td>6.49%</td>
</tr>
<tr>
<td>9</td>
<td>Japan</td>
<td>4.12%</td>
<td>Argentina</td>
<td>1.54%</td>
<td>Eq. Guinea</td>
<td>2.76%</td>
<td>Norway</td>
<td>0.85%</td>
<td>Columbia</td>
<td>5.49%</td>
</tr>
<tr>
<td>10</td>
<td>India</td>
<td>2.70%</td>
<td>Australia</td>
<td>1.27%</td>
<td>Chile</td>
<td>1.52%</td>
<td>OPEC</td>
<td>0.71%</td>
<td>Peru</td>
<td>3.11%</td>
</tr>
</tbody>
</table>

### Annex

<table>
<thead>
<tr>
<th>Steel Share</th>
<th>Aluminum Share</th>
<th>Chemicals Share</th>
<th>Paper Share</th>
<th>Cement Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>54.42%</td>
<td>77.57%</td>
<td>34.46%</td>
<td>86.66%</td>
<td>34.61%</td>
</tr>
</tbody>
</table>

Source: UN Comtrade

SITC Codes of included products (version 2): Steel (672, 673, 674, 675, 676, 677, 678, 679), Chemicals (51111, 51112, 51113, 51122, 51123, 51124, 51211, 52218, 52323, 52213, 52251), Cement (6612), Aluminum (6841, 6842), Paper (641, 642)
Carbon-Intensity of Production
2005

STEEL
TONS CO2 PER TON OF STEEL

CHEMICALS
ENERGY & CO2 INTENSITY INDEX

CEMENT
KILN TYPE AND FUEL SOURCE

PAPER
PAPER PRODUCTION FEEDSTOCK

MP: Mechanical Pulp, CP: Chemical Pulp, OP: Other Pulp, RP: Recycled Paper
Demand Growth

Source: UN Comtrade, IISI, USGS, Oil & Gas Journal, FAO
The Extent of US Trade Leverage over China
China as a Share of Global Production and Exports as Share of Chinese Production

CHINA AS SHARE OF GLOBAL PRODUCTION

- Steel: 2.6% (Production), 31.7% (Exports)
- Alum: 6.4% (Production), 24.5% (Exports)
- Ethylene: 0.7% (Production), 6.0% (Exports)
- Paper: 1.3% (Production), 13.8% (Exports)
- Cement: 1.0% (Production), 44.9% (Exports)

CHINESE EXPORTS AS SHARE OF PRODUCTION

- Steel: 0.7% (Production), 8.1% (Exports)
- Alum: 2.7% (Production), 26.0% (Exports)
- Ethylene: 0.0% (Production), 11.7% (Exports)
- Paper: 1.6% (Production), 9.2% (Exports)
- Cement: 0.5% (Production), 2.1% (Exports)

Source: UN Comtrade, IISI, IAI, FAOStat, OGJ, USGS and CSA estimates
China's Steel Trade Balance
Net Exports as a Share of Domestic Production

Beijing removes VAT rebate for steel exports

Source: China General Customs Administration and CEIC
US Emissions by Source
Direct CO2 Emissions, 2005

- Ferrous Metals: 0.6%
- Non-ferrous Metals: 0.3%
- Chemicals: 2.5%
- Paper & Pulp: 1.1%
- Non-metallic Minerals: 1.1%
- Other Manufacturing: 5.2%
- Commercial: 3.9%
- Residential: 6.0%
- Transport: 31.2%
- Power Generation: 32.7%

Source: IEA

Share coming from energy-intensive manufacturing