Article 6 Economic Analysis Workshop

25 January 2023
Agenda

• Opening remarks

• Findings from modelling runs
  o The impact of dropouts and club composition
  o Q&A

• Views from the negotiating room
  o Panel discussion: What to expect for carbon markets in 2023 and beyond
  o Q&A

• Closing remarks
Thanks!
The Rules of the Workshop

• Modified Chatham House Rule
  • You can report what was said, but not who said it, without their explicit permission
  • Presentations will be made available, unless the presenter requests that they not be
  • The agenda and attendees will be part of the open report of the meeting

• Snowmass rules
  • No whining
  • No grand standing
  • This is NOT all about you (the Snowmass Rule)
  • Do not break any of these rules unless you can break them all in less than 5 minutes (the Snowmass exception)
WELCOME REMARKS

• Dirk Forrister, IETA
Findings from modelling runs: The impact of dropouts and club composition

Jae Edmonds and Mel George, UMD/PNNL
Key Messages

• Article 6 holds enormous potential for enabling Paris ambition.

• Countries that continue to cooperate using Article 6 continue to benefit even when a large emitter does not participate.

• The club you join can affect how a country benefits from cooperative emissions mitigation.
A Global Carbon Market—Updated to Glasgow

**CO₂ Prices**

**Trade Flows Increased Ambition (MtCO₂)**

**Financial Flows Increased Ambition (Billion 2015$)**
A Global Carbon Market—Updated to Glasgow

Global net CO₂ emissions

Glasgow NDCs
Potential Enhanced Ambition
Impact of Dropouts

Countries that continue to cooperate using Article 6 continue to benefit even when a large emitter does not participate.
Impact of Russian Federation Independent Implementation

Cooperative Implementation of NDCs Without the Russian Federation
Carbon Markets with and without the Russian Federation

Russia
Revenue loss:
$75 billion in 2050
Cumulative $850 billion 2022 to 2050
Dropping Any Individual Country Leaves the Market Largely Intact But Reduces Mitigation Incentives for the Country that Mitigates Independently

**Graph: CO₂ Prices**

<table>
<thead>
<tr>
<th>Year</th>
<th>Cooperative Price</th>
<th>Independent Price</th>
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<tbody>
<tr>
<td>2030</td>
<td></td>
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</tr>
<tr>
<td>Full Cooperation</td>
<td>$27</td>
<td>$0</td>
</tr>
<tr>
<td>China out</td>
<td>$37</td>
<td>$-3</td>
</tr>
<tr>
<td>India out</td>
<td>$28</td>
<td>$10</td>
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<tr>
<td>Brazil out</td>
<td>$30</td>
<td>$3</td>
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<td>Russia out</td>
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<td>2050</td>
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<td>$0</td>
</tr>
<tr>
<td>China out</td>
<td>$172</td>
<td>$158</td>
</tr>
<tr>
<td>India out</td>
<td>$173</td>
<td>$185</td>
</tr>
<tr>
<td>Brazil out</td>
<td>$175</td>
<td>$146</td>
</tr>
<tr>
<td>Russia out</td>
<td>$175</td>
<td>$78</td>
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Impact on Marginal Cost of Mitigation from a Large Selling Region Not Engaging in Cooperative Mitigation
Carbon Markets with and without China

China Revenue loss: $190 billion in 2050

Cumulative $3.2 trillion 2022 to 2050
Dropping Any Individual Country Leaves the Market Largely Intact But Reduces Mitigation Incentives for the Country that Mitigates Independently

<table>
<thead>
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<th></th>
<th>2030</th>
<th>2050</th>
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</thead>
<tbody>
<tr>
<td>Full Cooperation</td>
<td>$132</td>
<td>$175</td>
</tr>
<tr>
<td>U.S.A. out</td>
<td>$111</td>
<td>$216</td>
</tr>
<tr>
<td>EU12 + EU15 out</td>
<td>$132</td>
<td>$244</td>
</tr>
<tr>
<td>U.S.A. + Canada out</td>
<td>$0</td>
<td>$216</td>
</tr>
</tbody>
</table>

Impact on Marginal Cost of Mitigation from a Large Buying Region Not Engaging in Cooperative Mitigation

- Cooperative Price
- Independent Price

Dropping any individual country leaves the market largely intact but reduces mitigation incentives for the country that mitigates independently.

Impact on Marginal Cost of Mitigation from a Large Buying Region Not Engaging in Cooperative Mitigation

<table>
<thead>
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</tr>
</tbody>
</table>
Carbon Markets with and without the U.S.A

All In

U.S. CO2 Price jumps from $27/tCO2 to $132/tCO2
The Club You Join Affects Your Role
Cooperation Clubs Can Provide Gains to Participants
A Hypothetical Club Based on China’s Belt and Road Initiative (BRI)
Comparison of Global Cooperation to A Hypothetical Club Based on China’s Belt and Road Initiative (BRI)

BRI Regions ITMO Transactions with Global Cooperation

BRI Regions ITMO Transactions with BRI-ONLY Cooperation

Seller to Buyer Change
Comparison of Global Cooperation to A Hypothetical Club Based on China’s Belt and Road Initiative (BRI)

BRI Regions Financial Transactions with Global Cooperation

BRI Regions Financial Transactions with BRI-ONLY Cooperation

Financial Flows in Adjusted BRI Regions (Billion 2015$) - All In

Financial Flows in Adjusted BRI Regions (Billion 2015$) - Club

Scale Change

BRI Club

South America_Northern
South America_Southern
Central America and Caribbean
South Africa
Africa_Southern
Africa_Eastern
Africa_Western
Africa_Northern
Middle East
Pakistan
India
Indonesia
South Asia
Southeast Asia
Central Asia
Taiwan
China
Russia
South Korea
Key Messages

• Article 6 holds enormous potential for enabling Paris ambition.

• Countries that continue to cooperate using Article 6 continue to benefit even when a large emitter does not participate.

• The club you join will affect how a country benefits from cooperative emissions mitigation.

• Local design is important, e.g., SDG achievement (to be documented).
Voluntary carbon markets, NDC achievement, and Global emissions mitigation

• **Motivation**: Voluntary carbon markets have been growing rapidly and induce activities with real-world consequences for the countries in which those actions occur, other countries connected in the global energy network, international financial transfers and for the Earth’s climate.

• **Proposal**: We propose to investigate these interactions for a hypothetical, stylized, voluntary carbon market, to be determined.
Future Work

Possible Hypothetical Stylized Voluntary Carbon Markets

- **Power Sector**: Power sector in a country, e.g., U.S., takes on a voluntary commitment that is more aggressive than implied by the resident country’s NDC. Power sector achieves emissions mitigation through both reduced emissions and purchased offsets.

- **Fuels Sector**: Producers of fuels, e.g. refineries, commit to purchase offsets to cover X% of the associated emissions associated with downstream fuel use.
Discussion
Panel

Views from the negotiating room – What to expect for carbon markets in 2023 and beyond, and how analysis may help

Maria Jishi, Saudi Arabia
Martin Hession, European Union
MJ Mace, AOSIS
Piotr Dombrovicki, Poland
Moderator: Andrea Bonzanni, IETA
Discussion
CLOSING REMARKS

• Dirk Forrister, IETA
• Jae Edmonds, UMD/PNNL
THANK YOU

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