Introduction to the Carbon Emissions Trading Market

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Overview

- Natsource Introduction
- Basics of Emissions Trading
- KP Update and Overview
- The Market
- Natsource’s Views
- Questions
Natsource: At a Glance

- Over-the-Counter commodities brokerage house
- Global Reach
- Large Energy and Environmental Broker
  - Large Broker of SO$_2$, NO$_x$
  - One of Highest Volume US Natural Gas Brokers
  - Major US Electricity Broker
- Greenhouse Gas (GHG) Advisory Services
- Client base of over 600 major firms
  - Utilities, Power marketers and Producers
  - Large industrials
  - Governments
Natsource Japan was established in May 2001, as a unique firm to help companies deal with and take advantage of drastic change in the energy and environmental field.
Basics of Emissions Trading
What Is Emissions Trading?

What options are most cost-effective?

Company A can reduce 1000 tons CO₂E at $2/ton = $2000

Company B can reduce 1000 tons CO₂E at $6/ton = $6000

SELL

1000 tons CO₂E at $4/ton = $4000

$2000 Profit

BUY

$2000 Savings

Company A - Seller

Company B - Buyer
KP Update & Overview
95 Countries Have Ratified

Current Total: 95

55 Parties Needed to Ratify

55% of Annex 1 Party 1990 CO2 Emissions

Source: UNFCCC as of September 27, 2002
**Options for Meeting the 55% Threshold**

- **EU = 24.2%**
- **Japan = 8.5%**
- **Other Annex 1 = 4.4%**
- **Canada = 3.3%**
- **Poland = 3.0%**
- **Russian Federation = 17.4%**

**NOTE:** Canada and Poland have both indicated their intent to ratify.

Source: UNFCCC as of Sept. 27, 2002
Kyoto Compliance Drives Demand and System Development

- National and regional systems under development.
- Policy makers do not have benefit of clear international rules.
- Concurrent policy development increases difficulty of harmonizing systems.
Early Market: Defining the Terms of Trade

- With government rules still in formation, participants define temporary rules
  - Nature of tradable commodity
  - Pricing structure
  - Liability for non-performance
  - Definition of baseline
  - Monitoring & verification plan

- As government rules are set, market will conform
Key Issues for International GHG Market

- Domestic system compatibility
  - Lack of international policy framework led to development of incompatible systems
  - Loss of economic and environmental benefits from fragmented market

- Party and non-Party trading linkages
The Market(s)
Early Market: Attributes of Transactions

- Early market began to emerge after 1997 agreement in Kyoto
- Transactions involved:
  - Early stage “emission reduction” units
  - These evolved into “verified emissions reductions” (3rd party review, higher credibility)
  - In 2001, “candidate” CERs, ERUs and AAUs emerged in market terminology
  - In 2001, actual GHG compliance instruments began trading in UK & Denmark
- Higher quality commands higher price
Recent Market Activity

- 1997 to June 2002 Estimated 200 mmt GHG Traded
- Last 12 months most active in GHG market (compliance tools, VERS); 30 to 50 mmt CO$_2$e traded in last year
- UK GHG trading program
  - DuPont - Mieco executed first GHG transaction of government-sanctioned instrument
  - Auction held to provide companies with funds to reduce emissions below a baseline; $305 million allocated, 4 mmt of reductions committed
  - Approximately 20 trades have occurred and 100,000 to 200,000 allowances traded
- Danish power sector cap & trade program
  - Initial cap on CO$_2$ of 23 million tons in 2000 is reduced 1 million tons per year through 2003
  - Approximately 10 trades have occurred and 300,000 to 500,000 allowances traded
- First swap of UK and Danish allowances brokered in 2002
- Swaps of Danish allowances for VERs have occurred
GHG Market Is Evolving

**Australia:**
US$208 million in government tenders for GHG reductions

**Kyoto Protocol:**
Drives Demand and System Development

**United Kingdom:**
Began April 2002; Tax discount in exchange for reduction target

**Other EU Countries:**
Planning to implement domestic trading programs in 2005 in line with EU plan

**Denmark:**
GHG cap in power sector, 2001-2003; Danish and UK allowances swapped

**Japan:**
Ratified Kyoto Protocol; GHG trading simulations in 2002; implementation of domestic measures

**Netherlands:**
Purchased $31 million in GHG reductions; 2 more tenders issued for JI and CDM-like reductions

**European Union:**
Ratified Kyoto Protocol; GHG trading system operational 2005

**Japan:**
Ratified Kyoto Protocol; GHG trading simulations in 2002; implementation of domestic measures

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**Recent Market Pricing**
GHG Prices by Commodity and Vintage (US$ per ton CO$_2$E)

<table>
<thead>
<tr>
<th>Commodity Type</th>
<th>Vintage Year</th>
<th>Price per ton CO2E (US$)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Verified Emission Reductions (&quot;VERs&quot;)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Annex B VERs</td>
<td>1991-2007</td>
<td>$0.30-$2.00</td>
</tr>
<tr>
<td>Annex B VERs</td>
<td>2008-2012</td>
<td>$1.50-$3.00</td>
</tr>
<tr>
<td>CDM VERs</td>
<td>2000-2012</td>
<td>$3.00-$6.00</td>
</tr>
<tr>
<td>Dutch ERUs</td>
<td>2008-2012</td>
<td>$4.40-$7.99</td>
</tr>
<tr>
<td><strong>Compliance Tools</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>UK allowances</td>
<td>2002</td>
<td>$16.39-$17.17</td>
</tr>
<tr>
<td>UK allowances</td>
<td>2003</td>
<td>$11.71-$12.49</td>
</tr>
<tr>
<td>UK allowances</td>
<td>2004</td>
<td>$11.71-$12.49</td>
</tr>
<tr>
<td>Danish allowances - bid</td>
<td>2002</td>
<td>$1.14-$2.60</td>
</tr>
</tbody>
</table>

**Source:** Natsource, September 2002

NOTE: Prices of GHG commodities are difficult to estimate. Prices are particularly difficult to estimate beyond 2012 because the international community will likely negotiate a new target for the Kyoto Protocol 2$^{nd}$ commitment period and because U.S. action is still uncertain.
Natsource Views
GHG Price Expectations

- **Pre-Kyoto (2005):**
  - Most companies expect GHG prices from $3-5 *
  - Range: $2-10; median $5; mean $5.33
  - Over 60% predict $5 or less

- **Mid-Kyoto (2010):**
  - Most expect prices to be around $10.
  - Range: $1.74 to $30; median $10; mean $10.96.
  - 70% expect $10 or less.

- **In these prices, most firms presume:**
  - Kyoto has entered into force by end 2002.
  - U.S. does not join Kyoto, but adopts separate policies that create modest market demand for international reductions

* US$ per tonne CO$_2$e
Future GHG Price Expectations

- Private Sector Study Group Estimates, 2005 and 2010
- Natsource Estimates, 2005 and 2010

Observed Market Prices

- Median
- Mean
Private sector price expectations

0 5 10 15 20 25 30
Price expectations ($/tCO2e)

Energy companies  Energy intensive industry  Financial sector  Transport

- Energy companies: Orange line for 2005, Blue line for 2010
- Energy intensive industry: Orange line for 2005, Blue line for 2010
- Financial sector: Orange line for 2005, Blue line for 2010
- Transport: Blue line for 2010
Natsource Views:  
Market Characteristics 2002-2007

- National-level and EU trading schemes will continue to emerge
- Voluntary corporate initiatives intensify
- Market influenced by a few large buyers (e.g., Dutch CDM & JI programs)
- Likely to see continued interest within Canada, Japan, the U.S. for VERs
- Gradually demand for VERs will shift to permits, as superior risk-hedging tool
Natsource Estimates: 2002-2007 Prices

- Fragmentation of markets is expected, producing regional prices
- No single global permit price is likely

<table>
<thead>
<tr>
<th>VERs:</th>
<th>below $5*</th>
</tr>
</thead>
<tbody>
<tr>
<td>UK:</td>
<td>$15.00 or less</td>
</tr>
<tr>
<td>Denmark:</td>
<td>$4.80 or less</td>
</tr>
<tr>
<td>EU (05-07):</td>
<td>$2.50-9.00</td>
</tr>
</tbody>
</table>

* US$ per tonne CO₂e
Natsource Views:
Market Characteristics 2008-12

- Kyoto rules should eliminate most regulatory discrepancies between systems
  - Increased opportunity to seek low-cost reductions
  - Russian/FSU permits will keep prices low
  - Russia should meet most minimum GHG inventory criteria
  - Global competition will limit Russia’s ability to employ strategic anti-competitive behavior
  - Increased regulatory certainty and demand will stimulate increased supply, limiting price rises

- Separate U.S. policy is likely to appear, creating some international demand
Natsource Estimates: 2008-2012 Prices

- Global prices will emerge
- Regional differences will narrow

Global AAU/CER price: $5 - $11
Questions
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