

EMISSIONS
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GROUP

Greenhouse Gas

MARKET
ANALYSIS

Introduction to the Carbon Emissions Trading Market

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NATSOURCE LLC

**Presented at Katoomba V
Tokyo, Japan
November 5, 2002**



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Overview

- Natsource Introduction
- Basics of Emissions Trading
- KP Update and Overview
- The Market
- Natsource's Views
- Questions



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Natsource Introduction



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Natsource: At a Glance

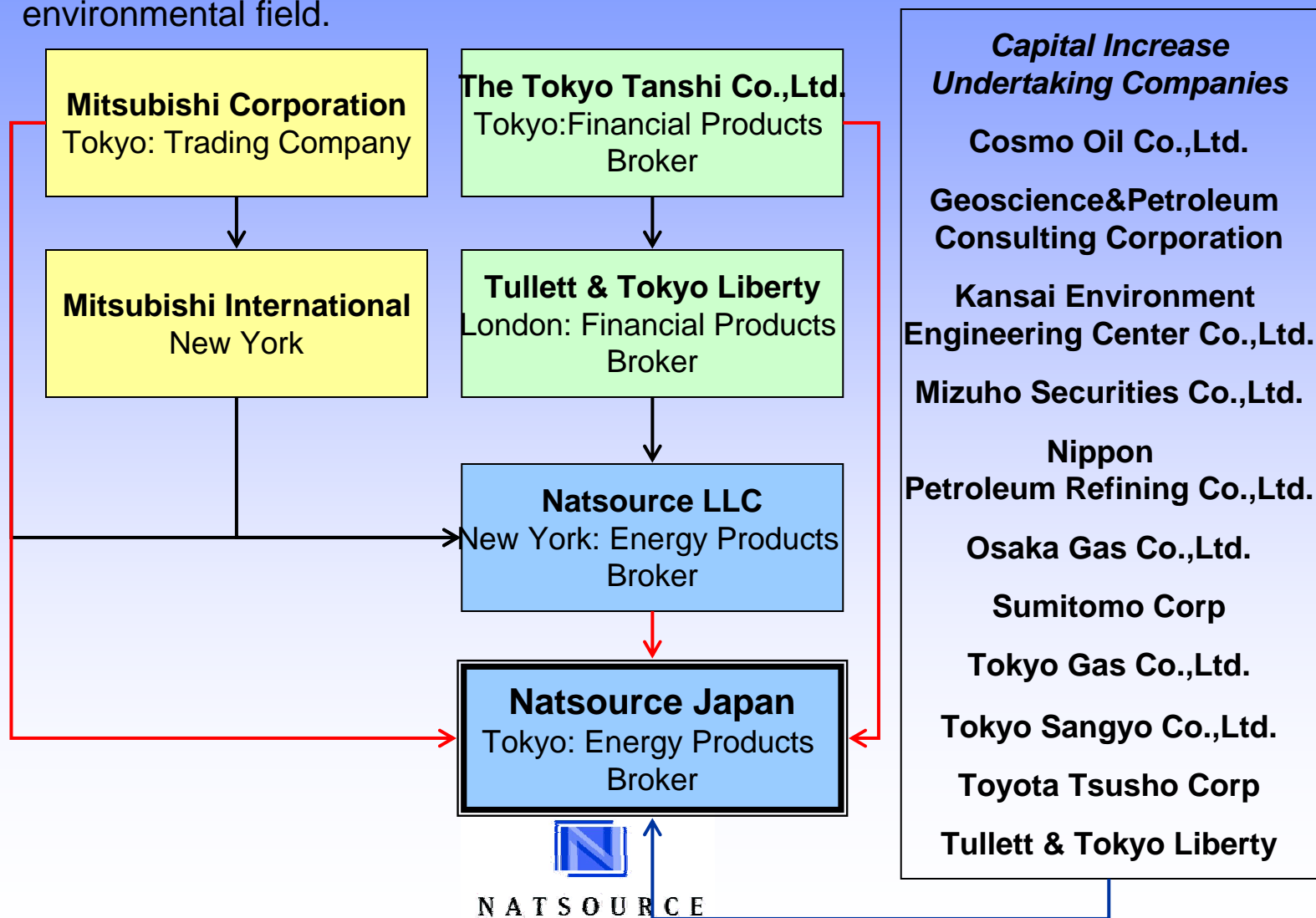
- Over-the-Counter commodities brokerage house
- Global Reach
 - Calgary, London, New York, Tokyo , Toronto, Oslo, Ottawa, Sydney , Washington D.C.
- Large Energy and Environmental Broker
 - Rated Top GHG Broker (*Environmental Finance* Magazine Survey, 2000 & 2001)
 - Large Broker of SO₂, NO_x
 - One 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



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Organization in Japan

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.



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Basics of Emissions Trading



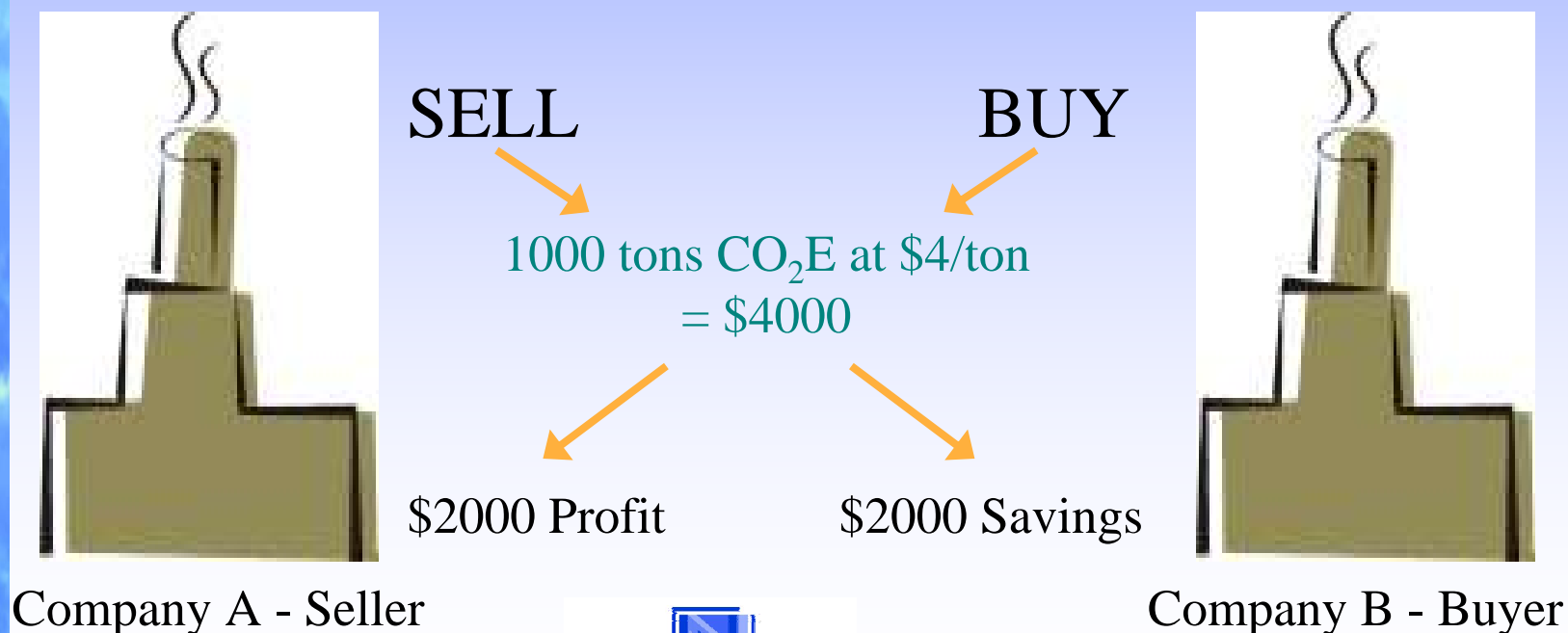
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What Is Emissions Trading?

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



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KP Update & Overview



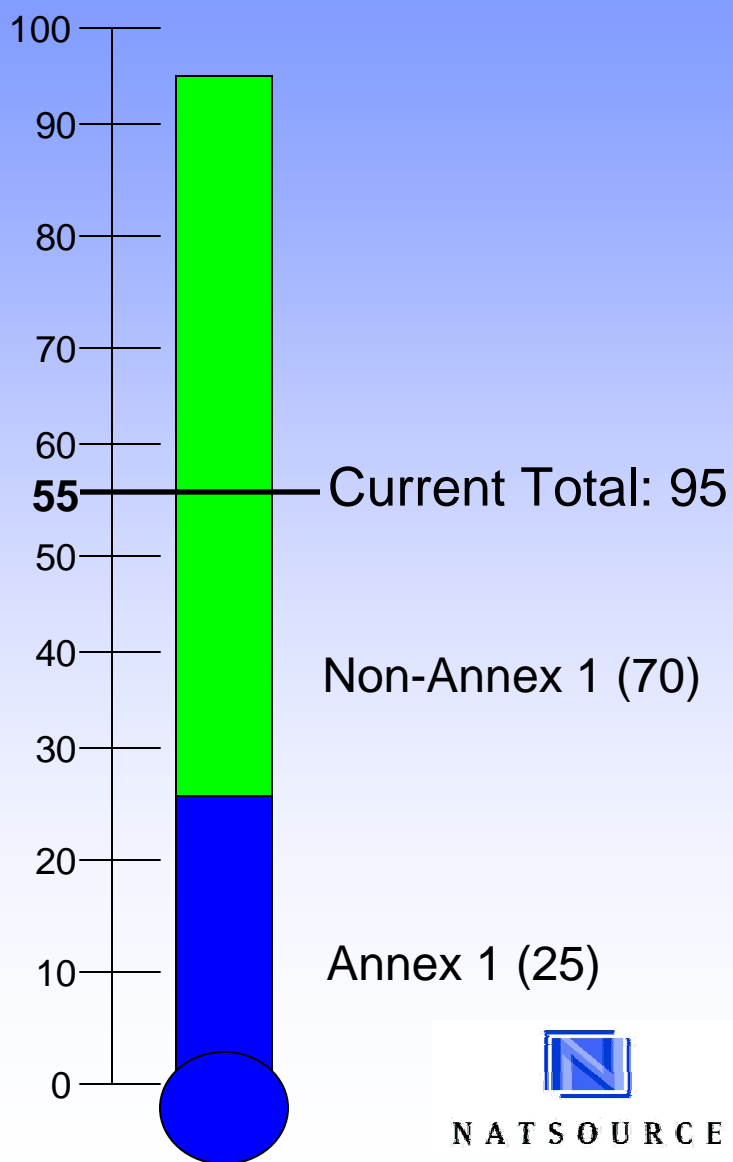
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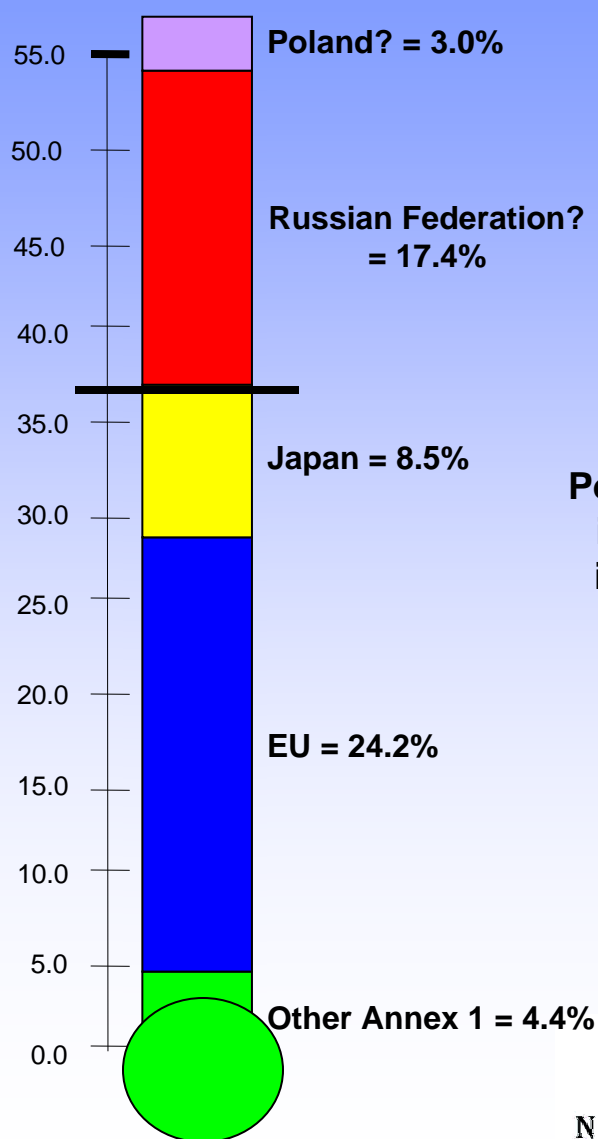
95 Countries Have Ratified



55 Parties
Needed to
Ratify
and
55% of Annex
1 Party 1990
CO₂
Emissions

Source: UNFCCC as of
September 27, 2002

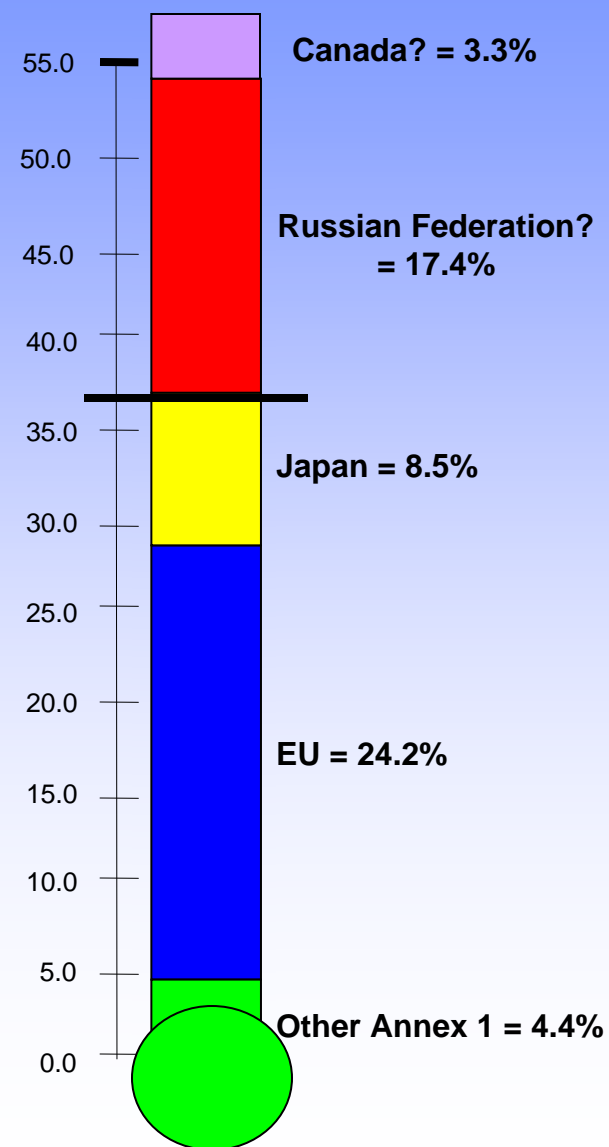
Options for Meeting the 55% Threshold



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



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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



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The Market(s)



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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 CO₂e traded in last year**
- **UK GHG trading program**
 - DuPont - Mico 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 CO₂ 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



Recent Market Pricing

GHG Prices by Commodity and Vintage (US\$ per ton CO₂E)

Commodity Type	Vintage Year	Price per ton CO ₂ E (US\$)
Verified Emission Reductions ("VERs")		
Annex B VERs	1991-2007	\$0.30-\$2.00
Annex B VERs	2008-2012	\$1.50-\$3.00
CDM VERs	2000-2012	\$3.00-\$6.00
Dutch ERUs	2008-2012	\$4.40-\$7.99
Compliance Tools		
UK allowances	2002	\$16.39-\$17.17
UK allowances	2003	\$11.71-\$12.49
UK allowances	2004	\$11.71-\$12.49
Danish allowances - bid	2002	\$1.14-\$2.60

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 2nd commitment period and because U.S. action is still uncertain.



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Natsource Views



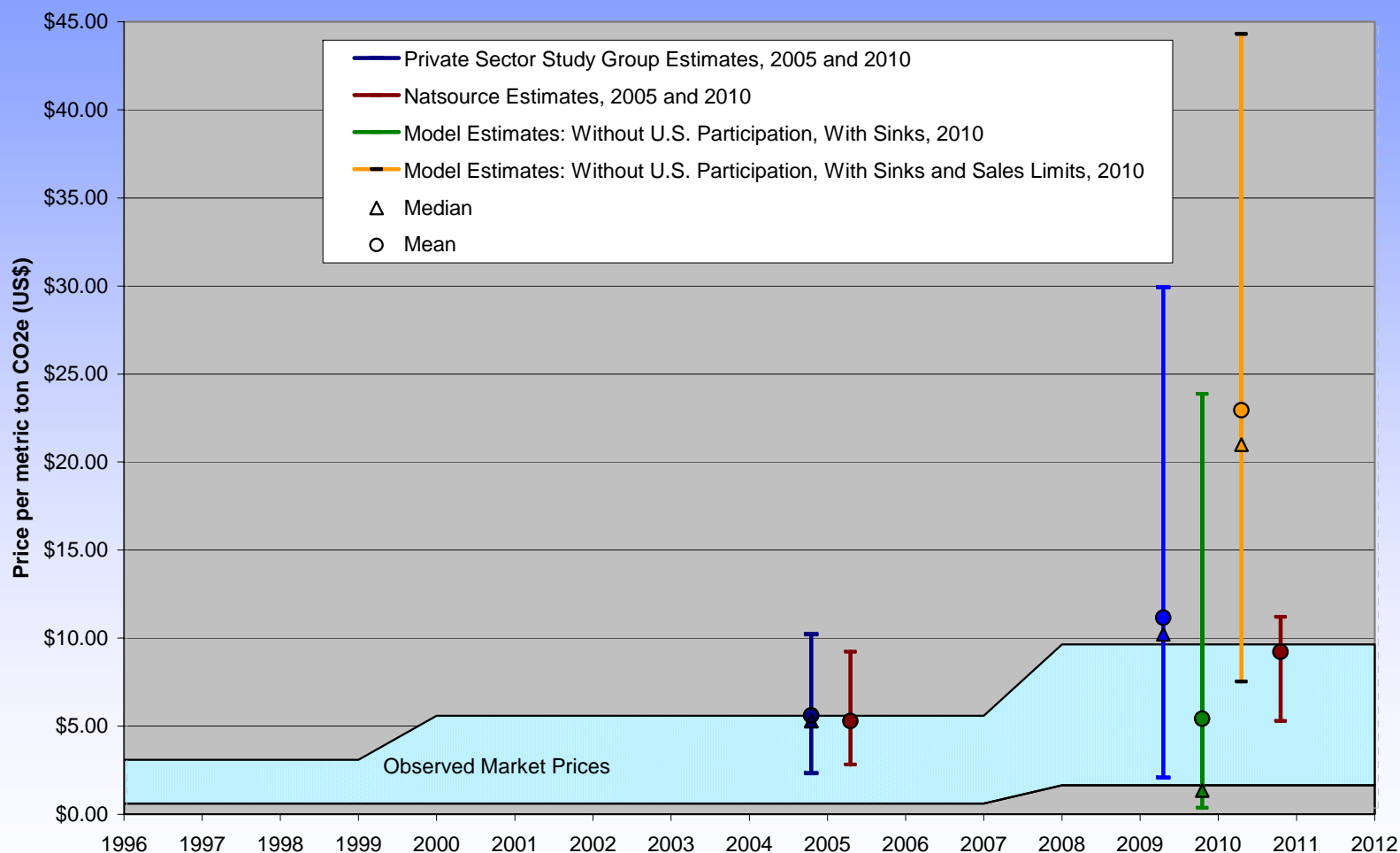
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GHG Price Expectations

- 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

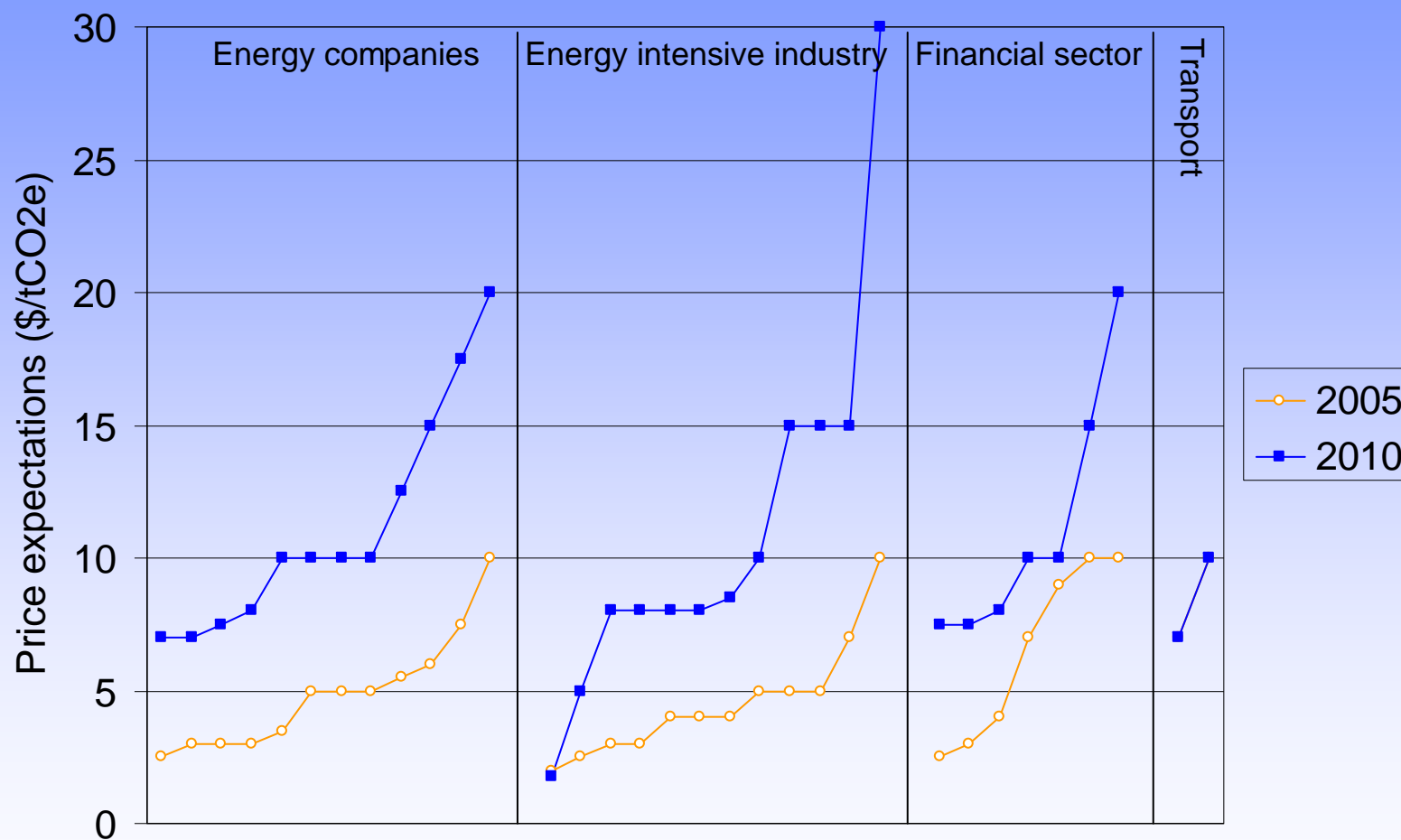


Future GHG Price Expectations



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Private sector price expectations



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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

VERs: below \$5*

UK: \$15.00 or less

Denmark: \$4.80 or less

EU (05-07): \$2.50-9.00



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* 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



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For More Information...

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