

Landfill Gas Energy

IFICCI-USEPA M2M

New Delhi, India

March 9, 2006

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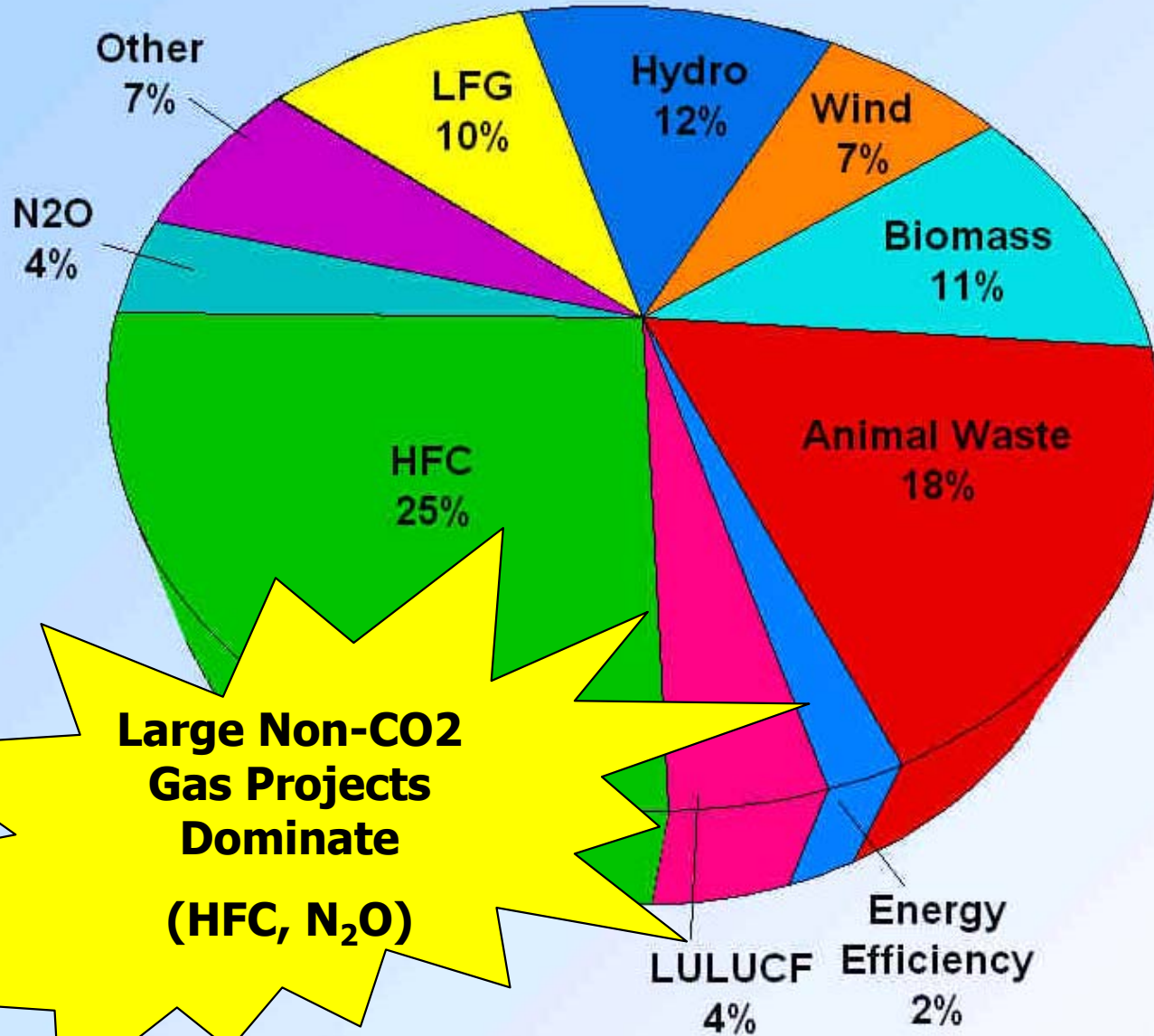


State of the Market 2005

- EU ETS up and running
- CDM Registered Projects: 20-30
- Total transactions:
 - 800 million tons traded
 - \$USD 11.28 billion
- Clean Development Mechanism/Joint Implementation transactions:
 - 425 million tons traded
 - \$USD 2.4 billion



CDM TECHNOLOGIES 2004

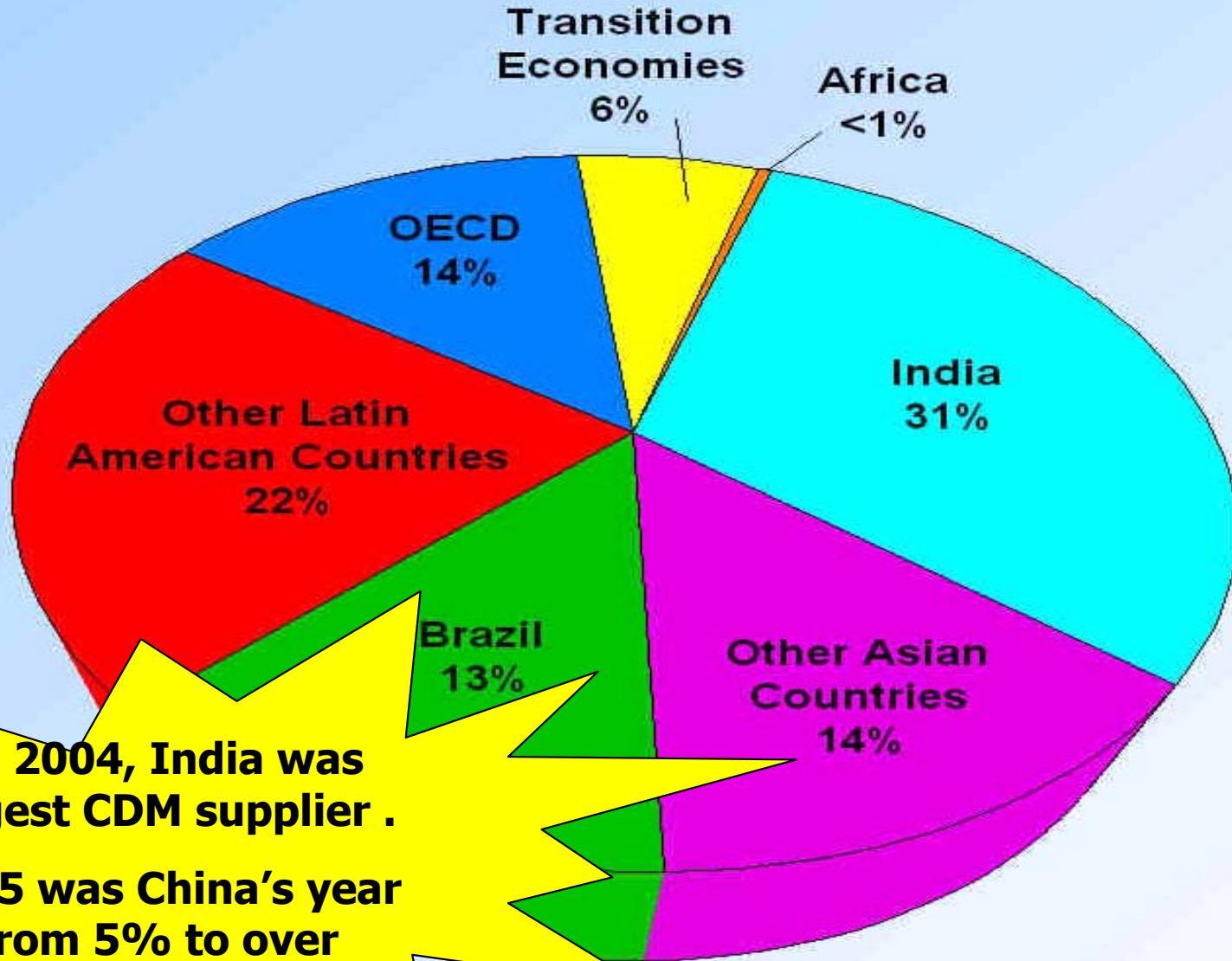


Source: World Bank Carbon Report

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SUPPLIERS 2004



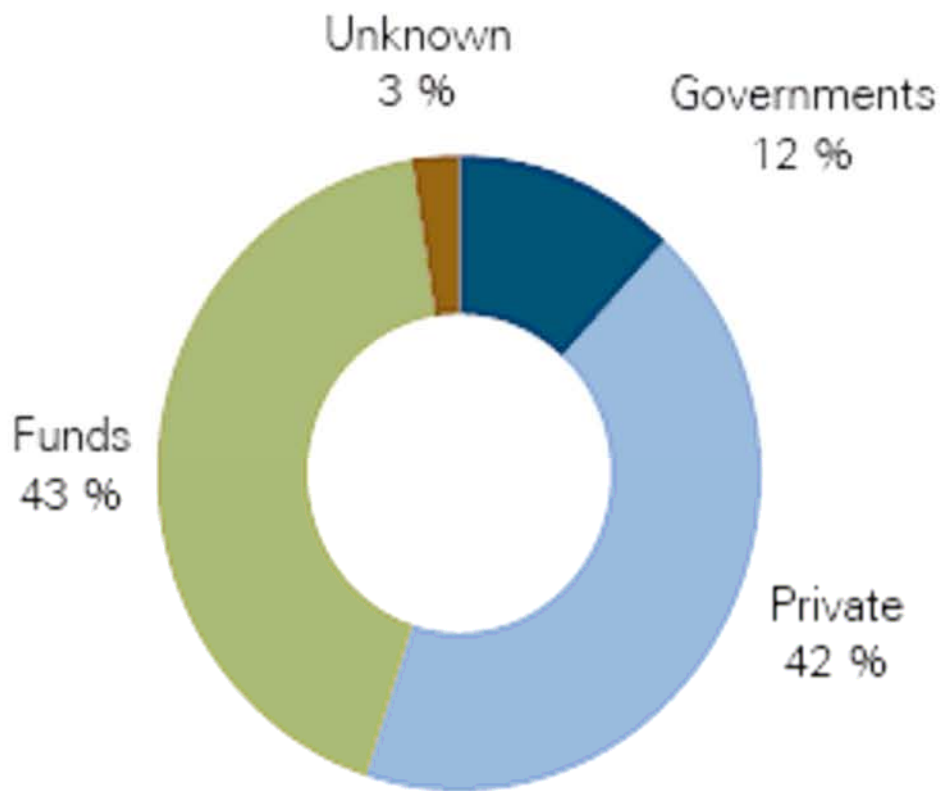
In 2004, India was largest CDM supplier .
2005 was China's year from 5% to over 40%.

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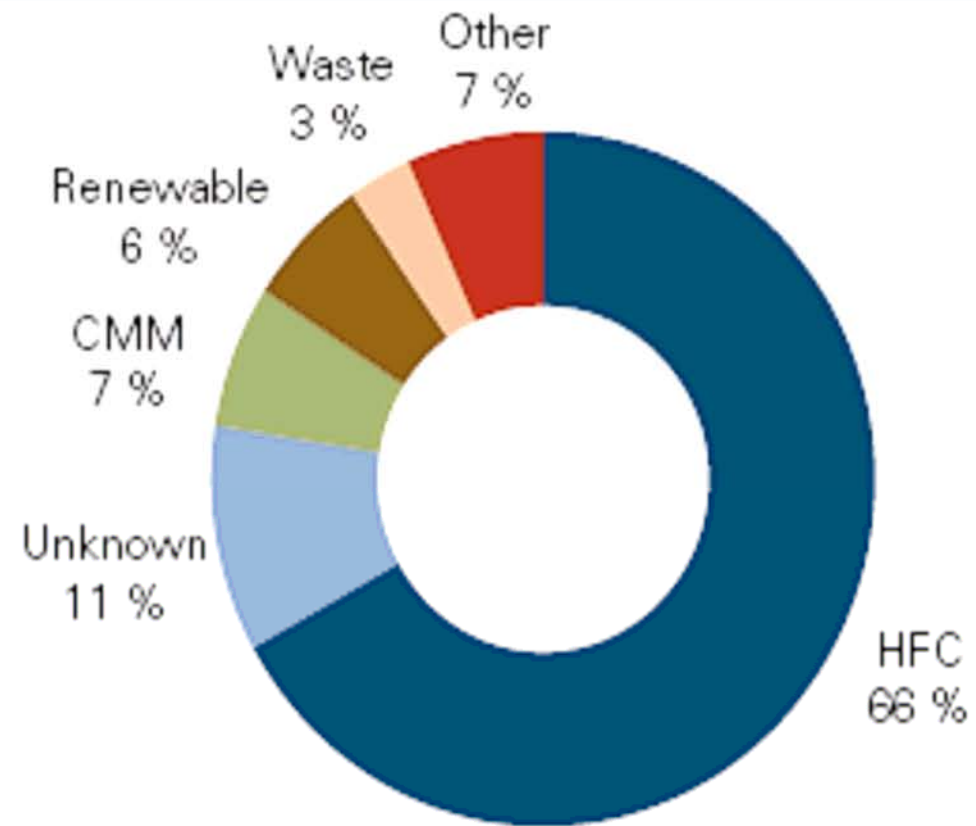


Carbon Market Project Overview 2005

Purchasers



Project Types



Overview of Carbon Credits

Ratification of the Kyoto Protocol requires that developed countries will reduce GHG emissions during 2008-2012

<i>Market Areas</i>	<i>Carbon Credit Shortage (in tonnes)</i>
Japan	800,000,000
Canada	1,350,000,000
Europe	<u>1,600,000,000</u>
Total Short =	3,750,000,000

CDM and JI help manage the total shortage



Macroeconomic Price Determinants:

Carbon: Supply & Demand

Upward price pressure:

- Japanese buying will continue
- US regional programs may create some demand
- EU tightness will continue to seek CERs to fill needs

Downward price pressure:

- Canadian uncertainty
- Linking Directive has not yet been used successfully
- Increased registration of CER projects
- Major non-CO2 "Mega-Projects" (i.e. \$930 million China HFC Project)
- Corporations with excess allocation not trading yet
- Russia & Ukraine supply has not been priced into the market

Uncertain price pressure:

- EU ETS "Phase 2" uncertainties
 - Allocation (NAP finalization June 2006?)
 - CER national percentage caps for "Phase 2" EU ETS
- Post 2012 negotiations



Microeconomic Price Determinants:



CER Specific Risk & Quality Determinants

$$\text{Realized CER Price} = \text{Perceived Value} - \text{Perceived Risk}$$

- **Compliance Risk** -- Probability that the GHG ER will qualify for desired compliance
- **Counterparty Risk** -- credit worthiness of ER sellers
- **Regulatory Risk (Country)** -- country policies governing crediting and transferring of project-based ERs to buyers
- **Performance Risk (Country)** -- the investment climate in host country
- **Performance Risk (Carbon)** -- the technology and extent to which generation, creditability and ownership of ERs is affected by the particular type of technology
- **Performance Risk (Technology)** -- the operational and/or commercial aspects of technologies utilized in ER projects
- **Structure of Contract** -- Spot vs. forward, upfront vs. payment on delivery, optionality (volume, timing, RoFR)
- **Additional buyer costs and, or additional environmental / social benefits**
- **CER stream delivery** – Timing and Size of CER generation and transfer is CRITICAL

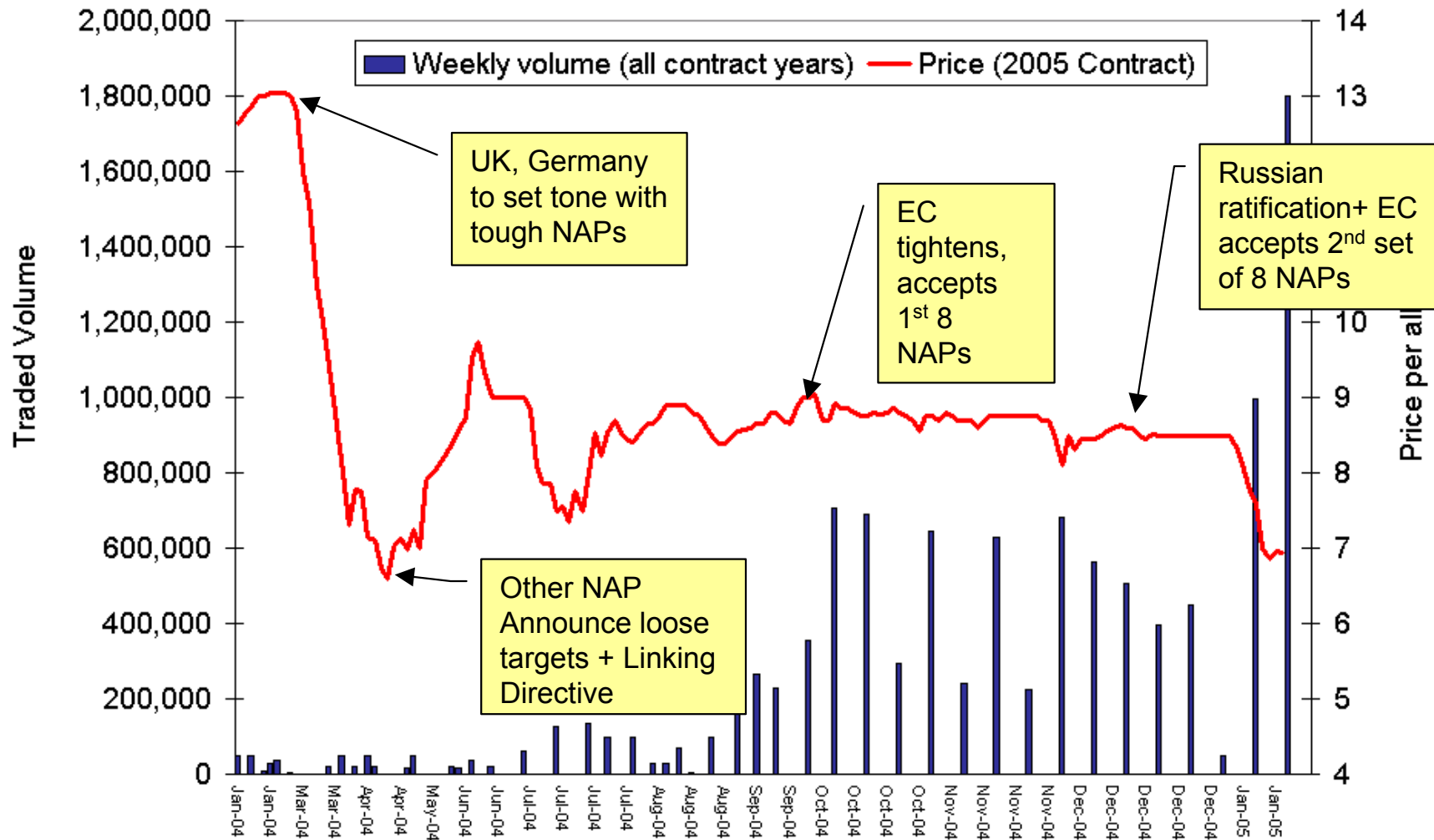


Current EU Pricing Snapshot:

EU Trading Scheme's Effect on CER Pricing



EUA Prices 2004: NAP Effects



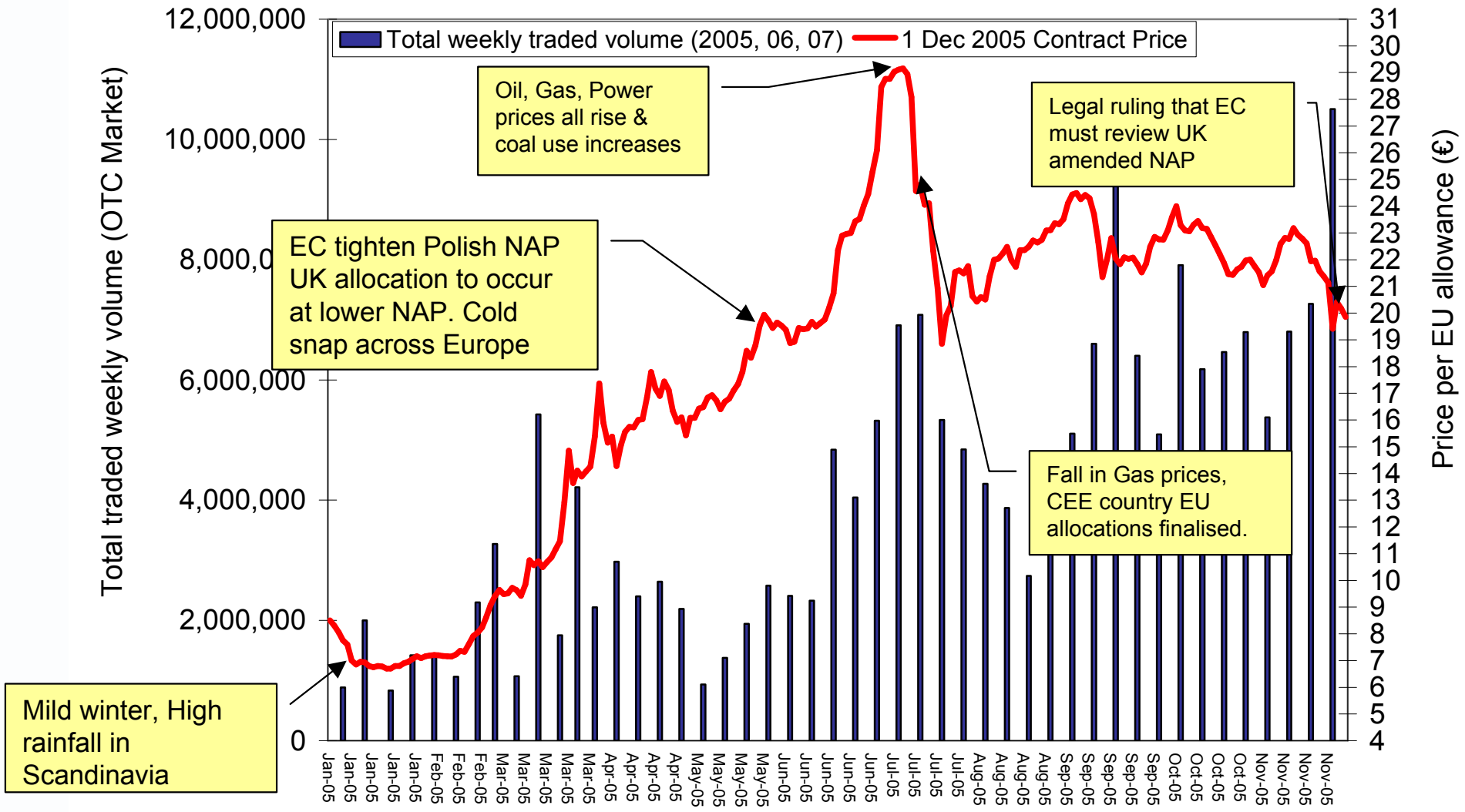
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EUA Prices 2005: Energy Fundamentals



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EU Market Pricing Factor: Dark Spread vs. Spark Spread

Spark Spread = Power price – Cost of Natural Gas

Dark Spread = Power price – Cost of Coal & Additional
Carbon Allowances

Price Effects:

- Dark spread > spark spread = coal is favored over gas
- EU Pricing currently driven by the economic dispatch of power plants.
- EU Allowances will adjust in value as
 - Dark Spread widens or narrows (i.e. expensive gas)
 - Price of power moves
 - Supply changes





Valuation of EUAs vs. CERs

CERs are not fungible with EUAs

Higher risk = Lower price

	EUA	CER
Risk	Low, €40 excess emission penalty (€100 from 2008)	High, no guaranteed delivery
Registry	Functional Registries	International Transaction Log not presently functioning
Trading partners	Trades occur with companies with investment grade credit	Trades occur with non-credit worthy companies
Contract Length	through 2007	through 2012
Contract Size	10,000 – 50,000	100,000 +

Price: EU Allowances vs. CERs

Timing: Supply & Demand curve will be dramatically different when CERs can finally transfer into EU market

CERs trade at a discount to EUA, because of:

- Timing – EU ETS Registries functional but not the International Transaction Log to allow CER delivery
- Only EUAs available during tight market (Dark Spread)
- Utilities's accounting mandates to buy fuel & compliance at the time the of power sale or faced an unhedged risk exposure
- By the time CERs in pending accounts can be transferred and used in EU it is likely that a back-log of supply will depress prices.

CERs also discounted against EUAs because of risk:

- Kyoto process risk (Methodology changes)
- Host country risks (Political, Taxation)
- Project risks (Technology failure, incorrect due diligence)
- Seller Risks (Credit, Fraud)
- Transfer Risk & Sponsor country limitations





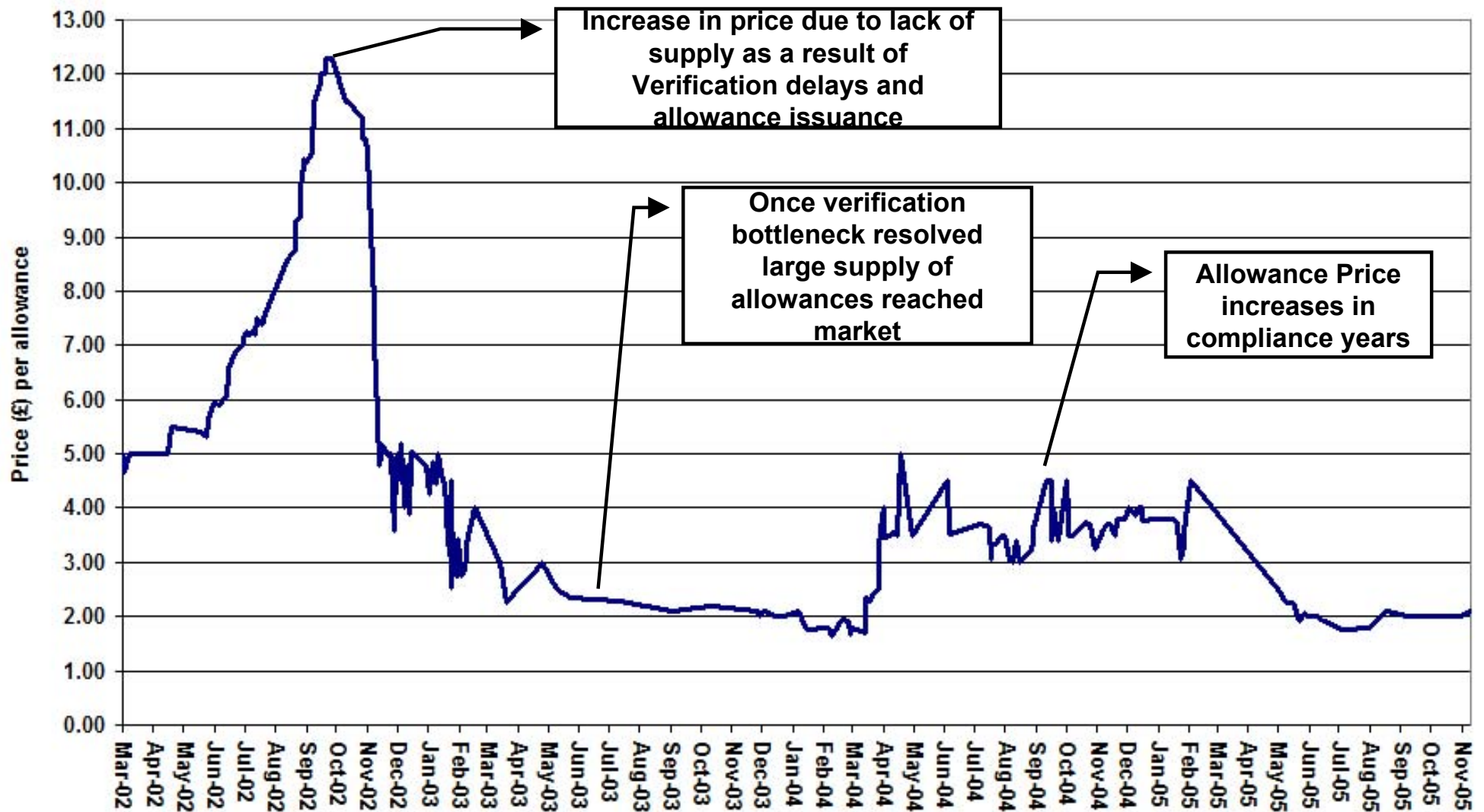
Historic Pricing Snapshot:

Does History Repeat Itself? A Look-back at Other Environmental Markets

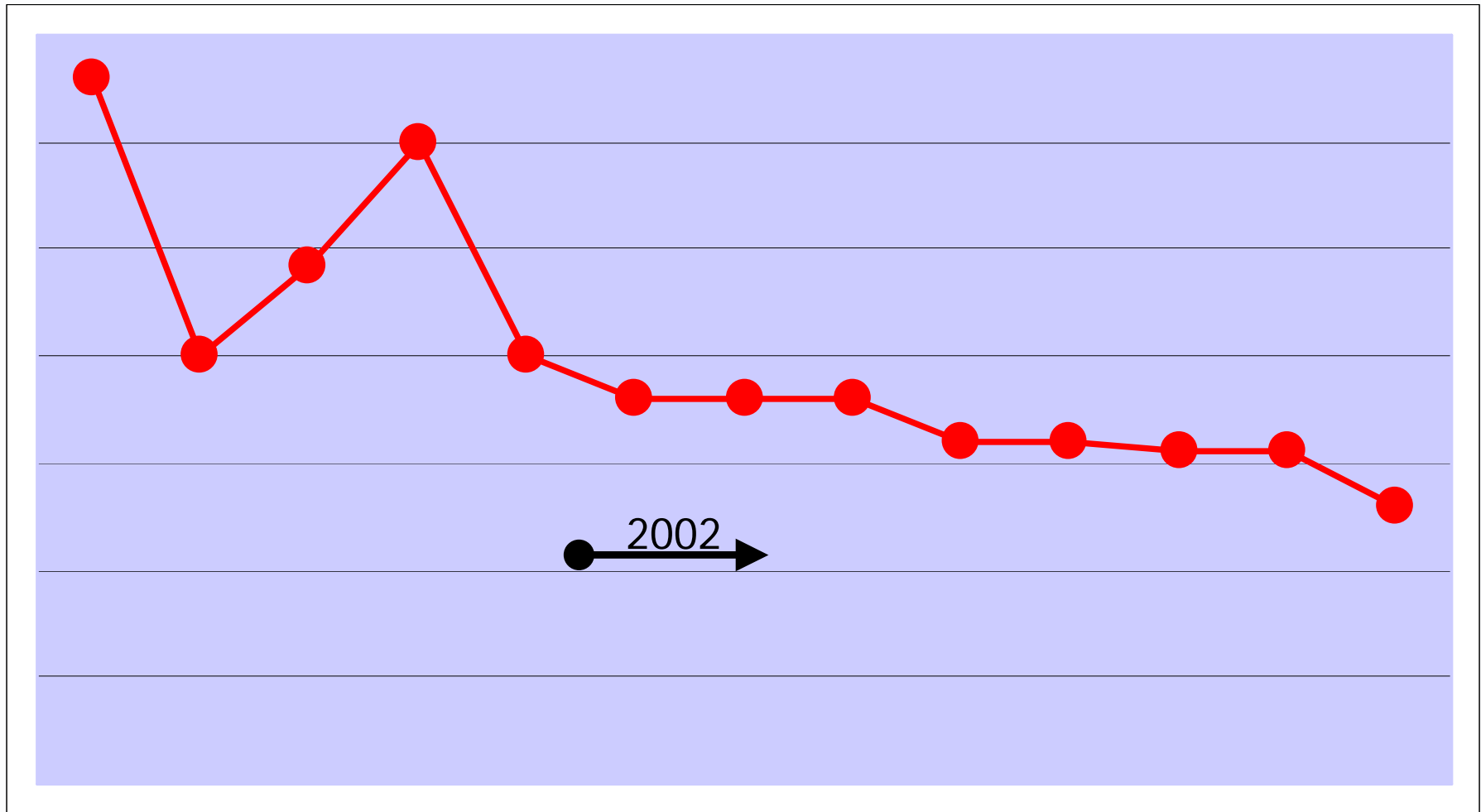


UK Allowance Pricing

UK Allowance Spot Market Price Curve (Current Vintage)



Danish Allowance Pricing

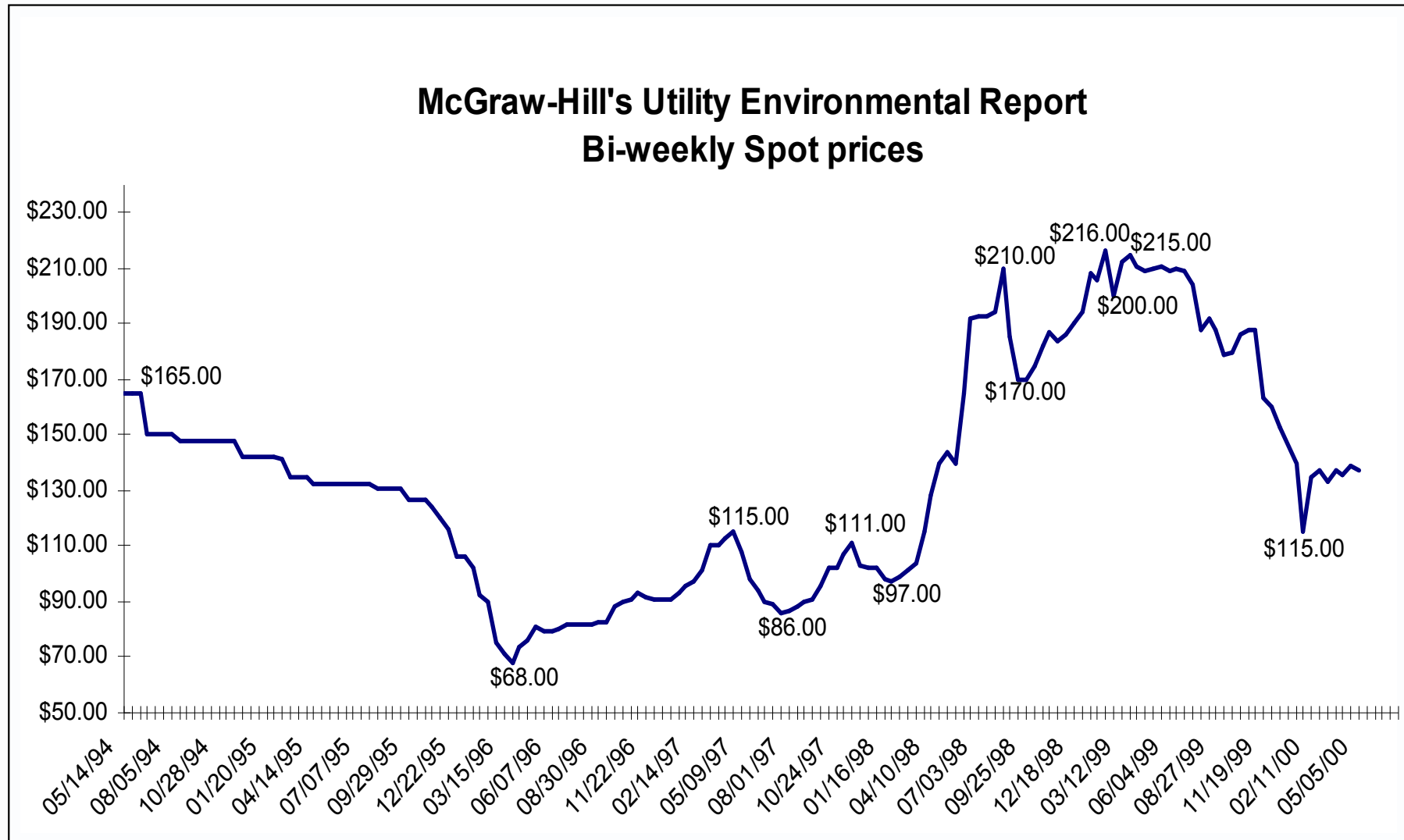


- Few participants (effectively 4)
- Pricing end 2002: DKr 3 @ 36 (no trades)

U.S. SO₂ – The first 6 Years



Pre-implementation projections: ~\$750 - 1500



USA Spot SO2



Spot SO2

NATSOURCE



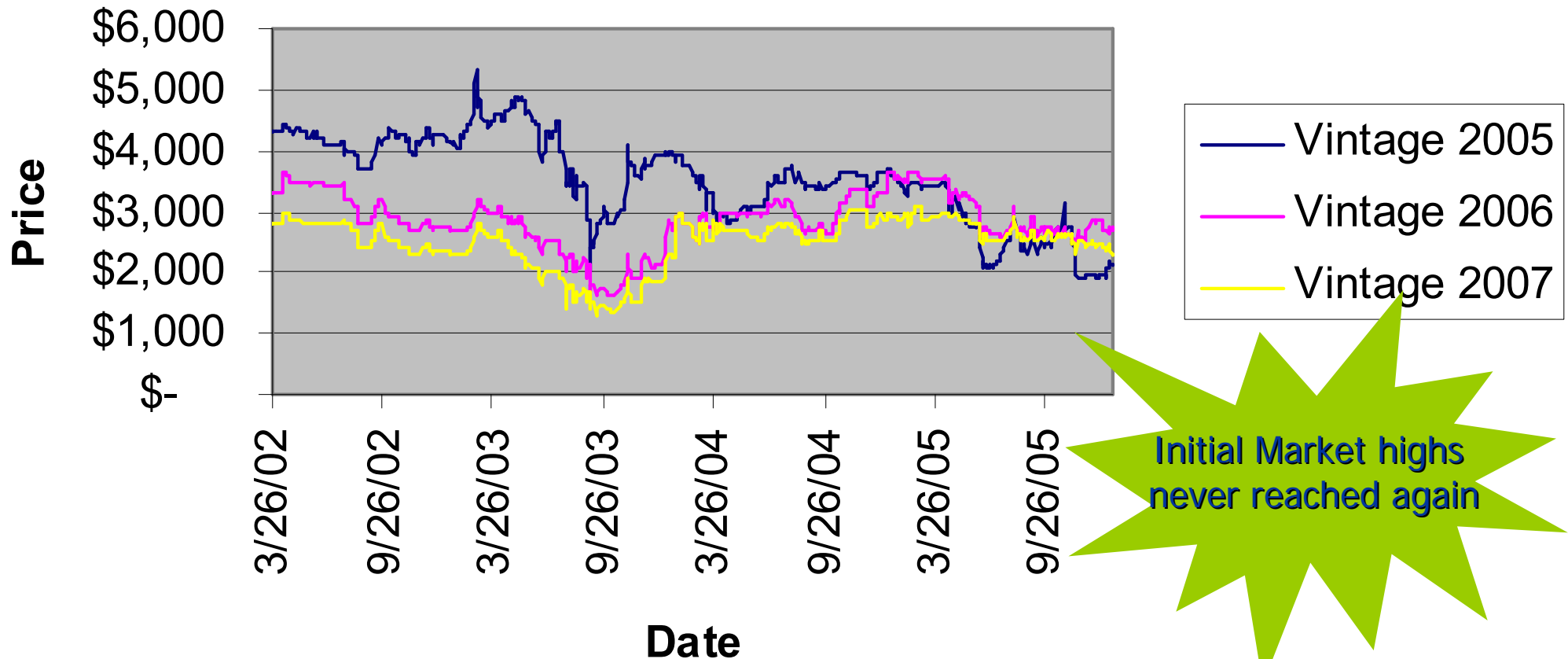
**Would you have sold
at the peaks?**

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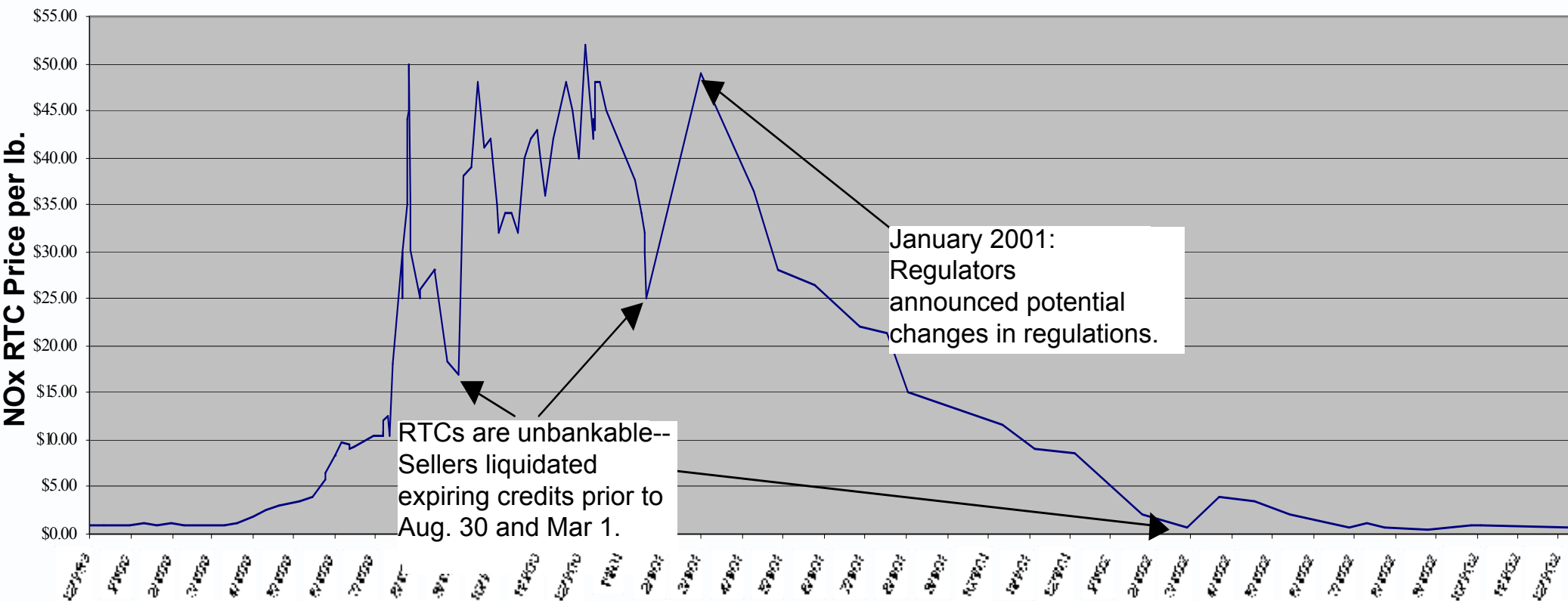


USA NOx

NOx Price History



Southern California NOx Reclaim Trading Credit (RTC) Spot



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ERPA Pricing

Price is Only One Factor

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But Seriously Now...

WHAT IS THE CER PRICE?

- When all risks & ERPA are considered, the bulk of transactions range in similar price bands depending on associated risks and ERPA terms.
 - Extremely high pricing and low pricing, while visible, make up less than 10% over overall transactions
- Beware of “Optical pricing”. ERPA Factors include:
 - Distribution of risk split between parties
 - Delivery and Payment terms
 - Will payment be made upon CER issuance into pending account or into Buyer’s national registry account?
 - CDM cycle funding or advance payments
 - Punitive damages vs. Delivery “if and when available”
 - Embedded unpriced options (ROFRs, etc)
 - Pricing structures including indexing, floors & upside sharing
 - Transaction costs and ease or difficulty of transaction



CER Price driven by Delivery Risk

CER Price increases



- Only a PIN available
- Project developing new methodology
- No Host government approval
- Poor Credit
- Project not registered
- Flexible CER delivery schedule
- No punitive damages
- Unilateral
- Upfront payment
- Payment upon CER issuance into pending account

- Approved methodology
- Host government approval
- Strong project partners, technology supplier
- Good Credit
- Ability for buyer to become a Project Participant (Multilateral)
- Project registered
- Guaranteed delivery schedule with punitive damages for non-delivery
- Payment on delivery into buyer's national registry account





CDM Project Development and Commercial Strategy

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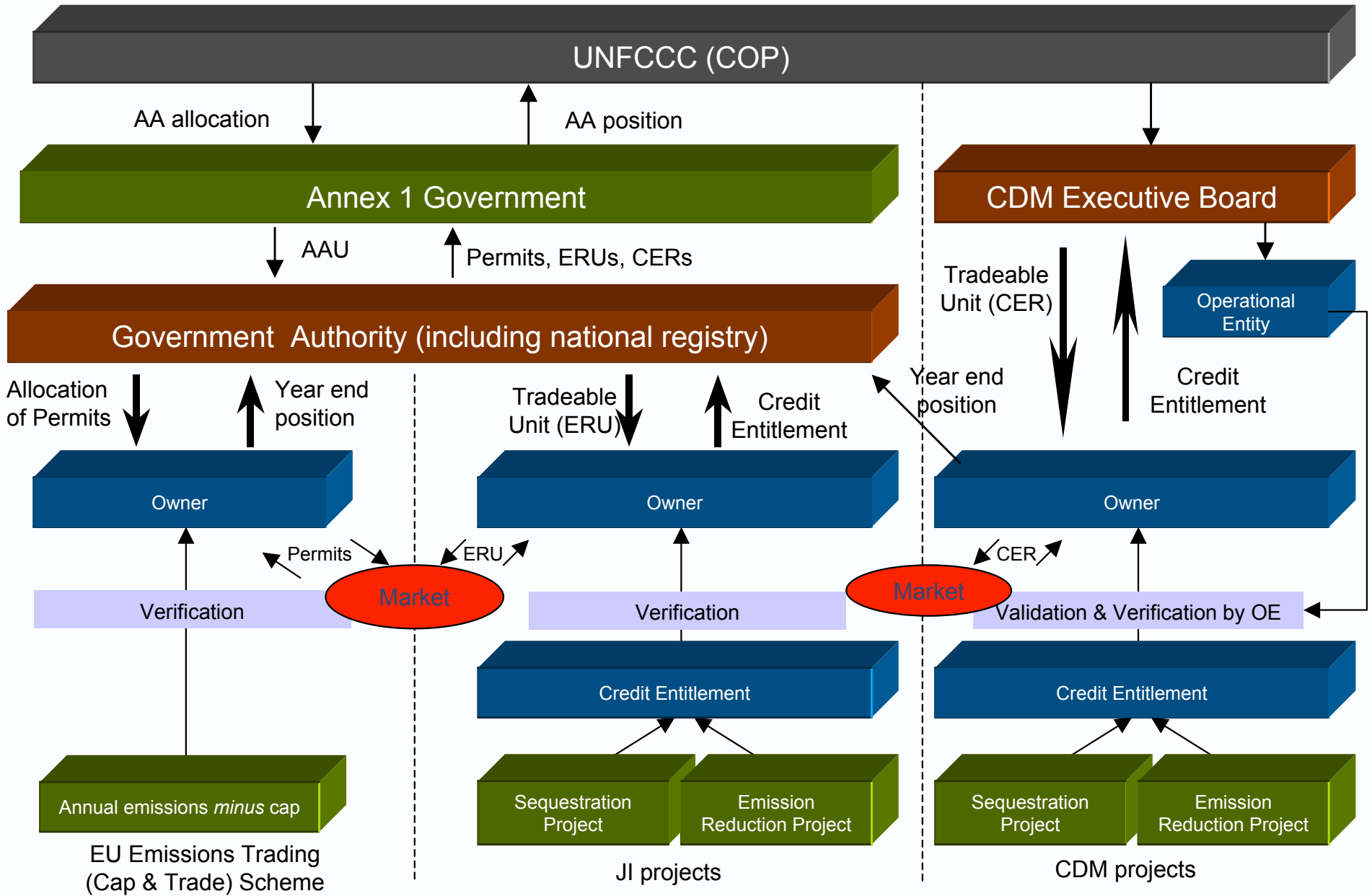


Current CDM Opportunities

Methodology	Approved?
Landfill gas (ACM0001)	Yes
HFC (AM001)	Yes
N ₂ O (AM0021)	Yes
Renewables (ACM0002)	Yes
Cement efficiency (AM0024 / ACM0005)	Yes
Livestock Manure Management (AM006)	Yes
Energy Efficiency (AM0017)	Yes
Waste water methane (AM0013)	Yes
Coal Mine Methane (ACM00)	Yes



Complex Highly Regulated Systems



Key Project Risk Factors

Lower Risk = Higher Value

Example of Key Risk Factors:

- Host country's investment climate
- Host country's CDM institutional readiness
- Credit rating of project participants
- Project's financing stage
- Project's stage in CDM cycle
- Project's stage of development
- Technology used
- Stakeholders' acceptance
- Clear ownership title

Model

Project's
Delivery
Shortfall
+
Rating

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Buyer's Information Checklist

- ☑ Type of project and location
- ☑ Expected emission reductions per year;
- ☑ Source of project data (3rd party expert?)
- ☑ Baseline methodology used (approved or a new methodology?)
- ☑ If new methodology they will need description and EB status
- ☑ Seller information (credit rating, financials, track record)
- ☑ Evidence of rights to negotiate for the sale of the CERs
- ☑ Project Timeline (installation, first CERs expected)
- ☑ Crediting Period (7 or 10 years)
- ☑ Timeline of project and credit creation (construction and first CER delivery)
- ☑ Status of Host Country DNA approval process
- ☑ Financing status and structure
- ☑ Other sales of CERs from project (percentages, initial rights)
- ☑ Available security from the project, project developer, counterparty
- ☑ Project Design Document (if available)



Seller Strategy

When is the Right Time To Sell?

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Seller Consideration: Timing

When is the right time to sell?

- Waiting may have paid off until now...
 - The market is fluid and a pro-active approach necessary
 - EUA's 40% volatility (according to Shell Trading)
 - Price movements go both ways...
 - Is just choosing to not participate now an action?
- Look at the facts: EU ETS Phase 1 is trading higher than Phase 2 due (Backwardation)
 - ITL Risk for Phase 1 (CER CAP Risk for phase 2)
 - The "market experts" think that future prices will be lower (Current EU supply squeeze is non-sustainable)
- Can a CER seller hedge this risk?
 - Book some fixed price sales at levels that guarantee project viability ("take money off the table")
 - Creative contract structures that enable price risk sharing at levels acceptable to each party.



Seller Consideration: Sustainable Long-Term Contracting

- Contracts must remain stable under all possible market and policy scenarios
- Expect the unexpected
- Projects need to prove viability under current market pricing and time frame
 - *Gambling on future prices is dangerous*
 - *Assuming revenue beyond 2012 is not prudent*
 - *Project should remain viable with minimum potential revenues under worst case scenario*



Mutually Beneficial ERPAs Must Recognize Long-term Uncertainty

- Indexed CER pricing basis EUA are risky
 - Long term EUA and CERs correlation is unlikely
 - If index cuts against buyers, risk of buyer default and/or coping with a buyer bankruptcy
 - If index cuts against sellers, you have not protected downside and risk of project failure and/or default
 - If pricing differentiates too greatly in either direction one party will suffer and contract could fail
- CER ERPAs can be structured to appropriately allocate shared risks/benefits but it takes experience, solid counterparties and creativity.
- It is optimal for sellers to secure a minimum revenue stream with the potential for profit sharing should CER market value increase



Natsource at a Glance

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 - New York
 - Ottawa
 - Washington, D.C
- **South America**
 - La Paz

Corporate Focus

- Emissions Markets
- Renewable Energy Markets

Three Business Units

- Asset Management Services
- Transactional Services
- Advisory & Research Services



Natsource Asset Management

- World's Largest Private Sector carbon asset manager.
 - Over half a billion Euros between GG CAP and Managed Accounts
- Investors from Canada, Japan, Europe and the USA
- Works in conjunction with other international carbon funds to create seamless transactions for “mega” CDM projects.
- Ability to support upfront PDD funding and feasibility work.
- Specializes in Flexible Structures including;
 - Pre-payment for CERs
 - Contracts with guaranteed minimum pricing
 - Upside market price profit sharing



Natsource GG CAP Participants

Over US \$600 Million Buying Power

- The Chugoku Electric Power Co., Inc.
- Cosmo Oil Co. Ltd.
- Electricity Supply Board (Ireland)
- Endesa Generacion
- E.ON UK
- EPCOR
- Hokuriku Electric Power Co.
- Hokkaido Electric Power Co., Inc.
- Iberdrola
- Norsk Hydro ASA
- The Okinawa Electric Power Co., Inc.
- Public Power Corporation S.A.
- Repsol YPF
- Sergey Brin
- Suntory Ltd.
- Tokyo Gas Co., Ltd.

GG-CAP's 26 participants have a combined market capitalization of more than USD\$300 billion



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