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What is the Carbon Market and How Will it Develop?

4th Climex Master Class

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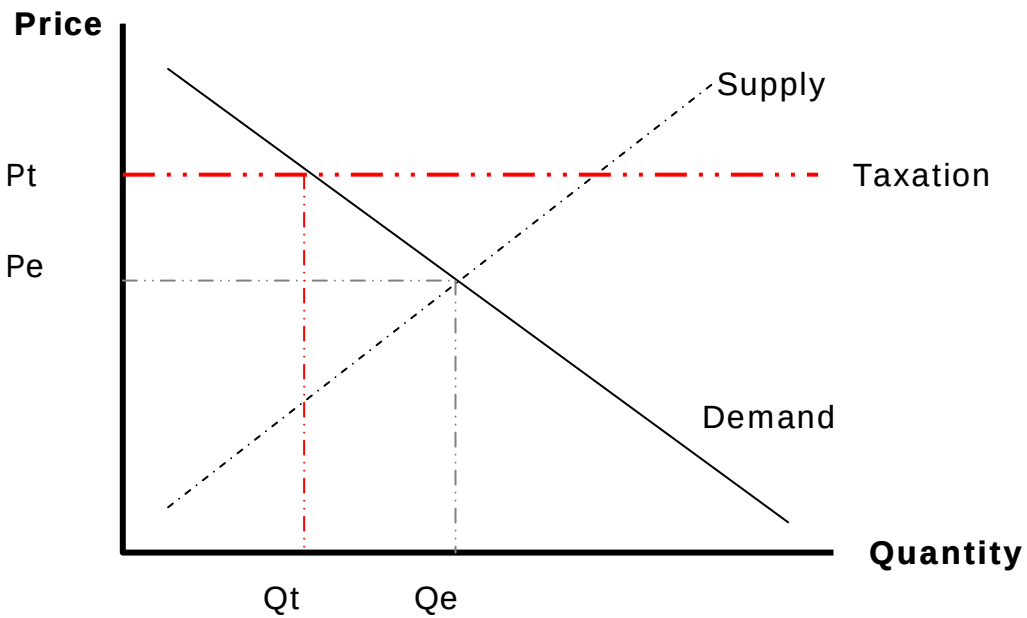
AGENDA

- Using market mechanisms to tackle climate change
- What are the instruments of the Carbon Market
- Crystal Ball 1: Demand for carbon credits
- Crystal Ball 2: Supply for carbon credits
- Themes we may see play out in the market
- What role does TFS play?

The Market Response to Climate Change

- Governments can drive private sector behaviour using **fiscal policy**
- In the climate change arena, the questions is "**At what level should taxes or subsidies be** to stimulate emissions reductions?"
- In addition, "What will the **cost to the economy** be?"
- **Unsuccessful** intervention can lead to **undesirable** outcomes



At Equilibrium, the quantity demanded lies at Qe

Following the introduction of taxation the quantity demanded falls to Qt, yet the price rises to Pt

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The Market Response to Climate Change

- The alternative for Governments is to allow **free markets** to determine the price of carbon
- Governments need only set up the correct framework for market mechanisms to operate, **leading to liquid active markets**
- If successful, the result will be the **greatest reductions at the lowest cost** to the economy as a whole
- We have the Kyoto Protocol and specifically the EU ETS, a **politically** conceived, **market-based** solution to an **environmental** problem

Main Types of Carbon Credits

ALLOCATED

- European Union Allowance (EUA)
  - **Allocated** by European governments to local industry, **not** linked to projects
  - Used in the EU ETS

PROJECT-BASED

- Certified Emissions Reduction, (CER)
  - **Non-Annex 1**; used for compliance in cap and trade schemes
- Emission Reduction Units (ERU)
  - **Annex 1**; used for compliance in cap and trade schemes
- Voluntary or Verified Emissions Reduction (VER)
  - Voluntary action, **no formal interaction** with compliance mkt

Different forms of CERs

PROJECT-BASED

- Primary CERs (pCER)
  - Contracted for **forward delivery**, i.e. 2008 – 2012
  - Usually purchased directly from project owner on **off-take basis**
- Issued CERs
  - Can be considered a **"*spot*" CER -** Fully fungible for compliance
  - Issued into registry account by EB once verification is complete
- Secondary CERs (sCER)
  - **Credit rated entity** sells on a guaranteed basis
  - No project performance risk – **only credit risk on the seller**
  - Contracted for **forward delivery**, i.e. 2008 – 2012
  - Priced off EUA contracts though increasingly becoming **dislocated**

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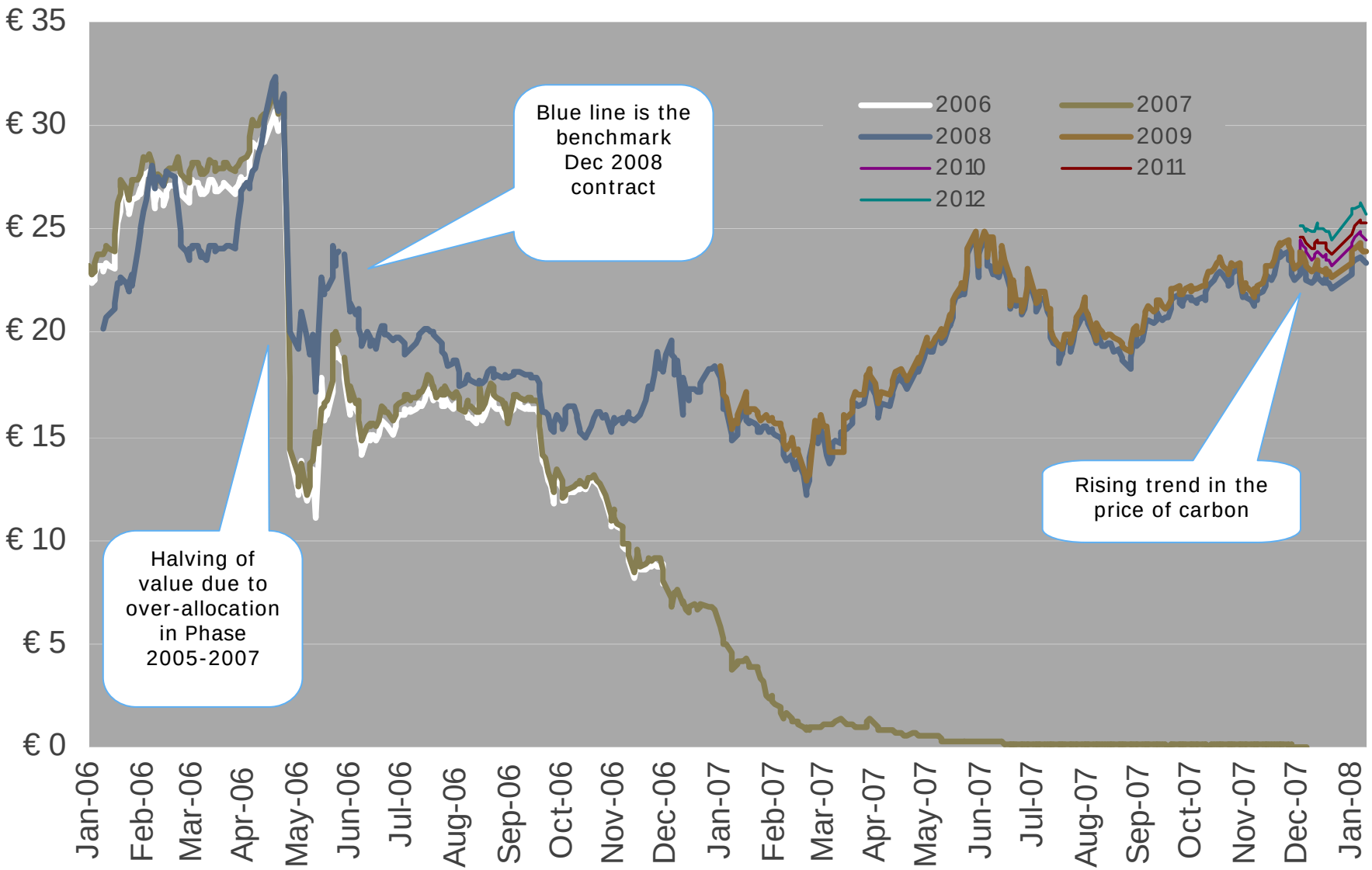
EU Allowance Pricing History



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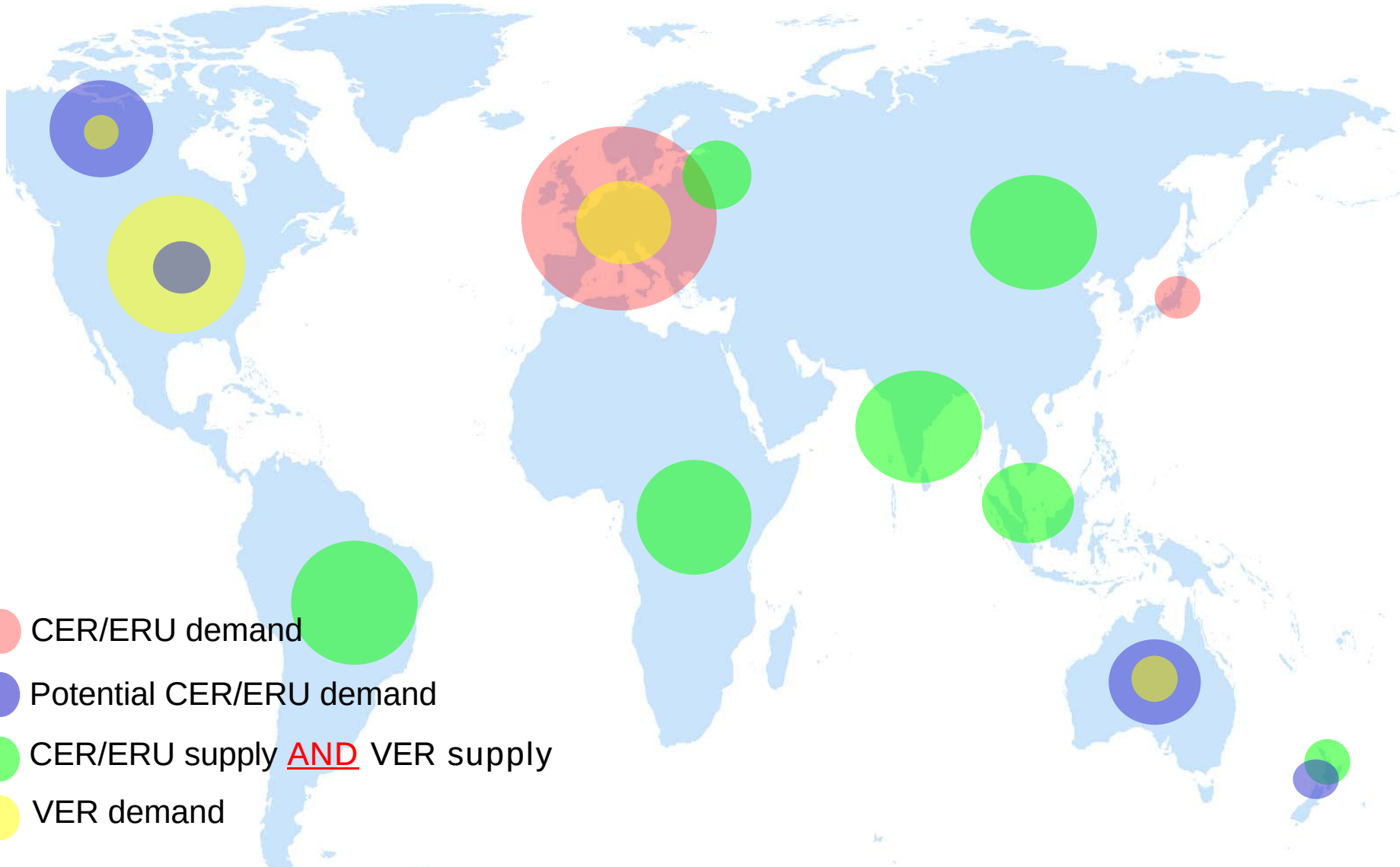
Global Demand and Supply of CO_2

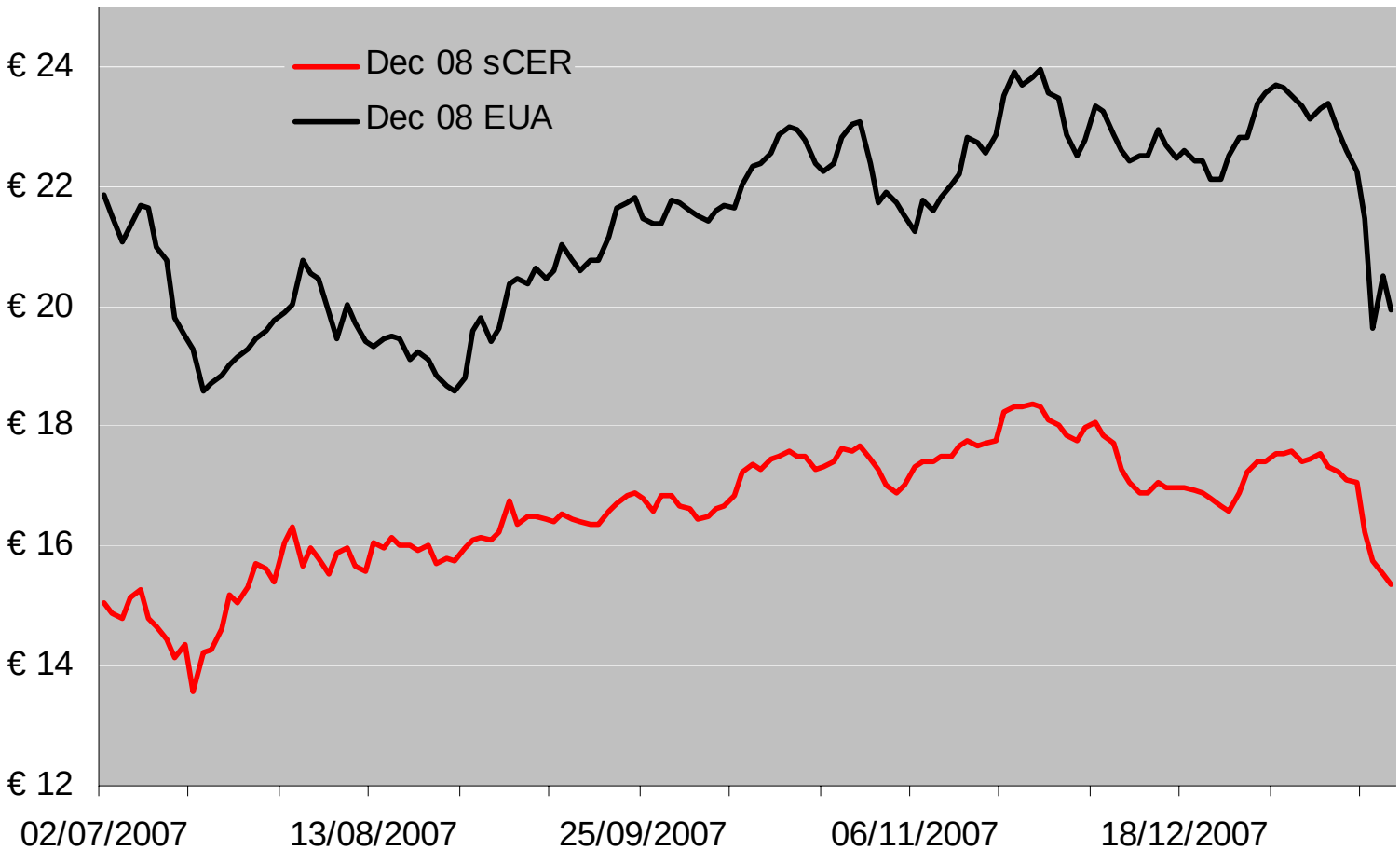


Overview of Demand for Carbon

- Kyoto Protocol – Europe, Japan, New Zealand, Canada
  - Caps on emissions finalised for 2008-2012, Bali Roadmap Post-2012
- European Union Emissions Trading Scheme (EU ETS)
  - European countries with a caps until 2012, commitments post 2012
  - National burdens **devolved** to heavy industrial emitters, airlines
- Voluntary Market – Europe/US
  - Corporates/ individuals offset emissions for marketing/ **social reasons**
- Regional/ National Schemes - US and Australia
  - **Proposed use of international carbon credits** for caps on local industry

EUA and Secondary CER Pricing

Indicative Price for Secondary CERs and EUAs



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Why did this happen?

Demand for Carbon: EU ETS

- The draft ETS review provides detail to the 2 scenarios post 2012
  - Kyoto replacement: 30% reduction by 2020
  - No Kyoto replacement: 20% reduction by 2020

- The pessimistic scenario – 20% cut – equates to roughly 1,800mt annual cap in P3, vs. 2,000mt in P2.

- There will also be full bankability from P2 to P3, hence the current EUA price should reflect the market dynamics of P3

- Supplementarity cap for P2 will apply to P2 AND P3
  - 1,400mt cap for 13 years not 5 years

Demand for Carbon: EU ETS

- If the ETS will have a greater short, with fewer CERs allowed over the 2 phases, this should be bullish EUAs in P3
- Due to 100% bankability, P2 price should reflect this
- So why did prices fall? Carbon market is part of the global economy and the sell off in international markets affected carbon as much as stocks or commodities
- The fundamentals remain strong for both EUAs and CERs – as we will see later

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Who was President of the United States at the time of Kyoto?

Who will be President of the United States at the time of Kyoto ratification

Demand for Carbon: United States

- No Federal support for Kyoto…**yet!**
- Many states have **already committed** to emissions reductions
- There are regional programs in the East and West
- **Lieberman – Warner** bill is the most well known of several Federal climate change bills on the table
- Thought he most well known, L-W is not necessarily reflective of what an eventual Federal system will look like

Demand for Carbon: United States

- Difficult to estimate shortfall given **little legislative guidance**
- Range is between **400mt and 500mt to 2012** and **700mt and 1,750mt by 2020** for the different bills
- Importantly, L-W **does NOT allow for international offsets**, but does allow for international allowances.
- It is likely that CERs will be allowable caps will be tight as **Americans want American** offsets
- Also, there are **quality concerns** about CERs

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Demand for Carbon: Australia

- Rudd Government **ratified** within hours of coming to power in Nov ’07
- Stated commitment to meet Kyoto target of **+8% of 1990 level** in addition to an internal target of **-60% of 2000 level by 2050**
- Climate Change Minister made recent comments that the Australian system will **“enable international linkages”**
- Extent of linkages is **unknown**
- To meet the Kyoto target, carbon demand will be **low**, though meeting 2050 target may lead to **demand growth**

Demand for Carbon: Japan, Canada, NZ

- **Japan** has a very high cost of abatement and is having difficulty meeting its Kyoto target
- Industry relatively efficient and Govt is **unsure on post 2012 caps**

- Canadian **unlikely to meet Kyoto target**
- Draft Climate Change Action Plan aimed to begin in 2010-2020
- Caps international credits at 10% - **CER demand will be low**

- **New Zealand** has set out to approved several JI projects
- But NZ may be short and hence could be an **ERU seller and CER buyer**

Supply of Carbon: CERs

- CERs from Registered or "Requesting Registration" projects = 1,200mt and pipeline supply projects to be 2,600mt giving a total of **3,800mt to 2012**[1]

- Risk Adjusted by 25%-50% = **2,850mt to 1,900mt**

- CER cap is roughly **1,390mt to 2020**, given no Kyoto replacement

- Demand from US, Japan, Canada and Australasia is difficult to estimate without rigorous analysis

- Back of the envelope calculations show a **low likelihood of an oversupply of CERs**

1. UNFCCC

Voluntary Carbon Market (VCM) Demand

- VER demand **continues to grow**, climate change in the public's mind
- Strong **corporate and retail climate change actions** across Europe with US, Japan and Australia also responding
- However, bad press has led to some scepticism and **reputational risk** is a major concern for companies
- Increased activity from **banks and trading houses**, not just end-users buying through off-setters
- Hard to see VCM buyers looking for CERs and volumes are low so there should be **limited impact CER demand**

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Voluntary Market Supply

- Pre-CDM VERs: currently the **main source of VERs**
- Small scale: often rural, **low volume** and no Approved Methodology
- Non-Kyoto countries: ERs from countries that have **not ratified Kyoto**
- Forestry VERs: key area where the voluntary market can take the lead
- Given the opportunity, developers will go through CDM and access **higher pricing**
- Main supply is from developers monetising non-compliance ERs (pre-CDM/ JI) so supply **will not adversely affect CDM**

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Consolidated view

- Despite supplementarity caps from the EC, risk adjusted supply should meet European, Japanese and American demand
- With rising coal prices, the EUA price will better reflect the cost of fuel switching and drive generation towards non-coal sources
- All market systems need a linkage to provide a global carbon price and hence drive international capital to the lowest cost abatement solution
- CDM at a crossroads: the glue of a truly global carbon market or the rejected child of the fragmented carbon market?
- Protectionism: Stifling a global market or driving behaviour to internal abatement?

Future themes to consider

- Clean commodities in the US
  - Supplying a CER with every ton of coal, aluminium; cross commodity market
- ETS cut in supplementarity
  - Real stance or bargaining tool or a multilateral post-Kyoto agreement?
- Forestry in the carbon market
  - Is there life for LULUCF without acceptance into ETS; is it only for the VCM
- Mobilising African CDM
  - Huge capacity to provide LULUCF credits but will there be a market
- China & India as Annex 1 countries?

About TFS

TFS is an **international commodities broker** in energy, finance, and emissions, and is part of one of the three largest brokerages in Europe.

TFS has been awarded **numerous awards** by the industry:

- In 2007 TFS was ranked 1st in Europe CERs Brokerage by Energy Risk.
- TFS was voted Energy Broker of the Year in the Commodities Now awards in 2005 and 2006, and won the Silver Award in Emissions Markets in 2005

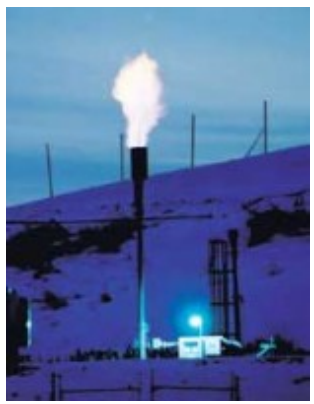
- TFS has also received an unprecedented 14 Winner or Runners Up awards in the 2007 Environmental Finance Awards

What role does TFS play?

- TFS offers:
  - Buyers **access to projects and credits** through our wide supply side coverage
  - **Marketing** of projects to a wide range of Buyers to get “market pricing”
  - **Guidance** on project development and referrals to local experts in technical and project development
  - **Negotiating** of the ERPA between the Buyer and the Seller
  - TFS **does not invest or trade in credits**, we are an **independent** market intermediary regulated by the FSA in London

- TFS provides Buyers and Sellers access to the Market efficiently
  - Relationships established **over 20 years**
  - Buyers from Europe, Japan and the United States, managed by international TFS offices with **20 Emissions Specialists**
  - Key clients including **investment banks**, regional/national financial institutions, **carbon funds**, **hedge funds**, state utilities & energy traders

TFS' experience in CDM



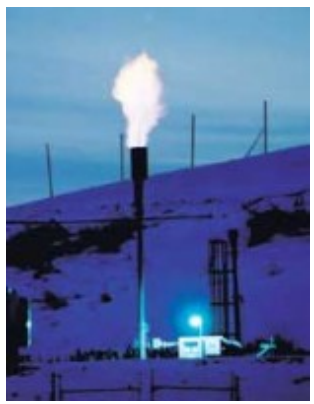
TFS' portfolio of CDM projects includes:

- Wind farms usually 50MW in scale
- Biomass co-generation using different feedstocks
- Small-scale hydropower <20MW
- HFC and N2O industrial chemicals
- Coal mine methane
- Animal waste management (pig farm)
- Methane flaring and energy generation from Landfills
- Waste heat to power for steel, cement works
- Energy efficiency

Examples of recent projects transacted:

- Several Chinese windfarms generating >2m CERs between the leading utilities in China and the U.K.
- Chinese nitrous oxide project in generating around 2m CERs
- Indian 7.5 MW biomass project generating 250k CERs

TFS' experience in VERs



TFS has a dedicated team covering VERs globally

Examples of recent projects transacted:

- 60k VCS VERs Bundle of Chinese renewable energy projects
- 20k VER+ VERs from an Indian industrial project
- 40k VCS VERs from an Indian biomass project
- 70k Gold Standard VERs

Thank You

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