

Carbon Finance

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risk intelligence

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- Climate change is occurring and threatens the balance of....
 - ... ecosystems
 - ... human society
 - These changes are caused partly by anthropogenic GreenHouse Gas emissions
 - Urgent global emission reduction is needed
 - That can be done by **Regulating / controlling** → **Kyoto protocol**
 - Establishment of flexibility mechanisms to facilitate the realization of the objectives
 - The majority of the European commission members were against the introduction of a trading system within the Kyoto protocol...
 - ... but it was finally established under the pressure of USA:
- Creation of an international carbon finance market**
- Establishment of a European market (European Union - Emission Trading Scheme: EU-ETS)
 - Followed by other key events...
 - IPCC Report/ Al Gore Nobel Prize about the global climatic crisis (2007)
 - 2009: US President Obama calls for a market-based cap-and-trade program
 - May 2009 adoption of the American Clean Energy and Security Act 2009 → US Cap and Trade?

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The Kyoto Protocol

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Focus on European Markets



The Kyoto Protocol

Presentation

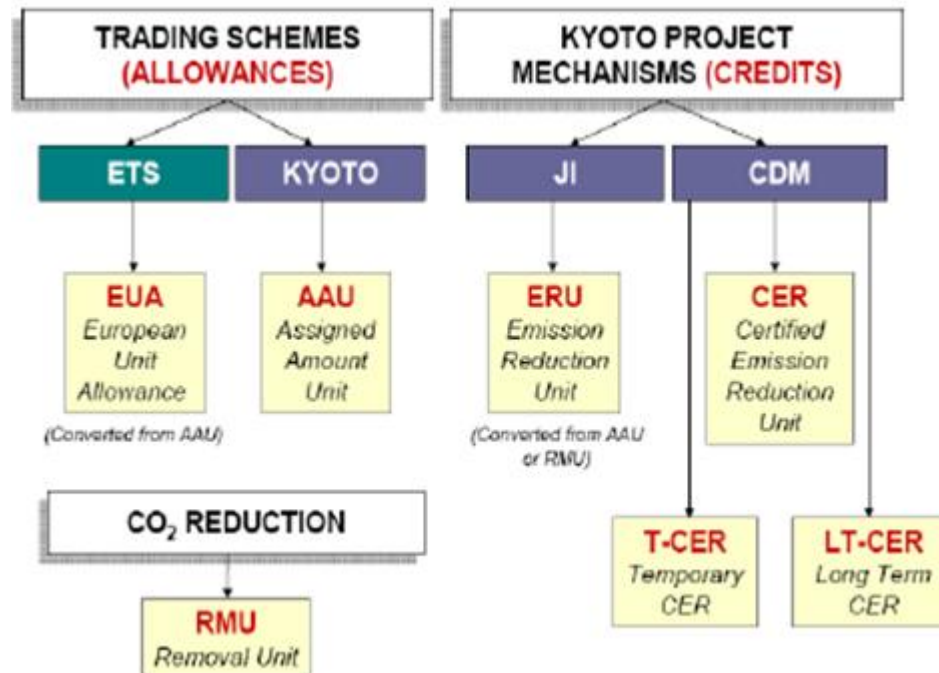
- The Kyoto protocol requires governments worldwide* to reduce greenhouse gases by 2012.
- Reducing global GHG emissions to limit the dangers of climate change is one of the most important goals of the Kyoto protocol. In doing so, the Kyoto Protocol intends to set a price on GHG emissions and define three **flexibility mechanisms**:
 - Emission allowance trading
 - Countries can trade in the international carbon credit market to cover their shortfall in allowances. Countries with surplus credits can sell them to countries with capped emission commitments under the Kyoto Protocol.
 - Emission allowance trading allow Assigned Amount Units (AAU), which are tradable.
 - Clean Development Mechanism (CDM)
 - Developed countries can 'sponsor' a greenhouse gas reduction project in a developing country (where the cost of greenhouse gas reduction project activities is usually lower), such as moving away from oil and increasing energy efficiency.
 - CDM projects** allow Certified Emission Reductions (CERs)** credits, which are tradable.
 - Joint Implementation Projects (JI)
 - Developed countries with relatively high costs of domestic greenhouse reduction invest in emission reduction projects in another developed country as an alternative to reducing emissions domestically.
 - JI allow Emission Reduction Units (ERU)



*Countries outside annex B do not have commitments

**CDM can be traded or used by annex 1 countries

The Kyoto Protocol

Allowances and Credits

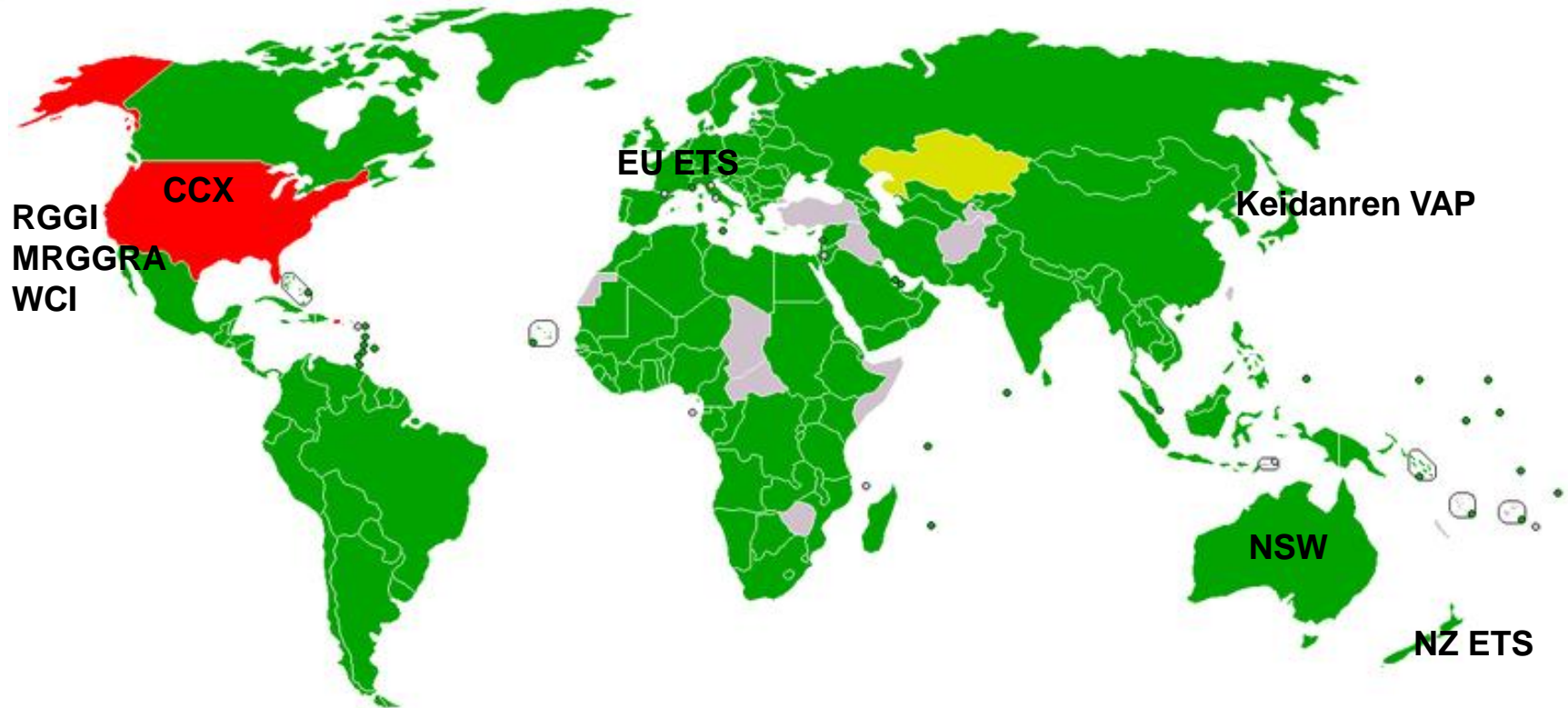


-  Flexibility mechanism
-  Exchange Community system of European Quotas

Source: Caisse des Dépôts (French register of GHG emission quota and credits control)

The Kyoto Protocol

The Kyoto Area and Local Initiatives



Protocol ratified

Protocol signed and under ratification

Protocol signed & ratification refusal

Non signatory countries

The European Example

Cap & Trade System

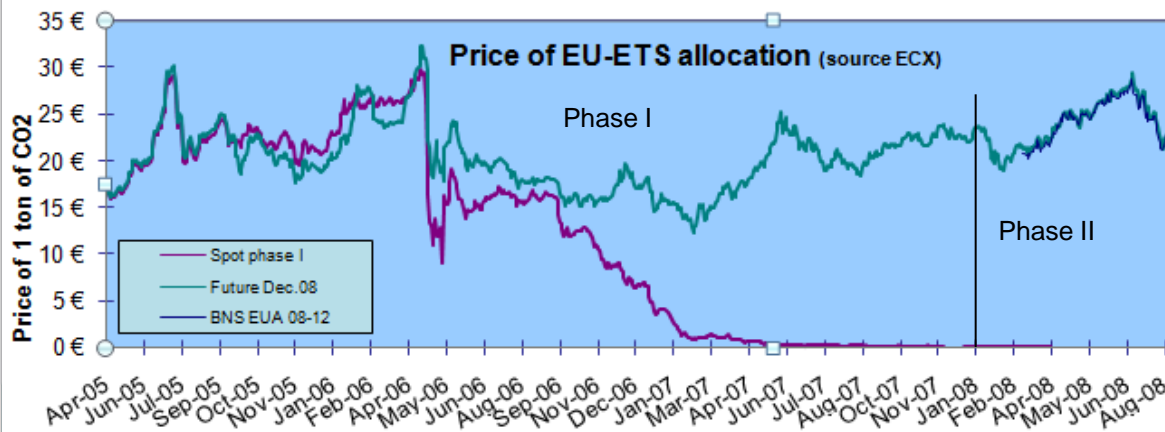
- The European market
 - European Union - Emission Trading Scheme (EU-ETS)
- Learning from practice: 2 phases + ...
 - Pilot phase (2005-2007)
 - Kyoto phase (2008-2012)
 - Post-Kyoto (2013-2020)...
- The system is based on the Cap&Trade principle:
 - The fixed limit (*cap*, total number of allowances available)
 - The price (*trade*) which has to be an incentive

Aim: to prompt companies to invest in clean technologies
- The efficiency of the quota trading system in reducing global emissions depends on both limit (*cap*) and price (*trade*) level.
- The annual compliance can be done by:
 - Emissions reduction
 - The purchase of European Allowances (EUA) to other installations
 - The purchase of emissions credits from flexibility mechanisms

Cap and Trade:

Based on a country's total allowance of emissions, as capped by the Kyoto Protocol, markets allocate companies' emissions at a given threshold, and charge them if they exceed it.

Companies that have emission units to spare - emissions allocated to them but not "used" - can sell these to businesses that have exceeded their limits.



- The difficulty...: to provide an incentive.
Price must be higher than investment cost, but a cap too high (excess of allowances) makes prices decrease (cf. April 2006)

The European Example

Zooming in on the Recession

- In 7 months, the spot EUA price declined from €28.73 in July, to €7.96 in February.

Principal Cause: Economic Crisis

- Decline of the production of big industries: less CO₂ emissions = excess of quotas
- Some companies sold their quotas at this point to increase their liquidity
- Correlation between carbon market and oil market (and other commodities)

→ Unbalanced supply and demand

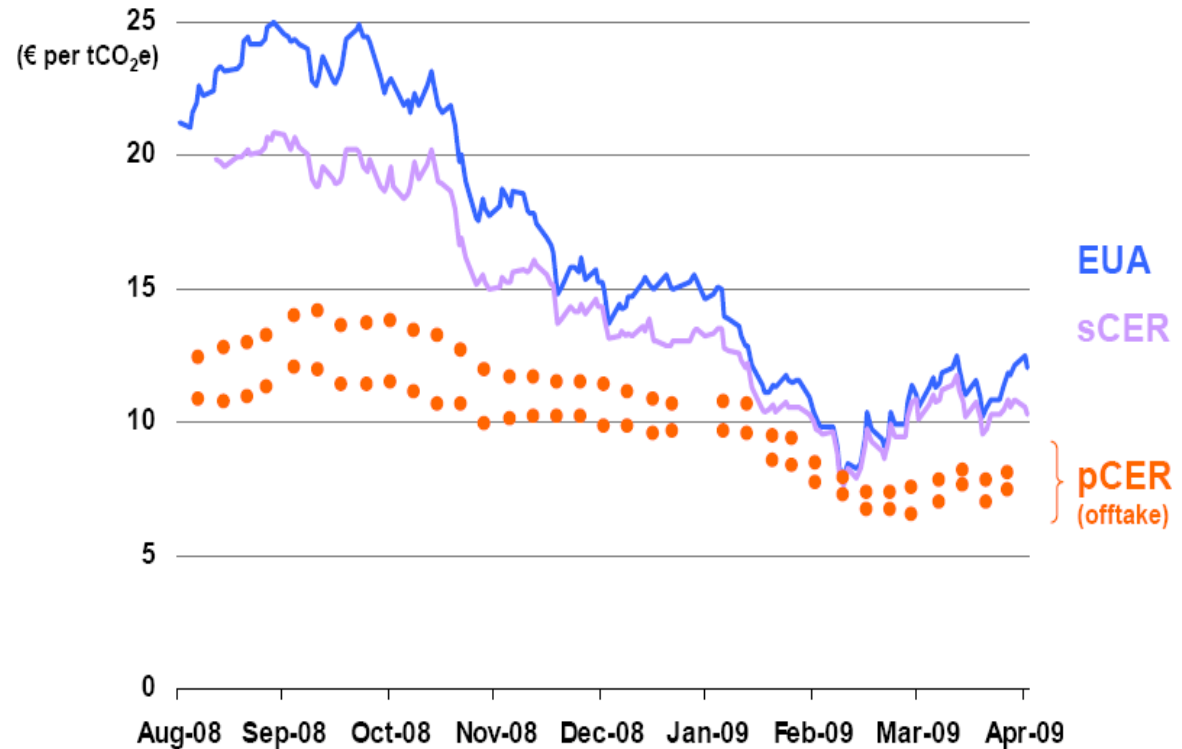
Second Cause:

2008: First Year of the Kyoto protocol:

Companies received more allowances than needed for compliance

For the first phase the allowances were allocated for free.

Figure 1: Carbon Prices Respond to the Recession



Source: The World Bank, *State and Trends of the Carbon Market 2009*

The European Example

Major European Markets Places

- **ECX/ICE - European Climate Exchange /Intercontinental Exchange**
 - Located in the United Kingdom
 - Listed products
 - EUA and CER futures and options
- **EEX – European Energy Exchange**
 - Located in Germany
 - Listed products and OTC
 - EUA and CER futures and forwards
- **Nord Pool**
 - Located in Norway with subsidiaries in Germany, Sweden, Finland, Denmark
 - Listed products and OTC
 - EUA and CER futures and forwards
- **BlueNext**
 - Located in France
 - Listed products
 - EUA and CER spot and futures
- **Nymex Green**
 - Located in the United States
 - Listed products
 - EUA and CER futures
 - EUA and CER European options

The European Example

Carbon Related Financial Products

List of tradable carbon related financial instruments:

- **Futures**
Purchase or selling at term of quotas on a listed market
- **Vanilla Options**
Right to purchase or sell an underlying at a certain price
- **Spreads**
Differential between two underlings
- **Swap**
Exchange of two underlyings. In fact, the exchange concerns the differential value at term.
- **Forwards**
Purchase or selling at term of an underlying on the OTC market
- **Forwards prepaid**
Purchase or selling of Forwards + financing: instead of getting paid on time when the quantity is effectively delivered, the seller wants to be paid immediately (- the financial cost which includes the money cost and the credit spread risk)

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Voluntary Carbon Markets

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Focus on American Markets



Voluntary Carbon Markets

Presentation

- A voluntary carbon market is intended for companies and organizations that want to compensate for their own emissions of CO₂.
- Voluntary markets do not enter in the framework of the Kyoto protocol and are not yet standardized
 - Voluntary for States / Constraint for Industries within Voluntary States
 - Voluntary for Industries not within Voluntary States
- Verified Emission Reductions (VERs) are tradable emissions reduction units that meet voluntary standards, such as the Gold Standards and the Voluntary Carbon Standard, which are not compliant with the Kyoto framework.
 - Both CERs (Kyoto Protocol) and VERs have market value and are consequently tradable, although VERs are not interchangeable with CERs or any Kyoto quota.
 - In response to these initiatives, carbon funds are expanding to finance these projects, creating a growing new industry.
- Unlike the Kyoto markets or the European market, voluntary market buyers do not have emission reduction constraints and buy carbon credits essentially for ethical or corporate image reasons.
- Voluntary markets are not regulated like others markets and rules can vary.

The American Example

Which system?

- Since the USA refusal to ratify the Kyoto protocol in 2001, they have been judged as laggards in comparison with the international level of fighting climate change.
- Despite the lack of action taken at a federal level (until the election of President Obama in 2009), many initiatives have been taken at a State level.
- The United States managed to build the necessary basis for the establishment of a national market of emission allowances.

- Very active private sector:
 - Set up in 2003, the **CCX (Chicago Climate Exchange)** is the first emission quota exchange platform based on voluntary participation. Each member has emission tradable quotas allocated and can exchange them to reach compliance objectives.
 - Launched in 2007, **TCR (The Climate Registry)** proposes to standardize the measures and verifications of GHG emissions methodologies. The objective being to homogenize the reporting and to constitute a data bank usable in the framework of futures national plans.
 - Created in 2007, the **USCAP, « United States Climate Action Partnership »**, was the first coalition of big businesses and NGO to pressure Congress to set up a restrictive emission allowance system.

- A public sector on the march:
 - In 2005, **The World Mayors & Local Governments Climate Protection Agreement** suggested that at least 141 municipalities respect the Kyoto objectives (884 mayors signed this agreement in October 2008.)
 - States established their own regulations (California, Florida...). In September 2006, California created the first American law to reduce GHG emissions. The **California Assembly Bill 32** (AB 32) requires a reduction of its GHG emissions from their 1990 level by 2020.
 - Several regional partnerships have set up future emissions trading markets (**WCI, RGGI, MRGGRA**)
 - Many bills have been submitted to the House of Representatives (**Climate Stewardship Act, Safe Climate Act...**), setting the basis of a future restrictive federal regulation .
 - In May 2009, the House of Energy and Commerce Committee adopted the American Clean Energy and Security Act 2009 based on the Waxman and Markey proposal.

The American Example

American Regional Partnerships

	RGGI	MRGHGRA	WCI
Launching date	January 2009	May 2010	January 2012
Participants	10 member states + 7 observers (USA et Canada)	8 member states (with 1 Canadian) + 4 observers	11 member states (with 1 Canadian) + 13 observers
Perimeter	Electricity producers > 25MW (fossil fuel)	Multi sectors	Multi sectors emitting > 25Kt CO2
Objectives	Emission stabilization at 170Mt from 2009 to 2014 then 10% more to 2019	Reduction from 60 to 80 % by 2050 compared to 2007	Reduction by 15% by 2020 compared to 2005
Emissions Allowances	Yes (Obligation to exchange it to at least 25%)	-	Yes
Compensatory credits	Yes (3.3% maximum)	-	Yes (49% maximum)
Kyoto credits (CER)	Yes	-	Yes

RGGI: Regional Greenhouse Gas Initiative

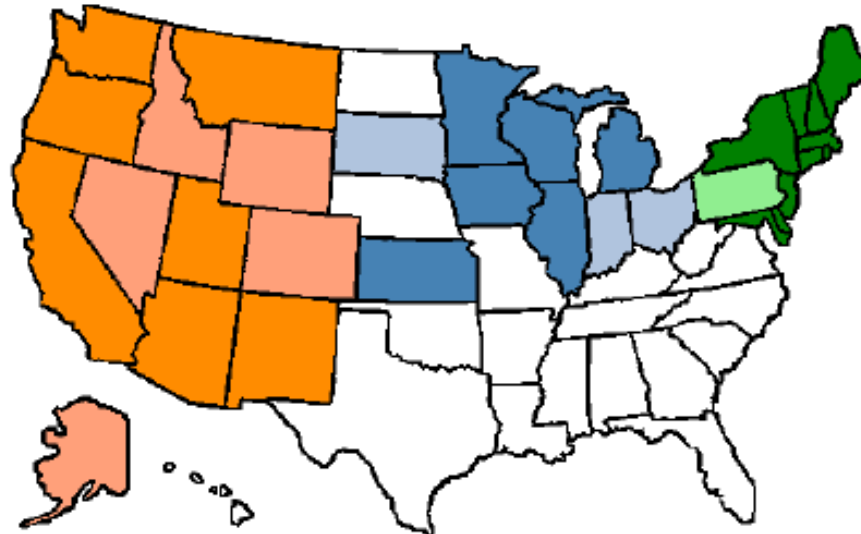
MRGGRA: Midwestern Regional Greenhouse Gas Reduction Accord

WCI: Western Climate Initiative

The American Example

American Regional Programs

States taking part to the regional programs of GHG reduction



- Regional Greenhouse Gas Initiative RGGI
- RGGI Observer
- Midwestern Regional GHG Reduction Accord
- MRHGRA Observer
- Western Climate Initiative
- Western Climate Initiative Observer

Source : Pew Center on Global Climate Change.

Voluntary Carbon Markets Around the World

Cap & Trade Initiatives

- Other Cap&Trade systems came to the forefront, proposing exchangeable compensation mechanisms and new credit unities.
 - In Japan, the **Keidanren Voluntary Action Plan (VAP)**:
 - The pilot trading system will enable the companies to reach their objectives notably thanks to the use of emission credits from the Kyoto protocol (CER, ERU...)
 - October 2008, launch of the trial domestic scheme (bringing together the VAP and the Japan-Voluntary Emissions Trading Scheme (J-VETS))
 - In New Zealand, the **NZ ETS**
 - The New-Zealand trading system, is quite like the Kyoto protocol functioning. It proposes, with certain restrictions, NZU allowances (NZ units) to restore at every end of period. The interest of the market is its large opening to other systems via the credits equivalences.
 - In Australia, the **NSW**
 - Concerns different economic sectors and a different type of action: GHG reduction, energy efficiency...
 - Units created: NSW greenhouse gas abatement certificates or NGACS
 - Proposed in March 2009, **Australian Carbon Pollution Reduction Scheme (CPRS)**, an emission trading scheme, starts in July 2011

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The Future of Carbon Markets



Industrialized Countries' Commitment

Post-Kyoto Horizon

Industrialized Countries' Carbon Emission Reduction Commitments at Post-Kyoto Horizon:

(The biggest polluters are USA, China and Europe)

● USA

- In favor of reducing their emissions by 2020 to their 1990 level (~ **15%**)
- A reduction of **80% by 2050**

● European Union

- “**Three 20**” by 2020: emissions reduction by **20%** below 1990 levels, 20% of renewable energy, 20% of energy efficiency improvement
- **EU** will increase its objective to **30%** if other industrialized countries make similar efforts.
- UK has adopted a carbon budget to reach **34%** of emission reduction by 2020 compared to 1990 levels and 80% by 2050.
- Germany has estimated a 40% CO2 emission reduction by 2020 compared to 1990 levels

● Russia

- Objectives aren't currently established

● Japan

- Objectives to reduce carbon emission by 15% by 2020 in comparison with 2005 levels.

● Canada

- Its objective is to reduce emissions by **20%** in 2020 in comparison to 2006 levels,
- and by **60-70% by 2050**

● Australia

- An objective of **5%** emissions reduction by 2020 compared to 2000 levels
- And by **15% by 2020** in case of an ambitious agreement concluded in Copenhagen

Industrialized Countries' Commitment

Focus on the United States

All eyes on USA...

If the Waxman and Markey Bill is adopted by Congress at the end of 2009...

- What is to be expected from the text?
 - A federal Cap and Trade
 - The submitted industries will have to pay 15% of CO2 quotas during the first few years. This will increase progressively up to 100% in 2020-2030.
 - Compensation mechanisms will be accepted
 - With possible links with other systems like the European EUA (not in the near future)

Which impact...?

- Copenhagen

The United States will have a strong influence on the negotiations of Copenhagen (December 2009) for the preparation of Post-Kyoto (190 countries will have to find an international agreement to succeed with the Kyoto protocol).
- Global carbon market

The US / UE links predicted by the Waxman and Markey Bill could be the basis of a **global carbon market**

Emerging Countries Carbon Emission Reduction Commitments at Post-Kyoto Horizon:

- **China**
 - Reduction by 20% of the energy consumption per home
 - China is predicted to quadruple its PIB between 2001 and 2010 by doubling their energy consumption...
- **India**
 - The Climate plan of last June recommends not fixing a cap on GHG emissions, but that emissions should never exceed wealthy countries' levels
- **Brazil**
 - Plans to reduce deforestation by half in 10 years to avoid the emissions of 4.8 billion tons of CO₂
 - Plans to increase energy efficiency and renewable energies

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OTC Conseil and Carbon Finance



OTC Conseil Expertise on Carbon Finance

- Our Service Offerings on Carbon Finance:
 - Services ranging from conducting opportunity studies to implementation for banks and companies
 - Setting up carbon trading desks,
 - Carbon funds or financing projects,
 - Risk measurement,
 - Arbitration or allocation tool between carbon, energy, commodities, ...
 - Assistance in new vehicles development: cartography, enquiries and awareness, synthesis and recommendations
 - Carbon assessment paired up with climate vulnerability analysis.
 - Corporate carbon management
 - Strategic marketing ("Carbon" products labelling, market centre, ..)
 - Assisting General Management, Finance Departments, Development Management, Sustainable Development Management, ...

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