



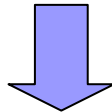
CO₂ Markets

Maria Mansanet Bataller

Motivation

- Climate Change Importance Increasingly
- Kyoto Protocol: International Response to Climate Change
- Flexibility Mechanisms

EMISSIONS TRADING



CARBON MARKETS



The presentation is organized as follows...

- Carbon Trading Origins.
- Carbon Trading in Europe : the EU ETS.
- Carbon Markets in Europe.
- Linking with UN Carbon Markets.
- Conclusion and final remarks



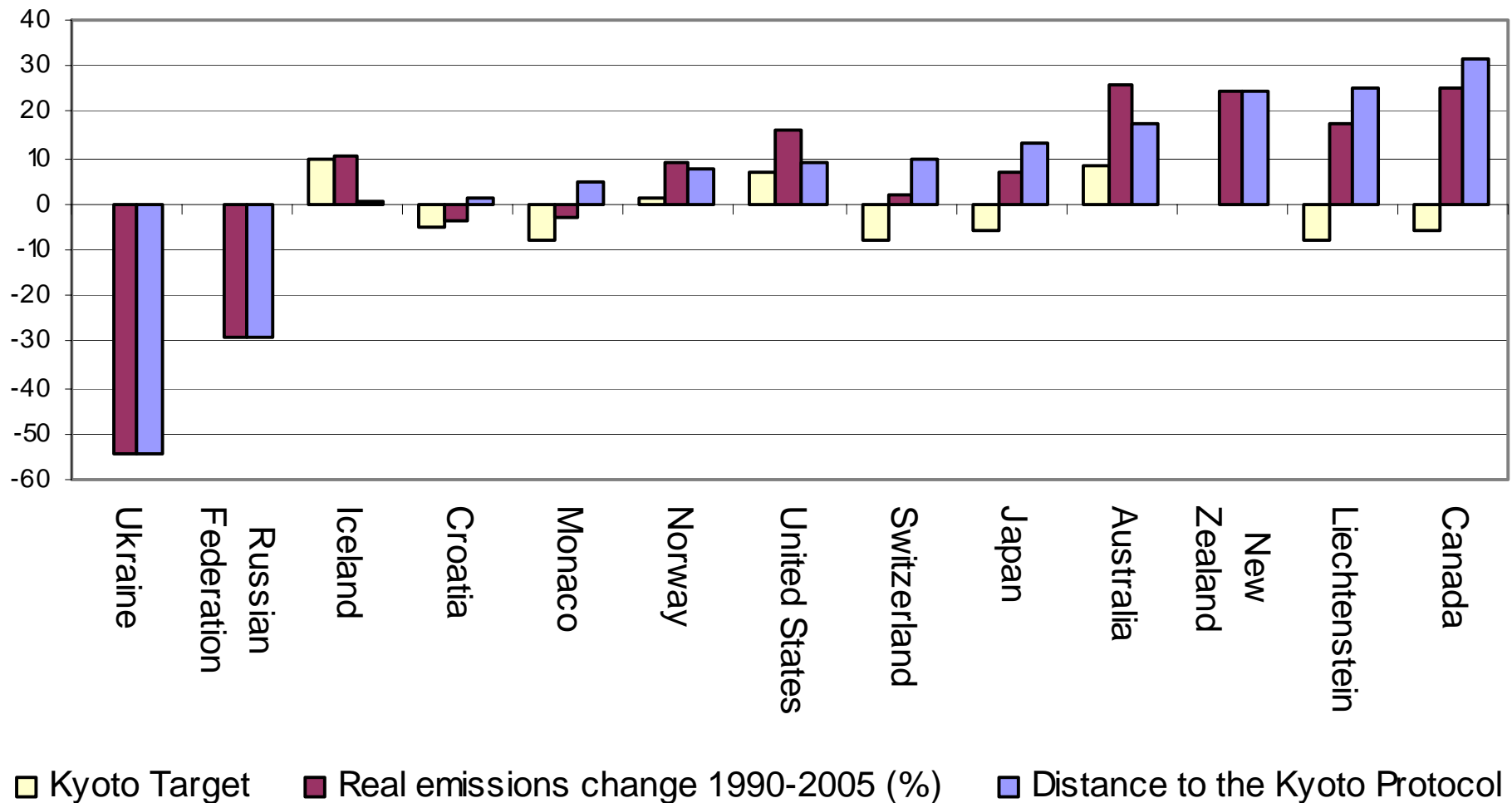
The presentation is organized as follows...

- Carbon Trading Origins.
- Carbon Trading in Europe : the EU ETS.
- Carbon Markets in Europe.
- Linking with UN Carbon Markets.
- Conclusion and final remarks

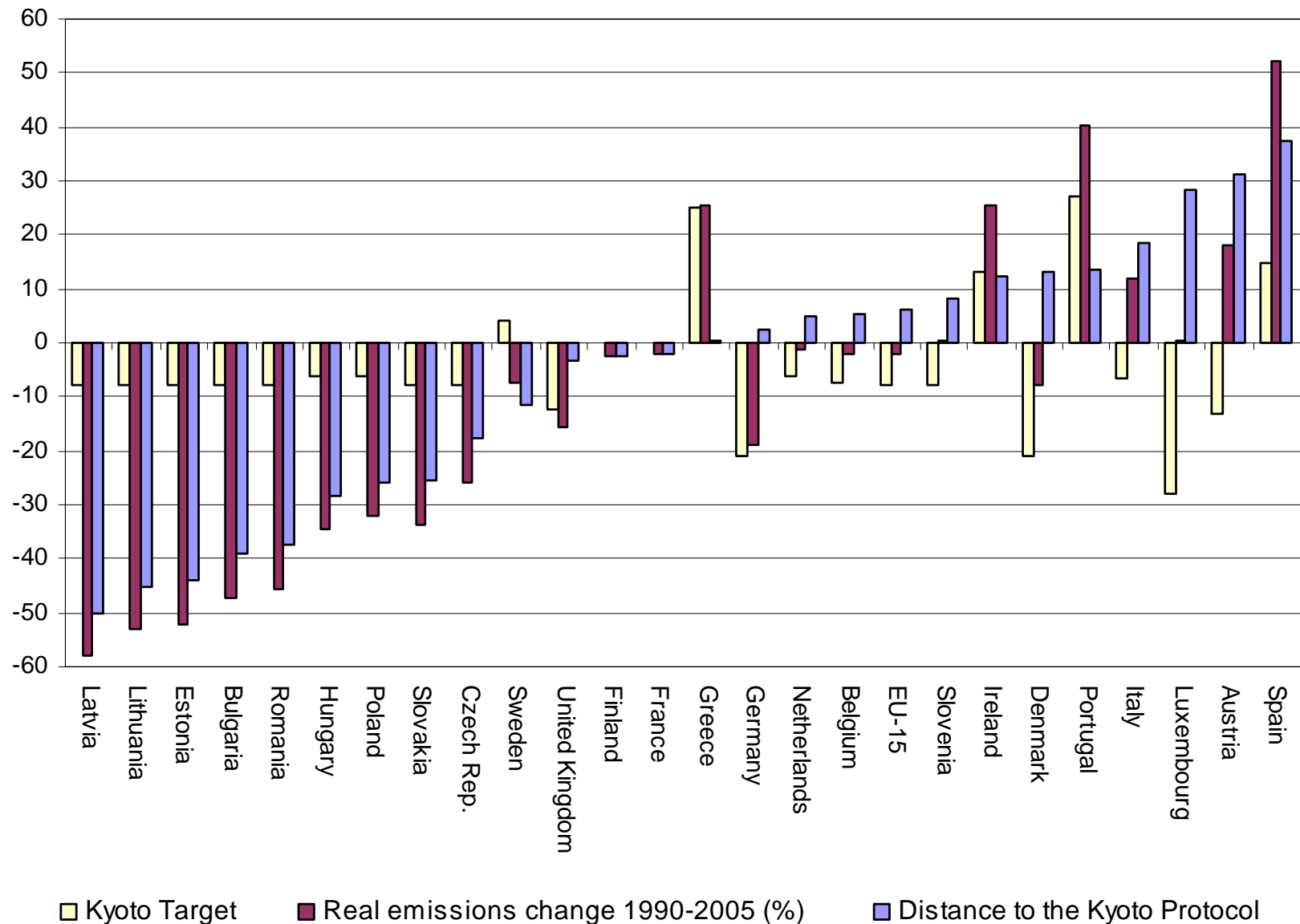
Origins of the EU ETS

- Kyoto Protocol (UNFCCC). 1997 & 2005
 - 55 Parts of the Convention including the developed countries representing 55% of their total emissions.
 - ↓ Global emissions by 5% from 1990.
 - Commitment period 2008 - 2012.
 - 6 GHG: CO₂, CH₄, N₂O, HFCs, PFCs, and SF₆.

Commitments by Country



Commitments in Europe





Kyoto Flexibility Mechanisms

■ Realization Emission Reduction Projects

□ Joint Implementation (art. 6)

- By an Annex I country in another Annex I country.
- Projects lead to Emission Reduction Units (ERUs).

□ Clean Development Mechanism (art. 12)

- By an Annex I country in a developing country.
- Projects lead to Certified Emission Reductions (CERs).

■ Emission Trading (art. 17)

Kyoto Objective 95% of the 1990 emissions

Kyoto Flexibility Mechanisms

JI

CDM

EMISSIONS TRADING

Linked to Eligible Countries
Registries

ERU

CER

Other Emission Trading
Schemes

EU ETS

EUA

Directives 2003/87/EC and
2004/101/EC

Trading sectors

Companies
Compliance

Non-trading sectors

Member
States
Compliance

Trade

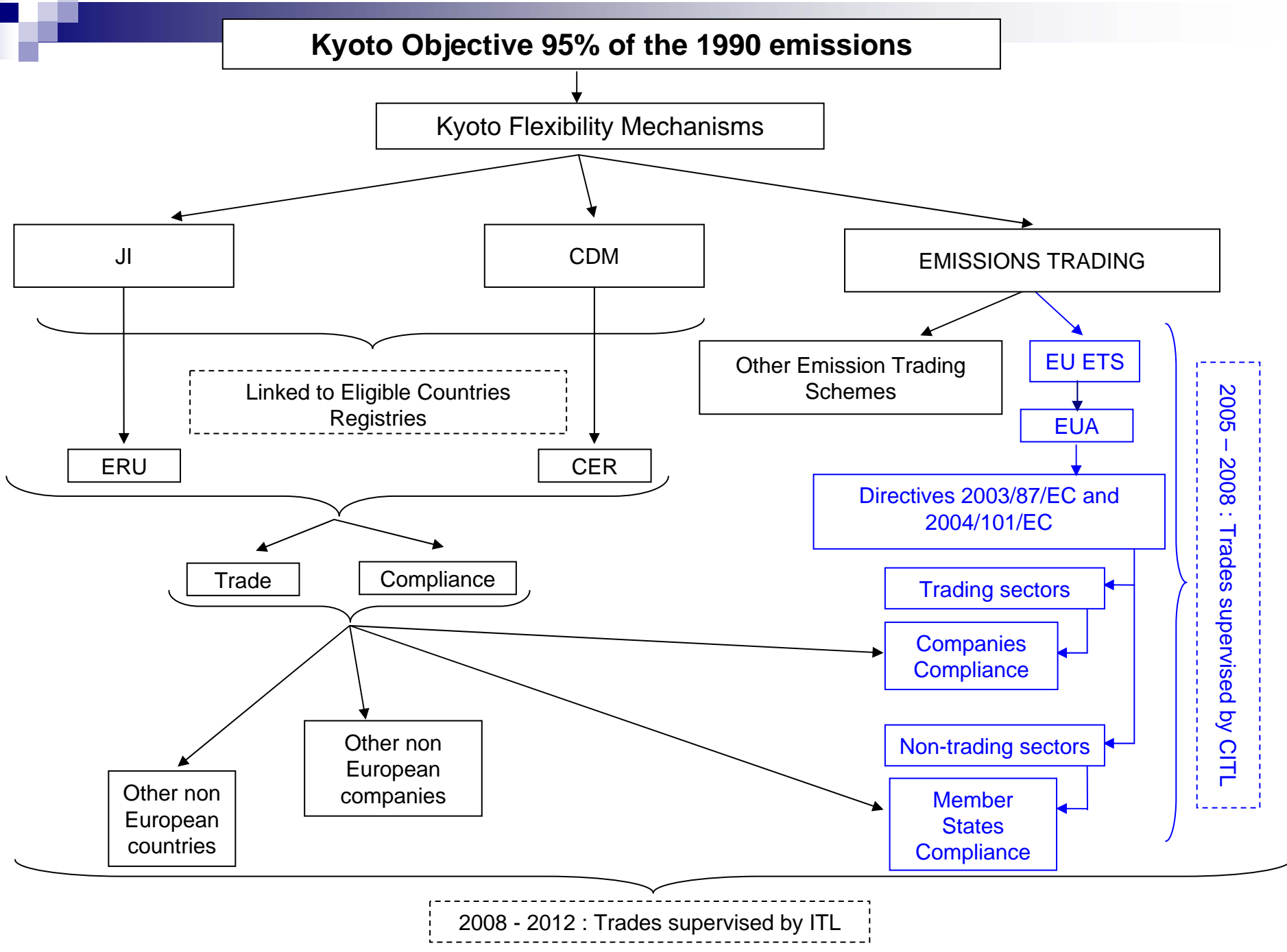
Compliance

Other non
European
countries

Other non
European
companies

2005 – 2008 : Trades supervised by CITL

2008 - 2012 : Trades supervised by ITL



Previous Allowance Trading Experiences

- SO_2 : USA, the Netherlands, Slovakia.
- *Reduce lead in petrol*: USA.
- *Renewable Energy Certificates*: Italy, the Netherlands, Sweden, UK, Finland, Denmark.
- *Quotas in fisheries*: New Zealand, Canada, Iceland, the Netherlands, UK, Denmark, Portugal, Italy.
- *Climate Change*: UK, Denmark.

The case of UK and Denmark

UK

- 03/2002 to 12/2006.
- 33 participants.
- Voluntary emission reduction targets against 1998-2000 levels.
- ▼ 3.96 million tCO₂-e.

Denmark

- Launched 1999
- 9 large emitters energy sector (30% total Danish GHG emissions)
- Cap and trade system
- Grandfathering allocation (reference period 1994 - 1998)
- Penalty : DKK 40
- Superseded by the EU ETS



The presentation is organized as follows...

- Carbon Trading Origins.
- Carbon Trading in Europe : the EU ETS.
- Carbon Markets in Europe.
- Linking with UN Carbon Markets.
- Conclusion and final remarks

EU ETS (2003/87/EC and 2004/101/EC)

- 1st January 2005.
- Phase I (2005-2007) and Phase II (2008-2012).
- It is the largest Emission Trading Scheme:
 - Over 11500 energy intensive installations
 - Close to 50% Europe CO₂ emissions).
- Supervisor : CITL
- Linked to UN Trading Scheme (CERs, ERUs).
- Sectors:
 - combustion plants, oil refineries, coke ovens, iron and steel plants, and factories making cement, glass, lime, brick, ceramics, pulp and paper.
- NAPs.

The NAPs

- Allowances allocated in total trading period, by sectors and by installations.
- Sectors covered and not by the directive
- 95% (90%) freely allocated Phase I (Phase II)
- Grandfathering
- Limit of CDM/JI as a percentage of total of allocated.

European NAPs

Member State	1st period cap (2005-2007)	2005 verified emissions	Proposed cap 2008-2012	Cap allowed 2008-2012 (in relation to proposed)	JI/CDM limit 2008-2012 in %
Austria	33.0	33.4	32.8	30.7 (93.6%)	10
Belgium	62.1	55.58	63.3	58.5 (92.4%)	8.4
Bulgaria	42.3	40.6	67.6	42.3 (62.6%)	12.55
Cyprus	5.7	5.1	7.12	5.48 (77%)	10
Czech Rep.	97.6	82.5	101.9	86.8 (85.2%)	10
Denmark	33.5	26.5	24.5	24.5 (100%)	17.01
Estonia	19	12.62	24.38	12.72 (52.2%)	0
Finland	45.5	33.1	39.6	37.6 (94.8%)	10
France	156.5	131.3	132.8	132.8 (100%)	13.5
Germany	499	474	482	453.1 (94%)	20
Greece	74.4	71.3	75.5	69.1 (91.5%)	9
Hungary	31.3	26.0	30.7	26.9 (87.6%)	10
Ireland	22.3	22.4	22.6	22.3 (98.6%)	10
Italy	223.1	225.5	209	195.8 (93.7%)	14.99
Latvia	4.6	2.9	7.7	3.43 (44.5%)	10
Lithuania	12.3	6.6	16.6	8.8 (53%)	20
Luxembourg	3.4	2.6	3.95	2.5 (63%)	10
Malta	2.9	1.98	2.96	2.1 (71%)	-
Netherlands	95.3	80.35	90.4	85.8 (94.9%)	10
Poland	239.1	203.1	284.6	208.5 (73.3%)	10
Portugal	38.9	36.4	35.9	34.8 (96.9%)	10
Romania	74.8	70.8	95.7	75.9 (79.3%)	10
Slovakia	30.5	25.2	41.3	32.6 (78.9%)	7
Slovenia	8.8	8.7	8.3	8.3 (100%)	15.76
Spain	174.4	182.9	152.7	152.3 (99.7%)	20
Sweden	22.9	19.3	25.2	22.8 (90.5%)	10
UK	245.3	242.4	246.2	246.2 (100%)	8
SUM	2298.5	2122.16	2325.34	2082.68 (89.56%)	-

Source: European Commission.

TOTALS

- 11% less than those proposed by countries.
- 73.3 million tonnes less than the verified emissions 2005.
- 216.67 million tones less than the allocated for Phase I (without Bulgaria and Romania).

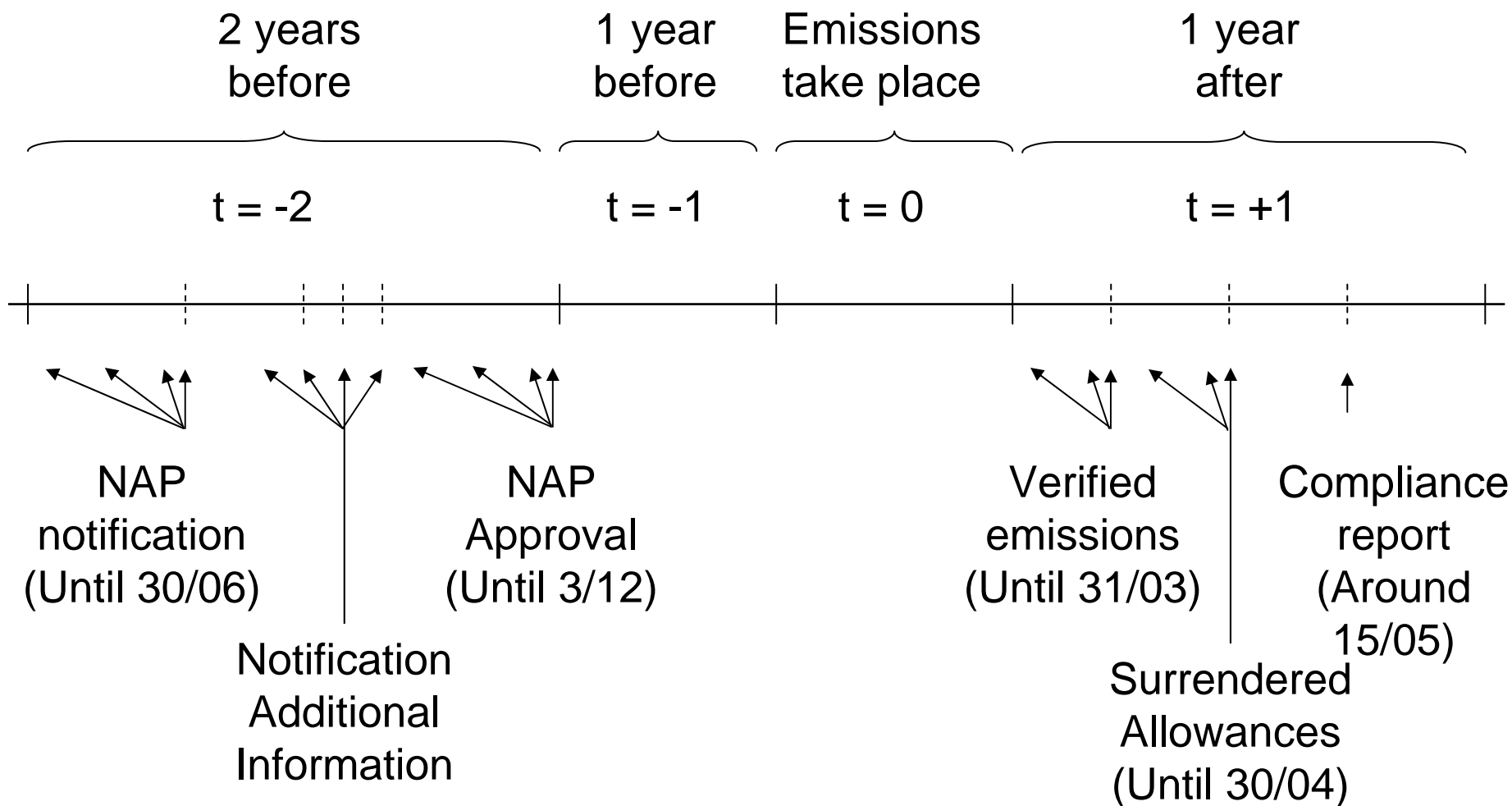
Annual million tonnes of CO₂



EU ETS (2003/87/EC and 2004/101/EC)

- Accounts transactions
 - Companies covered by the directive
 - Any natural and legal person
- The allowances are cancelled once they have been surrendered.
- Verification Real Emissions => Penalty if not commitment.
- Banking not allowed between Phases

EU ETS deadlines





The presentation is organized as follows...

- Carbon Trading Origins.
- Carbon Trading in Europe : the EU ETS.
- Carbon Markets in Europe.
- Linking with UN Carbon Markets.
- Conclusion and final remarks

EUA Trading in Europe

- OTC trading
- Organized Markets

	EUA				CER		
	OTC	ST	FUT	OPT	ST	FUT	OPT
BlueNext		✓	✓		✓	✓	
CLIMEX ALICANCE		✓					
ECX			✓	✓		✓	✓
EEX	✓	✓	✓				
EXAA		✓					
GME		✓					
LEBA	✓						
Nord Pool		✓	✓			✓	

EUA Spot Trading in EU ETS

	BlueNext	Energy Exchange of Austria (EXAA)	Nord Pool	Gestore Mercato Elettrico (GME)	European Energy Exchange (EEX)
Commodity	EUA	EUA	EUA	EUA	EUA
Country	France	Austria	Scandinavia	Italy	Germany
Market Launch	24 th April 2005	28 th June 2005	24 th October 2005	2 nd April 2007	9 th March 2005
Trading Days	From Monday to Friday	Weekly trading	From Monday to Friday	From Monday to Friday	From Monday to Friday
Delivery	Physical	Physical	Physical	Physical	Physical
Unity	1 EUA	1 EUA	1 EUA	1 EUA	1 EUA
Minimum contract size	1000 tCO2	1 tCO2	1000 tCO2	500 tCO2	1 tCO2
Tick minimum	0.01 €	0.01 €	0.01 €	0.01 €	0.01 €
Registry	Seringas	ECRA (Emission Certificate Registry Austria)	NEA (Dutch Emission Authority)	Sina Group	DEHSt (German Emissions Trading Authority)
Registry Management	Caisse des dépôts et consignations	ECRA (Emission Certificate Registry Austria)	Dutch Emission Authority	APART (Italian Environmental Authority)	DEHSt (German Emissions Trading Authority)
Clearing	LCH Clearnet SA	APCS (Austrian Power Clearing and Settlement AG)	Nord Pool Clearing ASA	Gestore Mercato Elettrico (GME) S.p.a.	Several Banks

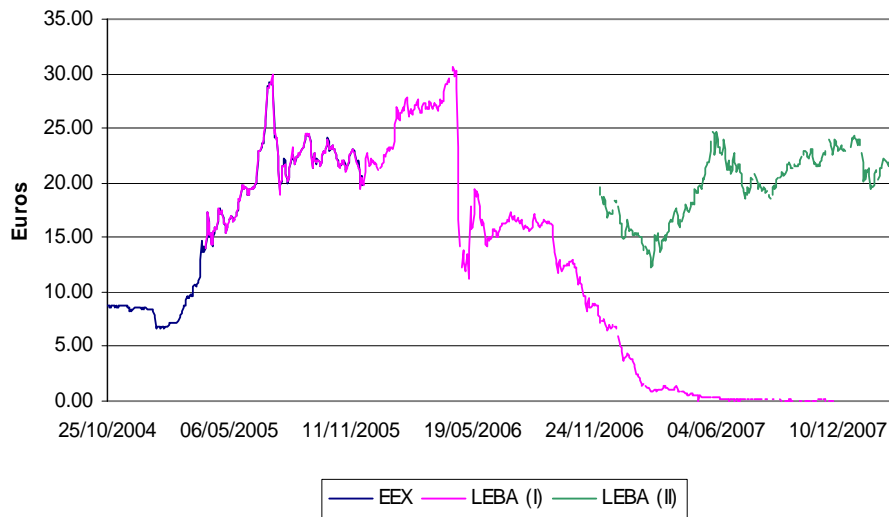
Phase II EUAs in BlueNext (26th February 2008) and NordPool (15th April 2008).

EUA Futures Trading in EU ETS

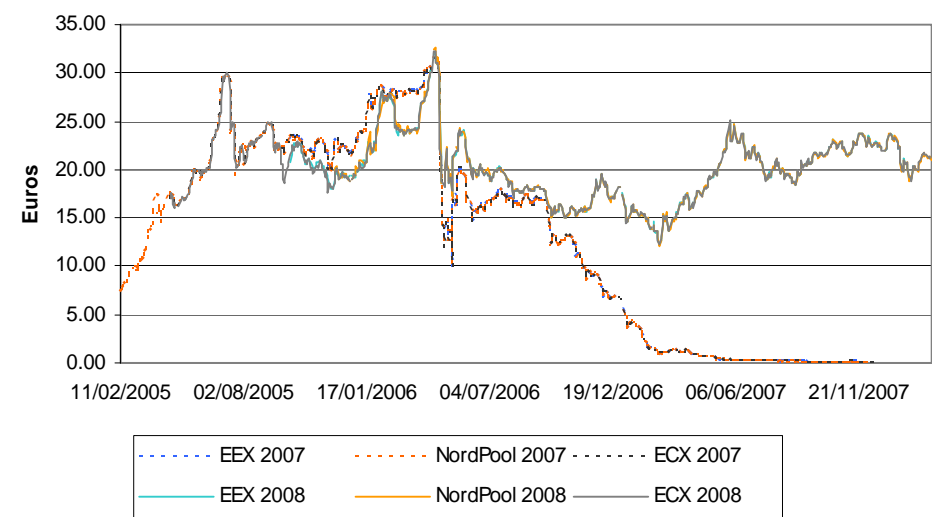
	Nord Pool	European Climate Exchange (ECX)	European Energy Exchange (EEX) / Eurex	BlueNext	The Green Exchange
Commodity	EUA	EUA	EUA	EUA	EUA
Country	Scandinavia	United Kingdom	Germany	France	USA
Market Launch	11 th February 2005	22 nd April 2005	4 th October 2005	<i>In a near future</i>	17 th March 2008
Trading Days	From Monday to Friday	From Monday to Friday	From Monday to Friday	From Monday to Friday	From 6:00 PM Sundays through 5:15 PM Fridays, Eastern Time,.
Contract Expiry	December 2005. December and March from 2006 to 2012	Quarterly contracts for 2005 and 2006. From September 2006 to march 2008 monthly contracts. December contracts from 2008 to 2012.	December contracts form 2006 to 2012	December contracts from 2008 to 2012	Quarterly contracts from December for 2008 to December 2010 December contracts from 2011 to 2012
Delivery	Physical	Physical	Physical	Physical	Physical
Unity	1 EUA	1 EUA	1 EUA	1 EUA	1 EUA
Minimum contract size	1000 tCO2	1000 tCO2	1000 tCO2	1000 tCO2	1000 tCO2
Tick minimum	0.01 €	0.01 €	0.01 €	0.01 €	0.01 €
Registry	Nea (Dutch Emission Authority)	Environment Agency	DEHSt (German Emissions Trading Authority)	Seringas	UK Emissions Trading Registry
Registry Management	Dutch Emission Authority	Environment Agency	DEHSt (German Emissions Trading Authority)	Caisse des dépôts et consignations	Environment Agency
Clearing	Nord Pool Clearing ASA	London Clearing House (LCH.Clearnet)	Eurex Clearing AG and the European Commodity Clearing AG (ECC)	LCH Clearnet SA	NYMEX ClearPort

Price Evolution

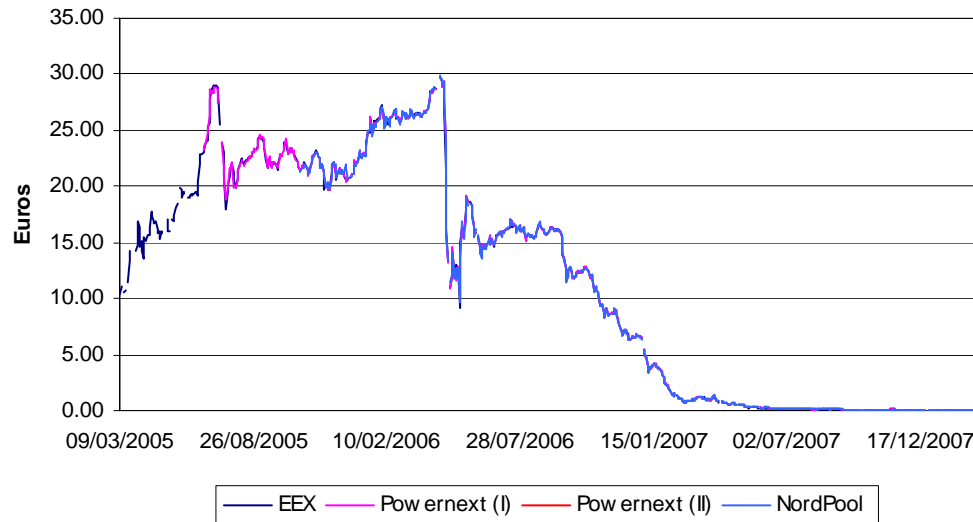
OTC



FUTURES

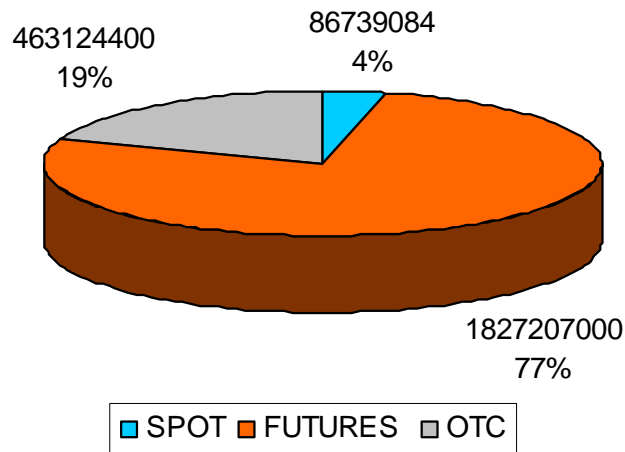


SPOT

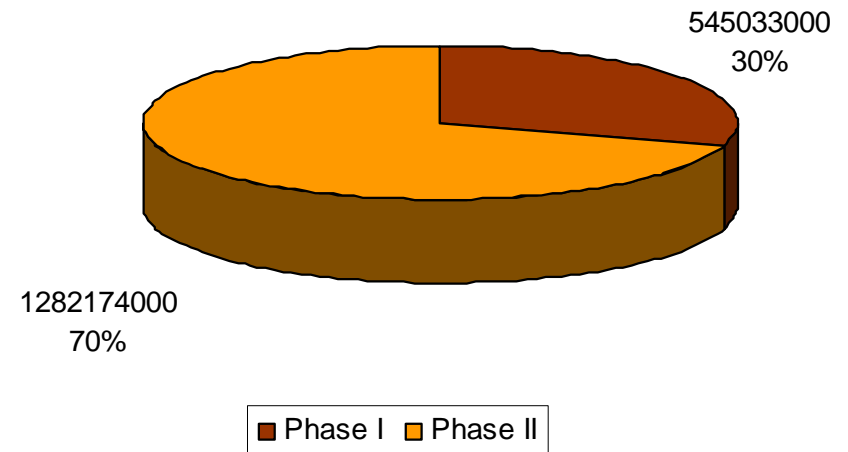


Volumes in European Carbon Markets

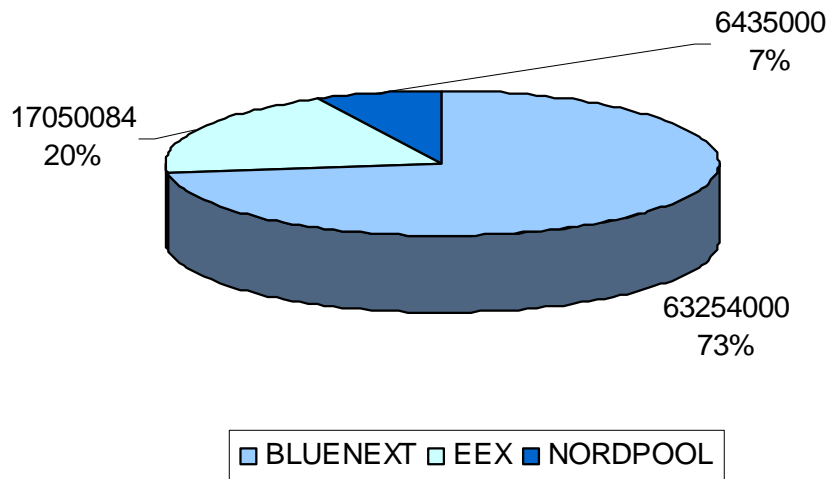
TOTAL VOLUMES EU ETS



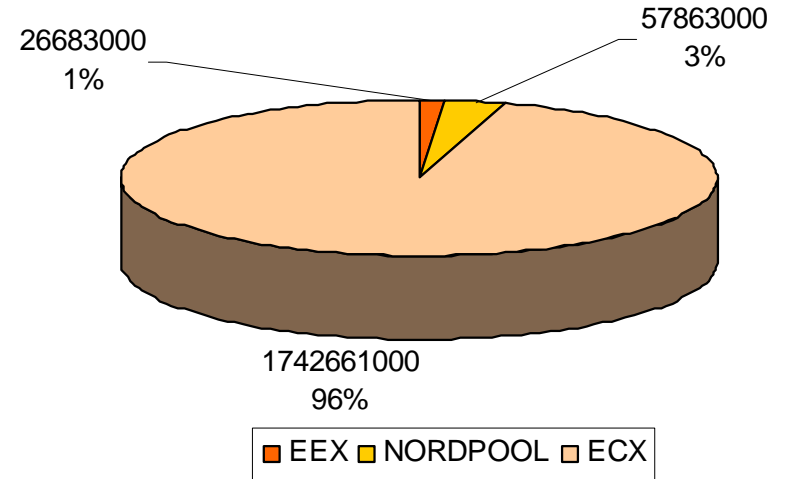
FUTURES BY PHASES



SPOT BY MARKETS



FUTURES BY MARKETS



EUA Option Trading in EU ETS

	European Climate Exchange (ECX)	The Green Exchange
Commodity	EUA	EUA
Country	United Kingdom	USA
Market Launch	13 th October 2006	17 th March 2008
Trading Days	From Monday to Friday	From 6:00 PM Sundays through 5:15 PM Fridays, Eastern Time,.
Contract Expiry	Front two contracts plus next six December contract months. Currently Jan08, Feb08, December contracts from 2008-2012 are listed	Quarterly contracts from December for 2008 to December 2010 December contracts from 2011 to 2012
Delivery	Physical	Physical
Underlying	Exercised into ICE Futures ECX CFI EUA Futures contracts.	1 EUA Futures contract
Minimum contract size	1000 tCO2	1000 tCO2

EUA Option Trading in EU ETS

European Climate Exchange (ECX)

Strike price increments	Fifty-five Strike prices are automatically listed for each contract month covering the price range from 1.00 € 55.00€
	The Exchange may add one or more strike prices nearest to the last price listed as necessary.
	Strike price intervals are €1.00.
Tick minimum	0.01 €
Option Premium	Premiums are paid at the time of the transaction
Nature of exercise	Exercised into ICE Futures ECX CFI CER Futures contracts. European-style exercise
Registry	Environment Agency
Registry Management	Environment Agency
Clearing	London Clearing House (LCH.Clearnet)



The presentation is organized as follows...

- Carbon Trading Origins.
- Carbon Trading in Europe : the EU ETS.
- Carbon Markets in Europe.
- Linking with UN Carbon Markets.
- Conclusion and final remarks

Kyoto Objective 95% of the 1990 emissions

Kyoto Flexibility Mechanisms

JI

CDM

EMISSIONS TRADING

Linked to Eligible Countries
Registries

ERU

CER

Other Emission Trading
Schemes

EU ETS

EUA

Directives 2003/87/EC and
2004/101/EC

Trading sectors

Companies
Compliance

Non-trading sectors

Member
States
Compliance

Trade

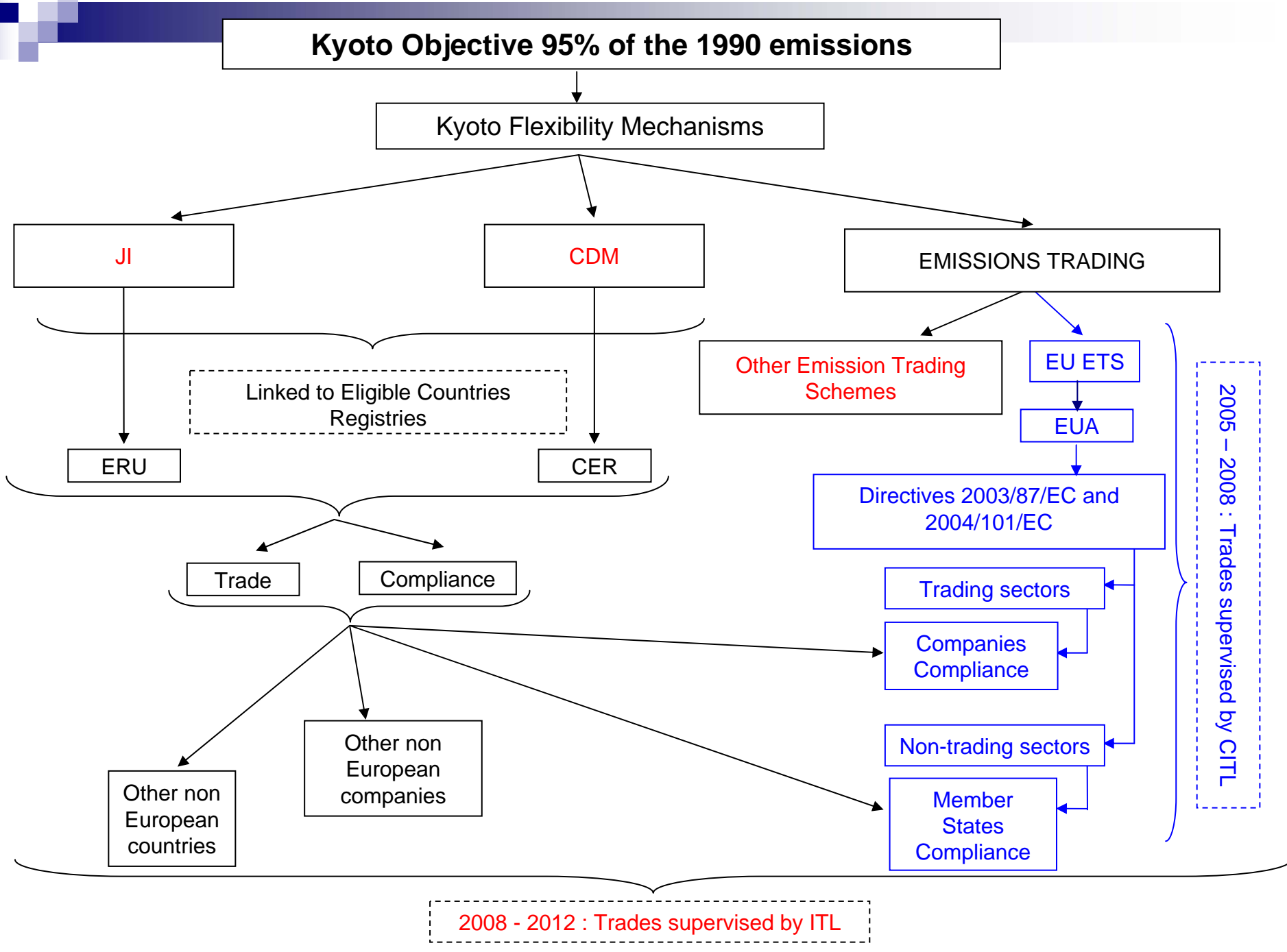
Compliance

Other non
European
countries

Other non
European
companies

2005 – 2008 : Trades supervised by CITL

2008 - 2012 : Trades supervised by ITL



Linking with UN Carbon Markets

- International Transaction Log
- CERs and ERUs may be obtained
 - Realization of a project
 - Secondary market
- In order to comply with Kyoto obligations
 - EUA
 - CERs
 - ERUs

} TRADABLE UNITS
- Possible in both Phase I and Phase II.
- Limit on CERs and ERUs (fixed by NAPs)

Limits on JI/CDM credits

Member State	1st period cap (2005-2007)	2005 verified emissions	Proposed cap 2008-2012	Cap allowed 2008-2012 (in relation to proposed)	JI/CDM limit 2008-2012 in %
Austria	33.0	33.4	32.8	30.7 (93.6%)	10
Belgium	62.1	55.58	63.3	58.5 (92.4%)	8.4
Bulgaria	42.3	40.6	67.6	42.3 (62.6%)	12.55
Cyprus	5.7	5.1	7.12	5.48 (77%)	10
Czech Rep.	97.6	82.5	101.9	86.8 (85.2%)	10
Denmark	33.5	26.5	24.5	24.5 (100%)	17.01
Estonia	19	12.62	24.38	12.72 (52.2%)	0
Finland	45.5	33.1	39.6	37.6 (94.8%)	10
France	156.5	131.3	132.8	132.8 (100%)	13.5
Germany	499	474	482	453.1 (94%)	20
Greece	74.4	71.3	75.5	69.1 (91.5%)	9
Hungary	31.3	26.0	30.7	26.9 (87.6%)	10
Ireland	22.3	22.4	22.6	22.3 (98.6%)	10
Italy	223.1	225.5	209	195.8 (93.7%)	14.99
Latvia	4.6	2.9	7.7	3.43 (44.5%)	10
Lithuania	12.3	6.6	16.6	8.8 (53%)	20
Luxembourg	3.4	2.6	3.95	2.5 (63%)	10
Malta	2.9	1.98	2.96	2.1 (71%)	-
Netherlands	95.3	80.35	90.4	85.8 (94.9%)	10
Poland	239.1	203.1	284.6	208.5 (73.3%)	10
Portugal	38.9	36.4	35.9	34.8 (96.9%)	10
Romania	74.8	70.8	95.7	75.9 (79.3%)	10
Slovakia	30.5	25.2	41.3	32.6 (78.9%)	7
Slovenia	8.8	8.7	8.3	8.3 (100%)	15.76
Spain	174.4	182.9	152.7	152.3 (99.7%)	20
Sweden	22.9	19.3	25.2	22.8 (90.5%)	10
UK	245.3	242.4	246.2	246.2 (100%)	8
SUM	2298.5	2122.16	2325.34	2082.68 (89.56%)	-

CERs Trading

- OTC trading
- Organized Markets

	EUA				CER		
	OTC	ST	FUT	OPT	ST	FUT	OPT
BlueNext		✓	✓		✓	✓	
CLIMEX ALICANCE		✓					
ECX			✓	✓		✓	✓
EEX	✓	✓	✓				
EXAA		✓					
GME		✓					
LEBA	✓						
Nord Pool		✓	✓			✓	

Futures CER Trading in EU ETS

	Nord Pool	European Climate Exchange (ECX)	BlueNext
Commodity	CER	CER	CER
Country	Scandinavia	United Kingdom	France
Market Launch	1 st June 2007	14 th March 2008	<i>In a near future</i>
Trading Days	From Monday to Friday	From Monday to Friday	From Monday to Friday
Contract Expiry	December contracts from 2006 to 2012	Quarterly contracts from December for 2008 to December 2012.	December contracts from 2008 to 2012
Delivery	Physical	Physical	Physical
Unity	1 CER	1 CER	1 CER
Minimum contract size	1000 tCO2	1000 tCO2	1000 tCO2
Tick minimum	0.01 €	0.01 €	0.01 €
Registry	NEA (Dutch Emission Authority)	Environment Agency	Seringas
Registry Management	Dutch Emission Authority	Environment Agency	Caisse des dépôts et consignations
Clearing	Nord Pool Clearing ASA	London Clearing House (LCH.Clearnet)	LCH Clearnet SA

Option CER Trading in EU ETS

European Climate Exchange (ECX)

Commodity	CER
Country	United Kingdom
Market Launch	<i>In a near future</i>
Trading Days	From Monday to Friday
Contract Expiry	Quarterly contracts from December for 2008 to December 2012.
Delivery	Physical
Unity	One ICE Futures ECX CFI CER Options contract
Minimum contract size	1000 tCO ₂
Strike price increments	Fifty-five Strike prices are automatically listed for each contract month covering the price range from 1.00 € 55.00€ The Exchange may add one or more strike prices nearest to the last price listed as necessary. Strike price intervals are €1.00.

Option CER Trading in EU ETS

European Climate Exchange (ECX)

Tick minimum

0.01 €

Option Premium

Premiums are paid at the time of the transaction

Nature of exercise

Exercised into ICE Futures ECX CFI CER Futures contracts. European-style exercise

Registry

Environment Agency

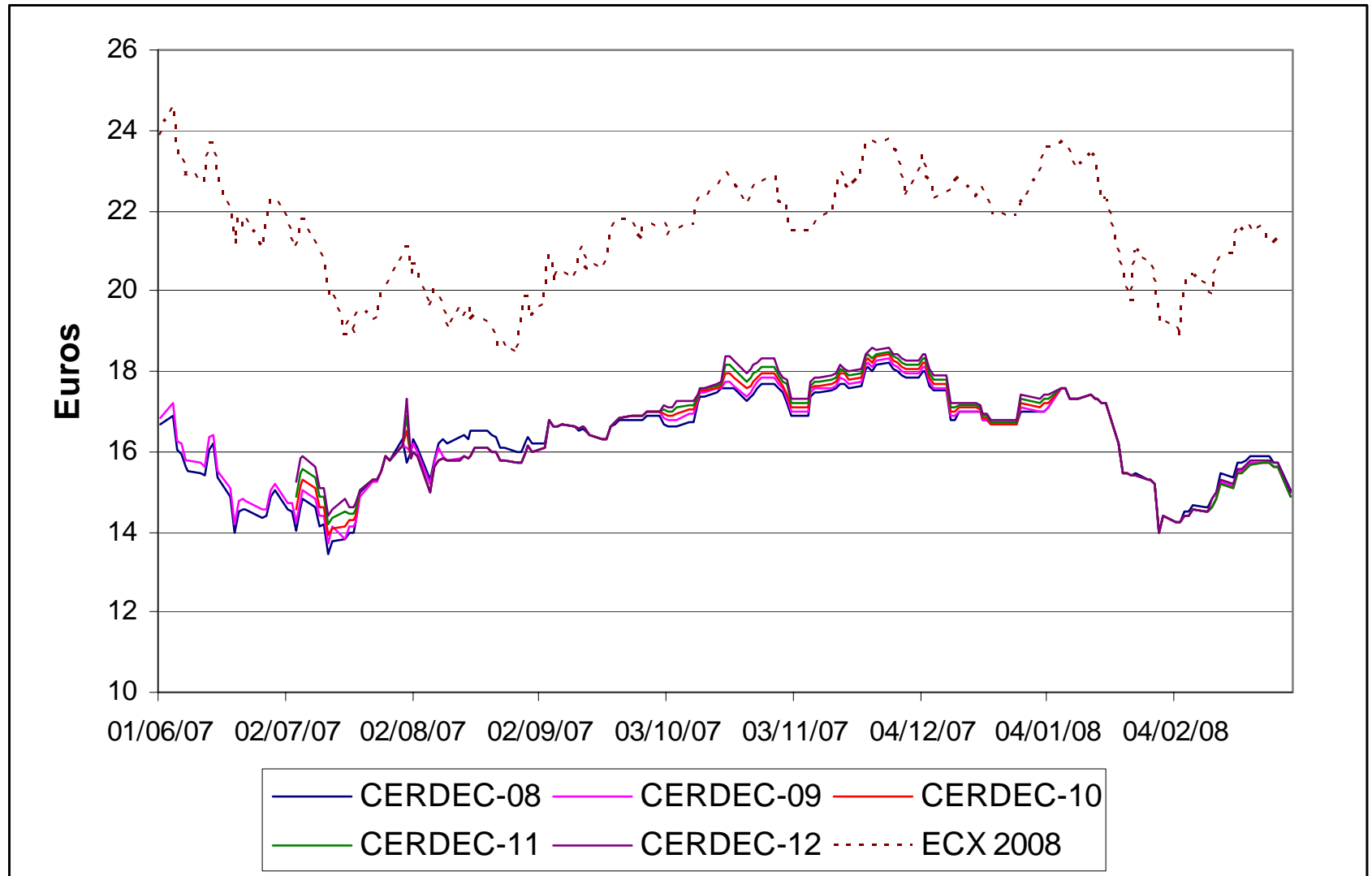
Registry Management

Environment Agency

Clearing

London Clearing House
(LCH.Clearnet)

CER Prices at Nord Pool



Linking with UN Carbon Markets

- EU ETS
 - Norway
 - Canada
- } **Linking Agreement**
- USA: Regional GHG Initiative (RGGI).
 - Japan: Pilot Project of ETS
 - South Korea, New Zealand, Switzerland and Australia.

Objective : All those systems linked

Linking with UN Carbon Markets

- Difficulties:
 - Characteristics non comparables.
 - Acceptance of the allowances issued by any other program.
- Efforts are being done (EU ETS with Norway, Iceland and Liechtenstein first international link)
- Registry connections with the ITL (only Japan, New Zealand and Switzerland have completed their initialization process).

Trading of EUA and CERs other than in Europe

- The Green Exchange (NYMEX) :
 - *Futures* on EUAs and CERs
 - *Options* on EUAs (European Style)
- Chicago Climate Exchange
 - Auction on CERs from a wind energy farm project in India



The presentation is organized as follows...

- Carbon Trading Origins.
- Carbon Trading in Europe : the EU ETS.
- Carbon Markets in Europe.
- Linking with UN Carbon Markets.
- Conclusion and final remarks

Concluding Remarks

- We have situated the ***origins*** of the EU ETS.
- We have presented the countries Kyoto commitment ***objectives*** and situation.
- We have described the ***EU ETS***.
- We have presented the ***Carbon Markets***
 - Description of the Contracts
 - Prices and Volumes.
- We have analyzed the carbon markets ***linking***
- The EU ETS has succeeded in ***establishing*** a price for carbon emissions.



Thank you for your attention !

maria.mansanet@uv.es