

Université Libre de Bruxelles  
Institut de Gestion de l'Environnement et d'Aménagement du Territoire  
Faculté des Sciences  
Master en Sciences et Gestion de l'Environnement

“Les conditions de réussite du Système Communautaire  
d'Echange de Quotas d'Emission (SCEQE)”

Mémoire de Fin d'Etudes présenté par  
SARAGOSSI, Judith  
en vue de l'obtention du grade académique de  
Master en Sciences et Gestion de l'Environnement

Année Académique : 2010-2011

Promoteur : Prof. Tom Bauler  
Co-promoteur: Mr. René Audet

Université Libre de Bruxelles  
The Institute for Environmental Management and Land-Use Planning  
Faculty of Sciences  
Master in Environmental Sciences and Management

“The conditions for success of the European Union  
Emissions Trading Scheme (EU ETS)”

Dissertation presented by  
SARAGOSSI, Judith  
in fulfilment of the requirements for the degree of  
Master in Environmental Sciences and Management

Academic Year: 2010-2011

Supervisor: Prof Tom Bauler  
Co-supervisor: Mr René Audet

# Acknowledgments

---

I wish to start by thanking my two dissertation supervisors, Mr Tom Bauler and Mr René Audet of the CEDD (ULB) for their regular support and advice, which helped greatly to define the scope, objectives and methodological approach of this master's assignment.

I am also grateful for the assistance and ideas provided by Emilie Mutombo of the CEDD (ULB) as well as Philippe Tulkens, Gerardus Klaassen, Pierre Valette, Domenico Rossetti, and Elisabeth Lipiatou of the European Commission. They helped me in particular at the early stage of this work to understand the functioning of carbon markets, especially the EU ETS, and the methods and use of environmental policy evaluations. Special thanks also to my reviewers Matthew Daniel, Margaret Robinson, and Isi Saragossi.

I am indebted to the participants of my survey, for giving me time out of their busy schedules to answer my questions. Their perspectives on the issues addressed in this project are an essential input.

Finally, I would like to thank my parents, family and friends, notably Sarina, Emilie, Elena and Stéphane, for their continuous encouragement and advice.

*"It's a job that's never started that takes the longest to finish."*

**J.R.R. Tolkien**

*"We do not inherit the earth from our ancestors; we borrow it from our children."*

**Chief Seattle 1820**



## Résumé

---

Depuis les années septante, les premières observations et préoccupations sur le changement climatique ont commencé à apparaître sur la scène internationale. Des lors, il a été convenu de l'importance d'agir pour prévenir, ainsi que pour s'adapter, à cette crise globale, notamment en diminuant les émissions de gaz à effet de serre. Cette solution, qui semble pourtant simple, s'avère en réalité complexe à mettre en œuvre. En effet, toute notre économie repose sur l'émission de ces gaz, particulièrement en ce qui concerne la production d'électricité. Les pays industrialisés, étant responsable de la plus grande partie des émissions jusqu'à présent, ont la responsabilité de conduire les efforts de réduction de ces émissions. Ceci permettrait aux autres pays de progresser dans leur développement économique afin de converger vers un niveau global uniforme d'émissions par habitant. L'Europe est en tête de ces efforts par la mise en place d'un instrument de politique climatique ambitieux depuis 2003, le Système Communautaire d'Echange de Quotas d'Emissions (SCEQE). Ce système, qui est le premier et le plus important au monde, est en partie responsable pour atteindre les objectifs de réduction internationale et domestique des émissions de l'Union Européenne de 8 % d'ici 2012 et de 20 % d'ici 2020 en comparaison aux niveaux de 1990. Le SCEQE a dû passer par une période d'expérimentation de 2005 à 2007 dont la réussite était indispensable pour passer à la phase suivante.

L'objectif de ce mémoire est d'étudier les conditions de réussite du SCEQE. A cette fin, une méthode d'évaluation a été élaborée visant à consulter un échantillon représentatif d'acteurs et d'experts européens. Cette évaluation est axée sur la pertinence de la révision de l'instrument pour adresser, à partir de 2013, les problèmes rencontrés durant les premières années de sa mise en œuvre. Après avoir examiné les rapports d'évaluations existants, afin d'identifier les principaux enjeux, un groupe de participants a été interviewé. La diversité des opinions recueillies est cohérente avec celle rapportée dans les publications. Les différences de point de vue semblent dépendre des résultats que les acteurs attendent de la mise en œuvre du système, à savoir, un prix carbone suffisamment élevé pour conduire à une croissance verte, ou une mesure permettant d'obtenir des réductions d'émissions au moindre coût. Un des principaux résultats de ce projet est que le système révisé prend en compte les problèmes identifiés durant les premières années, mais que les nouvelles dispositions ne sont cependant pas encore suffisantes pour atteindre pleinement les objectifs en termes d'efficacité environnementale, d'efficacité économique et d'équité sociale. Il s'agit principalement d'une question d'ambition et d'engagement politique. Le rapport propose notamment d'organiser les suites des travaux sur le SCEQE selon deux voies complémentaires, toutes deux visant à améliorer son efficacité à long terme. La première porte essentiellement sur les ajustements du cadre réglementaire actuel nécessaire à assurer une mise en œuvre optimale du SCEQE à partir de 2013. La seconde devrait préparer sa prochaine révision en se concentrant particulièrement sur les enjeux principaux liés à la conception et à l'ambition de l'instrument.



## Executive Summary

---

Since the 1970s, observations and concerns about climate change started to reach the international scene. It was agreed that action had to be taken to mitigate and adapt to this global crisis. Although the solution, reducing greenhouse gases emissions, is straightforward, it is in fact very hard to achieve. Indeed, our whole economy is currently based on the production of these gases, especially for electricity generation. However, as industrialised countries have emitted the most part of these gases historically, they face the responsibility to lead the efforts for reducing global emissions. This would notably allow for the others to progress in their development so as to converge towards global levelled emissions per capita. Europe has taken the lead by being the first to have adopted a strong climate policy instrument in 2003, the European Union Emissions Trading Scheme (EU ETS). As the first and biggest trading scheme to restrict greenhouse gases emissions to date, it is aimed at achieving EU's international and domestic emissions reduction targets of 8 % by 2012 and 20 % by 2020, compared to 1990 levels. The EU ETS had to go through a trial and error period from 2005 to 2007, and was under pressure to succeed to be able to continue to the subsequent implementation periods.

The aim of this dissertation is to understand the conditions for success of the EU ETS. This is realised through the development of an evaluation method by which a representative sample European stakeholder and experts are consulted to give their views on whether the revisions made to the instrument, to be applied in 2013, are adequate to answer the issues faced during its early implementation years. After a review of relevant publications, notably *ex ante* and *ex post* evaluations, to identify the main issues to discuss, a panel of participants was selected to be interviewed. It was observed that the range of opinions is consistent with those found in publications. The different points of views appeared to be dependant on what actors expected the scheme to deliver, namely a high carbon price for triggering a shift towards a low carbon economy or an instrument allowing for reductions to be achieved at the lowest costs. One of the main outcomes of the project is that, while early implementation issues have been addressed, most interviewees believe that current provisions are not yet adequate for the scheme to reach its full potential in terms of environmental effectiveness, economical efficiency and social equity. This is mainly a problem of political ambition and commitment. Building on the analysis of the stakeholders' positions and the available publications, the report suggests organising further work on the EU ETS along two related tracks in order to improve its long-term effectiveness. The first track should focus on the necessary adjustments to the current framework of the revised Directive to ensure its optimal implementation from 2013. The second track should start now to prepare for the next revision and focus in particular on a number of key issues and options related to the ambition and design of the instrument.



# Contents Tables

---

**Acknowledgments..... i**

**Résumé.....ii**

**Executive Summary ..... iii**

**Contents Tables.....iv**

**List of Figures..... viii**

**List of Tables .....ix**

**Acronyms and Abbreviations ..... x**

**Chapter 1 Introduction ..... 1**

**1.1 Background and problem identification..... 1**

        1.1.1 The origins and nature of the problem ..... 1

        1.1.2 Tackling climate change..... 2

        1.1.3 Europe’s response ..... 2

**1.2 Objectives .....3**

        1.2.1 Aim ..... 3

        1.2.2 Research question ..... 4

        1.2.3 Hypothesis ..... 4

**1.3 Methodology and scope .....4**

**1.4 Plan .....5**

**Chapter 2 Background literature review.....6**

**2.1 Introduction.....6**

**2.2 The wider context of international negotiations and European ambitions.....6**

        2.2.1 The rise of preliminary science and awareness on climate change..... 6

        2.2.2 The establishment of an international Treaty..... 7

        2.2.3 An addition to the Treaty: The Kyoto Protocol..... 9

        2.2.4 The role of the European Union in international climate negotiations .....11

            a. The EU’s political background .....11

            b. From American to European international environmental leadership.....11

            c. The EU roadmap.....12

        2.2.5 Timeline of the international and European context.....13

**2.3 Policy instruments for tackling climate change ..... 17**

        2.3.1 Overview of policy instruments .....17

        2.3.2 Market-based type instruments .....18

        2.3.3 Emissions trading and the specificity of carbon markets .....19

2.3.4	Emissions trading around the world.....	20
<b>2.4</b>	<b>European Union Emission Trading Scheme.....</b>	<b>20</b>
2.4.1	Definition.....	20
2.4.2	Rationale.....	21
2.4.3	The EU Emission Trading Directive and its revisions.....	22
a.	Objective.....	22
b.	Provision for review and further development.....	23
2.4.4	The scheme's characteristics.....	23
a.	Coverage.....	23
b.	Cap and allocation.....	25
2.4.5	Comparison summary between Phases.....	27
2.4.6	State of the literature on the EU ETS.....	28
<b>2.5</b>	<b>Conclusion.....</b>	<b>28</b>
<b>Chapter 3</b>	<b>Approach for evaluating the EU ETS.....</b>	<b>29</b>
<b>3.1</b>	<b>Introduction.....</b>	<b>29</b>
<b>3.2</b>	<b>Theory and practise behind environmental policy evaluation.....</b>	<b>29</b>
3.2.1	Policy and evaluation: definition and origins.....	29
3.2.2	Policy and evaluation: cycle and perceptions.....	30
3.2.3	Typical evaluation models.....	31
3.2.4	Identification of evaluation criteria.....	32
3.2.5	Example.....	34
<b>3.3</b>	<b>Early implementation issues.....</b>	<b>35</b>
3.3.1	Poor MRV.....	35
3.3.2	Poor abatement and over-allocation.....	35
3.3.3	Windfall profits and short-term profits.....	36
3.3.4	European competition distortions.....	36
3.3.5	Unfair burden sharing.....	36
3.3.6	Price volatility.....	37
3.3.7	Fraud.....	37
3.3.8	Unclear and poor coverage.....	37
3.3.9	Risky sectors addition.....	38
3.3.10	Poor transparency and communication.....	38
3.3.11	Poor long-term investments.....	38
3.3.12	Poor provisions and prospects for linking.....	38
3.3.13	Overview.....	39
<b>3.4</b>	<b>Evaluation methodology.....</b>	<b>39</b>
3.4.1	Rationale.....	39
a.	Foundation.....	39



b. Objective and approach.....	40
3.4.2 Evaluation grid.....	40
a. Issues to be evaluated.....	40
b. Criteria to be met.....	41
3.4.3 Survey .....	41
a. Selection of interviewees .....	41
b. Questionnaire.....	41
<b>3.5 Conclusion .....</b>	<b>42</b>
<b>Chapter 4 Positioning of actors at EU level .....</b>	<b>44</b>
<b>4.1 Introduction.....</b>	<b>44</b>
<b>4.2 Setting out: allocation of allowances.....</b>	<b>44</b>
<b>4.3 Implementation.....</b>	<b>50</b>
4.3.1 Consultation and reviews.....	50
4.3.2 Carbon market .....	52
4.3.3 Reinvestments.....	54
<b>4.4 Prospects .....</b>	<b>56</b>
4.4.1 Enlargement.....	56
4.4.2 Future .....	57
<b>4.5 Overview .....</b>	<b>60</b>
4.5.1 Issues.....	60
4.5.2 Criteria.....	63
<b>4.6 Conclusion .....</b>	<b>64</b>
<b>Chapter 5 Synthesis and Discussions .....</b>	<b>65</b>
<b>5.1 Introduction.....</b>	<b>65</b>
<b>5.2 Evaluation outcomes.....</b>	<b>65</b>
5.2.1 Overall views .....	65
5.2.2 Ideological positioning .....	66
a. Interviewees' expectations in terms of criteria.....	66
b. Qualitative classification of positions.....	67
5.2.3 Synthesis.....	68
a. Most severe problems seen during first implementation years .....	68
b. Barriers to the future success of the EU ETS.....	68
c. Points of convergence .....	69
d. Points of divergence.....	69
5.2.4 Aggregated opinion on the importance of evaluations .....	70
<b>5.3 Evaluation: merits and limitations .....</b>	<b>70</b>
5.3.1 Problems and limitations of (environmental) policy evaluation.....	70
5.3.2 Interview process: merits and limitations.....	71



5.4 Discussion and Recommendations ..... 72

5.5 Conclusion ..... 74

Chapter 6 Conclusion..... 75

References ..... 77

Annex I Definitions..... 84

Annex II Document Extracts..... 91

    a. Extract of the Agreements of the Report of the Conference of the Parties on its fifteenth session, held in Copenhagen from 7 to 19 December 2009 related to climate change targets and Annex I parties commitments (UNFCCC 2010) ..... 91

    b. EU legislation concerning the EU ETS, extract from the Regulatory Impact Analysis of the Revised EU Emissions Trading Scheme Directive from the Climate Policy Section, Department of the Environment, Community and Local Government of Ireland (Government of Ireland 2011) ..... 91

    c. Extract of Article 30 ‘Review and further development’ of the EU ETS Directive (European Parliament and Council 2009a)..... 92

    d. Extract of Evaluation standards related to evaluation design and conduction (European Commission 2002)..... 93

Annex III Figures and Tables ..... 95

Annex IV Survey ..... 106

    a. Evaluation grid ..... 106

    b. Interviewees (listed alphabetically) ..... 107

    c. Survey ..... 112

List of Figures

Figure 1 Spectrum of possible policy instruments (Brohé et al. 2009, p.29) .....17

Figure 2 Criteria for the evaluation of environmental policy instruments (Mickwitz 2003; Vedung 2000; IPCC 2007) .....33

Figure 3 Interviewees’ positioning .....67

Figure 4 Comparison of observed changes in surface temperature with results simulated by climate models using either natural or both natural and anthropogenic forcings (IPCC 2007) .....95

Figure 5 Atmospheric concentrations of CO2, CH4 and N2O over the last 10,000 years (large panels) and since 1750 (inset panels) (IPCC 2007).....96

Figure 6 Carbon markets at a glance (World Bank 2011) ..... 101

Figure 7 EUA over-the-counter (OTC) assessment (Reuters 2011f)..... 102



# List of Tables

---

Table 1 Timeline of international and European events .....13

Table 2 ETS Phases’ Characteristics (European Parliament and Council 2009c).....27

Table 3 List of interviewees .....43

Table 4 Conferences attended (classified by date) .....97

Table 5 General findings about performances of policies for mitigating climate change (IPCC 2007)  
..... 100

Table 6 Approaches to (environmental) policy evaluation (Crabbe & Leroy 2008)..... 103

Table 7 Approaches for designing evaluation research (Crabbe & Leroy 2008)..... 105

# Acronyms and Abbreviations

---

AAU	Assigned Amount Unit
BAU	Business as usual
CAN(E)	Climate Action Network (Europe)
CDM	Clean Development Mechanism
CEDD	Centre d’Etudes du Développement Durable / Centre for Studies on Sustainable Development
CER	Certified Emission Reduction
CICERO	Centre for International Climate and Environmental Research
CO <sub>2</sub>	Carbon dioxide
CO <sub>2</sub> e	Carbon dioxide equivalent
COP	Conference of the Parties of the UNFCCC
DG	Directorate General
EC	European Commission
EFA	European Free Alliance
EPC	European Parliament and Council
ERU	Emission Reduction Unit
ETUC	European Trade Union Confederation
EU	European Union
EU ETS	European Union Emission Trading Scheme
EUA	European Union Allowance
FPS	Federal Public Service
IGEAT	Institut de Gestion de l’Environnement et d’Aménagement du Territoire
GHG	Greenhouse gas
IETA	International Emission Trading Association
IPCC	Intergovernmental Panel on Climate Change
JI	Joint Implementation
MRV	Monitoring, reporting and verification
MS	Member State
NAP	National Allocation Plan
NGO	Non-Governmental Organisation
OECD	Organisation for Economic Co-operation and Development
ppm	Parts per million
RIPI	Recently introduced policy instruments
SCEQE	Système communautaire d’échange de quotas d’émission (voir EU ETS)
ULB	Université Libre de Bruxelles
UNEP	United Nations Environment Program
UNFCCC	United Nations Framework Convention on Climate Change
USA	United States of America
VAT	Value added tax
WMO	World Meteorological Organization



# Chapter 1 Introduction

---

The world faces two major interlinked challenges: closing the gap between living standards therefore overcoming world poverty, and managing *climate change* (words in italics are provided with a definition in Annex I) (Brohé et al. 2009). This dissertation focuses on the latter.

## 1.1 Background and problem identification

### 1.1.1 The origins and nature of the problem

Climate change is described by the United Nations' *Intergovernmental Panel on Climate Change* (IPCC) as a change in the state of climate over time, whether it is due to natural variability or resulting from human activities. Observations dating back as far as the beginning of the Industrial Revolution (c. 1750), alongside more accurate datasets beginning in 1970, suggest that the climate system is undergoing an unequivocal '*global warming*' (cf. Figure 4 in Annex III). The impacts of this relatively recent and rapid change are not yet fully understood. However, it is clear that many natural systems are being or will potentially be affected and will, potentially, continue to be so.

There are several possible anthropogenic and natural drivers which could be responsible for this change, as among which the variations in the atmospheric concentrations of *greenhouse gases* (GHGs) and in solar radiations. Only one, the recent increase in anthropogenic GHGs emissions, seems to coincide with the magnitude and timing of this change (IPCC 2007) (cf. Figure 5 Annex III). The GHGs, naturally present in our atmosphere, trap part of the sun's heat during a process called the *greenhouse effect*. They are thus responsible for maintaining the temperature on Earth sufficiently high to allow for life to exist (Brohé et al. 2009).

Since 1750, human activities have emitted increasing amounts of four long-lived GHGs, resulting predominantly from fossil fuel use, agriculture and changes in land use. These four GHGs are: *carbon dioxide* (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O) and halocarbons (a group of gases containing fluorine, chlorine or bromine). From 1970 to 2004, global anthropogenic GHGs emissions have grown by 70%. From its assessment of the available information on climate change, the IPCC (2007) has concluded "there is very high confidence that the global average net effect of human activities since 1750 has been one of warming".

It is important to note that emission level patterns vary across countries, developed countries emitting much more than developing ones. Similarly, negative climate change impacts will not be distributed uniformly, hitting more severely low-income countries, which are the ones less able to adapt (Brohé et al. 2009).

There are only two possible and complementary responses to climate change: *adaptation* and *mitigation* and a society's capacity to adapt and mitigate depends largely on socio-economical and



environmental factors (IPCC 2007). Moreover, the solution to prevent climate change will therefore need to take into account these factors in order to be fair and achievable.

### 1.1.2 Tackling climate change

Climate change is a crucial challenge facing not just our civilization but also the world in which we live. Solving it is a complex problem which raises questions of fairness much more delicate than those concerning the halt of ozone depletion and acid rain remediation, two other important environmental issues. Indeed, climate change touches many aspects of our economic life and is at the heart of the engine driving our industrial system, energy production. It is interesting to note that climate change was not considered a subject of concern when the notion of “the environmental crisis” emerged at the end of the 70s (R. Dorfman & N. Dorfman 1977). Fortunately, this has since changed.

Towards the end of the 20<sup>th</sup> century, the international community came together in order to find a solution for tackling this challenge, and is continuing to do so. The scientific paradigm behind climate change being now mostly accepted, it is the backbone of international negotiations, where it is translated into “emissions reduction targets focused on annual emission rates” (Waston & Lewis 2011). Since the 1990s, scientific research has led towards the establishment of a 2°C global warming increase above pre-industrial levels as a limit for avoiding dangerous climatic alterations. This translates into a stabilisation of GHG concentrations of around 450 ppm *carbon dioxide emissions equivalents*. According to the IPCC (2007), in order to reach this target, the world's GHGs emissions should be reduced by at least 50% below 1990 levels by 2050 and the peak should occur by 2020 at the latest.

Although these findings were acknowledged in 2009 at the 15<sup>th</sup> *Conference of the Parties* (COP) held in Copenhagen by the *United Nations Framework Convention on Climate Change* (UNFCCC) (cf. Annex IIa), the challenge remains for political leaders and policymakers to find a way to achieve these goals effectively and urgently. Furthermore, there is increasing evidence that, even at this level, climate change might cause serious damage in some parts of the world (Waston & Lewis 2011). So far, international negotiations have led to the determination of a binding agreement of emissions reduction targets for 37 industrialized countries and the European Community under the *Kyoto Protocol*, for the period 2008 to 2012 (UNFCCC 2011b). However, once the Kyoto period ends in 2012, there is yet no binding agreement for maintaining global temperature increases below 2°C or even 1.5°C (d' Oultremont 2011).

### 1.1.3 Europe's response

One of the precursors to the idea of *emissions trading* within Europe is the famous article by Coase, a leading economist, ‘The problem of social cost’ (Coase 1960). In this article, he argues that the most efficient economic approach to internalise environmental externalities would be by the assignment of property rights within a free market (Medema & Zerbe 2000). Building on this



theory, other economists defined how to create an emissions market which would allow the abatement of pollution at the least cost, while controlling an overall ceiling and creating a price signal boosting innovation. It was first applied in the USA in the Acid Rain Program, under the *Clean Air Act* of 1990, which created a *cap-and-trade* system for sulphur dioxide emitted by power stations. This first experience, which was successful, provided valuable insight for understanding how such a market could operate (Ellerman et al. 2010).

The European Union (EU) is legally empowered to take action in the environmental field since the Single European Act of 1986. Moreover, the EU considers climate change as one of its top priorities for action as it recognizes that the 'doing nothing' option may ultimately be more costly (European Commission 2011b). After two unsuccessful attempts at supporting taxation rather than emissions trading, first at European level with the proposal for a carbon energy tax in 1992, and second, at international level when EU negotiators failed to insert their proposed policy initiatives in the Kyoto Protocol of 1997, the European Commission (EC) saw an opportunity to take the lead in shaping international climate change policy by developing a strong domestic response to the Kyoto protocol (Ellerman et al. 2010).

Driven by the fervour of the industrial sector to avoid the establishment of a carbon tax and to help meet their Kyoto obligations, individual Member States (MSs) started to contemplate and even develop isolated emissions trading schemes, such as the United Kingdom in 2002. This early enthusiasm encouraged the EC to move rapidly to a unified scheme at EU level, notably to allow for simplifications and cost savings to be made. This is how, backed by several research papers, a Green Paper on emissions trading by the EC was issued in 2000 arguing the case for the launch of an emissions trading scheme trial period beginning in 2005 (i.e. Phase I EU ETS), before the start of international trading in 2008 (i.e. Phase II EU ETS). After ironing out various discrepancies between a number of EU institutions, the Emissions Trading Directive was formally issued on 13<sup>th</sup> October 2003 with trading commencing on 1<sup>st</sup> January 2005. (Ellerman et al. 2010) Phase II started as scheduled and is due to end in 2012, and a third Phase was later confirmed to begin in 2013.

In summary, carbon markets were created within the EU as a product of the introduction of restrictions to carbon dioxide emission equivalents (CO<sub>2</sub>e), a measure for mitigating the effects of climate change.

## 1.2 Objectives

### 1.2.1 Aim

This dissertation is part of the requirements of a third cycle complementary master degree in Environmental Management at the Free University of Brussels (ULB). The overall aim is to provide a holistic, independent and multidisciplinary overview and analysis of the state of play of the European Union Emissions Trading Scheme (EU ETS), examining its achievements to date and



potential for further progress. It provides a simple informational tool that can assist decision-making by stakeholders and policy makers involved in the climate change debate and contribute to the *implementation* of this on-going environmental policy instrument.

### 1.2.2 Research question

Do the modifications made, foreseen or currently in discussion to the EU ETS Directive address the problematic issues raised by the early implementation years, especially in terms of efficiency, effectiveness and equity? In other words, have we learned the lessons from the mistakes of the early implementation of the EU ETS and will they help facilitate the realization of the EU's environmental policy?

### 1.2.3 Hypothesis

There are diverging views on the achievements of the EU ETS and the factors conditioning its success. Whilst some may be critical of the efficacy of the EU ETS with respect to emission reductions, it is important to remember that environmental effectiveness is not the sole aim of this instrument. Targets should be realized using a combination of different instruments. One must also acknowledge that successful implementation of climate change mitigation is constrained by social, economic and political barriers.

## 1.3 Methodology and scope

A substantial preliminary work of research and consultation was necessary to explore the various dimensions of the topic before deciding on the precise focus of this dissertation. For, indeed, it was not an easy task to determine a specific approach for discussing the conditions of success of the EU ETS, firstly because of a lack of prior knowledge and secondly the availability of an extremely large amount of publications on the subject. Several research directions were considered including an analysis of the effect of the system on corporate behaviour and strategies and the appraisal of opt-ins and the potential inclusion of new sectors.

Existing literature covers mostly ex ante impact assessments of the EU ETS legislation and Phase I ex post evaluations. Ex ante studies and consultations are for most undertaken by governments, for example the European Commission. Ex post evaluations are often done by external think tanks, but not only. It appears therefore that doing an ex post consultation type evaluation of the views of the most prominent European actors on the revisions of the EU ETS legislation would be useful and bring a new perspective. The evaluation focuses on the changes considered necessary to address the main problems faced during the scheme's early implementation Phase. It also concentrates on obtaining an in-depth understanding of the perceptions and expectations of a relatively small number of experts and European stakeholder representatives on a qualitative level.



Several steps were necessary to provide a qualitative evaluation of the revision of the EU ETS. First, it was important to summarise what are the rules and functioning of the EU ETS as well as to understand what it is trying to achieve and in what context. Then, to apprehend what were and are the issues concerning the scheme, an investigation was conducted to identify the most important problems since its implementation. Before doing the actual assessment, it was decided to first review the theory behind environmental policy evaluation methods, as this would help decide on the methodology for the evaluation itself. A personal analysis with recommendations notably for future legislative revisions was then undertaken, combining the results of the survey with findings from relevant publications

The literature review, covering in particular the EU ETS and the environmental policy evaluation methods, was based on a survey of the most important publications online and in libraries. Documentation type varies from scientific to juridical. Additionally, actors and experts in the fields of carbon markets and policy evaluation were consulted for ideas and to recommend additional sources. Finally, several conferences were also attended that provided additional insight and inspiration on the climate change problematic and specific issues addressed in this work (cf. Table 4 in Annex III for a list of the conferences attended).

## 1.4 Plan

This dissertation is divided into four main chapters in addition to the introduction and the conclusion. After the introduction, which presents the scientific and political dimensions of the subject as well as the motivations behind this dissertation, the second chapter provides a description of the EU ETS by introducing the concept of emissions trading within its larger international, political, economical and juridical context. The evaluation model and method for assessing the revisions of the EU ETS are presented in the third chapter. This is based on a review of the theory underpinning environmental policy evaluations and of the issues faced during the early implementation years of the EU ETS. Accordingly, the fourth chapter provides the summary of the survey of opinions conducted at European level using the evaluation model. Then a comparative analysis of the opinions, integrating findings from relevant publications, as well as recommendations are presented in chapter 5. Finally, chapter 6 highlights the main findings arising from the research. It also recalls the limitations related to the project and suggests some orientations for future work.



## Chapter 2 Background literature review

---

### 2.1 Introduction

There seems to be a broad acceptance of the fact that the costs of reducing our emissions to levels significantly below BAU (business-as-usual) are lower than the cost of inaction. These costs of inaction would result from the high risk of serious outcomes arising from sustaining our recent growth levels. This common understanding shapes the foundations for the international political and economical responses to tackle climate change. An example of such a response is the fairly recent development of carbon markets around the world and in particular on the European scene. Therefore, this chapter is not meant to demonstrate why action is being taken, but to describe and justify what actions are possible, while focusing on the emergence and functioning of the EU ETS.

Starting by giving an overview of the international context to the development of a response to the climate change problem, the chapter goes on to present the main political solution to tackle this problem, particularly the EU ETS. It concludes by considering the evolution of the legislating of the EU ETS.

### 2.2 The wider context of international negotiations and European ambitions

#### 2.2.1 The rise of preliminary science and awareness on climate change

Climate change has formally moved to the top of the international agenda since the first World Climate Conference in 1979, a gathering of scientists organised by the World Meteorological Organization (WMO). This was one of the first major international meetings on climate change, where climate change was recognised as a 'serious problem'. A declaration was adopted calling on governments "to foresee and prevent potential man-made changes in climate that might be adverse to the well-being of humanity" (UNFCCC 2011b). The conference also established the World Climate Programme under the responsibility of WMO, the United Nations Environmental Program (UNEP) and the International Council of Scientific Unions, as a facilitator to initiate and coordinate activities in the area of climate change (WMO 2011). This paved the way for an increase in the amount of research carried out and evidence of the anthropogenic influence on the climate system and during the 1980s. Additionally, in the late 1980s and early 1990s, a number of intergovernmental conferences confirmed that climate change was a serious issue and requiring a collective response (Newell & Paterson 2010). These conferences together with the evidences being collected contributed to the growing international public interest in environmental issues, which raised the importance of climate change on the political agenda.



The science behind climate change explains the necessity for a carbon-constrained future, as fully detailed in the last IPCC report (IPCC 2007). The IPCC was established in 1988 by the WMO and UNEP to provide comprehensive scientific, technical, and socio-economic information on the state of our knowledge on the climate system, human induced climate change, potential impacts and options for mitigation and adaptation, and to guide policy makers. It has issued four reports to date, with the fifth due to come out by 2014, each providing improved understanding of the climate change problem (IPCC 2011). The first report, issued in 1990, had a non-negligible impact on both the public and the policy makers, thus providing the basis and impulse for negotiations at international level (UNFCCC 2011b). Whilst the existence of climate change used to be debated, it had become a reality which can be observed in some parts of the world in the form of rising sea levels and an increase in the occurrence of extreme events, for example. Research suggests that inaction will allow the problem to deteriorate and that costs of adaptation in the future will exceed the costs of current global mitigation (IPCC 2007; Stern 2007).

The first international Earth Summit in Rio de Janeiro in 1992, where more than 100 Heads of State met to address urgent environment and development issues, was the outcome of key negotiations in the United Nations since the issue of the IPCC's First Assessment Report. The topics of these negotiations were varied, ranging from the determination of GHGs emissions targets to the provision of financial resources for developing countries. The Summit resulted in the adoption of several documents, of which the one of interest for this dissertation is the Framework Convention on Climate Change (United Nations 1997). Indeed, it is the foundation for the global response to climate change.

### 2.2.2 The establishment of an international Treaty

The UNFCCC is an international Treaty that was adopted in 1992, currently comprising 195 Parties. It provides a structure for governments to share information, launch strategies and cooperate for mitigating and adapting to climate change (UNFCCC 2011b). It has the ultimate objective of achieving "stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system within a time-frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner", as stated in Article 2 (United Nations 1992). The idea that the problem can be dealt with by having countries reduce their emissions jointly, for example by trading them off amongst each other is included in the Convention. This idea was first presented in 1991 in a working paper published by the Centre for International Climate and Environmental Research (CICERO), a think-tank based in Oslo (Newell & Paterson 2010).

The Convention divides countries into two groups: *Annex I Parties* and Non-Annex I Parties. Annex I Parties are industrialised countries which have historically emitted the highest levels of



GHGs and should take the lead in implementing action to reach the Convention's objectives. Non-Annex I parties are mostly developing countries and some recently industrialised countries. The UNFCCC gives non-quantitative and non-binding objectives for GHGs concentration reduction levels, thus leaving nations to take individual action to reduce their emissions. Another group of countries, Annex I Parties that were members of the OECD in 1990, forms Annex II. They are responsible for providing financial resources and low-emitting technology to developing countries (Brohé et al. 2009).

The governing body of the Convention is the COP. It meets annually since 1995 to review the implementation of the UNFCCC and to negotiate solutions, commitments and potential legal instruments to achieve its objectives. During the third COP in 1997, these negotiations led to the adoption of the Kyoto Protocol, whereby major GHGs emitters among the Kyoto signatories were issued with binding caps on their emissions and issued permits to meet them. Operational and implementation specifications of the Kyoto Protocol were later defined at COP 4, with the adoption of the two-year Buenos Aires Plan of Action for completing the Kyoto rulebook. However, COP 6 failed to agree on a package of decisions under the Buenos Aires Plan of Action and thus it resumed before COP 7 as COP 6b leading to the adoption of the Bonn Agreement. Only a few months later, COP 7 was held adopting the Marrakech Accords, which finalised and formalised the Bonn Agreement. Thus, it was only by 2001 that the Kyoto Protocol was finally ready for implementation. It came into force in 2005 with the required ratification by at least 55 parties of the UNFCCC, comprising of at least 55 % of the total carbon dioxide emissions of 1990 from Annex I parties. It now covers a total of 63.7 % of total GHGs emissions. (UNFCCC 2011b)

The next big step was the adoption of two separate negotiation tracks, the first one during COP 11 (for the Kyoto Protocol) and the second during COP 13 (for the Convention). The AWG-KP (Ad Hoc Working Group on Further Commitments for Annex I Parties under the Kyoto Protocol) marked the entry into force of the Protocol in 2005 and COP 11 was the first to run in parallel to the Meeting of the Parties to the Protocol (CMP). The Bali Road Map adopted at COP 13 in 2007, includes the Bali Action Plan that establishes the AWG-LCA (Ad Hoc Working Group on Long Term Cooperative Action), the second negotiation track. This Road Map notably planned to conclude a new negotiation process by 2009 to tackle climate change specifically in the prolongation of the Kyoto period. (UNFCCC 2011b)

COP 15 was seen as an opportunity for governments to cooperate over the design of more regulated and interlinked emissions trading schemes (Brohé et al. 2009). It failed to meet the ambitions of the Bali Road Map, although it produced the Copenhagen Accord affirming the goal previously declared by the G8 that: "global average temperature above pre-industrial levels ought not to exceed 2°C" (BBC News 2009). COP 16, the latest to date, turns the Accord of COP 15 into the Cancun Agreement, reviving the confidence in the multilateral process on climate change. It acknowledges that the current targets are not sufficient to maintain global temperature increases



below 2°C and that this temperature ceiling needs itself to be reviewed by 2015. Replacing the Kyoto Protocol will require serious reviews to be made and the commitment of many countries that may not be ready to consider a second commitment period (i.e. Japan Australia, Canada and Russia). It seems as though it will be difficult to reach a legally binding agreement in the forthcoming COP (d' Oultremont 2011).

It is a challenging time for climate change negotiators and legislators and it is important to quickly deliver an accepted and realistic successor to the Kyoto Protocol, in order to support individual actions to tackle climate change such as the one taken by Europe establishing the EU ETS.

### 2.2.3 An addition to the Treaty: The Kyoto Protocol

The Protocol represents the only binding multi-lateral agreement to reduce GHGs emissions and the first international implementation of a cap-and-trade scheme. The 193 nations and the European Union, which signed the Kyoto Protocol (UNFCCC 1998), agreed to reduce overall GHGs emissions in 37 industrialised countries, listed in *Annex B* of the Protocol, by 5% from 1990 levels during the period from 2008 to 2012. In order to meet this target, the protocol produces a compliance market by establishing 'flexible mechanisms' that allow countries to trade carbon credits or emission reduction units. Those mechanisms are the *Clean Development Mechanism* (CDM), *Joint Implementation* (JI), and emission trading, known as the "Carbon Market". The protocol covers six GHGs (i.e. CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O, three types of fluorinated gases: HFCs, PFCs, SF<sub>6</sub> and two other industrial gases: CFCs, HCFCs) but excludes GHGs emissions from aviation and maritime transportation mainly for reasons of accounting difficulties. It also makes provisions for sanctions in the case of non-compliance of a party.

Each participant country receives a quantity of *Assigned Amount Units* (AAUs), Kyoto allowances equivalent to a metric tonne of CO<sub>2</sub>e. Allocation is made on the basis of *grandfathering* i.e. historical emissions of 1990. This method favours the more recently developed countries that were big emitters in 1990. Additionally, the sharing of emissions reductions of the Protocol places heavier targets on most developed countries. The targets effectively range from 8 % reduction to 10 % increase of emissions. This illustrates one of the difficulties of the Protocol: it needs to be fair, effective and realistic but in the end it only becomes accepted if it also follows the desires of its contributors. An example of a fairer approach to allocation, but which still poses a problem of acceptance, is the contraction and convergence principle, by which instead of treating the atmosphere as a globally common entity to be shared equally by all, rich countries are expected to reduce their emissions sufficiently to allow for the others to achieve a certain standard of development in order to reach a convergence on a similar per capita level of emission (Newell & Paterson 2010). While waiting for the improvement of allocation methods, a provision was made to enable countries to choose a less penalising *baseline* especially those whose economy changed after the removal of the *iron curtain* in 1989.



Participants are allowed to trade their carbon assets among each other, as provided by the emission trading mechanism. They can also make use of the CDM (producing *Certified Emission Reduction*, CER) and JI (producing *Emission Reduction Unit*, ERU). However, the majority of each country's target must be met primarily by domestic action. CDM and JI work on a similar basis, which is that one country with emission reduction obligations under the Protocol invests in *sustainable development* projects leading to emissions reductions in another country and claims those as substitutes for its reduction target. The only main difference is the host country. JI is between Kyoto Protocol participants, and CDM between Annex I and Non-Annex I Parties. A fourth type of unit is recognised by the Protocol, the *Removal Unit* (RMU), which is issued based on land-use change and forestry activities in Annex I Parties, such as reforestation. (UNFCCC 2011b) All transactions covering the three mechanisms are accounted for in national registries. Two other types of registries are used to keep track of units at different levels: (1) Independent Transaction Log as a monitoring tool to the UNFCCC and (2) Supplementary Transaction Logs that can be implemented by individual participant, as was done for the EU ETS (Brohé et al. 2009)

The CDM is tricky to use as it relies on the validation of emissions reduction projects that are usually difficult to assess and monitor due to their variability and location. Indeed, studies have proven that CDMs tend not to attain their promised amount of emissions reductions. This is perhaps not such a surprise as error margins in measuring emissions can vary from one sector to another and effectively reach 100%, as for some agricultural projects (Schapiro 2010). The size of the CDM market portrays well its popularity amongst Kyoto participants. Its relative success has two grounds, the fact that it allows for more cost-effective reductions to be pursued in the South by Northern countries, and by doing this, it allows the Southern countries to address the GHGs emissions issue without requiring them to accept reduction obligations. (Newell & Paterson 2010)

It is possible for nations to meet their objective jointly and they may also develop their own trading mechanisms in order facilitate meeting their targets. The EU is the only group of countries that chose that option, requiring them to reduce jointly emissions by 8% below 1990 levels. Consequently, the establishment of the EU ETS can be seen as a response to achieve the international targets set by the Kyoto Protocol for 2012, although there is no direct link between the two (Ellerman et al. 2010). Indeed, the EU ETS was agreed prior to the introduction of the Kyoto Protocol and will continue after the end of the Protocol's period. National targets for meeting this overall objective are attributed to each MSs under the European *Burden Sharing* Agreement, based on population growth and *energy efficiency* (Brohé et al. 2009). Moreover, the EU increased that target in its Climate and Energy Package of 2008 to a 20 % cut below 1990 levels by 2020 (European Commission 2011b).



## 2.2.4 The role of the European Union in international climate negotiations

### a. **The EU's political background**

It was during the 1950s, some time before the emergence of the concerns about climate change, at a time during which concerns about keeping peace were more of the essence, that the first major treaties were signed establishing the basis for what is now known as the European Union. In 1952, the Treaty of Paris established the European Coal and Steel Community aimed to maintain peace, and the Treaty of Rome in 1958, established the European Economic Community and the European Atomic Energy Community.

The environment was formally given consideration as a part of the EU's missions, when a chapter was dedicated to it in the first major revision to the Treaty of Rome, The Single European act of 1986, as mentioned in chapter 1. It gave the EU room for action in the field of the environment, subject to *qualified majority voting*. Whilst the treaties instituting the European Community remained silent on the subject up to that date, various events illustrate the rise of environmental concerns from the end of the 1960s both at European and international levels. This was politically realised during the international Conference of Stockholm of 1972 and the EU Paris Summit.

There are conflicting opinions on the reason of this early silence; some authors say that prosperity first had to be attained in order for other concerns to be addressed, others think that it was due to ignorance of the existence of serious environmental problems. Nevertheless, it is important to realise that the EU sees a real vocation in protecting the environment. (Misonne 2011)

### b. **From American to European international environmental leadership**

It was initially the USA that took the lead in the international negotiations leading up to the establishment of the Kyoto Protocol, supporting emissions trading and arguing for flexibility and cost-effectiveness. They were the frontrunners in establishing the framework to deal with the protection of the ozone layer in the 1980s. Moreover, they had previously successfully established the first mandatory emission trading system aiming at tackling the problem of acid rain with respect to SO<sub>2</sub> emissions, under the Clean Air Act of 1990. This gave them a precedent in the field of emission trading, inspiring the Kyoto negotiations. Eventually, together with the CICERO's propositions this led to the creation of the JI and CDM mechanisms in the Protocol. Supporting the creation of the CDM was also a way for the USA to reduce competitive disadvantage between countries under obligations and those not. They supervised the creation of the cap-and-trade system, leaving the others to implement the scheme. (Schapiro 2010) In 2001, their newly elected President Bush declared that the USA would not join the Protocol for fear of damaging the US economy (United Nations 2011). Indeed, whereas the SO<sub>2</sub> emission trading scheme bared a socially acceptable cost, it was not expected to be the case for an international trading scheme aimed at solving climate change, a problem much more intricate and global than that of acid rain (Brohé et al. 2009).



The decision not to join the Protocol marked the end of USA leadership on climate change. The EU was already progressively replacing them since the 1990s (Kilian & Elgström 2010; European Commission 2011b). What is more, in 1998, contrary to its previous position against emissions trading throughout the Kyoto negotiations, the EU decided to create its own emissions trading system as part of its strategy to meet its Kyoto targets and later its own emissions targets. This was formally stated in its Green Paper of 2000, although research on the benefits of such systems had been going on in Europe since the early 1990s (Newell & Paterson 2010).

To summarise the position of the EU, at first, they saw emissions trading as a way to avoid taking domestic action to reduce emissions, they then realised it was the only hope of keeping the USA on board of an international agreement. Once the USA pulled out of Kyoto, the EU saw it as the opportunity to take the role of leadership on climate change politics, after the refusal of a European carbon tax. At present, this position seems to be challenged by old and new participants to the global climate regime, such as the USA and China. A problem thus arises, that if no party is clearly given leadership power, it might keep on delaying international action (Kilian & Elgström 2010).

### **c. The EU roadmap**

The EU, taking the responsibility of setting an example for tackling climate change, issued the Green Paper on 'greenhouse gas emissions trading within the European Union' (European Commission 2000) to introduce the scheme as part of its climate strategy and launch a process of consultation on the scheme's suitability and possible functionality. It was followed by the start of the European Climate Change Programme for identifying and developing all the necessary elements to implement the Kyoto Protocol. It has been responsible for initiating many policy measures to reduce GHGs emissions, since the EC issued its first Community strategy to limit CO<sub>2</sub> emissions in 1991. Later it also provided a major input to the review of the EU ETS Directive. (European Commission 2008; European Commission 2011b)

Since 2010, the European Commission has created a Directorate General (DG) notably "to develop and implement cost-effective climate change politics and strategies", such as the EU ETS, as well as to promote them globally, namely DG Climate Action (European Commission 2011b). It is working towards reaching the EU's ambitious long-term targets of reducing emissions by 80-95 % below 1990 levels by 2050, as set in its 'Roadmap for moving to a *low carbon economy*' (European Commission 2011a), in accordance with the IPCC's (2007) findings. So far, measures are being implemented to reach a 20 % emissions reduction by 2020 and potentially 30 % if it is backed by similar action in other major economies. Those targets are supported by energy-related targets, also to be reached by 2020, to reduce energy consumption by 20 % by improving energy efficiency, increase renewable energy's market share to 20 % and increase renewable fuel's share in transport to 10 %.

Details of the implementation for these 2020 targets are contained in the climate and energy package of 2008. It contains four pieces of complementary binding legislations to implement these



'20-20-20 targets', making the EU the first to commit and provide measures to attain such ambitious targets. The package notably provides a revision and strengthening of the EU ETS confirming the implementation of its Phase III. It officially puts the EU ETS as the "keystone of the EU's climate strategy", as it is redesigned to contribute to around two-thirds of the overall emission reductions by 2020 i.e. 21 % decrease in allowances with respect to 2005 (European Commission 2009b). Eventually the EU aims to become a "highly energy-efficient, low carbon economy" (European Commission 2011b).

#### 2.2.5 Timeline of the international and European context

The following timeline aims to provide a global overview of events which occurred at international and European levels with respect to climate change and the EU ETS, most of which are discussed in this dissertation. It does not pretend to be exhaustive, but takes account of the acts deemed to be the most important. It combines information from various sources (UNFCCC 2011a; UNFCCC 2011b; Brohé et al. 2009; Ellerman et al. 2010; European Commission 2011c; European Commission 2011d; Newell & Paterson 2010).

**Table 1 Timeline of international and European events**

<b>1950</b>	The <b>WMO</b> is established as the specialised agency of the United Nations for meteorology (weather and climate).
<b>1952</b>	<b>Treaty of Paris</b> establishing the European Coal and Steel Community.
<b>1958</b>	<b>Treaties of Rome</b> establishing the European Economic Community and the European Atomic Energy Community.
<b>1967</b>	The EU <b>Merger Treaty</b> comes into force to restructure the European Institutions into a single institutional structure.
<b>1972</b>	The United Nations Conference on the Human Environment founds the <b>UNEP</b> to coordinate United Nations environmental activities and adopts the <b>Stockholm Declaration</b> as the first document explicitly recognising the right to a healthy environment.
<b>1979</b>	First <b>World Climate Conference</b> , held in Geneva and organised by the WMO, establishes the World Climate Programme.
<b>1983</b>	The <b>Brundtland Commission</b> , formally the United Nations World Commission on Environment and Development, is assembled by the United Nations for assessing environmental problems.
<b>1986</b>	The EU <b>Single European Act</b> , modifying the Treaty of Rome, enters into force, reforming the institution in preparation for new member states and the single market.
<b>1987</b>	The <b>Brundtland Report</b> , 'Our Common future, dealing with sustainable development and the change of politics needed for achieving it, is published.
<b>1988</b>	The <b>IPPC</b> is established by the WMO and UNEP.
<b>1989</b>	Resolution of a <b>General Assembly of the United Nations</b> calling for global summit on environment and development issues.



<b>1990</b>	<p>The IPCC releases its <b>First Assessment Report</b>.</p> <p>Second <b>World Climate Conference</b> is held in Geneva.</p> <p>Resolution of a <b>General Assembly of the United Nations</b> establishing the Intergovernmental Negotiating Committee for drafting the Framework Convention on Climate Change.</p> <p>Amendment to the <b>Clean Air Act</b> is passed in the United States establishing an emissions trading scheme for SO<sub>2</sub> emissions, of which the first Phase is due to start in 1995, to deal with the problem of acid rain.</p>
<b>1991</b>	Council <b>Directive 91/692/EEC</b> standardising and rationalising reports on the implementation of certain Directives relating to the environment.
<b>1992</b>	<b>United Nations Conference on Environment and Development</b> (Earth Summit) in Rio de Janeiro (Brazil) during which the <b>UNFCCC</b> , adopted earlier that year at the United Nations Headquarters, is ratified by 50 states.
<b>1993</b>	<p>The Treaty on the European Union (TEU, <b>Treaty of Maastricht</b>), in preparation for the European Monetary Union and introducing elements of a political union, enters into force.</p> <p>European Council <b>Decision 93/389/EEC</b> for a monitoring mechanism of Community CO<sub>2</sub> and other greenhouse gas emissions, amended by Council Decision 99/296/EC.</p>
<b>1994</b>	<p>The <b>UNFCCC</b> comes into force in March.</p> <p>European Council <b>Decision 94/69/EC</b> approves the UNFCCC.</p>
<b>1995</b>	<p><b>Dissolution of the</b> Intergovernmental Negotiating Committee, allowing the Conference of the Parties (COP) to become the UNFCCC's ultimate authority and <b>COP 1</b>, the First Conference of the Parties to the UNFCCC meets in Berlin (Germany) and adopts the <b>Berlin Mandate</b>.</p> <p>The IPCC publishes its <b>Second Assessment Report</b>.</p>
<b>1996</b>	<p><b>COP 2</b> meets in Geneva (Switzerland) and adopts the <b>Geneva Declaration</b>.</p> <p>European Parliament and Council (EPC) Directive 96/61/EC, concerning integrated pollution prevention and control (<b>IPPC Directive</b>), now Directive 2008/1/EC, establishes a single permitting process for certain industries to determine appropriate control to protect the environment.</p>
<b>1997</b>	<b>COP 3</b> meets in Kyoto (Japan) and adopts the international community's main treaty to date, the <b>Kyoto Protocol</b> .
<b>1998</b>	<p>The <b>Kyoto Protocol</b> is opened for signature at UN headquarters in New York.</p> <p><b>COP 4</b> meets in Buenos Aires (Argentina) and adopts the <b>Buenos Aires Plan of Action</b>.</p>
<b>1999</b>	<p><b>COP 5</b> meets in Bonn (Germany).</p> <p>The EU <b>Treaty of Amsterdam</b> comes into force, reforming the EU institution in order to prepare for the arrival of new member countries.</p> <p>European Council <b>Decision 1999/468/EC</b> lays down the procedures for the exercise of implementing powers.</p>
<b>2000</b>	<b>COP 6</b> meets in The Hague (Netherlands) but fails to agree on a common set of decisions under the <b>Buenos Aires Plan of Action</b> .



	Publication of the EC <b>Green Paper on greenhouse gas emissions trading within the European Union</b> and launch of the <b>European Climate Change Programme (ECCP I)</b> , due to conclude by 2004.
<b>2001</b>	<b>COP 6b</b> resumes in Bonn (Germany) and adopts the <b>Bonn Agreements</b> . <b>COP 7</b> , held in Marrakesh (Morocco), produces the <b>Marrakesh Accords</b> . The IPCC publishes its <b>Third Assessment Report</b> .
<b>2002</b>	<b>COP 8</b> meets in New Delhi (India) and adopts the <b>Delhi Declaration</b> . EPC <b>Decision No 1600/2002/EC</b> established the Sixth Community Environment Action Programme. European Council <b>Decision 2002/358/EC</b> approves the Kyoto Protocol and agrees for Member States to fulfil emissions reduction commitments under the Kyoto Protocol jointly.
<b>2003</b>	EPC issue the <b>Emission Trading Directive 2003/87/EC</b> on 13 <sup>th</sup> October as the formal declaration of the EU ETS, due to commence a little over one year later, amending Council Directive 96/61/EC. EPC <b>Directive 2003/4/EC</b> make provision on public access to environmental information, notably EU ETS related information. The EU <b>Treaty of Nice</b> for reforming the institutions to improve functioning after reaching 25 Member States, comes into force. ECP <b>Directive 2003/6/EC</b> on insider dealing and market manipulation (market abuse). <b>COP 9</b> meets in Milan (Italy) and adopts several decisions.
<b>2004</b>	EPC <b>Linking Directive 2004/101/EC</b> , amending Directive 2003/87/EC, makes provision for the use of Kyoto Protocol's project mechanisms in the EU ETS. EPC <b>Decision No 280/2004/EC</b> concerning a mechanism for monitoring Community GHGs emissions and for implementing the Kyoto Protocol. EPC <b>Directive 2004/8/EC</b> , amending Directive 92/42/EEC, on the promotion of cogeneration based on a useful heat demand in the internal energy market. <b>COP 10</b> meets in Buenos Aires (Argentina) and adopts several decisions.
<b>2005</b>	Entry into force of the <b>Kyoto Protocol</b> . Start of the first period of the EU ETS on 1 <sup>st</sup> January ( <b>Phase I EU ETS</b> ) and launch of the second <b>European Climate Change Programme (ECCP II)</b> . <b>COP 11</b> meets in Montreal (Canada) at the same time as the 1 <sup>st</sup> Conference of the Parties serving as the Meeting of the Parties to the Kyoto Protocol ( <b>CMP 1</b> ), adopting numerous decisions to strengthen global efforts to fight climate change.
<b>2006</b>	The <b>CDM</b> becomes operational. <b>COP 12/CMP 2</b> meets in Nairobi (Kenya).
<b>2007</b>	The IPCC publishes its <b>Fourth Assessment Report</b> . <b>COP 13/CMP 3</b> meets in Bali (Indonesia) and adopts the <b>Bali Road Map</b> .
<b>2008</b>	Start of the second period of the EU ETS on 1 <sup>st</sup> January ( <b>Phase II EU ETS</b> ) <b>COP 14/CMP 4</b> meets in Poznan (Poland). ECP agrees on the <b>Climate and Energy Package</b> proposed by the EC, which becomes



	<p>law the following year.</p> <p>EPC <b>Directive 2008/101/EC</b>, amending Directive 2003/87/EC, includes aviation activities in the EU ETS.</p>
<b>2009</b>	<p>The EU Treaty on the functioning of the European Union (TFEU, <b>Treaty of Lisbon</b>), for improving the way in which global problems such as climate change are addressed, enters into force.</p> <p>EPC <b>Regulation No 219/2009/EC</b> adapting a number of instruments subject to the procedure referred to in Article 251 of the Treaty to Council Decision 1999/468/EC (the <i>Comitology</i> Decision) with regard to the regulatory procedure with scrutiny.</p> <p>EPC <b>Directive 2009/29/EC</b>, amending Directive 2003/87/EC, improving and extending the EU ETS.</p> <p>EPC latest version of the <b>Emission Trading Directive</b> 2003/87/EC amending Council Directive 96/61/EC, as amended by Directive 2004/101/EC, Directive 2008/101/EC, Regulation No 219/2009/EC, Directive 2009/29/EC.</p> <p><b>COP 15 /CMP 5</b> meets in Copenhagen (Denmark) and produces the <b>Copenhagen Accord</b>.</p> <p>Third <b>World Climate Conference</b> held in Geneva.</p>
<b>2010</b>	<p><b>COP 16/CMP 6</b> meets in Cancun (Mexico) and adopts the <b>Cancun Agreement</b>.</p> <p>The EU establishes <b>Directorate General Climate Action</b> (previously part of DG Environment) to deal with climate change issues.</p>
<b>2011</b>	<b>COP 17/CMP 17</b> is due to meet in Durban (South Africa).
<b>2013</b>	Start of the third period of the EU ETS on 1 <sup>st</sup> January ( <b>Phase III EU ETS</b> ).
<b>2014</b>	Planned issue date for the IPCC's <b>Fifth Assessment Report</b> .

Since the latest version of the Emission Trading Directive, a number of Decisions, Regulations and Communications by the European Union have been issued to give it more precision. The subjects vary from the quantity of allowances to the list of aircraft operators covered under the EU ETS.

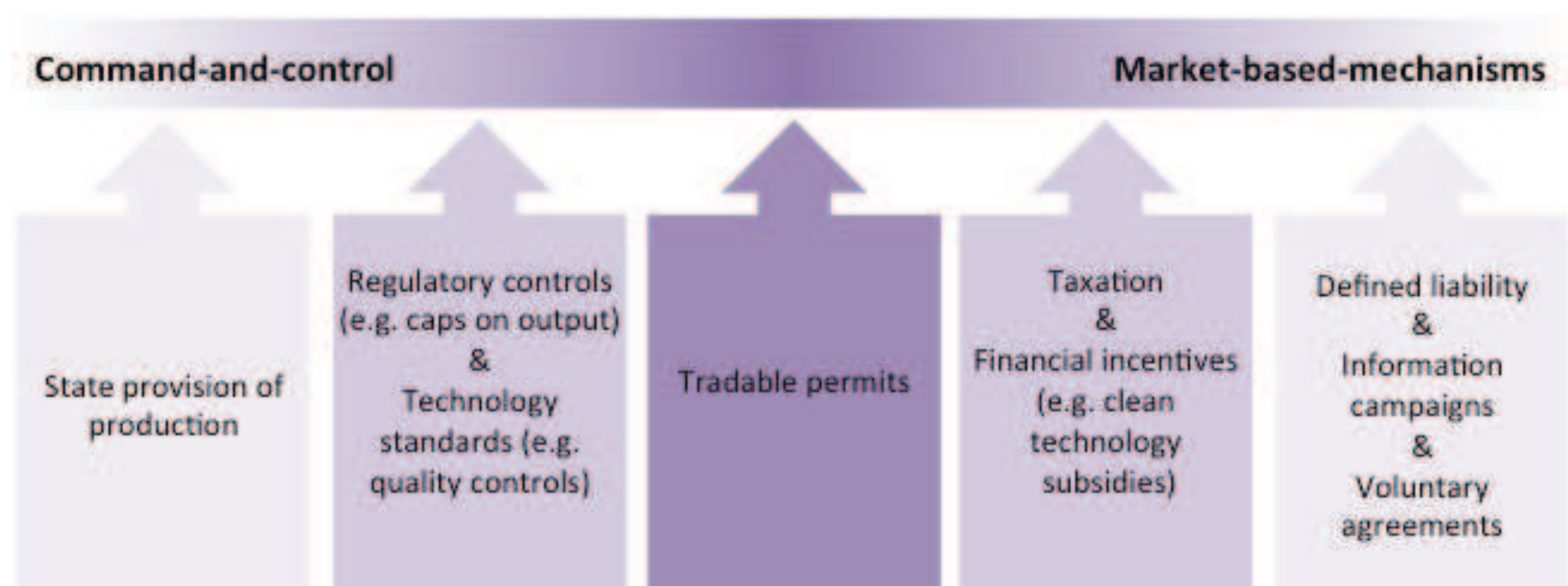
The timeline shows clearly that the acknowledgement of the fact that economic institutions and systems must be changed in order to devise new methods of control for both resource allocation and pollution control is not new. However, its acceptance and implementation is taking some time to alter our impacts on the environment. Nevertheless, over the last twenty years we have considerably improved our understanding of climate change, and its causes and consequences. We have also started to develop more adequate *policies* and legal instruments in order to prevent it.



## 2.3 Policy instruments for tackling climate change

### 2.3.1 Overview of policy instruments

There is a wide variety of policies and instruments which can be used to reduce the risks of reaching a global climate crisis. The two extreme categories of policy instruments for reducing climate change are command-and-control and *market-based* approaches, with emission trading positioned at the middle of the spectrum, as it can be observed on Figure 1 below. For a review of findings about performances of those policies from the Fourth Assessment Report of the IPCC (2007) cf. Table 5 in Annex III. The main difference between command-and-control and market based policy instruments, is with the participant. Whereas with the former, it is the government or state which takes control over decisions regarding the production of goods, services and pollution abatement, in the second case, this role is given to individuals and firms. The latter option is thus traditionally the favoured option of free market economies (Brohé et al. 2009). However, the experience of implementating all of those instruments has demonstrated that each has its own advantages and disadvantages.



**Figure 1 Spectrum of possible policy instruments (Brohé et al. 2009, p.29)**

Therefore, choosing the right instrument depends on many factors, notably the culture, the politics, and the administration of a country as well as the sector of application and interaction with other instruments. On top of these cultural and political considerations, instruments need to be evaluated considering their outcome i.e. policies may vary regarding their distributional impact, cost or environmental effectiveness in achieving emissions abatement and their institutional feasibility. Moreover, the expected diversity of interests of stakeholders for a given policy renders it even more difficult to choose the best policy for all, unless everyone happens to agree. All things considered, the aim remains to select the most cost-effective instrument for a set scenario as greater reduction can then be made at the same cost (Bernheim 2011b).

Knowing this, it is obvious that only a combination of instruments will lead to any desired outcome. To give an example, if only instruments from the right end of Figure 1 are used the impact on



emission levels will be limited, but they are necessary to encourage the development of new technologies which will support instruments on the middle to left side of the spectrum. Additionally, as mentioned by the IPCC (2007), it is also important to “integrate climate policies in broader development policies” to facilitate of their implementation.

### 2.3.2 Market-based type instruments

The dominant debate amongst policymakers, when trying to move away from a GHGs producing economy, is to choose between *taxation* or trading, both market-based type instruments (Brohé et al. 2009). In other words, should carbon be given a price by introducing taxes on emissions or by setting emissions caps on firms or countries and allowing trading?

In policy terms, emissions trading schemes are quantity (i.e. market regulated) instruments in the sense that the regulator decides on the number of permits to be issued, allowing the market to set the price (Morris & Worthington 2010). Conversely, taxation operates through price mechanisms. Therefore, as climate change can be seen as a consequence of the growing quantity of GHGs emissions, it seems obvious that the use of quantity instruments would seem more fit for the purpose of achieving the required reduction targets in quantity of emissions. However, it eventually depends on the regulator's assessment of abatement costs versus damage costs or “risk of a catastrophic event occurring” and its priorities with regard to the state of affairs at the time (Brohé et al. 2009, p.33). Taxation measures are preferred if policymakers are concerned about cost of mitigation and vice-versa. This is because taxation provides more certainty on abatement costs than the other system, which provides more certainty on avoiding reaching the damage stage. It is interesting to notice that when emission trading scheme credits are *auctioned* rather than given out for free, the two mechanisms have similar practical effect: that of charging the cost of CO<sub>2</sub> emissions to consumers and producers, in accordance with the international environmental law principle ‘polluter pays’.

The *Stern Review* (Stern 2007), which provides the first concrete economic analysis of climate change, favours emission trading over carbon taxation, while giving economic support to “strong and early action on climate change” (Brohé et al. 2009, p.202). As for polluting industries, although they would traditionally prefer having the option of a free market, thus the use of quantity rather than price mechanisms, the latter can provide more certainty for planning investments. Emissions trading is thus not the only solution to the problem of climate change but seems to be part of the mix of instruments to be used.

By using market forces to prevent climate change, one in fact exploits the same forces that led to it by creating worldwide industrial growth, which in turn led to global warming and climate change as an inevitable consequence. This is the precise logic adopted by the United Nations as it is slowly trying to morph carbon into a novel commodity: “one whose value resides entirely in the promise of its absence” (Schapiro 2010). Rightfully so, carbon trading has become the fastest growing



commodities market. Even more, carbon markets are aiming to promote the role of business in the reduction of greenhouse gas emissions rather than relying solely on punishing measures imposed on the industry in the form of taxations and regulations (Brohé et al. 2009). However, it is also essential not to forget that market measures need to be complemented by other governmental policies in order to bring change. For example, the issue of permits for emitting polluting substances under the Integrated Pollution, Prevention and Control Directive is required for industrial and agricultural activities with a high pollution potential which are not covered under the EU ETS. (European Parliament and Council 2008)

### 2.3.3 Emissions trading and the specificity of carbon markets

It is widely believed that emissions trading can provide support for the necessary cuts in carbon emissions in order to prevent the worst impacts of climate change from occurring, provided they are implemented correctly (Morris & Worthington 2010).

The two basic types of emissions trading schemes are cap-and-trade and baseline-and-credit systems. In a cap-and-trade system, the government sets gradually decreasing emission limits and distributes allowances between participants covered by the scheme, allowing them to either abate emissions or buy extra allowances, as is done in the EU ETS. Baseline-and-credit schemes, such as the CDM, involve setting emission limits for a sector, project or company and encouraging participants to reduce their emissions below this baseline in order to obtain credits, which could potentially be traded. (Brohé et al. 2009)

Implementing a cap-and-trade system essentially involves creating a carbon market. Carbon markets are unique: "carbon exists as a commodity only through the decisions of politicians and bureaucrats, who determine both the demand, by setting emissions limits, and the supply, by establishing criteria for *offsets*" (Schapiro 2010).

The specificity of handling carbon like a commodity, unlike corn or steel for example, is that there is not one single way of producing units of credit (i.e. one tonne of CO<sub>2</sub>e) and these are intangible and invisible. Carbon credits can emerge from a range of different conditions and components, which cannot easily be measured or reliably monitored. For example, it is one thing to measure carbon savings from switching to more efficient technologies at coal power stations, but another to compute carbon capture equivalents from pig farming. In that sense, market mechanisms, such as CDMs and JIs, are unlike any other *security* since the ability to reduce GHGs emissions is potentially infinite as such gases emerge from every corner of the planet. (Schapiro 2010)

Emission trading obeys conventional market mechanisms shaped by the forces of supply and demand, in which the establishment of a cap on emissions (i.e. the supply) within a specified scope sets the demand for allowances. The demand is therefore dependant on the stringency of the cap and the price remains low if the participants are able to reduce their emissions easily or if the cap is too high. The scope generally needs to define the scheme's coverage in terms of location, time,



and gases. Any emissions trading scheme has critical elements, which if not well engineered, can jeopardize its success, to mention the most obvious ones: coverage definition, reliability of the monitoring, reporting, and verification (MRV) (Brohé et al. 2009). The last three are essential in order to support the scheme's integrity and rely upon the ability of the regulating bodies to accurately account emissions. Maintaining the scheme's integrity is key to establishing participant confidence and allowing it to persist into the future.

The 'global carbon market' is still under construction, as several of the questions, or even problems which emerged from its establishment remain unanswered today. They emerged as a result of introducing a singular new commodity and concern the accountability of corrupted credits: How to avoid them? Who should be liable? How can they be revoked? (Schapiro 2010)

#### 2.3.4 Emissions trading around the world

As explained, the fundamental principle behind the concept of emissions trading is that it allows emission reductions to occur where it costs least to obtain them. Therefore, the broader the coverage of the scheme, the greater the potential benefits can be. This is one of the main reasons for aiming towards the development of one global carbon market. Since the creation of the Kyoto Protocol, several carbon emissions trading schemes have been planned, developed or operated as regulatory tools to deal with climate change either at national, regional or inter-national/regional levels (Betsill & Hoffmann 2011). However, none have yet reached a stage or size similar to that of the EU ETS. It is interesting to note that different countries use different policy mixtures to respond to their emissions reduction targets according to varying factors, notably their stage of development and national circumstances, which confirms what has been explained previously. These two factors also influence the required intensity of the target and the difficulty with which a country or region will be able to meet it. Indeed, the stage of development will determine the ability, but also the willingness to act (Australia Government 2011). Moreover, each emissions trading system is designed differently, for example some act upstream (e.g. CO<sub>2</sub>e emitters) while others downstream (e.g. fossil fuel producers), but usually the same implementation issues are faced (Newell & Paterson 2010). Eventually, all those systems could be linked to the European scheme and to each other providing incentive for the creation of a truly global regime.

## 2.4 European Union Emission Trading Scheme

### 2.4.1 Definition

The EU ETS puts a cap on carbon dioxide emissions equivalents from European stationary installations of the most *energy-intensive* industrial sectors, and will soon be applied to the aviation sector. Part of the cap is attributed to the scheme's participants and the rest is auctioned, the participants are then allowed to trade these emissions permits on a market; hence it is a cap-and-trade system. At the end of each year, real emissions need to be offset by these pollution rights,



bought or received, of each entity covered. Consequently, when polluters expect to their allowance, they must enter the market to buy permits sold by those with surplus allowances or invest in measures or technologies to reduce their emissions. Thus, through the EU ETS, European politicians are essentially internalising an externality that is currently the main cause of human induced climate change. It sends a clear message to GHGs emitters, which is that producing GHGs will incur costs.

If the market of emissions rights for sulphur dioxide introduced the principle of emissions trading, then the EU ETS is the world's first large-scale company-level emissions trading system. It is currently also the biggest, followed by the United Nations' CDM (cf. Figure 6 in Annex III). It is viewed, not only by the European Commission but also by many others, as the centrepiece of the European Union's Climate Change Programme (Bailey 2010; Ellerman et al. 2010; European Commission 2011e). This environmental policy instrument is an example of *top-down* climate politics where a central bureaucracy, the European Commission, supervises a multijurisdictional agreement (Schapiro 2010). The scheme is called a 'downstream' system which means it operates by imposing obligations to those who physically emit GHGs as opposed to 'upstream' systems whereby producers of fossil fuel, for example, need to hold enough allowances for each GHG emitting resource unit sold (Newell & Paterson 2010). Finally, it is also a flexibility mechanism as it provides participants with the ability to trade within the limit of the cap, ensuring that "emissions are cut where it is the cheapest to do so and investments are directed to where they buy the greatest emission savings" (European Commission 2011a).

#### 2.4.2 Rationale

From the review of literature so far, there appear to be two main drivers to the development of the EU ETS:

- (1) The positioning of the EU as new leader in the climate change area of international relations. As Europe is seen as part of the group of industrialised countries facing the responsibility to lead the run towards reducing greenhouse gases emissions since the 1970s (R. Dorfman & N. Dorfman 1977), it has been under pressure to set a global example of domestic action to mitigate the crisis.
- (2) Cap-and-trade systems are policy instruments designed to mitigate climate change that avoid the use of price instruments such as carbon taxes, which only work on a limited range of emissions. Moreover, as quantity policy instruments they provide assured emissions reductions at the least cost.

Therefore, the 'European wide scheme' was set out within an international political context as one of the results of the Kyoto Protocol and of an appraisal of different tools to tackle climate change that demonstrated its efficiency gains (Rossetti di Valdalbero 2010). It is interesting to remember that the status of emissions trading within the EU underwent a complete evolution from being a



non-option to becoming the cornerstone of the EU's environmental policy providing a platform for subsequent action at global level, as explained in chapter 1 and at the beginning of this chapter.

### 2.4.3 The EU Emission Trading Directive and its revisions

The EU ETS was established under Directive 2003/87/EC, adopted in 2003 and amended four times:

(1) Directive 2004/101/EC, the Linking Directive, added specifications with respect to the use of the Kyoto Protocol's project-based mechanisms (European Parliament and Council 2004). More specifically it gives companies access to CDM (from 2005) and JI (from 2008) credits to meet part of their obligations under the EU ETS.

(2) Directive 2008/101/EC included aviation activities in the scheme (European Parliament and Council 2009a).

(3) Regulation (EC) No 219/2009 revised the regulatory procedures with scrutiny and committee procedure (European Parliament and Council 2009b).

(4) Directive 2009/29/EC improved and extended the EU ETS and is effectively a revision of Directive 2003/87/EC (European Parliament and Council 2009b).

In June 2009, the European Commission published the consolidation of the "EU ETS Directive 2003/87/EC of the European Parliament and of the Council of 13 October 2003 establishing a scheme for greenhouse gas emission allowance trading within the Community and amending Council Directive 96/61/EC" as a documentation tool without any legal status (European Parliament and Council 2009a). A list of EU ETS complementary legislative pieces can be found in Annex IIb.

#### **a. Objective**

The Kyoto Protocol and the decisions taken by the European Parliament and the Council require the European Community and its Member States to reduce their GHGs emissions with a view to mitigating climate change. The EU ETS Directive has as its objective to contribute to fulfilling these commitments, through the creation of "an efficient European market in greenhouse gas emission allowances, with the least possible diminution of economic development and employment" (European Parliament and Council 2009a). The development of the EU ETS is based on the principles of transparency, economic efficiency, cost-effectiveness, fairness and solidarity (European Parliament and Council 2009a) and the aim of the instrument created is the protection of, first, the environment, and second, competition (European Commission 2001). The development of the EU ETS is based on the principles of subsidiarity and proportionality. This means that it has been established that taking action at Community-level will provide better means to reach the above objectives and that the planned action does not go beyond what is necessary to achieve those objectives (European Parliament and Council 2009a).



**b. Provision for review and further development**

Article 30 of the Directive contains provision for review and further developments. In general, reviews of the Directive are required to take into account: (1) experience from the application of the Directive and progress in various areas such as monitoring, (2) the developments made in the context of its compatibility with the UNFCCC and the Kyoto Protocol, and (3) the extent to which objectives of the package of policies and measures implemented at MS and EU level have been attained (European Parliament and Council 2003).

Further developments, due to take place prior to the implementation of the first Phase of the EU ETS in 2005, were planned in two areas, namely to review of coverage on the basis of progress achieved in monitoring and make provisions for linking to project-based mechanisms. The first provisions for its review were to be submitted by a report of the EC to the EPC by June 2006 at the latest. The specific areas of concern to be revised were: (1) improving the economic efficiency of the scheme by reviewing coverage in terms of GHGs emissions and activities; (2) improving harmonisation of the methods of allocation and the registries; (3) the use of credits from project mechanisms; (4) the level of penalties for excess emissions; (5) the functionality of the market; (6) the adaptation of the scheme to an enlarged EU; (7) pooling; and (8) impact of project mechanisms (European Parliament and Council 2003). The second provision for its review is to be submitted by December 2014 specific issues to be reviewed can be found in the extract of Article 30 of the Directive in Annex IIc (European Parliament and Council 2009a). There are also provisions for reviewing the linear reduction factor by 2020 in the view of adopting a decision by 2025.

**2.4.4 The scheme's characteristics**

Unless stated otherwise, the following description of the functionality of the EU ETS is sourced from the EU ETS Directive (European Parliament and Council 2009a).

**a. Coverage**

The scheme is organised in successive periods of time of different duration, which are called Phases, in order to enable target reductions to occur incrementally and also to allow for trial and error to improve the running of such a novel scheme. The scheme has been projected up to its Phase III. It started operation in 2005 with Phase I, which lasted from 1<sup>st</sup> January 2005 to 31<sup>st</sup> December 2007. It was labelled explicitly as “learning by doing” and it can thus be seen as a pilot period (Newell & Paterson 2010). We are now in 2011, the penultimate year of the second trading period. Phase II also corresponds to the first commitment period of the Kyoto Protocol, which started in 2008 and is due to end in 2012. Finally, Phase III was later confirmed to begin on 1<sup>st</sup> January 2013 and to last until 2020. To sum up, the scheme started in 2005 and is planned until 2020, Phase I lasted 3 years, Phase II will last five years and Phase III, 8 years. Although no official agreement has yet been issued specifying a fourth Phase, the Directive is applicable beyond 2020 unless it is revoked.



The scheme currently comprises more than 12,000 installations in 30 countries, covering just under half of the EU GHGs emissions, which is approximately 2 billion tonnes per annum (Morris & Worthington 2010). Five countries have joined in since the start of the scheme in 2005 with the EU-25. Bulgaria and Romania joined the EU and entered the EU ETS during the last year of its first implementation Phase in 2007. Iceland, Liechtenstein and Norway joined the scheme's second Phase in 2008. Additionally, Switzerland is planned to join the scheme by 2013 (Reuters 2011a).

The scheme covers the power generation industry and other energy-intensive industrial sectors namely the production and processing of ferrous metals, the mineral industries and industrial plants for the production of pulp, paper and board. The largest industries being regulated are power generation, chemical, steel, and cement (Schapiro 2010). Airlines are planned to be included in the program in 2012, this includes all emissions from flights arriving at or departing from aerodromes on the territory of countries participating in the EU ETS (Sills 2011). The aviation sector contributes towards 3% of the EU GHGs emissions. It is in terms of level of emissions, the fastest growing sector but also the second largest after electricity generation once it joins the system (Reuters 2011b). The EC planned to widen the scope of the scheme in 2013, modifying sectors and gases coverage. So far, aluminium makers and petrochemical companies are scheduled for inclusion and nitrous oxide and perfluorocarbons emissions will be covered. Exclusion is provided for small installations which are already subject to equivalent emission reduction measures. Additionally, in the case when both EU ETS and IPCC Directives apply to an installation, permits under the IPCC Directive shall not include direct emission limit values provided no local pollution is caused.

EU ETS main trading units are called EU Allowances (EUAs). Additional tradable credits can be generated outside the regulated emissions market, within a set threshold limiting the amount of emissions allowed above the cap. This can be achieved through the use of baseline and credit schemes under which no cap is set on overall emissions only an emission baseline under which emissions may be reduced. The EU ETS allows the use of two such *mechanisms* from 2008, the CDM and JI as created by the Kyoto Protocol. Each respectively produces CERs and ERUs. The overall use of those credits cannot exceed 50 % of the EU-wide reduction effort below 2005 levels for both Phases II and III and it is up to MSs to specify the actual quantity allowed to be used by each participant. Effectively, this means that the use of those credits is limited to around 11 % of participants' allocation during the second Phase (Brohé et al. 2009). The EU recently agreed to ban carbon credits generated from most industrial gas offsets, which will apply after a fourth month period of heavy lobbying from industry and some MSs. Allowing the use of CDM credits for abating those gases under the scheme proved to be inefficient (Allan & Coelho 2011). In Phase III, no CERs can be issued from new-projects unless they are from least developed countries. Similarly, ERUs units may only be issued from projects registered before 2013. Provisions for the eligibility of



international offset for compliance during Phase III are not yet clearly defined in the EU ETS Directive and are currently under enquiry by associations (IETA 2011b).

#### **b. Cap and allocation**

The overall cap on emissions is reduced over time to achieve the EU reduction targets. It is currently around 6.5 % below the 2005 level slowly levelling to 21 % by 2020 (European Commission 2011a). This is the translation in the traded sector of the 20 % economy-wide reduction target with respect to 2009. To give an idea of orders of scale, the CO<sub>2</sub> cap is set at 2.08 billion tonnes for Phase II (EurActiv 2011a).

During the first two Phases, the quantity of allowances to be allocated and allocation methods were the responsibility of MSs subject to approval by the European Commission. These specifications were to be issued in National Allocation Plans (NAP) before the start of the period they corresponded to. As the start of the second Phase coincided with the Kyoto Protocol, countries also had to specify in their NAP which flexibility mechanisms they would be using (Galharret 2009). Each NAP had to comply with criteria provided in the Directive, notably to meet reduction targets. Based on these NAPs each country issued allowances to operators of each installation covered, while keeping aside some allowances for new entrants. This was initially the plan for Phase III. However, after the scheme was revised, it was decided to set an EU-wide quantity of allowances to be issued each year starting in 2013.

The total annual EU-wide credit quantity is to be decreased from the mid-point of Phase II, as set in NAPs for 2008-2012, linearly by 1,74 % each year. This linear factor is to be revised by 2025 at the latest. (European Parliament and Council 2009a) These credits were introduced at about 15€, doubling within a year (Sills 2011), a graph showing the evolution of the carbon price can be seen in Figure 7 in Annex III. Measures are provided in the event of excessive price fluctuations on the market.

There are two main methods for allocating quotas: free allocation and auctioning. Whereas free allocation requires someone responsible for the fair sharing of quotas among actors, auctioning relies solely on interactions of participants in the market. Both have advantages and disadvantages, making each best used at different stages or with different participants of the scheme. Indeed, if free allocation was seen as appropriate during the first implementation period of the EU ETS, it cannot produce sufficient results to be used throughout as it can lead to cases of over-allocation, to name one issue (Brohé et al. 2009). Nevertheless, it allowed for the necessary infrastructure for MRV to be set up. At least 50% of the revenues generated from auctioning should be used for environmental purposes as stated in the EU ETS Directive, for example, to develop renewable energies to meet the commitment of the EU to using 20% of renewable energies by 2020. However, there is not yet any obligation to do so.



During Phase I, countries had to allocate at least 95 % of allowances free of charge, a number which was reduced to 90 % for Phase II. Allocation amounts are determined on the grandfathering approach, which relies on past period emissions thus involving some uncertainties for Phase I allocations. The allowance of free quotas to the electrical sector is the most stringent resulting from the absence of exposure to international competition. In compensation, the right to offsets has preferably been allocated to this particular sector (Galharret 2009). During Phase III, the amount of free allocation is limited to particular cases, such as as for high efficiency co-generation and in the case of threat to international competitiveness. The sector and companies concerned with the latter issue can be found under the '*carbon leakage* list' (European Commission 2009a). As mentioned above, it is the EC that is responsible for determining the quantity of allowance to be auctioned and to be allocated free of charge. Free allocation for this Phase will be determined based on EU-wide ex ante *benchmarks* (i.e. reference emission factors) to ensure emissions reduction and the use of most efficient techniques.

Free allocation is provided amongst others for district heating and high efficient cogeneration. No more free allowances will be given to electricity production and CO<sub>2</sub> storage infrastructures, except in special cases i.e. electricity produced from waste gases and electricity sectors under modernisation. From 2013, the amount of free allowances will be limited to 80 % of the allocation amounts, which will be reduced each year to reach a maximum of 30 % by 2020 and phased out by 2027. Total free allocation is provided for installations in sectors exposed to the risk of carbon leakage up until 2020. The quantity to be auctioned is attributed to each MS by the EC based on previous allocation amounts, countries' development stage and severity of a country's Kyoto Protocol target. Each MSs is responsible for auctioning the total quantity of allowance not allocated free of charge. Aircraft operators will be allocated the equivalent of 97% of their historical emissions with 15% auctioning during 2012, their first year of participation in the scheme. This value shall be reduced to 95% for the following periods, provided no amendments are made, with at least 15% being auctioned.

Borrowing and *banking* of emissions is allowed within trading periods. Additionally, whereas banking between the first two Phases was up to the discretion of Member States, for the subsequent periods there is an obligation on Member States to allow for unlimited banking between Phases. The banking provision in reality creates one period out of Phases II and III.

The number of allowances corresponding to total real emissions of each installation are required to be surrendered at the end of each calendar year. Sanctioning is accomplished in two ways, through fines and the obligation to redeem missing rights during periods of subsequent compliance. Emissions and transactions are recorded in national registries, which are due to be replaced by an EU-wide registry from 2012 onwards.



### 2.4.5 Comparison summary between Phases

It can be seen from Table 2 below that, whereas there is not much difference between the two first Phases, the revision of the EU ETS Directive led to relatively important modifications for the third Phase. One of the questions that we can ask ourselves is whether those modifications address the problems that were encountered during Phase I. To answer this question, one must first take a look at the assessment and criticism made of Phase I in order to establish whether they were adequate.

**Table 2 ETS Phases' Characteristics (European Parliament and Council 2009c)**

	<b>Phase I: 2005-2007</b> Pilot Phase	<b>Phase II: 2008-2012</b> Kyoto Period	<b>Phase III: 2013-2020</b> EU leadership
<b>Cap &amp; allocation</b>	3 year compliance cap	5 year compliance cap	Yearly compliance, with yearly linear decrease of 1,74 %
	Allowance allocation decentralised to MSs through the preparation of NAP, which needs to be approved by the European Commission		Allowance allocation taken by the European Commission
	Allowed up to 5% of auctioning, which most chose not to do, leading to overall free allocation	Allowed up to 10% of auctioning	Majority of auctioning (100% for the electricity sector and for all others 20% gradually increased to 70% by 2020 and 100% by 2027, except derogations
	Free allocation based on grandfathering		Free allocation based on benchmarking
	Borrowing is allowed within the period but not between Phases		
	Banking allowed only from one year to the other within the first period	Unlimited banking of emission quotas	
<b>Coverage</b>	Stationary installations listed in Annex I of the initial Directive 2003/87/EC	Same as for previous Phase with the addition of aviation from 2012	Activities as listed in Annex I of Directive 2009/29/EC i.e. aviation and additional sectors and installations
	Carbon dioxide emissions only		Carbon dioxide, nitrous oxide and perfluorocarbons
	EU-25 then EU-27 on 1 <sup>st</sup> January 2007	30 countries: EU-27 plus Norway	Iceland, Liechtenstein and
	Only Europeans quotas allowed	Possibility to use Kyoto credits in limited amounts which must be specified in countries' NAP along with European credits	Possibility to use Kyoto credits in limited amounts along with European credits



#### 2.4.6 State of the literature on the EU ETS

The background literature research revealed the existence of a wide range of publications concerning the EU ETS, such as journal articles, assessment reports, news stories, etc. The topics vary from lessons learnt from the first Phase and prospect of the second Phase to in-depth analysis of specific issues such as absolute vs. intensity-based emissions caps and evaluation of precise evaluation criteria like environmental effectiveness, and finally case studies of sectorial and national impacts. Knowing what has already been done and what is feasible in terms of available time and expertise, and to keep a multidisciplinary approach, it was decided to survey opinions at European level on the success of the revisions of the EU ETS in addressing past issues.

### 2.5 Conclusion

This background literature review has portrayed what is seen as one of the key response to the mitigation of climate change: emissions trading. Many countries have started to take action in order to reduce their GHGs emissions at both domestic and international levels. The recourse to emissions trading is increasing. This is notably the path chosen by the EU for contributing to achieving its targets under the Kyoto Protocol. Since its establishment in 200 and the start of trading in 2005, the EU ETS, first and largest system regulating greenhouse gas emissions, has faced many challenges and has been improved and enlarged.

Based on this overview, focus will be given to the EU ETS ex post assessments, that is concerning its early implementation years, and on how to conduct evaluation of policy instruments such as to set a method for analysing opinions on the modifications forecasted to Phases II and more specifically Phase III.



## Chapter 3 Approach for evaluating the EU ETS

---

### 3.1 Introduction

Whilst public *policy evaluation* is a relatively recent practise in the counselling of policy makers by scholars and scientists, it is becoming a widespread and integral part of the policy making process (Vedung 2000). The main task of this dissertation is the development of a custom-made approach for the evaluation of the revision of the EU ETS Directive, using the theory behind (environmental) public policy evaluations. The aim is to provide another perspective on the policy instruments which may differ from those given in available assessment reports. The approach is to identify the main problems faced during the scheme's early implementation years as the main areas of concern for the revision. Indeed, evaluation means looking backwards in order to better operate in the future. The idea is to design an evaluation grid building on the most important issues and criteria of performance or merit to assess the revision of the EU ETS Directive and to gather the views of a representative group of European experts and stakeholders.

The first part of this chapter focuses on understanding the basic concepts behind public policies and their evaluation. Then after giving an overview of the early criticisms of the EU ETS, the assessment methodology is provided.

### 3.2 Theory and practise behind environmental policy evaluation

#### 3.2.1 Policy and evaluation: definition and origins

Environmental policy instruments are defined by Mickwitz (2003) as “a set of techniques by which governmental authorities wield their power in attempting to affect society – in terms of values and beliefs, action and organisation – in such a way as to improve, or to prevent the deterioration of, the quality of the natural environment”. As explained in the previous chapter, different categories of environmental policy instruments exist, notably “economic instruments”, under which the EU ETS falls. This category aims at altering the costs/benefits to the agents usually having an impact on the production process as opposed to the inputs or outputs. Independent on their kind, policies can be directed to different levels of regulatory intervention from input to damage, in this case it is at the emissions' level (Stavins 2001). Moreover, the literature makes a distinction between three types of policy impacts: (1) output or performance (quantity and quality of the products and services), (2) outcome or social change, and (3) environmental change (Crabbe & Leroy 2008).

The emergence of public policies is based on the interaction between three underlying rationales, known as the JEP triangle: juridical, economic and socio-political approaches. In this order, they reflect the three types of evaluations and criteria that emerged throughout the history of environmental policy evaluation. Policy evaluation came in response to various concerns about



policy successes raised by the policy-makers themselves and even more so by the policies' stakeholders from entities which the policy applies to, to NGOs and academics. Since the slow birth of this type of policy evaluation at the end of the 19<sup>th</sup> century, there has been a gradual shift in the type of criteria emphasized, changing the direction of the evaluation from administrative monitoring to a reflection on possible enhancements, as explained by the JEP triangle. Although, the development of environmental policy evaluation similarly to that of environmental policy itself is fairly recent, it is now growing rapidly in many parts of the world notably at EU level. (Crabbe & Leroy 2008)

The necessity for undertaking evaluations came later to the environmental field than to many other policy sectors. This is in part due to the unusual characteristics of environmental problems such as the high level of uncertainties, widespread geographical coverage, long time frames, unequally distributed causes and consequences, as well as the prominent role played by scientific information. These characteristics and the way they are perceived will eventually affect environmental policy instruments' evaluation, that is, essentially the determination of its worth with the intention of using it in the future. Indeed, instrument evaluations should affect their implementation and design as well as that of new instruments. (Mickwitz 2003)

### 3.2.2 Policy and evaluation: cycle and perceptions

Policy-making can be simplified into a series of reiterative stages during which evaluations can be performed. The evaluation of policies at European level involves two procedures aimed at improving the policy making process: (1) ex-ante evaluation of potential impacts of new policies and (2) ex post evaluation of the effectiveness of existing measures (European Parliament and Council 2002). There is a third type of evaluation that is increasingly used regarding recently introduced policy instruments (RIPI), it can be seen as the intermediate between the former two and is the approach adopted here. It is sometimes called 'ex nunc' and has emerged from the need and interest of assessing the effects of recently introduced policy instruments that are on going or still under development and for which little feedback from implementation is available. It can be particularly useful as it is easier to modify an instrument before it is solidly established with a long implementation history. Moreover, the evaluation of policy outcomes is limited due to the nature of environmental processes, which may take a long time to unfold, making it sometimes necessary to focus on outputs only. (Crabbe & Leroy 2008; Kautto & Similä 2005)

Although there are requirements for ex ante impact assessment and a growing demand for RIPI evaluations (Mickwitz 2003), ex post evaluations, which are less often carried out, are however extremely relevant (Ellerman et al. 2010). Moreover, according to Vedung (2000) evaluation should solely be a retrospective assessment of public intervention that excludes the performance of projective appraisals. Thus, on top of the guide for ex-ante evaluations, the EC provides standards for all the stages involved in the production of policy instruments evaluation, notably



their design and conduction (cf. Annexe IIId). These standards do not apply to all instruments but, when they do, they apply irrespective of the nature of the author of the evaluation (European Commission 2002).

Crabbe and Leroy (2008) highlight the three most distinct views on policy, each implying a different perspective on policy evaluation and its functionality, these are: policy as a rational goal-oriented and problem solving process, as the interaction of political interests and as an institutional phenomenon. In fact, each perception is valid and corresponds to a certain policy making process and evaluation level. However, the most classical and robust evaluation methods correspond to the first view i.e. the control loop.

### 3.2.3 Typical evaluation models

Over the years, evolutions of the various approaches to policy evaluation led to the elaboration of methods for answering the question they raised. It should first be noted that several mainstream evaluation concepts remain relevant for evaluating *environmental policies*. The first type of evaluation model developed and recently re-named 'effectiveness evaluation', aims at comparing results/achievements with original goals. While being straightforward it fails to question the goals and to take accounts of side effects and costs. From those flaws, was developed the goal-free and the side-effects evaluations, leaving the cost criticism unanswered. The first, through which the evaluator is unaware of the targets, helps to renders goals irrelevant, especially if their effects are not significant. The second evaluates anticipated and unanticipated effects and categorises them qualitatively. (Mickwitz 2003) Those models are example of effectiveness models, economic and professional model are the two other categories. The first takes costs into consideration the second differs only in the author of the evaluations. (Vedung 2000) For a more exhaustive list of evaluation models confer to Table 6 in Annex III.

In addition to these classical evaluation methods, two other categories of what Crabbe and Leroy (2008) call "approaches for designing evaluation research" have developed: (1) approaches adopting an alternative perspective on knowledge input in evaluation that, for example, makes use of disagreements between experts or the involvement of laypeople and (2) approaches that aim at improving the actual utilisation and implementation of outcomes from the evaluation process. A list of those approaches is presented in Table 7 in Annexe III. Finally, before embarking on the evaluative process it is also important to first assess the evaluability of a given policy area.

A tool, the reconstruction of intervention theories, has been developed alongside the evaluation models, in order to address the specificity of environmental policies and focus evaluations. It is the specification of what must be done to achieve set goals, generally consisting of expectations with regards to actors, inputs, outputs, outcomes and their interactions. In other words, it is about describing intentions of a policy implementation and functioning rather than how a policy instrument actually works. Eventually, it helps identifying what to collect data on, which Phase the



evaluation should focus on and contributes towards interpreting the results of the evaluation itself. (Kautto & Similä 2005) The tool is in fact the first step undertaken in the monitoring process, a major form of evaluation, which is based on theory. Other types are impact assessment or pre-evaluation, that focuses on intervention consequences. (Vedung 2000)

Any evaluation model provides only a partial perspective on its own. This is why authors of evaluation guides tend to recommend a combination of several models in order to provide comprehensive final results (Vedung 2000).

#### 3.2.4 Identification of evaluation criteria

Although it is often argued that environmental improvement should be the only aspect of interest when evaluating an environmental policy instrument, those policies are bounded by other aspirations or requirements, as it can be understood from what has been discussed above. Thus, limiting the scope of evaluations would be inadequate (Mickwitz 2003).

According to Mickwitz (2003), criteria can be classified in three groups: (1) general, (2) economic, and (3) democracy. Similar criteria are presented by Vedung (2000) i.e. effectiveness, efficiency, productivity and procedural values. This author adds that productivity and efficiency criteria should be compared to points of reference, that is standards of performance, in order to set highs and lows. Benchmarks, international comparisons, the past and client expectations are example of the most common value standards used in public policy evaluation. Lastly, the IPCC (2007) has also defined a set of four principal criteria for evaluating environmental policy instruments from their own literature survey, whether making ex ante choice among instruments or evaluating ex post instruments performance. These are: environmental effectiveness, cost-effectiveness, distributional considerations and institutional feasibility. A summary of those criteria can be found in Figure 2 below.

When evaluating a specific environmental policy instrument not all criteria will be relevant and thus an important aspect of the evaluation process is the appropriate selection of those. According to the availability of data and the research methods, the criteria might need to be modified during the evaluation and the evaluation scales themselves may vary (i.e. from nominal to ratios). Another factor influencing the criteria considered is the reason for conducting the evaluation. (Crabbe & Leroy 2008)



Category	Criteria	Related Questions
Mickwitz (2003)		
General criteria	Relevance	Are key environmental problems covered by the goals of the instrument?
	Impact	What are the impacts resulting from the implementation of the instrument?
	Effectiveness	To what degree the outcomes achieved correspond to the intended goals of the instrument?
	Persistence	Does the effect of the instrument have a lasting impact on the state of the environment?
	Flexi/Predicta-bility	Can the instrument cope with changing conditions?/Is it possible for actors to prepare and take into account the instrument and its implications?
Economic (efficiency)	Cost-benefit	Are the benefits worth the cost in monetary terms?
	Cost-effectiveness	Do the results justify the resources used?
Democracy-related	Legitimacy	To what degree is the instrument accepted by the actors?
	Transparency	To what degree are the processes, outputs and outcomes of the instrument observable for outsiders?
	Equity	How are the cost and outcomes distributed? Do all participant have equal opportunity to take part in and influence the processes used?
Vedung (2000)		
General criteria	Effectiveness	What is the degree of outcome goal-achievement, cost disregarded?
Economic (efficiency)	Productivity	What is the output through cost?
	Cost-benefit	What is the monetarised value of program effects through monetarised program costs?
	Cost-effectiveness	What are the program effects in physical terms through monetarised program costs?
Democracy-related	Procedural values	Is the program fair to all actors and does it provides legal equity
IPCC (2007)		
General criteria	Environmental effectiveness	What is the extent to which the policy meets its intended environmental objective or realizes positive environmental outcomes?
Economic (efficiency)	Cost-effectiveness	What is the extent to which the policy can achieve its objectives at a minimum cost to society?
Democracy-related	Distributional considerations	What is the incidence or distributional consequences of the policy, which includes dimensions such as fairness and equity, although there are others?
	Institutional feasibility	What is the extent to which the policy instrument is likely to be viewed as legitimate, gain acceptance, adopted and implemented?

Figure 2 Criteria for the evaluation of environmental policy instruments (Mickwitz 2003; Vedung 2000; IPCC 2007)



Finally, environmental policies and their instruments are usually obtained through compromises resulting from the conflicting objectives involved in environmental issues. Therefore, the scope of evaluations should not be limited to the goals reached through this process only, and potentially include those that were not represented or which were represented unequally (Mickwitz 2003). Eventually, an evaluation is specific to what kind of policy or instrument is being evaluated and who is undertaking the evaluation.

### 3.2.5 Example

The American SO<sub>2</sub> trading program is the first use of emissions trading instruments in environmental policy. Its implementation dates back to 1990, which makes it the most mature instrument of this kind, as opposed to the EU ETS (Boutabba et al. 2011). Advantage can be taken of this experience to analyse how evaluations were conducted in view of getting inspiration and understand how the theoretical background developed above may apply to evaluate changes made to the EU ETS.

What follows is a summary of the ex post evaluation on SO<sub>2</sub> *tradable permits* by (Ellerman 2003). The assessment starts by giving a background and description of the scheme as well as a methodology for the evaluation. The ex post evaluation is for informational purposes and is based on the construction of a counterfactual situation, which involves assessing firstly emissions reductions in terms of cost and amounts and secondly effects of emissions trading compared to alternative programs. It first analyses one aspect of economic efficiency, which is whether full cost savings potential has been attained. It mentions the importance of assessing whether broader welfare effects are realised, regarding the use of proceeds from auctioning for example, but this goes beyond the analysis of the instrument itself. The next step is the evaluation of the magnitude of compliance costs and savings notably to compare actual and predicted values. Thirdly comes environmental effectiveness, the main concern of environmental groups, which is largely evaluated by analysing emissions reductions and potential causes for those. Finally, more specific issues are assessed: whether *voluntary* aspects, such as possibility for actors to opt in, were worth the extra admin costs and whether the dynamic effects supposed to provide incentive for innovation are taking place.

Overall, this provides an interesting example for ex post evaluations and proves to be a relevant application of the theory. In retrospective, Ellerman et al. (2010), reckon that the core criterion for defining success in this case were “political and administrative feasibility and the achievement of environmental target at lower costs than the alternatives”, whereas *dynamic efficiency* (i.e. the innovation dividend) was less considered. This is in the line with what a study on National Allocation Plans identifies as the key criteria for assessing the EU ETS, namely market efficiency, distributional effects and environmental effectiveness (Betz & Sato 2006).



### 3.3 Early implementation issues

As mentioned previously, Phase I has been the scheme's 'trial' period and represents for many the integration of the environment into strategic planning by setting a price on carbon. The first version EU ETS Directive sets out the rules for the first two Phases. Therefore, the main issues observed during Phase I generally also apply to Phase II, with sometimes less severity due to the learning process and changes introduced in Phase II. The main differences are that NAPs were modified and Kyoto Protocol's project mechanisms that were allowed to be used within certain limits. It is thus important to note that some improvement had been introduced in the second Phase, notably as a result of the provision of more guidance, better access to information, stricter implementation of existing rules, and improved carbon accounting system.

Scholars and organisations have produced reports looking backward on the first implementation years (covering Phase I and in some cases also part of Phase II) which identify merits and the main problems encountered and why they arose. As part of their analyses they often make recommendations for improvement. What follows is a brief description of the main issues identified in these reports with some illustrative examples. Some of the issues are specific to Phase II. Criticisms of the plans for Phase III are out of the scope of this section.

#### 3.3.1 Poor MRV

A reliable, accurate and transparent MRV system, in other words life-cycle carbon accounting, is the foundation for successfully achieving environmental targets and for the system to be fair (Ethical Corporation 2010). Eventually, the credibility of the whole system relies on it. However, there was no reliable way of getting accurate emissions data to establish the national allocation plans. This contributed to creating over-allocation (Newell & Paterson 2010).

There were also criticisms over poor compliance and enforcement. This is was due to the lack of harmonisation and binding rules on these issues, which were addressed differently at Member States level (European Commission 2008).

#### 3.3.2 Poor abatement and over-allocation

Regardless of the method of credit distribution most reports agree on the fact that too many credits were domestically allocated than what polluters actually required (European Commission 2008; d' Oultremont 2010; Ellerman et al. 2008; Newell & Paterson 2010; Morris & Worthington 2010). This eventually caused the price of carbon to crash at the end of 2007, as shown on Figure 7 in Annex III. The over-allocation was due to: (1) technical factors (lack of verified emission data, reliance on projections, poor guidance, and indirectly time constraints) and (2) economic factors (tendency to project strong economic growth and protectionism resulting from decentralised allocation).



Whether this issue was considered addressed in the revised NAP or not, over-allocation continued to be a problem in the start of the second Phase. GHGs emissions declined as a result of the financial crisis of 2008, deviating from the projections used in the NAP. This shows that the adequacy of the cap depends also on the variations in the economical and political landscapes (d'Oultremont 2010). This over-allocation caused several problems and mainly meant that little or nothing had to be done to reach targets due to low scarcity of credits leading to low carbon price. It was the equivalent of a short-term incentive that did not essentially impact long-term investment decisions.

### 3.3.3 Windfall profits and short-term profits

Resulting from excessive free allocation some companies that were able to pass on the cost of the carbon to their customers, notably within the electricity sectors, made extra profit out of the scheme (Ellerman & Joskow 2008; Newell & Paterson 2010). This is called windfall profit and was seen as unfair, essentially questioning the credibility of the whole system.

Other enterprises that were not necessarily able to pass on the price of carbon to their customers but which were given too many allowances were able to turn them into profit. On the other hand, some participants potentially lost money when the end of the period came and no banking allowed them to keep extra credits. This is a notably a result of speculation.

### 3.3.4 European competition distortions

Some Member States and industries complained that the scope of the Directive and the EC were too flexible, notably in terms of allocation. Member States implemented it differently according to their national political positions, often favouring particular industries. In turn this led to a distortion of competition in the internal market of the EU. This was caused by two early implementation decisions: (1) free allocation and (2) decentralisation of allocation. Moreover there was a lack of accompanying measures notably for the smaller installations, which complained about the disproportionate administrative costs that was imposed upon them (European Commission 2008).

### 3.3.5 Unfair burden sharing

The EU has engaged as a whole to share efforts to achieve its Kyoto target. This effort is thus shared between by EU ETS sectors and the other sectors. Knowing that the EU ETS covers around 45 % of CO<sub>2</sub> emissions in the EU and taking the reduction potential and abatement costs into account, it was evident that sectors covered by the scheme had to contribute proportionally much less than the other sectors (Betz & Sato 2006). Indeed, most actors covered by the scheme, especially those exposed to international competition, lobbied against having to pay for their quotas. As a result, the EU decided to allocate most allowances free of charge and this undermined the scheme's credibility.



Moreover, the provision made by the Linking Directive to allow the use of CDMs and JI further diluted domestic action, as they could be used instead of investing in low carbon technologies domestically (Bailey 2010).

### 3.3.6 Price volatility

Carbon price under the EU ETS can be influenced by a number of factors such as fuel cost and political decisions and this has been seen in the volatility in the spot price during Phase I (d' Oultremont 2010). Although this was buffered in the short-term by forward and futures trading, it increased long-term investment risks and thus reduced the dynamic efficiency of the EU ETS (Betz & Sato 2006). Indirectly, this also had an impact on confidence in the market itself. The volatility was caused, notably, by poor transparency and no provision for banking.

### 3.3.7 Fraud

Variations of classic scams can be used to game the carbon market, however there are also some schemes specific to carbon trading. For example, companies exaggerated their emissions and used some of their surplus credits for extra profit (Chan 2010; Gronewold 2011; Friends of the Earth 2011). Another example, during the month of January 2011, the EU ETS has been forced to close its spot market for a week due to a theft of pollution permits from Greece's national registry by cyber hackers. In total, up to 30 millions Euros of the scheme's allowances were stolen from national registries of several European countries (Euractiv & Reuters 2011). Another type of fraud that has occurred is tax evasion (Reuters 2011a). These frauds are the result of the lack of legislative framework and financial regulation. This has already been explained above and is caused mainly by low enforcement and lack of additional regulation notably financial ones.

### 3.3.8 Unclear and poor coverage

The coverage was criticised for two main reasons, lack of clarity and little coverage. The initial EU ETS Directive (2003) had unclear definitions of the types of installations to be covered by the trading scheme, which in a way contributed to the problem of over-allocation. The scheme targeted some high carbons-emitting sectors, however others were left uncovered such as the aluminium sector. Moreover, the only GHG affected was CO<sub>2</sub> (Bailey 2010). This was decided for practicability reasons in order to reduce the risk of problems that might arise from this new set up. Additionally, the lack of response for voluntary opt-ins illustrated the underestimation of the need for expressly including new sectors to the scheme (Ellerman & Joskow 2008).

Also one of the criticisms to the way the EU ETS works is that it does not yet cover emissions linked to the outsourcing of European consumption (i.e. trade) and is limited to domestic emissions. However, over a third of CO<sub>2</sub> emissions fall into that category (Ethical Corporation 2010).



### 3.3.9 Risky sectors addition

As part of its objective to enlarge the EU ETS, the EU agreed to add the aviation sector. This essentially brings an international level to the scheme as it covers all companies entering the EU. Regarded as a challenge for airlines, it is expected that the additional costs will be mostly transferred to passengers' fares. US and Chinese airlines have recently taken counter measures against their inclusion in the scheme's scope (Reuters 2011d; Reuters 2011a). Whether this addition succeeds or not will have a non-negligible impact on the credibility of the system and future additions of other sectors, e.g. the maritime sector (EurActiv 2011b). It will notably depend on the international legal framework.

### 3.3.10 Poor transparency and communication

Transparency is needed at many levels and it is lacking at several level of the European trading system. First of all, it was unclear what activities were covered from the start. Secondly, when the scope was expanded to include more activities in Phase II, there were no accessible source of public data indicating the scale and nature of the expansion (Morris & Worthington 2010). This lack of transparency, other than leading to implementation problems, is a barrier for making proper analysis of the system. However this is what is required as the mistakes from the early implementation Phases showed a need for re-establishing confidence in the EU ETS domestically and internationally (European Commission 2008). There is a lack of a dedicated body for communicating the merits of the system or at least provide constructive critics.

### 3.3.11 Poor long-term investments

The first version of the EU ETS Directive (2003) forecasted the instrument until 2012; the third implementation period was to be confirmed in the revision of the Directive. This was a problem in terms of insufficient regulatory certainty and predictability for enterprises to be able to decide on long-term investments in low carbon technologies, one of the desired effects of using emissions trading schemes (European Commission 2008). What is more, participants were not able to bank unused allowances, which did not create the right incentive for enterprise to modify their investments plans to incorporate the carbon price (Ellerman & Joskow 2008).

### 3.3.12 Poor provisions and prospects for linking

Although praise was given to the provision for linking the EU ETS to the CDM, the lack of provisions for linking to compatible cap-and-trade systems in other parts of the world was criticised (European Commission 2008). More generally, the uncertainties related to the possibilities of connexion to other trading systems are determinant for the future of the scheme, notably by affecting the development of certain actions such as investment in green technologies (d' Oultremont 2010). The fear of economical impacts appears to be an important barrier to the



expansion of carbon markets and more generally to international negotiations, as many countries are concerned about the lack of fairness (Ethical Corporation 2010).

### 3.3.13 Overview

It is interesting to note that most problems are intricately linked to each other and it is hard to decide how to distinguish them from one another. This was one way of presenting them, although it might not be the best. It is also important not to just see the problems and realise that the trial period of the EU ETS “performed surprisingly well” considering the context as concluded by The Pew Centre on Global Climate Change, an independent NGO, in one of its analyses (Ellerman & Joskow 2008), and that it can be seen as a political success (Newell & Paterson 2010).

## 3.4 Evaluation methodology

### 3.4.1 Rationale

#### a. **Foundation**

In order to be able to evaluate the success of the EU ETS, it is important to bear in mind the specific characteristics of these types of market-based environmental policy instruments, as mentioned previously. Stavins (2001) summarises them well by stating that market based instruments should allow pollution control at the lowest cost to society, by providing incentives for the greatest control to occur where it can be achieved most economically. This would create a cost-effective allocation of the pollution control burden, without requiring access to unattainable information. Consequently, these instruments induce the adoption of improved cost-efficient environmental control technologies. The adequacy of choosing this category of environmental policy instruments and more precisely the type of instrument (i.e. tradable permits) depends itself upon the various characteristics of the environmental problem as well as the political, economic and social context in which the problem is being regulated. The main objective of the EU ETS, as stated in the revised Directive, is to contribute to the EU's overall greenhouse gas reduction commitments in a “cost-effective and economically efficient manner” (European Parliament and Council 2009a) and “contribute to transforming Europe into a low greenhouse-gas-emitting economy and create the right incentives for forward looking low carbon investment decisions by reinforcing a clear, undistorted and long-term carbon price signal” (Irish Community and Local Government 2011).

As indicated earlier in this chapter, there is a spectrum of possibilities with regards to evaluation methods. The starting point used for conducting this evaluation are the issues related to the implementation of Phase I identified in subsection 3.3, which gives many possibilities for evaluating the success of the EU ETS. However, it is too early to evaluate the success of the scheme with respect to these issues, as the revisions made to the Directive to address them will not be implemented before 2013. This is why, at this stage, the question to be addressed in the evaluation



is whether the revisions are adequate. While there are similarities with an ex ante impact assessment carried out before adopting a proposal, the evaluation to be performed here is more like an ex post 'sufficiency assessment' of the adopted revisions. It is therefore a mix between ex ante and ex post, as the effects of the revisions have not yet been seen but the revisions itself have already been adopted.

#### **b. Objective and approach**

There are essentially three ways to assess whether legislative provisions are be adequate to solve specific issues: to realise quantitative projections, to seek the views of experts and stakeholders, or to wait for and analyse after-the-fact information on the effects. The approach chosen here is the second one.

The review of the literature on evaluations related to the revised Directive shows that this approach could fill a gap: available assessment reports based on consultations have been produced mainly by the public authorities and carried out prior to the adoption of the legislation which may differ from the initial proposal. Therefore, the evaluation conducted here differs from and complements existing ones by providing a qualitative assessment, based on the views of a small but representative sample of experts and European stakeholders, of how the main problems encountered during the early implementation years of the EU ETS have been addressed in the revised Directive. Additionally, here the views are obtained through meetings and not correspondence.

The approach used here combines features of several methods summarised in Table 6 and Table 7, and aims at providing descriptive and qualitative assessment from a systematic information collection, analysis and assessment. According to Vedung (2000), evaluations are performed either to increase accountability, to improve intervention or to advance basic knowledge; here the objective is both basic knowledge provision and potential for improving intervention. Moreover, this evaluation could provide useful feedback on findings of ex post evaluations of the early years of implementation of the EU ETS as these evaluations were the base for designing the opinion survey.

### **3.4.2 Evaluation grid**

In order to structure the evaluation, an evaluation grid is established. It is essentially a classification of issues that will be evaluated against a selection of criteria. It provides the basis for developing the questionnaire used to collect views of the experts and stakeholders. The evaluation grid can be found in Annex IVa.

#### **a. Issues to be evaluated**

Eventually thirteen issues were selected from section 3.3 and organised according to the following discussion topics: cap, allocation, infrastructure, mechanisms, time horizon and coverage.



### **b. Criteria to be met**

Using the targets of the EU Directive (cf. sections 2.4.3a and 3.4.1a), the common criteria against which an environmental policy instrument should be evaluated and knowing that the purpose of the revised Directive is to “improve and extend the EU greenhouse gas emission allowance trading scheme so as to achieve a more efficient, more harmonised and fairer EU ETS in the third and future trading periods” (Irish Community and Local Government 2011), the following criteria are defined:

(1) Environmental effectiveness: are the environmental targets in terms of emissions reduction being reached? Are they reached in a sustainable manner through the EU ETS?

(2) Cost efficiency: are these targets achieved at the lowest possible costs with the least disturbance to the economic system?

(3) Social equity: are these targets achieved through a level playing field with the least disturbance to society?

### **3.4.3 Survey**

#### **a. Selection of interviewees**

Having established this evaluation grid, it is crucial to make an appropriate selection of the right actors that will be interviewed. Following preliminary contacts to check their availability, interviews were held with 9 persons (i.e. 8 interviews in total as for one interview 2 actors were present). The group of interviewees is composed of senior persons with recognised expertise with respect to the issues investigated; it includes representatives of main actors or interest groups directly concerned as well as experts speaking in their own capacity. Stakeholder's representatives are mostly from European associations or organisations. Together this panel is covering a broad range of opinions. Four interviewees (Brohé 2011; Panneels 2011; Looman & Hannon 2011) preferred to speak as individuals giving personal views rather than give official positions of the organisation for which they work. The list of interviewees can be found in Table 3 below. Further details about their organisation and their role can be found in Annex IVb. A note at the end of this Annex, lists other potential participants, which were either unavailable or next in line if the composition of the panel of interviewees were not sufficiently balanced or the scope of the study were to be widened.

#### **b. Questionnaire**

The questionnaire could finally be constructed based on the evaluation grid and knowing the participants. Additionally, individualised questions were also prepared for each interviewee, taking into account his or her profile. The questionnaire was sent in advance to allow each interviewee to prepare him- or her-self and used as guide during the interview. The questionnaire



is provided in Annex IVc includes a note explaining the changes made to the questionnaire during the interview process.

### 3.5 Conclusion

There are many ways of evaluating environmental policies. The evaluation approach depends on many factors such as the subject, information and means available and most importantly the objective of the evaluation. It is a process that is essential during the whole life cycle of a policy instrument from its design to its revision. The EU ETS, an environmental policy instrument, is the pillar for Europe's response to climate change and thus many evaluations have been established to point out its weaknesses. Most evaluation agrees on the main problems of the first 'version' of the instrument, though not necessarily on the scale and solution. Having identified those and based on the knowledge gained in the literature review, this chapter provides the tool that is used to conduct the investigation on the adequacy of the provisions for Phase III of the EU ETS.



Table 3 List of interviewees

No.	Level	Category	Organisation	Interviewee	Role
1	European	<b>Governmental organisation</b>	European Commission (EC)	Thomas Bernheim (Bernheim 2011a)	Policy officer in the International Carbon Market, Aviation and Maritime Unit of Directorate for European and International Carbon Markets within DG CLIMA
2	European	<b>Governmental organisation</b>	European Parliament (EP)	Bas Eickhout (Eickhout 2011)	Member of the Greens / European Free Alliance Group
3	International / National	<b>Expert / Governmental organisation</b>	Federal Public Service (BEFPS)	Etienne Hannon (ULB) (Looman & Hannon 2011)	Head of political and monitoring cell of the Climate change Service in DG Environment of the Health, Food chain safety and Environment FPS and Lecturer at the ULB
				Mark Looman (Looman & Hannon 2011)	Head of the national registry cell of the Climate change Service in DG Environment of the Health, Food chain safety and Environment FPS
4	National / International	<b>Expert / consultant</b>	CO2logic (CON)	Arnaud Brohé (ULB) (Brohé 2011)	Managing partner at CO2logic consultancy (emissions offsetting) and external scientific collaborator at the CEDD of the ULB
5	European	<b>Expert / Trade union confederation</b>	European Trade Union Confederation (ETUC)	Anne Panneels (Panneels 2011)	Political advisor in the Environment Unit
6	European	<b>Business confederation</b>	BUSINESSEUROPE (BE)	Folker Franz (Franz 2011)	Director of Industrial Affairs Department
7	International	Network of <b>businesses</b>	International Emissions Trading Association (IETA)	Simone Ruiz (Ruiz 2011)	EU policy director
8	European	Network of <b>NGOs</b>	Climate Action Network Europe (CANE)	Julia Michalak (Michalak 2011)	EU climate policy officer



## Chapter 4 Positioning of actors at EU level

---

### 4.1 Introduction

The central questions that this research tries to answer is: “Have we learnt from the past?”, and more specifically, “Are the revisions of the EU ETS (already decided, planned or envisaged) on the right track to avoid repeating mistakes from its early implementation period?” Answer to this question by various European actors will provide an overview of the range of opinions and give guidance on what needs to be improved, as well as indirectly provide grounds for investigating the relevance and use of ex post evaluations of the EU ETS and whether they reflect the opinions of experts/stakeholders consulted in this project.

This chapter presents the results of the interviews of a representative sample of major EU ETS experts and stakeholders based on the questionnaire elaborated at the end of the previous chapter. It is organised in four subsections. The first three correspond to the main themes around which the questions were organised; sometimes they are subdivided depending on how independent individual issues are of each other. The contributors are not explicitly named anymore, as this enquiry is less about who says what than what are the differences of views, source can be found in Table 3. As each interview is summarised separately, the issues on which interviewees have similar or different opinions are easily apparent. When paragraphs are in italics it means that the interlocutors considered themselves not fully familiar with the topic, and were expressing tentative views.

### 4.2 Setting out: allocation of allowances

The main differences are between Phases II and III, except for the cap, which was made more stringent in the second Phase already, and the improved guidance for national allocation introduced in Phase II. In the third Phase, free allocation methods are due to change from national to European allocation using benchmarks rather than grandfathering. Additionally, as well as being reduced annually, a significant proportion of the cap will be auctioned instead of being given mostly out for free, except for companies listed on the carbon leakage list (to preserve international competitiveness). Offsetting will be restricted and banking authorised between periods.

- 1 There is not much difference between Phase I and II as the first version of the Directive foresaw both Phases, the revision of the EU ETS in 2008 will not be implemented before Phase III. Harmonisation of the EU ETS is going to improve the level playing field of the European carbon market. The use of EU-wide benchmarks improves fairness and promotes the best performing enterprises. There remains unfairness due to the fact that the starting point of sectors is not the



same and that some are threatened by international competition, but this is being dealt with by the use of compensating measures in the form of partly free allocations. The problem of windfall profits is addressed through full auctioning for the sectors concerned.

Whether or not the cap is set too high compared to actual emissions growth, by definition the environmental reduction targets will always be met. Over-allocation was solved during Phase II thanks to the new monitoring infrastructure, though emissions unexpectedly dropped by 11% in 2009 as a result from the economic crisis. This new over-allocation problem, which is passed on to Phase III through banking, could be dealt with by changing to efficiency cap or decreasing the absolute cap. The first option shows many disadvantages, notably that it does not ensure absolute reduction of emissions, and the second will not happen unless Europe is the only one taking such measures to combat climate change. As for banking, it is essential to ensure flexibility, predictability and overall efficiency. Thus, this is a grey area that will have to be addressed soon. The EU ETS might not yet have been able to produce a carbon price high enough to trigger low carbon technological investment. It has produced a significant impact in the sense that participants are now integrating carbon price in their long-term strategy planning. It is thus important to now support this move by deciding on measures to support the carbon price.

The new rules for offsetting are adequate. It will provide more financial transfer to developing countries that require it the most. The move towards covering entire sectors and not just projects as with the CDM is also important but will require putting benchmarks below BAU to also trigger efforts from the countries where the reduction will occur.

- 
- 2 Revisions provided are a clear improvement both in terms of effectiveness and fairness as risk of over-allocation resulting from individual countries focusing too much on their own interests is reduced. For the reduction of free allocation, however it still being undermined by the exemptions provided to sectors and companies under the carbon leakage list, which is too exhaustive (roughly three quarters of enterprises) and is not yet a reflection of reality. This should be improved by removing the sectors that are not actually threatened by international competition and by cancelling their free allocation. This problem should be addressed during the next revision of the directive, if not sooner, by rethinking the solution to prevent competitiveness problems. While partial free allocation might be adequate for some sectors, it might be best for others to go for full auctioning with some kind of border measures.

The cap is still too large (i.e. over-allocation) thus preventing the scheme of being effective for two reasons: provision for banking of allowance from previous periods and lower baseline than anticipated resulting from the economic crisis of 2008. This surplus will further increase provided that an energy efficiency instrument is adopted. This over-allocation sets a low carbon price, which renders the scheme useless, especially if it were to become null. For the EU ETS to



deliver its full potential in Phase III, the cap should be reduced by adopting the 30 % emissions reduction target or by making provisions for setting aside carbon credits and also putting some constraints on banking.

Offsetting should be constrained even more; although it can be a very adequate tool, it is too difficult to control whether it really allows achieving emissions reductions yet.

- 
- 3 The ideal and only fair system of allocation is full auctioning. The method for preserving competitiveness is adequate but criteria need to be more stringent. Even though full auctioning can solve this, as long as the cap is set such that the carbon price does not pose a threat to competitiveness. Although, benchmarking is the most adequate way for this free allocation, it seems that it was set too high preventing the scheme to be more effective. Thus, provisions for Phase III allocation certainly are not a threat to economic development or competitiveness of its participants, which is a good thing considering the 2008 economic crises. However, environmental and social criteria have been downgraded too much. Full auctioning should have been a feature in Phase III. Going from a national to a centralised system prevents protectionism but does not necessarily reduce industrial lobbying.

As the EU ETS is meant to constitute the main tool for reducing emissions, the cap should be adjusted to meet possible reductions and actual BAU, thus industrial reality and not political out-dated representations. Without an adequate cap, the EU ETS is just a hollow instrument. It might occur that some industries will not be required to buy credits before a couple of years to achieve their target as allocation plans for Phases II and III were made prior to full analysis of Phase I results and not taking into consideration effect of external events. Although the cap ensures a 21 % emissions reduction by 2020 no matter what, reductions might not be reached through technological improvements or environmental investments but rather a declining BAU that resulted from financial crisis. This is essentially a missed opportunity, which might not seem to be a problem at first impression, however it is unfair in terms of effort sharing as EU ETS sectors get easy targets while non ET ETS sectors fail to reach their targets. One of the reasons for this difference is that, under the EU ETS, governments have to constantly negotiate with participants. The principles behind the directive, i.e. benchmarking, carbon leakage list, absolute cap, are becoming more adequate and fairer, but criteria should be more stringent, notably growth predictions need to be readjusted. Similarly for banking, though necessary in an ideal fair market, it should not be allowed between Phases II and III, especially if partly free allocation remains. Low cap and banking cannot be provided at the same time for the system to be effective.

Offsetting is a good idea overall, however it provides a possibility to increase the European cap and should thus be restricted as much as possible to guarantee domestic action. An additional issue related to these, which is less a problem of the European system, is that it is hard to prove the genuineness of the reductions.



4 Going from national to centralised allocation was an important decision and much fairer approach. The use of benchmarks is also an improvement but they should be more unified and provided stricter verifications. Going towards more auctioning is a positive step. Although, there is still going to be too much free allocation, that is what was possible politically and by the end of the third Phase an improved proportion will be reached. Competitiveness will probably not be much of an issue if the emissions reduction target is not increased and provided banking is authorised, both of which ensure a low carbon price. In theory the problem of windfall profits has been addressed, only practise will show whether it works out and if we will not see the same problem in the aviation sector. Politically, targets can only be achieved in incremental steps, until eventually the system will end up having a similar effect to that of a carbon tax.

Over-allocation occurred again in the second Phase, notably since nothing was planned for the cap to be adapted according to production levels. This has not been addressed; although benchmarking is the best allocation approach, it remains a projection. Thus, there is no over-allocation during Phase III as such, but banking allows passing on this issue from the previous Phase. Ideally, there could be a provision for quotas to be corrected with respect to production volume per year, as we are not protected from the risk of another economic recession. Also, the EU should agree to move to a 30 % reduction target to solve this issue. The cap ensures the system's effectiveness, reduction targets are being reached and industries increasingly take into account the price of carbon into their decisions even though it is not the only reason. One way to check this will be through the evolution of benchmarks. Banking is required, thus a way to reduce over-allocation could be to set a carbon floor price and make sure that the price increases from one period to the other. The system is only truly effective if the price of carbon is above a certain level, if this is not achieved a portion of quotas could be taken off the market. Some would say it would distort the market, nevertheless it is in fact not a real market. One way to solve many problems would be to opt for full auctioning.

Offsetting is an interesting opportunity, which should be maintained even though the Kyoto Protocol is not renewed.

---

5 The projected move to a centralised allocation system is surely fairer and more effective than it is now. It will promote solidarity by providing a global European vision. It was necessary to decrease free allocation for more auctioning. However, the threat to competitiveness should be dealt with in a more personalised manner for each enterprise or sector, some are at risk of losing international competition while others require more investment in clean technologies. Therefore, there is a need for establishing tailored accompanying measures.

Whether the cap will lead to more than just the necessary emissions reductions is really a question that will only be answered from practise during Phase III. It is hard to say if the cap will prevent over-allocation, something to be observed again as it depends on many different



factors. Those are notably the accompanying measures mentioned above and the stringency of rules for example the one exempting some of the electricity networks of full auctioning. Banking means that over-allocation is passed on between periods and the system is more predictable. The latter is important for the system to function well. Therefore while it is important to provide banking, there should also be provisions for acting on the volume of allowances, notably to stabilise the price.

- 
- 6 The modifications in terms of centralisation and full auctioning for the energy sector were expected and fought for in order to reduce competition distortions within the EU and windfall profits. For the other sectors, the combination of free allocation based on benchmarks complemented by auctioning in case of carbon leakage is a complex approach that goes into the right direction to deal with competitiveness. It would have been even better to also provide 100 % free allowances for sectors that are already above the benchmark without them having to comply with the criteria of carbon leakage.

The over-allocation we see now does not prevent the scheme to be effective under the target of the Directive. It occurred as a result of the economic recession and there is no reason to think that over-allocation will linger. Thus, there is no reason for readjusting the system now, as the EU ETS is there to reduce emissions at the lowest costs as stated in Article 1 of the Directive. Although, it is true that the system only exists provided that there is a price on carbon and that for the power sector the price might need to reach a certain level for certain technologies to be used. The latter is not the case for most energy intensive sectors and thus the assertion that a certain carbon price needs to be provided for changes to be triggered should be questioned. Provision for banking is adequate to ensure that the scheme is predictable.

It is very likely that offsetting will be very limited during Phase III, in the absence of an international agreement. Based on the opinion that emissions reductions under the EU ETS should be made at the lowest costs, this will be a problem in Phase III unless new CDMs are allowed or bilateral agreements are adopted.

- 
- 7 Auctioning is the fairest and most effective method of allocation. It is the easiest way for managing the supply of quotas and it directly creates a price signal. Ideally, it would be the best option, but politically it was not possible. Indeed, free allocation is the approach chosen to preserve competitiveness. Although, it is less of an issue at the moment than it might become in the future, provided that the carbon price increases. It is also hard to assess whether the carbon leakage list itself is fair for industries, as this will require a quantitative assessment to be completed once it will be implemented. It is also dependant on how well and fairly benchmarks have been set and whether they have been in some case influenced by industrial lobbying. At the moment these issues are much the result of a political compromise. The other consideration is fairness in terms of difference between MSs with various level of development. Provisions



have been made for a part of auctioning revenues to be reallocated to those in need. Central allocation is also more effective and further prevent over-allocation. The issue of windfall profits has been addressed and the fact that some companies are allowed to make profit out of the scheme is not the same issue and is part of the market system. However, it is true that auctioning provides more efficiency in that regard.

The excess of supply during the current Phase is not due to over-allocation but a fall in production levels. It can be said that it is being effective as emissions reduction are being observed and it does not depend on whether allowances are free or not. However, achieving effectiveness can mean two different things, either it is just enough to achieve reductions targets at the lowest costs or it also means achieving incentives for promoting a green economy. According to the current goals of the Directive, which puts cost efficiency first, the cap is thus effective. The issue is thus not whether targets will be achieved, but whether they are sufficient to create enough demand or scarcity to sustain a carbon price. The market does not exist if the price of carbon drops to zero. The cap is absolute and set ex ante, whereas its appropriateness depends partly on variable events, such as for example actors' behaviour and other policy measures. It might be important to agree on action to be taken to prevent reaching an excessively low carbon price. The question of whether there should be a price floor is maybe not the right one as it would be expensive, it might trigger lobby for price ceiling. What would be more appropriate is to have a reserve price for auctioning. Accordingly, it should be decided in a few years from now whether we move from 20 % to 30 %. Regarding banking, it is an important provision to have, although it allows for over-allocation to be carried over from one period to another.

The amount of offsetting allowed during Phase II seems to be adequate, in the end its up to the MSs to decide how much up to the EU-wide limit they are going to use. This also leaves to them to decide if they want reductions that are more domestic or more cost effective. There will be more restrictions (i.e. with respect to type and country) and the EC will be given more ruling power during Phase III, limiting the supply of offsets on the market. These decisions are adequate because they provide more control and improve the quality and significance of offsets.

- 
- 8 The changes made to the Directive regarding allocation are without a doubt going in the right direction. Full auctioning would have been most transparent and fairest method of distributing allowances, while improving the effectiveness of the scheme. The two main exceptions from this method, industries threatened by carbon leakage and power sectors of weaker European countries, are creating problems and distortions. It is possible to find other ways to deal with those exceptions, as for example free allocation provided for decreasing the risk of carbon leakage that could be dealt with using border tax adjustments. In any case many measures are left to be specified clearly to ensure effectiveness is reached. The carbon leakage list seems to be adequate. Windfall profits are being addressed by requiring profits made from free



allocation in the power sectors to be reinvested into modernisations of the sector. It is also important that benchmarks are set to trigger real technological change. Thus there will need to be provisions to adapt them to growth evolutions within different sectors since the financial crisis in order to prevent issues from the past to arise again.

The environmental target of the EU ETS is being met due to a combination of external circumstances. This is why the target is not sufficient for the EU ETS to meet its environmental goals even though there are other important factors to consider. Current provisions for the cap allow some participants to make profits from the scheme. The target is the main drive behind the scheme and for setting up all other policy instruments. If the target is met without them, then they are essentially useless. In that sense, over-allocation is still a problem, mainly because there are no legal possibilities for tackling it, except by committing to a higher GHGs reduction target. The political momentum has gone since the European Parliament introduced the move to a 30 % reduction target, thus something is required in the legal framework to allow for setting aside allowances, for example.

## 4.3 Implementation

### 4.3.1 Consultation and reviews

The EU ETS is the result of compromises, revisions and additions. It is meant to be a flexible market mechanism. For that reason, transparency, adaptability, access to information and the consideration of consultations are of the essence. These issues are discussed below.

- 1 There are rules and procedures that have to be followed whenever the EU comes up with a proposal, ensuring that the system is transparent. Stakeholder consultation and impact assessment are always undertaken before a decision is taken, although it is evident that all views cannot be met. Information is accessible through the EC and they even launched an outreach program with the rest of the world especially for sharing its infrastructure.

Revising the scheme is a lengthy process, this is why it can only be done once in a while and it is in the best interest of the scheme success that the next revision takes place only once the third Phase has been implemented. This notably provides better predictability.

- 
- 2 The system is transparent as information is available but the system is becoming so complex that actually only a small numbers of stakeholders, experts, are able to find, understand and even manipulate information on the system. Similarly for consultations, although they are having an impact, only experts, usually coming from industries, fully understand issues such that the contribution is maybe not as fair as it could be.

There is a feeling that once the third Phase will start it will be harder to accommodate adjustments to the system again before 2020 partly as a result of pressure from industries.



Although, this is only an impression, the EC should be given full support and room for action if problems undermining the success of the scheme were to be encountered.

---

3 The system is becoming less transparent as a result of the increasing number of exceptions and additional rules, which are truly only comprehended by a limited number of experts. Something needs to be done to solve this unforeseen problem. Only the outcome of the system after the fact can be transparent.

---

4 Consultation is extensively done although it is a fact that the industry plays a more important role in the process due to the fact that they are directly concerned and that the level of complexity allows only a few actors to really contribute to discussions. There is a lot of information available, although as some of it is strategic it may only be accessible indirectly. This is also something that will be improved during the third Phase once several issues will be dealt with at European level.

---

5 The system is not transparent enough, it seems that consultation is really accessible only by the ones who have good reasons to afford to have experts on the topic. This is usually the case for industries covered by the EU ETS, who on top of being the majority during consultations also lobby for their interests on the side. The system is getting so complex that it is hard to cover the information on all issues such as financial, political and industrial.

---

6 There have been some issues with regards to stakeholder consultation, resulting from a lack of details of the revised Directive obtained through many compromises. Overall, the EC made effort to consult actors even when it was not necessary to do so while trying to accommodate all. The system can thus be said to be sufficiently transparent given the complexity it has reached. Regarding access to information, as modifications are on-going it is hard to assess that now knowing that the system is going to be much more complex in its third Phase. Some companies are lost and think there is too much bureaucracy involved, but once some experience is gained these issues will be resolved. Nevertheless, the system is maybe very complex and it is not evident that this is something that will be addressed in the future.

---

7 Transparency could be further improved in terms of simplifying access to information explaining better why certain decisions are taken. However it is already quite well achieved in the way the political process is organised, in addition to the Directive which provides the overall framework there are easily adjusted implementation measures and complementary pieces of regulations such as for the registry and auctioning. There are specific independent rules for the decision process to be transparent ensuring that all relevant stakeholders are consulted.

It is not always easy to make revisions to the Directive unless it is intentionally vague leaving room for action. First, it is a lengthy political process and second there is always a risk that more than the planned modifications will be made. This is why the EC is sometimes reluctant to



address issues directly. This is something that cannot really be modified.

- 
- 8 *The consultation process appears to be organised in a successful way, covering all point of views and the information is transparent and parties interested have access to it. In that sense, it seems that the scheme is successful but communication on the opportunities that the EU ETS can create could be improved.*

Indeed, one of the reasons for European actors being reluctant to increase GHGs reduction targets is the lack of supporting analysis. The information is there, but it is not presented in the right way and only certain actors are able to use it, enabling them to take advantage of the system. The system does need to be made more transparent by simplifying its rules.

#### 4.3.2 Carbon market

The carbon market, although it has recently been created artificially, is an economic or financial system and should behave as such. Therefore, like any other market, it is at risk of speculations and frauds. The market success notably depends on adequate MRV.

- 1 The carbon market has evolved a lot since its establishment. As it becomes more mature and complex, it increasingly faces issues that any other market would. Its fluctuations reacts to fundamentals and the price is becoming more stable and less volatile. There are two different regulatory frameworks to deal with it: EC market regulation covering the spot market and financial regulation for the derivative market.

Fraud occurs as a result of lack of market oversight. Currently, stakeholders appear to be satisfied with the solution brought in by the last review of the registry regulation, which increased security.

MRV measures have been improved already in the second Phase and will be converted into a regulation in the third Phase, thus improving stringency and fairness. Given that the juridical powers of the EC are limited to certain areas, it is normal that it may take time before some measures are harmonised.

- 
- 2 The behaviour of the market itself does not seem to pose a problem. On the other hand, what is a problem is the lack of clarity with respect to the long-term goals of the system. At the moment, it seems that the EU ETS is mostly seen as a medium term tool for providing the lowest carbon price, whereas it is also meant to stimulate innovation in the long term. Politicians need to set transparent long-term prospects for a low carbon economy in order to significantly impact companies' strategies, improve the system credibility, and allow to better predict the carbon price and to cope with momentary peaks.

*The fraud incident was surely alarming pointing out problems of reliability in the system, which will only be fully resolved, once the EC takes all the adequate steps for preventing similar event from happening again.*



- 3 The carbon market works well, reacting to the main political decisions as any other market would, giving no need to adjust the carbon price.

Fraud issues were the least of concerns when this environmental instrument was first established, however it became a full-fledged economic market and should have been regulated as such. Although many improvements have been made since the problem came up, not submitting it to full antifraud regulation for Phase III may be a missed opportunity. Moreover, binding objectives should be defined in order to remove the potential of VAT fraud, as some countries have not yet addressed this issue.

*It seems that there has been no use of enforcement measures; this might be due to the fact that all rules have always been respected or that the system might still be a bit too lax. If it is the latter, the fairness and credibility of the system could be compromised.*

- 
- 4 There are many actors and intermediaries in this new market, and thus it can be considered to be quite liquid. Moreover, the price of carbon can be accessed transparently and in real time. The price volatility during Phase I was expected, notably due to some speculation, over-allocation and no banking between periods, and it has not occurred since then.

*It is hard to say whether anti fraud measures will be sufficient.*

There has been a huge improvement of knowledge in terms of industrial emissions in Europe. It has tremendously improved since the start of the scheme and provisions are being made to harmonise the MRV system.

- 
- 5 The carbon market is influenced by political decisions like any other market. However, it is more than a market, it is Europe's key climate change instrument. Therefore, its movements should be tempered and there should be more regulation on traded volumes to maintain a sufficient and stable price. This is the only way to promote investments in energy efficient technologies and reach the potential for a new economic development.

Precautions have been taken to address the fraud issue. However, they are not yet sufficient to ensure that the market is not threatened anymore.

As for what will be in place concerning MRV, there should be more investments for developing independent expertise and external regulation.

- 
- 6 Nothing has indicated any significant problem of market speculation but it could happen and this is the reason why there should be a stronger market oversight. This is not a primary concern and it seems that it will be addressed in a proposal at the end of 2011.

*More harmonisation should be provided to prevent fraud.*

*Overall, MRV measures seem to be working.*

- 
- 7 The market is effective as the carbon price reacts well to the rules of supply and demand. However it is hard to say whether the carbon price reflects well marginal abatement cost. Some



price distortion and volatility are seen showing that the market is not that resilient. This is partly due to the difficulty of predicting political decisions or interventions on the EU ETS. However this is not an issue as the carbon market is still more stable than most other exchanges. It is also important to improve security and certainty to attract market players and keep the market as liquid as possible and decrease risks of volatility.

It took two fraud incidents to really improve market oversight. Some steps are still required in order to improve security such as the harmonisation of measures to prevent VAT fraud across Member States, but the system can be said to be reliable. However, market oversight could be improved further by applying some financial control legislations over the spot market and increasing the responsibilities of a market supervisor. These steps should be sufficient and it might not be necessary to have carbon allowances classified as a financial instrument, one of the intentions of the EC, as this might bring unnecessary additional rules, making the scheme even more complex to implement.

MRV seems adequate, as non-compliance with the rules is negligible. Looking back it took almost five years to built this system, which now provides unmatched knowledge of Europe's GHGs industrial emissions. Moreover, MRV that is currently defined under guidelines is soon going to be regulated.

---

8 *The EC is currently addressing the issue of fraud. Therefore we will need to wait to see whether it has been addressed well.*

*MRV will need to be applied to a number of measures put in place to deal with Phase I issues, such as carbon leakage and requirements for reinvestments of some power companies' revenues.*

#### 4.3.3 Reinvestments

There is going to be a significant source of revenues resulting from the auctioning of allowances starting in 2013. How this money will be reinvested is crucial, especially in terms of promoting the scheme and other instruments of the climate change policy package.

1 It is important for the carbon price not to fall to zero to coordinate policies. This is something that needs to be tackled as proposals for such instruments are being discussed. As for the reinvestment of auctioning revenues, there is no binding agreement so only practise will tell whether any of the criteria are met.

---

2 The lack of a binding agreement for reinvesting revenues is a missed opportunity. As it is, they will mostly be used for lowering the national debt. One reason for creating a carbon price is for supporting investments in new technologies, innovation that will lead to further carbon reductions. Thus it is a crucial point to address for the system to perform well.

---

3 The arrangements made for the use of revenues does not fulfil any of the three criteria, partly as a result of the state of the economy at the time it was decided. There should be an agreement on



reinvesting the revenues notably to support non EU ETS sectors' and developing countries' efforts towards fighting climate change.

---

4 There is an important debate at the moment on how the revenues should be used. Anyone defending a cause, from social security to environmental protection, will say the money should be used in a different way. It makes sense that some of it should be reinvested to further support the transition to a low carbon economy. It would be interesting to use the concept of double dividend, for example to reduce a charge on enterprises that could at the same time solve the problem of competitiveness.

---

5 To ensure the success of the EU ETS, it will be important to increase the control on the reinvestment of the auctioning revenues. It is important that these investments are used to support sustainable development and the transition to a low carbon economy as well as for addressing social and fairness issues, which are given less importance in the Directive.

---

6 It is hard to tell know whether revenues should be used in a different way than what is suggested in the Directive since we do not have significant auctioning until 2013. No country has yet committed to anything and what is going to happen will depend on the budget situation. It does seem unlikely that it will be reinvested in energy efficiency.

---

7 Coordination with other policies is essential in order to set the parameters of the EU ETS in the right way. What makes even more sense is for policy instruments not to be superimposed but coordinated as for example use of auctioning revenues of set aside allowances to support technological developments such as for carbon capture and storage. This supports the carbon price and accelerates innovation. This issue should be addressed carefully in the future. So far there is no transparent way for monitoring how the revenues to date have been used so it is hard to say whether it has been used towards supporting the success of the scheme. However, auctioning was not significant and from 2013 onwards MSs will have to provide reports to explain how they plan to invest those revenues, providing more transparency. This is already a positive step.

---

8 The current provision for auctioning revenues reinvestment is very poor. There should be restrictions to what countries are allowed to do in using these. It will be important to specify the criteria that these reinvestments will have to fulfil. It could be reused in a way that supports the EU ETS to trigger a snowball effect, as recommended by several studies. For example this could take the form of internal transfers to countries where abatement cost is low but funds are not available to act upon it, which in turn would allow them to consider more positively a move towards increasing emissions reduction targets. Of course this will require a whole new legislative framework for MRV. It is also crucial to coordinate the EU ETS with other measures, so that they reinforce each other and do not exacerbate over-allocation.



## 4.4 Prospects

### 4.4.1 Enlargement

The scheme will be enlarged to cover more industrial sectors and include GHGs other than CO<sub>2</sub>. Since the start, five countries have been added to the scheme and the aviation sector will be included in 2012. Negotiations are open for the inclusion of Switzerland into the scheme and the inclusion of the maritime sector is considered although the likelihood of that happening is faint.

1 The addition of the aviation sector is positive, and even though it is getting too much free allocation, they are provided based on grandfathering. This means that since the sector expected to grow rapidly, the problem will be solved soon. The scheme could be further enlarged to cover more sectors and more GHGs. The more sectors are added to the scheme, the more its effectiveness has the potential to increase, as there is an increase of net buyers and thus of the carbon price. Of course this instrument is not appropriate for all of them. There are provision in the directive for opt ins, whether it is used and effective is something that will need to be addressed during the next revision of the Directive.

---

2 Although it was important to include aviation, other than considering the maritime sector???, no more provisions should be made for enlarging the scope of the scheme. Indeed, we are already seeing some problems arising from the addition of such a global industry as the air transport sector. It is far more important to ensure the scheme's credibility and effectiveness during its third period.

---

3 The addition of the aviation, while it poses juridical problem, is a very positive step. Like any other sector covered the challenge is to decide on adequate allocation of quotas.

---

4 Maritime will be considered only if the addition of aviation is successful. Subject to this condition, the addition of these growing sectors in need of measures to reduce their emissions can only be beneficial to the effectiveness of the system. It might also help to protect competitiveness and the environment as it could become more expensive to import goods. The next addition that could be discussed once an outcome is being reached for the previous two sectors is for the possibility to cap emissions more upstream or find a way to deal with emissions from road transport and buildings.

---

5 The addition of new sectors to the EU ETS needs to be done in conjunction with the establishment of accompanying measures for that sector. Something needs to be done in order to deal with each sector complexity and this is something that is missing in the system right now. It is hard to predict whether the addition of aviation will be a success. It will surely determine if there is a chance to add the maritime sector.

---

6 The addition of the aviation sector is going to be interesting to show where the EU stands internationally. If it were to fail to apply to the sector internationally, it will probably have a



negative impact on some energy intensive sectors and on the possibility to use border adjustment measures. Hopefully, it will succeed. Other than the addition of aviation and potentially maritime sectors, the primary concern of the policy makers should be the stabilisation of the system, not further enlargement. It is something that could be discussed provided the system is successful in a few years from now.

---

7 Adding aviation was a bold move and it presents the opportunity of bringing the EU ETS to other sides of the world in a sense. Therefore it is important to support it. Nevertheless, it should not be the last sector to be added to the EU ETS. Also the coverage of some sectors is still only partial, i.e. covering one gas or one specific activity. It would probably be more difficult to include other particular sectors such as buildings but improvements should be made to the possibility for opt in of additional companies and sectors. The addition of the maritime sector will be less easy than aviation as they never showed preference for emissions trading over other measures, unlike the aviation sector. Provisions for linking to other trading schemes is also very important and should be developed further, now with Switzerland and potentially next with California.

---

8 *Aviation is a good addition knowing that the scheme has stabilised since its first implementation Phase. The linking of the EU ETS to other carbon markets might also be an option in the future. However, these links will need to be carefully designed; a larger carbon market will be more complex to deal with.*

---

#### 4.4.2 Future

Although, there are no clear provisions for the scheme to stop after its third implementation period in 2020, detail of implementation are only provided until that date. The scheme continues to be linked with the Kyoto mechanisms until 2012 provided no other international agreement is adopted. As for links to other emissions trading schemes nothing is yet set in stone. Having those issues in mind as well as all previously discussed topics, it is also interesting to picture what might happen in 2020. Moreover, the EU ETS is unique in terms of several characteristics and it is under scrutiny by several countries and regions, whether it will be taken as an example or model remains to be seen. Those are the topic summarised here.

1 There are provisions until 2050 for reducing the EU's GHGs emissions, which would ensure a high carbon price. Whether those are adopted or not will depend on the international context. However, the EU ETS will continue to exist as long as the price of carbon is positive. Indeed, the linear reduction in the cap continues after 2020 unless decided otherwise.

It seems likely that by 2020 trading systems will have started to develop around the world, notably in Australia, Korea, Japan and China. However, nothing is certain and the lack of other similar markets developing around the world should not prevent the EU ETS from existing, even though it will be harder to demand higher targets from the industry. It would be more



feasible for Europe to meet its ambitions if there was a level playing field. This is one of the reasons why Europe is currently promoting the EU ETS and offering to share its infrastructure through an outreach programme with the rest of the world, especially with China.

The EU ETS is being taken as an example by other countries and regions.

- 
- 2 Policy decisions, to project what is going to happen after the third trading period, should be taken fast in order to increase the scheme's credibility and predictability with companies. Indeed, in legislative terms, 2020 is very close and the carbon price needs to be determined on the basis of long-term prospects. It is most probable that EU ETS will remain in place after 2020, hoping that its cap will be tighten to deliver 2050 targets and that carbon leakage will be adequately dealt with.

Lack of links to other emissions trading schemes should not have any effect on the EU ETS, as it is also a good standalone tool for achieving low carbon emission in a cost effective way. In reality, it will undoubtedly trigger a debate questioning the adequacy of the system with a non-negligible impact on the second review of the system.

This scheme is taken as an example elsewhere, hopefully other regions will learn from its mistakes.

- 
- 3 Credibility of the system is questioned due to a lack of plan for the fourth Phase. There are two possibilities for the fourth Phase of the EU ETS either the cap is reduced significantly to promote green investments or the EU ETS should be replaced by another measure. If in the future the facts were to show that most participants barely made an effort to reach their targets under the EU ETS, opposition to the system would increase while credibility would drop.

One of the ways the European system could regain its credibility is if other countries commit themselves to continue to reduce their emissions and if they also develop emissions trading schemes to be linked to the EU ETS. However, there is a risk that other system might also be too lax, diluting the EU ETS sectors' efforts. It important to modify the rules of our system, before considering linking it to others or for promoting it as a model. Lack of international agreement will prevent ambitious targets to be agreed for the future EU ETS, which will seriously question its suitability.

It is taken as an example, as the largest system of its kind; several countries are studying it and some are even developing similar schemes. However, it needs to be tailored to the circumstances and goals of various countries.

- 
- 4 It is clear that the system is there to stay at European level and the only uncertainty is the stringency of targets. Provided there is no fall back into a financial crisis, it is one of the only solutions to ensure industrial emissions reductions. The EU ETS is most likely to continue after 2020 and probably with a higher carbon price.

Prospects are less optimistic for any international agreement to continue, this will mean that



the EU ETS will become increasingly hard to defend as issues such as competitiveness might become a real problems once the carbon price goes up. The challenge, which the EU is actually starting to embrace, is going to be about finding regions in the world that are ready to develop similar schemes. There are little hopes for this to happen by 2012, and with reduction in the use of CDMs and the end of the Kyoto Protocol, Europe should thus also focus on the establishment of bilateral agreements.

The system is being taken as an example around the world with the hope that USA and China will be part of those using a similar scheme.

- 
- 5 There is a need to strengthen the provisions for what will happen once the third Phase ends. Especially with the growing international scepticism concerning the EU ETS. As Europe has establish a roadmap for lowering its GHGs emissions until 2050, there is a necessity for a strong mechanism or more to persist beyond 2020. Whether it will be the EU ETS or another instrument, is something that remains to be determined.

By establishing the EU ETS, Europe has taken the lead for tackling climate change. However, now there is a risk that if a similar path is not chosen by other nations, it will compromise the future of the system. In that sense, the EU ETS does not perform very well. Ideally, emissions trading schemes should be developed internationally, as otherwise the EU ETS will have to bear the consequences.

It is interesting to notice that a very small fraction of countries actually look at the EU ETS and not all are supportive. Internationally, those countries that do not intend to embark on emissions trading are quite critical of the EU system and the approaching end of the Kyoto Protocol does not help this.

- 
- 6 There is a case for providing more predictability and political certainty for what is going to happen in 2020. So far, companies have been very much concerned about the implementation of Phase III, but it is necessary to start concrete planning for Phase IV. It is very difficult to predict what is actually going to happen in 2020. The safest bet is that the emissions trading will continue with its current systems of reduction factor and free allocation to address carbon leakage.

The likely scenario for emissions trading and high emissions reduction targets in the near future is that Europe will be on its own. This just means that the EU ETS will have to be less ambitious by keeping its current targets and not reaching a very high carbon price. It is possible to engage unilaterally, but then one has to deal with the potential consequences. It is important to note also that the Directive provides several measures that will only happen in the case of international agreement such as the 30 % reduction readjustment.

Whereas until 2009, the EU ETS used to be the symbol of EU leading the way in taking action against climate change and serving as example, it seems that this momentum was broken



during COP 15. The fear is thus that if emissions trading systems are developed elsewhere they might look very different from the EU ETS, although it is hard to tell.

- 
- 7 The revised directive does insure continuity of the market and supports its credibility. It also provides very important rule changes. Therefore, it is important for policy makers to leave the system develop and adapt to those modifications for a couple of years, before agreeing on how the market will look like after 2020. It is sure that lack of clear plan for Phase IV is an issue but it is too soon to act on it. It will most surely persist beyond 2020, as there does not seem to be any replacement for it, and it is very hard to revoke such a Directive. It is the international context that will determine how strong it will be.

It will probably become harder to support and sustain the EU ETS in the future, unless countries around the world realise it is in their own long-term interest to reduce their GHGs emissions. Some countries, such as Japan and Australia, are about to introduce a carbon tax or market. Still, we are far from reaching an international level playing field. The extent to which similar systems are being developed is also going to have a positive impact on the carbon price. Although carbon price is not the only factor taken into account to set business strategies, it does add up to the cost. Thus, the lack of intention by other countries to incur a price on carbon is a threat to the future of the EU ETS.

The EU ETS is being taken as an example, several countries, notably Japan, the USA and Taiwan, are currently observing it.

- 
- 8 The provisions for the future of the EU ETS are not transparent enough as the scheme itself is becoming a hybrid instrument. This will need to be tackled but there is no reason to assume that Europe will not continue to implement it after 2020. It is in its own interest to do so and would cost a lot in terms of self-confidence, climate and money if it did not.

More and more countries take interest in the EU ETS. It does not mean that they want themselves to develop carbon markets. Nevertheless, a lot of efforts are made by the EU to promote emissions trading, notably as a way to bring more revenues to the national budget, which is looking increasingly attractive to several countries.

The EU is being taken as an example and it is its ambition to lead the climate agenda. It is in the best position to do so, as it has taken the role of promoter of essential values such as the prevention of climate change.

## 4.5 Overview

### 4.5.1 Issues

The survey focuses on selected key problems observed during the implementation of the EU ETS, and issues considered important for improving its implementation in the future. This section provides a summary of the views of the participants on other problems they consider important as



well as on the problem(s) or issue(s) they consider most critical. At the end, a sentence or two by each participant captures its overall view on the EU ETS.

- 1 The biggest mistake made in the first Phase was that there were no inventories to confirm emissions projections, which resulted in over-allocation. There are several issues that will need to be addressed in the next couple of years for enabling the market to be successful. Its future will need to be specified especially regarding cap stringency, market oversight will need to be improved and, lastly, it will be important to provide CDM at sector level and make provision for what type of offsetting will be allowed once we know what happens to the Kyoto Protocol.

The EU ETS is one of the most efficient instruments to prevent climate change.

- 
- 2 One of the main barriers is political bravery. The system needs more support in order to prevent it from becoming the complex product of too many compromises and additional rules, weakening its effectiveness. Before being able to provide that support, the way the system is applied should be questioned, confirmed or revised, especially regarding the issue of the use of one size-fits-all solution is worth considering. Questioning the system is risky, however, it covers such dissimilar industrial sectors, which might require different market mechanism systems. For example, the power sector should be able to decrease its emissions faster than energy intensive industries and the price reflected in the current market might not be adequate for achieving this in the short term.

Overall it is a very interesting instrument.

- 
- 3 The main issues seen during the pilot Phase of the EU ETS are over-allocation and lack of auctioning, which if done to 100 % once the cap is properly set resolves the first issue. The main barrier to the success of the scheme is too generous cap or over-allocation.

The system is adequate though its parameters need to be modified and it should serve an ambition.

- 
- 4 Three main issues that can be observed from Phase I are over-allocation, price volatility and windfall profits. One of the main barriers is over-allocation and the lack of agreements on the reinvestment of revenues. However, another main issue which has not received adequate attention is the level of complexity that the system will reach by Phase III; hopefully a methodology to simplify further the implementation over the next periods will emerge from the experience.

It is very important to preserve and support the system if one considers that climate change is the problem of the 21<sup>st</sup> century.

- 
- 5 The main problems seen during Phase I were fraud, speculation and low carbon price. Another important issue, which maybe has been less addressed, is the lack of measures supporting successful implementation, notably to integrate social aspects to this half environmental half



economical Directive. This is an issue which is hidden under each problem seen by the EU ETS and which is usually approached too late. The biggest barrier to the success of the EU ETS is that not enough importance is given to market regulations such as necessity of border controls or measures for setting aside allocations. This is partly due to a lack of political willingness and bravery in Europe, which could change anytime.

The EU ETS is Europe's chosen method, although it might not be the best it should now be improved as much as possible. The EU ETS is an instrument that requires to be implemented concurrently with supporting and regulatory measures. This is something that could be done from 2013 by reinvesting auctioning revenues. There is a wide range of different opinions coming from the European trade unions on the EU ETS. Some are critical of the EU ETS, whereas others are fundamentally against the use of market mechanisms. Although most agree on the 'polluters pay' principle.

---

6 The main issues that occurred during Phase I were competition distortions resulting from national allocations and recourse to the method of grandfathering for free allocation. All major issues have been dealt with for Phase III. Only implementation will tell whether improvements are sufficient. Several barriers do remain, notably poor access to offsetting and also the system's predictability and stability, as participants need to be given reasons to support the scheme. However, one could fundamentally question the way the EU ETS has been designed, whether it should include different sectors or have absolute cap or not. These are legitimate questions, however, the system was chosen amongst others for certain reasons and in the context of European consensus for reducing GHGs emissions. Therefore, this system needs to be kept and implemented as it is in the best possible one, while communicating and making best use of its advantages and dealing with its problems.

Those criticising the scheme should give it the benefit of the doubt, it is evolving and it has come from a long way, stopping now would be nonsense. It is probably the best-fit approach for Europe. Nonetheless, it is important to realise there is a wide range of opinions within the businesses community on all issues concerning the system. Usually the opinion across countries and across similar sectors is more or less homogenous.

---

7 The most problematic issues of Phase I were over-allocation mainly resulting from poor MRV, lack of centralisation and poor control leading to fraud and windfall profits. The latter was necessary for allowing the market to develop. In spite of the many problems that occurred during Phase I, studies show that there were some emissions reductions, which proves that it succeeded to pass on the right signal. Now that the system is being centralised with tailor made infrastructures, it is going to be a very complex system to handle. As soon as we left the pilot Phase, pressure increased not to make mistakes. The challenge now is a technical rather than a political one. It is whether the EC will be ready on time for implementing Phase III and capable



to deliver on expectations. One of the main barriers is lack of communication on the success of the EU ETS, especially knowing there is not much alternative for acting on European industries. The EU ETS is an essential instrument to be used in the policy mix for preventing climate change.

- 
- 8 The main critiques of the EU ETS are; first, it is becoming too complex, especially regarding allocation and secondly, the lack of flexible mechanisms to react in case of unexpected event and to deal with over-allocation. In the end, this might prevent it from bringing more than just emissions reduction (i.e. incentives for the development of low carbon technologies). This is also why it is very important to improve the system's predictability.

It is important for the EU to keep the carbon market working effectively not only for its economic interest for driving a low carbon economy and competing with emerging markets but also to keep its position in the foreign diplomacy. A carbon market is the best of what we have at the moment notably since it is in place and it provides the social message i.e. polluters pay. There are different positions on the topic of carbon markets amongst NGOs notably some saying they are not effective and bring all kinds of fraud problems and that energy efficiency is a better measure. Obviously, it is only through a combination of several instruments that Europe will reach its 2020 goals.

#### 4.5.2 Criteria

Three criteria, against which issues were assessed, which were considered during the survey, are not the only ones that could be considered. Moreover, some are more important or harder to fulfil than others. This section provides the views on this particular topic.

- 1 What is important when assessing an instrument with regards to criteria is to define them well before starting the evaluation. One of the most important criteria is political feasibility. The EU ETS is not necessarily made to be fair this is why the main criteria that it needs to achieve are environmental and economical ones, whereas social equity can be reached through other measures, such as the redistribution of revenues.

- 
- 2 There is a lack of attention to assessing achievements in terms of low carbon innovation. It is also the hardest criteria to meet i.e. for the system to deliver a carbon price that is sufficient to trigger innovation and thereby ensure long-term emissions reductions.

- 
- 3 Two other criteria can be added, although both could be classified under effectiveness. These are market security and effort made by participants to reach their targets. The hardest criterion to meet is equity with regard to non-EU ETS effort sharing.

- 
- 4 An important criterion to remember to consider but which falls under effectiveness is simplicity, it is also the hardest to meet, though not the most important.

- 
- 5 All the criteria considered are important. However, the social criterion is usually given less



importance and it is also the hardest to meet. As the EU ETS has been improving in terms of the two other criteria it is time to focus on social equity and to put mechanisms in place to ensure that it is attained. It means more than having fair rules and good communication. It is also about providing adequate support for a fair transition to a low carbon economy.

---

6 The most important criterion is cost efficiency and it is the hardest to meet. Whereas it is relatively straightforward to ensure that effectiveness is achieved, the question is at what cost.

---

7 The three criteria considered are very academic and it is also important to just compare with what are the alternatives to the scheme. Yet the most difficult criterion to meet is probably equity because again it's a theoretical concept that is hard to reach in practise.

---

8 An important criteria to investigate is to which extent the instruments really drives innovation and whether investments are being made in research and development and by whom. Most criteria are actually hard to assess. For example, it may be quite simple to measure GHGs reduction, but it is hard to attribute it to a cause, is it due to the EU ETS or energy efficiency measures.

## 4.6 Conclusion

It can be observed that there is no straightforward response to whether the EU ETS revision successfully answers the issues it faced and is still facing. As expected the various stakeholders have different opinions notably according to whom they represent and what they personally believe in, however they also do agree on certain points. The next step is to distillate the main messages coming out of this survey relating them to the bigger picture and to set out a number of recommendations.



## Chapter 5 Synthesis and Discussions

---

### 5.1 Introduction

This chapter provides a synthesis of the outcomes of the interviews summarised in the previously, using the evaluation grid as structuring analytical framework. It starts by presenting the overall opinions on the question of the adequacy of the revised EU ETS Directive. It then identifies and analyses where opinions converge or differ considerably on the various issues. Problems and limitations of environmental policy evaluation, and more specifically those associated to the surveying approach used, are also discussed. Finally, a more personal set of recommendations is provided based on the analysis of the literature and views of European stakeholders and experts.

### 5.2 Evaluation outcomes

#### 5.2.1 Overall views

The answer to whether the revision addresses the problems identified in the first years is not a simple and unequivocal yes or no, as could be expected in view complexity of the system and of the multiple objectives and criteria to be considered. Nevertheless, taking a pragmatic perspective (as we are not in an ideal world), it can be said that the overall view is that the changes introduced in the revision go a long way in providing solutions to the major problems and the EU ETS should be kept as the instrument of choice for controlling industrial emissions in Europe. There are however remaining significant weaknesses in the system and the views of the interviewees on their relative importance vary, reflecting mostly different ideological positions, notably on what the EU ETS is meant to achieve as an environmental policy instrument. The revised EU ETS is generally considered better equipped for improving achievements with respect to the three performance criteria, although, for some issues, the solutions are or may not be sufficient and some will bring new problems.

The major issues have been dealt with, namely through the centralisation of allocation, the use of more auctioning, and the improvement of MRV. Interviewees tend to agree that, as a result of these changes, the system will undergo significant transformation as of 2013 and that it is therefore necessary to implement them and see whether they are sufficient, before considering further significant changes to the EU ETS. In the mean time, the system needs more support, politically and legally, notably by making it less complex, creating where appropriate more accompanying measures, and integrating it better in Europe's climate policy. The challenge appears thus, at this stage, more technical than political. Even though, they believe that the system is important to preserve, four actors consider that its basic design might not be the most adequate. One of them, in



particular, believes that any new revision should address questions such as the appropriateness of covering different sectors under the same cap-and-trade system.

Regarding the international perspective, interviewees agree that the EU ETS is attracting much attention from countries that are on the verge of implementing policies to tackle climate change, but the prospects for that happening soon or for their instruments to resemble the EU ETS are thin. They also believe that, although it should be avoided, lack of international agreement or of possibilities for linking the EU to other carbon markets would lead to less ambitious environmental targets for the EU ETS.

During the first interviews, it appeared that some of the changes introduced in the revised Directive would bring new issues, not identified during the implementation of Phase I and therefore specific to the implementation of Phase III. That is why the questionnaire was revised during the interview process (cf. Note at the end of Annex IVc) in order to include two additional issues, namely: provisions for auction revenues and offsetting.

### 5.2.2 Ideological positioning

As specified above, it is important to stress that each participant, and each EU ETS stakeholder, has his own expectation in terms of the performance of the instrument. This can be clarified by discussing the mind-set of survey participants in terms of evaluation criteria as it helps to understand how judgmental they are on each issue. A clear and precise definition of performance criteria is not only the foundation for designing policy instruments but also for assessing their performance. As pointed out by Franz (2011), there are different levels of ideological conflicts between EU ETS stakeholders. First, there are those who are sceptical about using market mechanisms as opposed to command-and-control instruments. Then, some disagree on whether emissions trading is the right market mechanism to use. Lastly, there are those who believe that if emissions trading is used, it is meant to provide reductions at the lowest possible costs, thus the lower carbon price the better; others consider that it has to sustain a price level sufficient to trigger investments for supporting the shift to a low carbon economy, for example in renewables energies.

#### **a. Interviewees' expectations in terms of criteria**

The cap is a key parameter determining the effectiveness of the scheme, while efficiency is essentially achieved through trading, and social equity depends on various factors such as burden sharing, compensation and accompanying measures.

Most participants consider that efficiency is as important than effectiveness and that it has been achieved relatively well. Perceptions on achievements regarding effectiveness depend on what participants expect of the scheme. While they generally agree that it should lead to reduced emissions, four consider that it should also lead to increased green investments, including technological innovation. Regarding the social equity criteria, while most interviewees consider

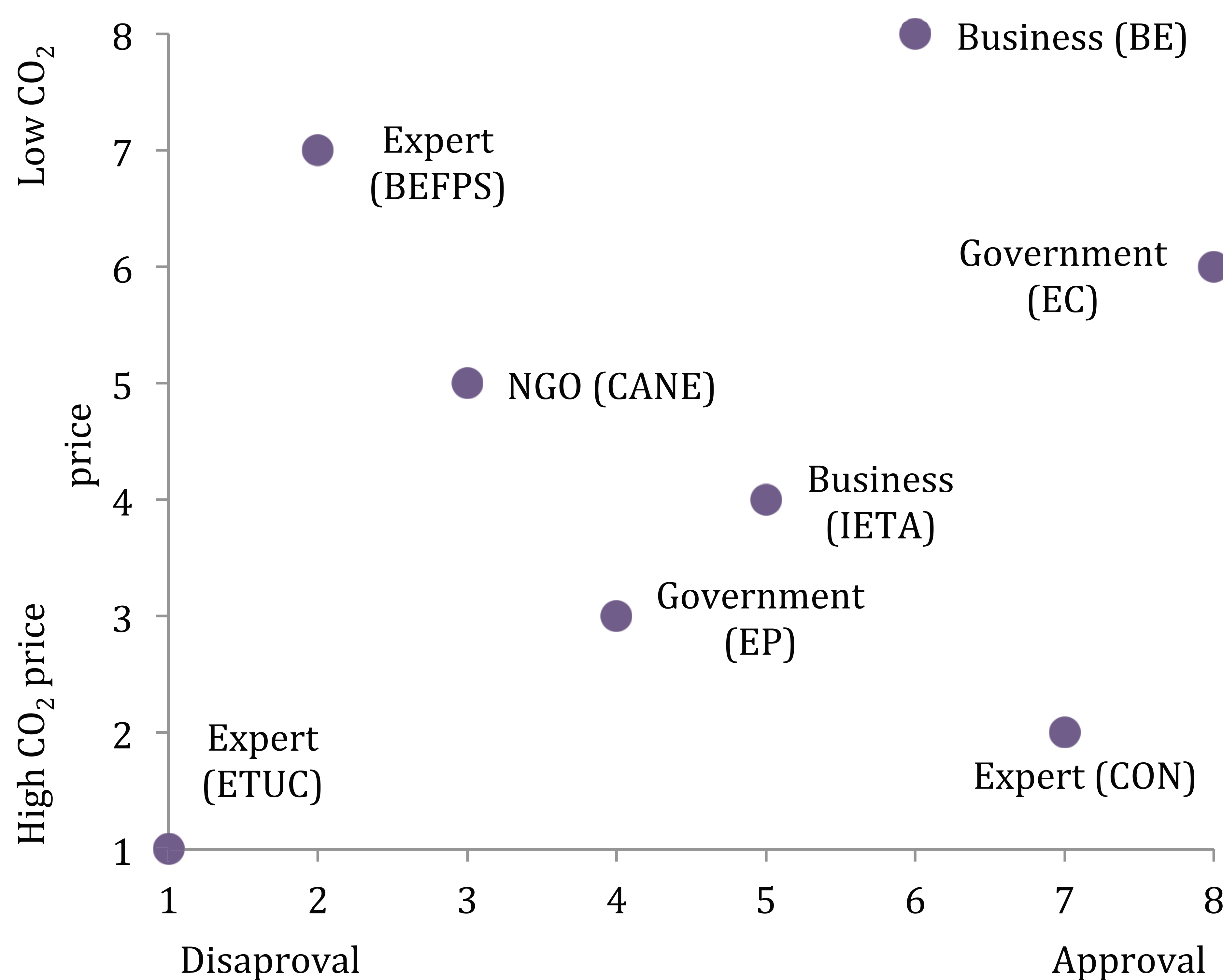


that it is given less importance in the Directive and is the most difficult criteria to meet, three of them consider that it should be given more importance in the scheme, including through specific dedicated measures and that is the criteria for which there has been less achievement.

While all participants agree that the initial three criteria are the most important ones, some participants also consider that political feasibility, investments in low carbon innovation and technologies, market security, efforts made to reach targets and simplicity of the instrument, also deserve attention and are worth evaluating.

#### b. Qualitative classification of positions

In order to provide a comparative overview of the opinions of the interviewees and as a way to check whether their view on one topic might help predict their view on other topics, the scatter plot below has been realised by comparing their views with respect to two parameters: the extent to which they appear globally critical about EU ETS and its revisions and how strongly they seem to believe that a high price should be put on GHGs emissions to trigger the right level of investments. Participants have been ranked with respect to each other (thus on a scale from 1 to 8) on these two parameters. For the purpose of the analysis, the differentiation between the opinions of the participants has been voluntarily exaggerated by amplifying the distances between their positions with respect to the two parameters, avoiding also to give the same score when they are perceived to be very close to each other. Obviously this representation is subjective and should not be taken as an accurate reflection of the positions of the interviewees.



**Figure 3 Interviewees' positioning**



The chart seems to show a correlation, if we exclude the data for Expert (BEFPS) and Expert (CON): the more an actor expects the EU ETS to behave as a price mechanism, the more critical he is of the capacity of the revised scheme to provide the adequate price to trigger all kinds of low carbon developments. However this is not a robust conclusion given the limited size of the sample, the method used to score the opinions and the loose correlation observe. Indeed, the two 'outliers' confirm that this is not necessarily the case. A stakeholder expecting a high carbon price will not necessarily be very critical of the scheme, even though his expectation is far from being met, because he may put more value on the scheme's early achievements, namely introducing carbon into companies considerations. On the contrary, another actor may be critical of the provisions for the third Phase regardless of his opinion on the expected price level.

To tie back with what has been said above, this would support the view that there is not necessarily a direct relation between the positions of an actor on the different ideological levels. To give an example, actors who believe emission trading should provide nothing more than the required abatements at the lowest costs will probably want to have unrestricted access to offsetting, and for that reason they might be very critical of the scheme.

### 5.2.3 Synthesis

#### **a. Most severe problems seen during first implementation years**

More than half of the interviewees agree that over-allocation was the biggest problem in the first Phase of the EU ETS, regardless of the reason e.g. decentralised allocation or no auctioning. Other problems considered to be important but by a minority of participants (each mentioned twice) are: price volatility, windfall profits and poor market oversight. Other important issues, each mentioned only once are: European competition distortion and lack of measures supporting successful implementation.

#### **b. Barriers to the future success of the EU ETS**

There is quite a consensus on what are the main barriers that currently threaten the success of the revised scheme (i.e. taking into account the changes introduced in the revised Directive). Half of the participants voted for the lack of provisions for setting aside quotas in case of over-allocation and the insufficient support to promote the EU ETS (through more communication on the merits, political commitment and accompanying measures). The next barrier, with three voices, is the complexity of the rules of the system notably in terms of allocation. Next come, each with two votes: poor predictability, weak market oversight, and inadequate provisions for offsetting notably at sector level.. Other issues also mentioned (once) are: lack of agreement on the reinvestment of revenues and poor market regulation notably in terms of border control.

As a point of clarification, it should be emphasised that the focus here is on the barriers; participants may not agree with the provisions for addressing an issue, without necessarily considering that this is in itself a barrier to the successful implementation.



**c. Points of convergence**

What follows is brief synthesis of the opinions on the issues for which there is a good convergence of views between the interviewees. They are presented according to the order in which the questions appeared in the questionnaire.

Auctioning is the fairest and most effective allocation method. In that sense, the revision improved the scheme by providing more auctioning. The cap does not address over-allocation passed over from banking and something will have to be done about that. In terms of consultation and access to information, the system is adequate but the complexity that the revision will bring means that only a few can benefit from this transparency. The issues around MRV are dealt with although new provisions might be required for implementing the new rules of the Directive. There is a lack of binding provision for reinvestment (a missed opportunity) and some part should be reinvested to support the EU ETS in one way or another. Fraud has been addressed, but only implementation will tell if the measures of market oversight are sufficient. Volatility is not seen as a problem anymore. Dependence of the scheme on how the rest of the world decides to address climate change creates a problem of predictability. The plan for adding new sectors is adequate. The provisions for linking to other carbon markets and the international promotion are adequate.

**d. Points of divergence**

The principal issues on which interviewees disagree are the following: (1) the way to achieve equity within and outside Europe (free allocation or compensation measures), (2) the need and way to deal with over-allocation (increase targets or set aside), (3) the use of limits for offsetting (increased and move to sectorial mechanisms or reduced to a minimum), and (4) on what to reinvest the revenues (MSs partly or fully binding reinvestment requirements on MSs; supporting the EU ETS through compensation measures and low carbon innovation or help developing countries to fight against climate change).

The allocation method and the cap stringency clearly appear as the most important issues and barriers. Although the cap provides certainty in terms of emissions for covered facilities, some believe it is not put at the right level in order to trigger adequate reductions of emissions or investments in low carbon technologies. Those who share this view believe that eventually this could be solved by opting for a longer term 30 % reduction target at European level, while, in the meantime, providing a legal framework to set aside quotas in case of lower than expected growth. Indeed it seems to be the general view that floor price is not a feasible solution. As for allocation method, several agree that the best way to deal with competitiveness is through compensation measures and that full auctioning would solve many problems notably decrease the level of complexity.



#### 5.2.4 Aggregated opinion on the importance of evaluations

Overall, the evaluations of the EU ETS are considered to have been useful, especially to identify its main operational difficulties as well as major design problems. Moreover, they usually also helped define ways to improve the implementation and possible solutions to address the design problems. Evaluations are also a way for organisations to communicate their positions and contribute to the decision process that shapes the EU ETS. There are many different types of evaluations and evaluations using the same assessment methodology end up sometimes with very different findings. This reflects differences of interest and perspective among the various actors concerned and helps identify on which issues their views differ and why. It also shows that there is hardly one single objective way of assessing the success of the EU ETS because of the initial complexity of the problem it tries to solve.

By providing information on the actual implementation of the scheme and its effects, the evaluations also contribute to increase transparency and have an impact (positive or negative) on the confidence of stakeholders and other actors in the system. It is therefore important to be aware of this 'marketing effect'. Accordingly, authors should define clearly the assumptions, scope, and methodological shortcomings underpinning their evaluation as well as what message they actually want to deliver: is the scheme adequate but needs to be improved or do they really want to convey that it is not the right solution? Otherwise, they might unintentionally risk providing an incomplete or even distorted view of the system for which support is currently waning. Moreover, timing of evaluation is of the essence. Right now the system needs stabilisation and it is not recommended, and probably not feasible either, to make fundamental changes to the system in between revisions. Thus, new ideas such as set aside might better be postponed until already decided changes have been implemented. The overall objectives, rationale and context of the scheme should always be present when analysing data and suggesting solutions. For example, when analysing quantitative data, conclusions should not just be based on absolute numbers and political feasibility should be considered when comparing with different options.

While a diversity of studies contributes to enhance the understanding of the issues and possible solutions as well as differences of interests and views between stakeholders, there is also a need and demand for more neutral and holistic evaluations, in particular ex post evaluations, that establish clearly the achievements of the EU ETS so far.

### 5.3 Evaluation: merits and limitations

#### 5.3.1 Problems and limitations of (environmental) policy evaluation

There are different biases in evaluations, mainly associated to of the motivation of the evaluator, the scope of the evaluation and the method used (Mickwitz 2003). In the case of environmental policies, the challenge is that the issues at hand are very complex, reflecting the complexity of the



interactions of man and nature. The way they are reduced to simpler problems in order to be able to deal with them can lead to design instruments that may fail to address the real problem (Crabbe & Leroy 2008). At the level of the evaluation, this may lead to a distorted representation of the problems addressed and unreliable or even erroneous results regarding the adequacy of the policy instrument.

In the case of the evaluation carried out in this project, the evaluator has a neutral view on the subject but is not an expert on the issues such emissions trading. While the scope of the issues addressed is broad and consistent with the policy instruments evaluated, the limited time and resources available had an influence on the method used and the depth of the analysis. Hence the outcomes of this evaluation should be taken with caution. The method used here is a type of stakeholder consultation, which itself has its own merits and limitations. The issue of data availability was not directly a problem.

### 5.3.2 Interview process: merits and limitations

Conducting interviews is a very interesting and useful way of finding qualitative information and rapidly collecting the views of different actors. Compared to other types of stakeholder consultation and even to literature review, it gives the freedom to query the motivations behind specific opinions and choices. What is more, compared to other methods, the interview of carefully selected actors is a way of covering in a short time a broad range of issues as well as accessing and going beyond the vast amount of information available in publications.

However, it is essential to have a good appraisal of the extent to which the views of individual participants are or not objective and detached from the interest of the organisations they represent, as this is important to understand why some may have different views on an issue or different interpretations of the same facts (Crabbe & Leroy 2008).

Using a carefully prepared questionnaire based on a preliminary review of the literature, the interviews allowed to gain much more insight on the issues at stake, globally and individually, than would have been possible through only desk research or a survey with written replies to a questionnaire.

The selected interviewees constitute a representative sample of main actors, stakeholders from different types of organisations concerned and 'neutral' individual experts, all very knowledgeable about the issues and recognised for their expertise. However, a larger number of interviewees combined with longer interviews (preferably a second series of meetings with each participant) would have allowed to deepen the analysis of the issues, develop a more detailed understanding of the differences of views, and cross-check and sharpen both the results of the evaluation globally and on specific issues.

Nevertheless, it should be stressed that the variety of views collected through the interviews are generally consistent with those found in published evaluation reports, an indication of the quality



of the sample of interviewees. Furthermore, the added value of this project should also be emphasized. First, unlike most existing evaluation reports, the present report provides a comparative synthesis of the views of the main stakeholders concerned. Second, the interviews have helped distinguish more clearly than in available reports between: (1) the issues on which efforts should focus in the short term to facilitate and improve the implementation of the revised Directive in Phase III and (2) the issues to start investigating now in order to prepare the next review due in 2014 in view of a third revision of the Directive.

Finally, the limitations discussed here are less relevant to the next section on recommendations as it is based on both the outcomes of interviews and a detailed study of the literature.

## 5.4 Discussion and Recommendations

Building on the outcome of the interviews and the review of publications, this section provides an aggregated personal view on the conditions of success in the medium and long term of the EU ETS. It starts by revisiting the European approach to address climate change and some of the fundamental design choices behind the EU ETS, and then elaborate on the factors and decisions which are important to evolve towards long-term EU 2050 goals.

It is inevitable to question the foundation of what Newell & Paterson (2010) calls 'climate capitalism', our way of mitigating climate change with city financiers and environmental NGOs shaping climate politics within the rules of our old system called capitalism. We are currently designing solutions articulated around the construction of carbon markets that are partly based on money creation, taking the risk that the main objectives might never be achieved due to insufficient commitment of the private sector. As the climate, economic and financial crises co-exist; the question is thus can the market and the financial sector really play their key roles in delivering the responses to the problems of climate change? (Schapiro 2010) The responses required have to be engaged soon and fast with the appropriate level of ambition and mobilisation of all actors concerned. Changing our whole economy would be too ambitious and simply not feasible. Finding the right solutions to climate change within the existing economic framework would be facilitated by and could also help us moving out of the race for growth at all means.

Having settled the framework in within which the solutions have to be developed, we can now discuss the design of the solutions. There is no doubt that emissions trading is the right way for dealing with industrial emissions, as alternatives are either politically unfeasible or not effective (Ellerman et al. 2008). However, the EU ETS could be undermined as its Directive is congested with exceptions trying to deal with the particularity of each sector, preventing it from reaching its full potential in terms of emissions reductions. There also needs to be less room for interpretation of the Directive, while ensuring a right balance between predictability and possibilities for correcting mistakes.



Taking the main sectors covered, namely the power sector and energy intensive sectors, as example of how this could be achieved, let's consider their differences. Emissions reductions in the power sector are attainable at relatively lower cost compared to energy intensive sectors, considering notably that the latter are more exposed to international competition and therefore more vulnerable to increases in expenditures. Moreover, drastic emissions reductions in the power sector are essential if overall GHGs targets are to be achieved according to Europe's 2050 roadmap (Committee on Climate Change 2008). Therefore more ambitious measures are essential to support a rapid shift towards the de-carbonisation of this sector by supporting radical innovation in order to both reduce the emissions of new power plants that will replace those to be retired in the coming decades as well as the growth of electricity demand in Europe.

There are serious doubts about the capability of the revised EU ETS to bring about sufficient scarcity in the market to induce the scale of changes and investments required. This shows that the power sector needs a more stringent cap than the energy intensive sectors. However decreasing the cap would hurt the energy intensive sectors. This could be avoided in two ways: by providing, within a full auctioning approach, compensation measures or external policy levers such as border controls, or the cap could be adapted to each sector.

Deciding to decrease further the cap, as already planned, is an important decision to be taken soon, as the success of the EU ETS is dependant upon the credibility of the emissions rights created (Brohé et al. 2009). This decision should reflect EU's own ambition and not be based upon what may or may not happen at international level. The UK has shown that ambitions can be raised unilaterally (EurActiv 2011c). Of course there are consequences, but when was any great system achieved without short-term sacrifice? There would be major long-term benefits to the economy and society at large. The challenge to undertake the right actions is political will (Brohé et al. 2009).

The political challenge posed by climate change, unlike most other environmental problems, requires deep socio-economic transformation; thus developing the EU ETS in isolation to other instruments or changes isn't an option. This is the reason why it will be important, notably to establish binding provisions for the use of auction revenues in particular to support technological innovation. The scale of financial resources required to incentivise the necessary range of radical innovations is such that these revenues are not likely to be sufficient and would need to be supplemented by prioritising the development of low carbon technologies in EU innovation policy. The development of these technologies would benefit other countries, in particular developing countries which depend on technology transfer for their own innovation.

Fundamental societal transformations have usually occurred during times of crisis such as war or economic depressions. However we cannot afford to wait for such a catalyst or cataclysm, though it may come, to start acting on climate change. The need to act is reinforced by the fact that, to a large extend, those expected to make the changes are not the ones that will suffer the worst from the lack of action (Newell & Paterson 2010).



Even though, the creation of a clear carbon price signal within the EU ETS is vital if Europe realistically wants to achieve its emissions reduction targets by 2050, one of the outcomes of the survey was that no significant changes should be made to the EU ETS until the next implementation Phase. Indeed, the revision has taken into account most of the design concerns seen during the early implementation years, and making new changes now risks compromising the whole system. Therefore, it seems imperative, in order to improve the long-term effectiveness of EU ETS to organise further work on the EU ETS along two related tracks. The first track should focus on the necessary adjustments to the current framework of the revised Directive to ensure its optimal implementation from 2013. It would in deal with issues related notably to the market oversight, the carbon leakage list, and the new sectors. The second track should start now to prepare for the next revision and focus in particular on the issues and options discussed earlier in this section. Clearly this dual approach should be led by the EC. It is advisable that the EC establishes a separate body to oversee the implementation of the system, so that it can concentrate on the assessment of the system and the preparation of actions to reinforce the credibility of the current system and new legislations for the future system.

## 5.5 Conclusion

By providing an analysis of the outcomes of the interviews, this chapter provided insight of the spectrum of opinions of stakeholders related to the adequacy of the revisions made to the EU ETS Directive. The limitations to the evaluation method used in this project were presented and discussed, leading to the conclusion that they do not affect in a significant way the main findings. Finally, the author presented her personal views on the main issues that should be further investigated with a longer term perspective extending beyond the current Directive.



## Chapter 6 Conclusion

---

The EU ETS is the first and most important initiative taken to address the worldwide threat of climate change. It is the pillar of Europe's climate change policy. Although its achievements so far are encouraging, and in some ways exceptional, its success is uncertain.

The research question that guided this project is whether the modifications made to the EU ETS Directive, for implementation in 2013, address the problematic issues raised during the early implementation years in terms of environmental effectiveness, economical efficiency and social equity. The hypothesis was that there are different points of views depending on the perspective taken to evaluate success. Namely, that depends on how criteria are defined and which one is given more importance. The evaluation method used to answer this question was to first identify the main problems faced during the scheme's early implementations years. They were then used to construct a questionnaire for surveying the opinions of a representative group of European experts and stakeholders. The aim was to use a method of assessment that is not well represented in the existing EU ETS evaluation literature and provide an overview of opinions at European level. As expected, there is no straightforward response to the investigated question. However, the global view is that the revision has taken into account most of the design concerns seen during the early implementation years. Stakeholders agree that the EU ETS should be kept as the instrument of choice for controlling industrial emissions in Europe. They also agreed that although some major issues are still required to be dealt with, such as over-allocation, this will probably not be feasible before the start of the second review of the EU ETS. The points of divergence between opinions resulted partly to what stakeholders expect out of the scheme and thus how much they expect from solutions to problems. Two opposite sides were identified, those who want the EU ETS to provide reductions at the lowest possible costs and those who want it to sustain a price level sufficient to trigger investments for supporting the shift to a low carbon economy. However, the different views are not only the reflection of different expectations but also due to the complexity of the issues themselves. One of the challenges is to keep the EU ETS from becoming as complex as the problem it is trying to solve. Based on the analysis of the interviews, the research suggested organising further work on the EU ETS along two related tracks in order to improve its long-term effectiveness. The first track should focus on the necessary adjustments to the current framework of the revised Directive to ensure its optimal implementation from 2013. The second track should start now to prepare for the next revision and focus in particular on a number of key issues and options related to the ambition and design of the instrument.

This dissertation began by stating two major challenges faced by humanity, namely world poverty and climate change. Climate change policies need to shift our economy towards low carbon growth and at the same time low carbon growth can help overcome world poverty (Brohé et al. 2009).



This shows how important it is to support the EU ETS. It is almost certain that emissions trading will play a key role in shifting our economy and “only by drawing on the lessons learned can emissions trading in Europe develop to realise its full potential” (Betz & Sato 2006).



## References

---

- Allan, A. & Coelho, J., 2011. EU bans industrial offsets from 1 May 2013. *Thomson Reuters Point Carbon*.
- Australia Government, 2011. Shaping a global solution. *Australia Government, Department of Climate Change and Energy Efficiency*. Available at: <http://www.climatechange.gov.au/government/international/global-action-facts-and-fiction/cc-countries-acting-now.aspx> [Accessed July 24, 2011].
- Bailey, I., 2010. The EU emissions trading scheme. *Wiley Interdisciplinary Reviews: Climate Change*, 1(1), pp.144-153.
- BBC News, 2009. G8 set new global warming targets. *BBC*. Available at: <http://news.bbc.co.uk/2/hi/8141352.stm> [Accessed March 15, 2011].
- Bernheim, T., 2011a. The conditions for success of the EU ETS (European Commission).
- Bernheim, T., 2011b. The European carbon market - origins, current state and future perspectives.
- Betsill, M. & Hoffmann, M., 2011. The Contours of "Cap and Trade": The Evolution of Emissions Trading Systems for Greenhouse Gases. *Review of Policy Research*, 28(1), pp.83-106.
- Betz, R. & Sato, M., 2006. Emissions trading: lessons learned from the 1st phase of the EU ETS and prospects for the 2nd phase. *Climate Policy*, 6, pp.351-359.
- Boutabba, M.A., Beaumais, O. & Lardic, S., 2011. Permit price dynamics in the U.S. SO<sub>2</sub> trading program: A cointegration approach. *Energy Economics*, In Press, Corrected Proof.
- Brohé, A., 2011. The conditions for success of the EU ETS (ULB and CO<sub>2</sub>logic).
- Brohé, A., Eyre, N. & Howarth, N., 2009. *Carbon Markets: An International Business Guide* First, Earthscan Ltd.
- BUSINESSEUROPE, 2011. BUSINESSEUROPE. Available at: <http://www.businesseurope.eu/content/default.asp?PageID=571> [Accessed July 18, 2011].
- CO<sub>2</sub>logic, 2011. CO<sub>2</sub>logic, be "logic" about nature. Available at: <http://www.co2logic.com/home.aspx/en/about+us/about+us> [Accessed July 18, 2011].
- CAN Europe, 2011. Climate Action Network Europe. Available at: <http://www.caneurope.org/> [Accessed July 18, 2011].
- Chan, M., 2010. *10 Ways to Game the Carbon Markets*, Friends of the Earth.
- Coase, R., 1960. The problem of social cost. *Journal of Law and Economics*, 3(1), pp.1-44.
- Committee on Climate Change, 2008. *Building a low-carbon economy - the UK's contribution to tackling climate change*,



- Crabbe, A. & Leroy, P., 2008. *The Handbook of Environmental Policy Evaluation*, EarthScan.
- Cramster, 2011. Definition of Iron Curtain. Available at: <http://www.cramster.com/definitions/iron-curtain/449> [Accessed June 30, 2011].
- Dorfman, R. & Dorfman, N., 1977. *Economics of the Environment: Selected Readings* 2nd ed., W W Norton & Co Inc.
- Eickhout, B., 2011. The conditions for success of the EU ETS (European Parliament).
- Ellerman, A.D., 2003. *Ex post evaluation of tradable permits: the U.S. SO<sub>2</sub> cap-and-trade program*, Center for Energy and Environmental Policy Research, Massachusetts Institute of Technology.
- Ellerman, A.D. & Joskow, P., 2008. *The European Union's Emissions Trading System in Perspective*, Massachusetts Institute of Technology.
- Ellerman, A.D., Convery, F.J. & Perthuis, C. de, 2010. *Pricing Carbon: The European Union Emissions Trading Scheme* 1st ed., Cambridge University Press.
- Ellerman, A.D., Convery, F.J. & de Perthuis, C., 2008. *The European Carbon Market in Action: Lessons from the First Trading Period, Interim Report*, Massachusetts Institute of Technology.
- Ethical Corporation, 2010. Carbon Accountability: the first objective for COP16? *WEM The Environment Magazine*, pp.25-27.
- ETUC, 2011. European Trade Union Confederation. Available at: <http://www.etuc.org/r/2> [Accessed July 17, 2011].
- EurActiv, 2011a. EU Emissions Trading Scheme. *EurActiv*. Available at: <http://www.euractiv.com/en/climate-change/eu-emissions-trading-scheme/article-133629> [Accessed March 22, 2011].
- EurActiv, 2011b. Global maritime carbon deal dead in the water. Available at: <http://www.euractiv.com/en/climate-environment/global-maritime-carbon-deal-dead-water-news-506074> [Accessed July 30, 2011].
- EurActiv, 2011c. UK businesses face extra costs with carbon price floor plan. Available at: <http://www.euractiv.com/en/climate-environment/uk-businesses-face-extra-costs-carbon-price-floor-plan-news-504100> [Accessed July 8, 2011].
- Euractiv & Reuters, 2011. Greek police trace EU "carbon thieves" in Romania. Available at: <http://www.euractiv.com/en/climate-environment/greek-police-trace-eu-carbon-thieves-romania-news-501727> [Accessed March 24, 2011].
- Eurofound, 2011. Comitology. *Eurofound*. Available at: <http://www.eurofound.europa.eu/areas/industrialrelations/dictionary/definitions/comitology.htm> [Accessed July 3, 2011].
- European Commission, 2011a. Climate change.



European Commission, 2009a. Commission Decision of 24 December 2009 determining, pursuant to Directive 2003/87/EC of the European Parliament and of the Council, a list of sectors and subsectors which are deemed to be exposed to a significant risk of carbon leakage.

European Commission, 2011b. Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: A Roadmap for moving to a competitive low carbon economy in 2050.

European Commission, 2011c. EUR-Lex, Access to European Union law. *Europa*. Available at: <http://eur-lex.europa.eu/en/index.htm> [Accessed July 3, 2011].

European Commission, 2011d. Europa, Gateway to the European Union. *Europa*. Available at: [http://europa.eu/index\\_en.htm](http://europa.eu/index_en.htm) [Accessed July 1, 2011].

European Commission, 2011e. Europa, Gateway to the European Union. *Europa*. Available at: [http://europa.eu/abouteuropa/index\\_en.htm](http://europa.eu/abouteuropa/index_en.htm) [Accessed July 17, 2011].

European Commission, 2011f. European Commission, Climate Action. Available at: [http://ec.europa.eu/dgs/clima/mission/index\\_en.htm](http://ec.europa.eu/dgs/clima/mission/index_en.htm) [Accessed July 17, 2011].

European Commission, 2002. *Evaluation Standards*, Available at: [http://www.google.be/url?sa=t&source=web&cd=3&ved=0CDEQFjAC&url=http%3A%2F%2Fec.europa.eu%2Fdgs%2Fsecretariat\\_general%2Fevaluation%2Fdocs%2Fstandards\\_c\\_2002\\_5267\\_final\\_en.pdf&rct=j&q=Evaluation%20standards%20of%20the%20Commission&ei=kgYKTtHID4SEOrX4ZgB&usg=AFQjCNHSeVyW0ID54EEDkVJyO462mcuusQ&sig2=sRx3Fl7iNcBaTCS2iL0bfQ](http://www.google.be/url?sa=t&source=web&cd=3&ved=0CDEQFjAC&url=http%3A%2F%2Fec.europa.eu%2Fdgs%2Fsecretariat_general%2Fevaluation%2Fdocs%2Fstandards_c_2002_5267_final_en.pdf&rct=j&q=Evaluation%20standards%20of%20the%20Commission&ei=kgYKTtHID4SEOrX4ZgB&usg=AFQjCNHSeVyW0ID54EEDkVJyO462mcuusQ&sig2=sRx3Fl7iNcBaTCS2iL0bfQ) [Accessed June 28, 2011].

European Commission, 2000. Green Paper on greenhouse gas emissions trading within the European Union.

European Commission, 2009b. Leading global action to 2020 and beyond.

European Commission, 2008. Proposal for a Directive of the European Parliament and of the Council amending Directive 2003/87/EC so as to improve and extend the greenhouse gas emission allowance trading system of the Community.

European Commission, 2001. Proposal for a Directive of the European Parliament and of the Council establishing a scheme for greenhouse gas emission allowance trading within the Community and amending Council Directive 96/61/EC.

European Commission, 2010. What is the EU doing on climate change? Available at: [http://ec.europa.eu/clima/policies/brief/eu/index\\_en.htm](http://ec.europa.eu/clima/policies/brief/eu/index_en.htm) [Accessed May 22, 2011].

European Parliament, 2011. European Parliament. Available at: <http://www.europarl.europa.eu/parliament/public/staticDisplay.do?id=146&language=en> [Accessed July 19, 2011].

European Parliament and Council, 2002. Decision 1600/2002/EC of the European Parliament and of the Council of 22 July 2002 laying down the Sixth Community Environment Action Programme of 10 September 2002.



European Parliament and Council, 2009a. Directive 2003/87/EC of the European Parliament and of the Council of 13 October 2003 establishing a scheme for greenhouse gas emission allowance trading within the Community and amending Council Directive 96/61/EC.

European Parliament and Council, 2003. Directive 2003/87/EC of the European Parliament and of the Council of 13 October 2003 establishing a scheme for greenhouse gas emission allowance trading within the Community and amending Council Directive 96/61/EC.

European Parliament and Council, 2004. Directive 2004/101/EC of the European Parliament and of the Council of 27 October 2004 amending Directive 2003/87/EC establishing a scheme for greenhouse gas emission allowance trading within the Community, in respect of the Kyoto Protocol's project mechanisms.

European Parliament and Council, 2008. Directive 2008/1/EC of the European Parliament and of the Council of 15 January 2008 concerning integrated pollution prevention and control.

European Parliament and Council, 2009b. Directive 2008/101/EC of the European Parliament and of the Council of 19 November 2008 amending Directive 2003/87/EC so as to include aviation activities in the scheme for greenhouse gas emission allowance trading within the Community.

European Parliament and Council, 2009c. Directive 2009/29/EC of the European Parliament and of the Council of 23 April 2009 amending Directive 2003/87/EC so as to improve and extend the greenhouse gas emission allowance trading scheme of the Community.

European Parliament and Council, 2009d. Regulation (EC) No 219/2009 of the European Parliament and of the Council of 11 March 2009 adapting a number of instruments subject to the procedure referred to in Article 251 of the Treaty to Council Decision 1999/468/EC with regard to the regulatory procedure with scrutiny.

FPS, 2011. Federal public service - Health, food chain safety and environment. Available at: <http://www.health.belgium.be/eportal/Environment/index.htm?fodnlang=en> [Accessed July 18, 2011].

Franz, F., 2011. The conditions for success of the EU ETS (BUSINESSEUROPE).

Friends of the Earth, 2011. Carbon Markets. Available at: <http://www.foe.org/global-warming/carbon-markets> [Accessed February 16, 2011].

Galharret, S., 2009. *Paquet Climat Energie: Trop d'offsets peuvent-ils nuire à l'Union européenne?*, Institut du développement durable et des relations internationales.

Government of Ireland, 2011. DRAFT Regulatory Impact Analysis of the Revised EU Emissions Trading Scheme Directive.

Greens/EFA Group, 2011. The Greens/European Free Alliance. Available at: <http://www.greens-efa.eu/43-about-us.html> [Accessed July 19, 2011].

Gronewold, N., 2011. Europe's Carbon Emissions Trading -- Growing Pains or Wholesale Theft? *The New York Times*. Available at:



<http://www.nytimes.com/cwire/2011/01/31/31climatewire-europes-carbon-emissions-trading-growing-pai-74999.html> [Accessed February 16, 2011].

Hannon, E., 2011. The conditions for success of the EU ETS (ULB and Fedral Public Service).

IETA, 2011a. International Emissions Trading Association (IETA). Available at: <http://www.ieta.org/> [Accessed July 18, 2011].

IETA, 2011b. List of Questions on Eligibility Rules for Offsets in EU ETS.

IGEAT, 2011. ULB - Institut de gestin de l'environnement et d'aménagement du territoire. Available at: <http://igeat.ulb.ac.be/en/unites-de-recherche/details/unit/centre-detudes-du-developpement-durable/> [Accessed July 18, 2011].

Investopedia, 2011. Security. *Investopedia*. Available at: <http://www.investopedia.com/terms/s/security.asp> [Accessed July 10, 2011].

IPCC, 2007. *IPCC Fourth Assessment Synthesis Report (AR4) and Appendix: Climate Change 2007*, Geneva, Switzerland: IPCC.

IPCC, 2011. IPCC Publications and Data. Available at: [http://www.ipcc.ch/publications\\_and\\_data/publications\\_and\\_data.shtml](http://www.ipcc.ch/publications_and_data/publications_and_data.shtml) [Accessed March 19, 2011].

Irish Community and Local Govervment, 2011. *Revised EU Emissions Trading Scheme Directive, Draft Regularoty Impact Analysis*, Climate Policy Section.

Kautto, P. & Similä, J., 2005. Recently Introduced Policy Instruments and Intervention Theories. *Evaluation*, 11(1), pp.55 -68.

Kilian, B. & Elgström, O., 2010. Still a green leader? The European Union's role in international climate negotiations. *Cooperation and Conflict*, 45(3), pp.255 -273.

Looman, M. & Hannon, E., 2011. The conditions for success of the EU ETS (Federal Public Service).

Medema, S. & Zerbe, R., 2000. The Coase Theorem. *Encyclopedia of Law and Economics*, 1.

Michalak, J., 2011. The conditions for success of the EU ETS (Climate Action Network Europe).

Mickwitz, P., 2003. A Framework for Evaluating Environmental Policy Instruments. *Evaluation*, 9(4), pp.415 -436.

Misonne, D., 2011. Droit de l'environnement.

Morris, D. & Worthington, B., 2010. *Cap or trap - How the EU ETS risks locking-in carbon emissions*, Sandbag.

Newell, P. & Paterson, M., 2010. *Climate Capitalism: Global Warming and the Transformation of the Global Economy*, Cambridge University Press.

d' Oultremont, C., 2011. Report of the Expert Seminar: From Cancun to Durban. In Egmont Institute.



- d' Oultremont, C., 2010. *The EU's Emissions Trading Scheme: achievements, key lessons, and future prospects*, Belgium: Egmont - The Royal Institute for International Relations.
- Panneels, A., 2011. The conditions for success of the EU ETS (European Trade Union Confederation).
- Reuters, 2011a. Airline CO2 trade to lift costs, fares, CO2 price. *Thomson Reuters Point Carbon*. Available at: <http://www.pointcarbon.com/1.1516877> [Accessed March 24, 2011].
- Reuters, 2011b. BNP Paribas Fortis cooperating with CO2 inquiry. *Thomson Reuters Point Carbon*. Available at: <http://www.pointcarbon.com/news/1.1528804> [Accessed April 20, 2011].
- Reuters, 2011c. Carbon Market Europe 18 March. *Thomson Reuters Point Carbon*, 10(11). Available at: <http://www.pointcarbon.com/news/cme/1.1519277> [Accessed March 25, 2011].
- Reuters, 2011d. China's airlines threaten challenge to EU ETS. *Thomson Reuters Point Carbon*. Available at: <http://www.pointcarbon.com/news/1.1519969> [Accessed March 25, 2011].
- Reuters, 2011e. EC sets aviation cap at 212.9m in 2012. *Thomson Reuters Point Carbon*. Available at: <http://www.pointcarbon.com/news/1.1513032> [Accessed March 25, 2011].
- Reuters, 2011f. *Point Carbon EUA OTC assessment*, Thomson Reuters Point Carbon.
- Rossetti di Valdalbero, D., 2010. *The Power of Science*, Brussels: Peter Lang.
- Ruiz, S., 2011. The conditions for success of the EU ETS (International Emissions Trading Association).
- Schapiro, M., 2010. Conning the climate: Inside the carbon-trading shell game. *Harper's Magazine*, pp.31-39.
- Service federal Changement climatiques, 2011. Climat. Available at: <http://www.climatechange.be/spip.php?rubrique127&fs=> [Accessed July 18, 2011].
- Sills, B., 2011. Carbon trading goes local. *Bloomberg Markets*, 20(5).
- Stavins, R., 2001. Experience with market-based environmental policy instruments. In *Handbook of Environmental Economics*.
- Stern, N., 2007. *The Economics of Climate Change: The Stern Review*, Cambridge University Press.
- Stiglitz, J. & Walsh, C., 2006. *Economics* 4th ed., WW Norton.
- The Pew Center on Global Climate Change, 2011. Climate change 101: Cap and trade.
- UNFCCC, 1998. Kyoto Protocol to the United Nations Framework Convention on Climate Change.
- UNFCCC, 2011a. Meetings Archive. Available at: <http://unfccc.int/meetings/archive/items/2749.php> [Accessed March 22, 2011].
- UNFCCC, 2010. *Report of the Conference of the Parties on its fifteenth session, held in Copenhagen from 7 to 19 December 2009, Part Two*, United Nations.



UNFCCC, 2011b. United Nations Framework Convention on Climate Change. *UNFCCC*. Available at: <http://unfccc.int/2860.php> [Accessed July 3, 2011].

United Nations, 2011. Gateway to the UN System's Work on Climate Change. *UN Website*. Available at: <http://www.un.org/wcm/content/site/climatechange/pages/gateway> [Accessed July 25, 2011].

United Nations, 1997. United Nations Earth Summit+5. *United Nations*. Available at: <http://www.un.org/esa/earthsummit/> [Accessed July 1, 2011].

United Nations, 1992. United Nations Framework Convention on Climate Change.

Vedung, E., 2000. *Public Policy and Program Evaluation*, Transaction Publishers.

Waston, R. & Lewis, R., 2011. Cumulative Carbon Budgets. *The Environmentalist*, (1).

WMO, 2011. World Meteorological Organization: Working together in weather, climate and water. *World Meteorological Organization*. Available at: [http://www.wmo.int/pages/index\\_en.html](http://www.wmo.int/pages/index_en.html) [Accessed July 3, 2011].

World Bank, 2011. *State and Trends of the Carbon Market 2011*, Washington DC.



## Annex I Definitions

---

**Adaptation** “Initiatives and measures to reduce the vulnerability of natural and human systems against actual or expected climate change effects. Adaptation can be anticipatory, taking place before observed changes, or reactive. It can also be autonomous or spontaneous, being triggered by non-climate-related stimuli. Example include raising dyke levels or the substitution of more temperature shock resistant plant for sensitive ones.” (Newell & Paterson 2010)

**Allowance** “A government-issued authorization to emit a certain amount. In greenhouse gas markets, an allowance is commonly denominated as one ton of CO<sub>2</sub>e per year. The total number of allowances distributed to all entities in a cap-and-trade system is determined by the size of the overall cap on emissions.” (The Pew Center on Global Climate Change 2011) “In the EU ETS, such allowances are known as EUAs.” (Newell & Paterson 2010)

**Annex I Parties** “The group of countries included in Annex I (as amended in 1998) to the United Nations Framework Convention on Climate Change (UNFCCC), including all the OECD countries in the year 1990 and countries with economies in transition. Under Articles 4.2 (a) and 4.2 (b) of the Convention, Annex I countries committed themselves specifically to the aim of returning individually or jointly to their 1990 levels of greenhouse gas emissions by the year 2000. By default, the other countries are referred to as Non-Annex I countries.” (IPCC 2007)

**Annex II Parties** “The group of countries included in Annex II to the United Nations Framework Convention on Climate Change (UNFCCC), including all OECD countries in the year 1990. Under Article 4.2 (g) of the Convention, these countries are expected to provide financial resources to assist developing countries to comply with their obligations, such as preparing national reports. Annex II countries are also expected to promote the transfer of environmentally sound technologies to developing countries.” (IPCC 2007)

**Annex B Parties** “The countries included in Annex B to the Kyoto Protocol that have agreed to a target for their greenhouse-gas emissions, including all the Annex I countries (as amended in 1998) except for Turkey and Belarus.” (IPCC 2007)

**Assigned Amount Unit (AAU)** One of the four types of emissions allowances/credits recognised by the Kyoto protocol. “Parties with commitments under the Protocol (Annex B Parties) have accepted targets for limiting or reducing emissions. These targets are expressed as levels of allowed emissions, over the 2008-2012 commitment period. The allowed emissions are divided into assigned amount units.” (UNFCCC 2011b)

**Auctioning** “A method for distributing emission allowances in a cap-and-trade system whereby allowances are sold to the highest bidder. This method of distribution may be combined with other forms of allowance distribution.” (The Pew Center on Global Climate Change 2011)

**Banking** “The carry-over of unused allowances or offset credits from one compliance period to the next.” (The Pew Center on Global Climate Change 2011)

**Baseline** “The state against which a change is measured. For example the EU ETS uses average annual emissions for the baseline period of 1998-2003 against which to measure emissions reductions.” (Newell & Paterson 2010)

**Benchmarking** “Uses a measurable variable such as a baseline to evaluate the performance of an organisation over time. Benchmarking may be drawn from internal experience, that of other



organisations or for legal requirement. Carbon dioxide benchmarking is designed to make the carbon emissions of organisations transparent.” (Newell & Paterson 2010)

**Bottom-up models** “Bottom-up models represent reality by aggregating characteristics of specific activities and processes, considering technological, engineering and cost details.” (IPCC 2007)

**Burden sharing** “A system to fairly mitigate climate change across individual countries. The EU commitment to reduce its greenhouse gas emissions by 8% under the Kyoto Protocol is shared between the Member States under a legally binding ‘Burden Sharing Agreement’, which sets individual emissions targets for each Member State.” (Newell & Paterson 2010)

**Cap (on emissions)** “A mandated constraint in a scheduled timeframe that puts a “ceiling” on the total amount of anthropogenic greenhouse gas emissions that can be released into the atmosphere.” (The Pew Center on Global Climate Change 2011)

**Carbon dioxide** “A naturally occurring gas, also a by-product of burning fossil fuels from fossil carbon deposits, such as oil, gas and coal, of burning biomass and of land use changes and other industrial processes. It is the principal anthropogenic greenhouse gas that affects the Earth’s radiative balance. It is the reference gas against which other greenhouse gases are measured and therefore has a Global Warming Potential of one.” (IPCC 2007)

**Carbon dioxide-equivalent (CO<sub>2</sub>e)** “The atmospheric warming effect of a greenhouse gas expressed in terms of the warming effect of carbon dioxide. This has also become the basic unit of measurements for carbon permits in carbon markets.” (Newell & Paterson 2010)

**Carbon leakage** “Refers to carbon emissions in countries without obligations to reduce their emissions, usually the south, which result directly from reductions in a country where emissions are constrained. This can occur, for example, through relocation of energy-intensive production into non-constrained regions, or the knock-on effects of CDM projects set up in the South, if they simply displace emissions elsewhere.” (Newell & Paterson 2010)

**Certified Emission Reduction (CER)** One of the four types of credits recognized under the Kyoto protocol that can be used instead of AAUs. These credits are created by a project developed under the CDM.

**Clean Air Act** “The first legal document establishing a mandatory emissions trading scheme” (Brohé et al. 2009). It is aimed at tackling acid rain in the United States by setting maximum levels for SO<sub>2</sub> (sulphur dioxide) and NO<sub>x</sub> (nitrogen oxides). It currently covers all installations with a power capacity exceeding 25MW and any new power plant.

**Clean Development Mechanism (CDM)** CDM is one of the three mechanisms of the Kyoto Protocol by which Annex I parties may obtain credits by investing in any non-Annex I party (i.e. developing countries) to reduce or save GHGs emissions while promoting sustainability principles. Emission reductions are accounted by doing the difference with a baseline scenario without investment from the Annex I party. The credits are called Certified Emissions Reductions (CERs) and can, once generated, be bought and traded. This mechanism enables for reductions to be made at lower cost than otherwise domestically possible. (Brohé et al. 2009)

**Climate change** “Refers to any change in climate over an extended period of time, typically decades, whether due to natural variability or as a result of human activity.” (Newell & Paterson 2010)

**Comitology** “Comitology (or ‘committee procedure’) refers to the procedures under which the European Commission executes its implementing powers delegated to it by the legislative branch (i.e. the European Parliament and the Council of the European Union) with the



assistance of so called 'comitology committees' consisting of Member State representatives. This delegation of power is now based on Article 290 TFEU." (Eurofound 2011)

**Compliance** "Compliance is whether and to what extent countries do adhere to the provisions of an accord. Compliance depends on implementing policies ordered, and on whether measures follow up the policies. Compliance is the degree to which the actors whose behaviour is targeted by the agreement, local government units, corporations, organisations, or individuals, conform to the implementing obligations." (IPCC 2007)

**Conference of the Parties (COP)** "Conference of the supreme body of the UNFCCC, comprising countries that have ratified or acceded to the convention. It meets every year to review progress on implementation of the Convention's aims and to negotiate future commitments." (Newell & Paterson 2010)

**Emission Reduction Unit (ERU)** One of the four types of credits recognized under the Kyoto Protocol that can be used instead of Assigned Amount Units (AAUs). There are issued under JI projects.

**Emission(s) trading** "A market-based approach to achieving environmental objectives. It allows those reducing greenhouse gas emissions below their emission cap to use or trade the excess reductions to offset emissions at another source inside or outside the country. In general, trading can occur at the intra-company, domestic, and international levels. The Second Assessment Report by the IPCC adopted the convention of using permits for domestic trading systems and quotas for international trading systems. Emissions trading under Article 17 of the Kyoto Protocol is a tradable quota system based on the assigned amounts calculated from the emission reduction and limitation commitments listed in Annex B of the Protocol." (IPCC 2007)

**Energy efficiency** "The ratio of useful energy output of a system, conversion process or activity to its energy input." (Newell & Paterson 2010)

**Energy intensity** "The ratio of energy use to economic or physical output. At the national level, energy intensity is the ratio of total primary energy use or final energy use to Gross Domestic Product. At the activity level, one can also use physical quantities in the denominator, e.g. litre fuel/ vehicle km." (IPCC 2007)

**Environmental policies** They typically combine the identification of a goal, which can be general to specific, for solving, preventing or improving environmental issues with some means to achieve it. It involves an iterative political process from the start till the end. (Stavins 2001)

**Fossil fuels** "Carbon-based fuels from fossil hydrocarbon deposits, including coal, peat, oil and natural gas." (Newell & Paterson 2010)

**Dynamic efficiency** Dynamic efficiency is a term in economics, which refers to an economy that appropriately balances short run concerns (static efficiency) with concerns in the long run (focusing on encouraging research and development). (Stiglitz & Walsh 2006)

**Global warming** "The increase in global surface temperature, as a consequence of radiative forcing caused by anthropogenic greenhouse gas emissions." (Newell & Paterson 2010)

**Grandfathering** "An allocation of permits which reflect the current status quo of carbon dioxide emissions. The targets agreed at Kyoto reflect this allocation principle; rich countries were allocated tradable emissions rights in proportion to their 1990 emissions levels." (Newell & Paterson 2010)

**Greenhouse effect** "Greenhouse gases effectively absorb thermal infrared radiation, emitted by the Earth's surface, by the atmosphere itself due to the same gases, and by clouds. Atmospheric radiation is emitted to all sides, including downward to the Earth's surface. Thus



greenhouse gases trap heat within the surface-troposphere system. This is called the greenhouse effect. Thermal infrared radiation in the troposphere is strongly coupled to the temperature of the atmosphere at the altitude at which it is emitted. In the troposphere, the temperature generally decreases with height. Effectively, infrared radiation emitted to space originates from an altitude with a temperature of, on average,  $-19^{\circ}\text{C}$ , in balance with the net incoming solar radiation, whereas the Earth's surface is kept at a much higher temperature of, on average,  $+14^{\circ}\text{C}$ . An increase in the concentration of greenhouse gases leads to an increased infrared opacity of the atmosphere, and therefore to an effective radiation into space from a higher altitude at a lower temperature. This causes a radiative forcing that leads to an enhancement of the greenhouse effect, the so-called enhanced greenhouse effect." (IPCC 2007)

**Greenhouse gas (GHG)** "Greenhouse gases are those gaseous constituents of the atmosphere, both natural and anthropogenic, that absorb and emit radiation at specific wavelengths within the spectrum of thermal infrared radiation emitted by the Earth's surface, the atmosphere itself, and by clouds. This property causes the greenhouse effect. Water vapour ( $\text{H}_2\text{O}$ ), carbon dioxide ( $\text{CO}_2$ ), nitrous oxide ( $\text{N}_2\text{O}$ ), methane ( $\text{CH}_4$ ) and ozone ( $\text{O}_3$ ) are the primary greenhouse gases in the Earth's atmosphere. Moreover, there are a number of entirely human-made greenhouse gases in the atmosphere, such as the halocarbons and other chlorine and bromine containing substances, dealt with under the Montreal Protocol. Beside  $\text{CO}_2$ ,  $\text{N}_2\text{O}$  and  $\text{CH}_4$ , the Kyoto Protocol deals with the greenhouse gases sulphur hexafluoride ( $\text{SF}_6$ ), hydrofluorocarbons (HFCs) and perfluorocarbons (PFCs)." (IPCC 2007)

**Implementation** "Implementation describes the actions taken to meet commitments under a treaty and encompasses legal and effective phases. Legal implementation refers to legislation, regulations, judicial decrees, including other actions such as efforts to administer progress, which governments take to translate international accords into domestic law and policy. Effective implementation needs policies and programmes that induce changes in the behaviour and decisions of target groups. Target groups then take effective measures of mitigation and adaptation." (IPCC 2007)

**Industrial revolution** "A period of rapid industrial growth with far-reaching social and economic consequences, beginning in Britain during the second half of the eighteenth century and spreading to Europe and later to other countries including the United States. The invention of the steam engine was an important trigger of this development. The industrial revolution marks the beginning of a strong increase in the use of fossil fuels and emission of, in particular, fossil carbon dioxide. In this Report the terms pre-industrial and industrial refer, somewhat arbitrarily, to the periods before and after 1750, respectively." (IPCC 2007)

**Intergovernmental Panel on Climate Change (IPCC)** "A global scientific body for the assessment of climate change, established in 1988 by the United Nations Environment Program (UNEP) and the World Meteorological Organization (WMO). Its purpose is to report on the current state of scientific knowledge about climate change and its potential environmental and socio-economic consequences. The preparation of the Assessment Reports on Climate Change is a key activity of the IPCC, reviewing and assessing the most recent scientific, technical and socio-economic information produces worldwide relevant to the understanding of climate change. There have been four of these to date, from the first in 1990 to the fourth in 2007." (Newell & Paterson 2010)

**Iron curtain** "The Iron Curtain was the Western term, taken from a 1946 speech by Winston Churchill, describing the post-World War II domination of Eastern Europe by the Soviet Union (USSR). The phrase was ironically reinforced by the Berlin Wall's 1961 construction by East Germany to prevent its own citizens from leaving. The phrase aptly illustrates the absolutist terms in which NATO and Warsaw Pact countries viewed each other during the Cold War.



Soviet military invasions of Hungary (1956) and Czechoslovakia (1968) to prevent their withdrawal from the Warsaw Pact reinforced this view. The "curtain" began to disappear beginning with the independent Solidarity labour movement in Poland in 1980 and the subsequent policy known as Perestroika instituted by Soviet leader Mikhail Gorbachev. The USSR dissolved in 1991." (Cramster 2011)

**Joint Implementation (JI)** JI is one of the three market-based mechanisms of the Kyoto Protocol. It allows "Annex I countries or companies from these countries to implement projects jointly that limit or reduce emissions or enhance sinks, and to share the Emissions Reduction Units. JI activity is also permitted in Article 4.2(a) of the United Nations Framework Convention on Climate Change." (UNFCCC) The credits it generates are called Emissions Reduction Units (ERUs).

**Kyoto Mechanisms (also called flexibility mechanisms)** "Economic mechanisms based on market principles that parties to the Kyoto Protocol can use in an attempt to lessen the potential economic impacts of greenhouse gas emission-reduction requirements. They include Joint Implementation (Article 6), Clean Development Mechanism (Article 12), and Emissions Trading (Article 17)." (IPCC 2007)

**Kyoto Protocol** "The Kyoto Protocol to the United Nations Framework Convention on Climate Change (UNFCCC) was adopted in 1997 in Kyoto, Japan, at the Third Session of the Conference of the Parties (COP) to the UNFCCC. It contains legally binding commitments, in addition to those included in the UNFCCC. Countries included in Annex B of the Protocol (most Organization for Economic Cooperation and Development countries and countries with economies in transition) agreed to reduce their anthropogenic greenhouse gas emissions (carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulphur hexafluoride) by at least 5% below 1990 levels in the commitment period 2008 to 2012. The Kyoto Protocol entered into force on 16 February 2005." (IPCC 2007)

**Market-based environmental policy instruments** They are "regulations that encourage behaviour through market signals rather than through explicit directives regarding pollution control levels or methods." When well implemented, these instruments can encourage firms to undertake pollution control efforts that are "in their own interest and that collectively meet policy goals. In contrast, conventional approaches to regulating the environment, called command-and-control regulations, allow little flexibility in the way of achieving the set goals. (Stavins 2001)

**Low carbon economy** "An economy which minimises the output of greenhouse gas emissions into the biosphere, but specifically carbon dioxide emissions." (Newell & Paterson 2010)

**Mitigation** "Mitigation means implementing policies to minimise the effect of climate change. It includes strategies to reduce greenhouse gas sources and emissions and enhance greenhouse gas sinks." (Newell & Paterson 2010)

**Offsets** "A financial instrument aimed at reducing greenhouse gas emissions. One carbon offset credit represents the reduction of one metric tonne of carbon dioxide or its equivalent (tCO<sub>2</sub>e) in other greenhouse gases. Individuals, companies, or governments can purchase carbon offsets to mitigate their greenhouse gas emissions from sources such as transportation or electricity use." (Newell & Paterson 2010)

**Policies** "In United Nations Framework Convention on Climate Change (UNFCCC) parlance, policies are taken and/or mandated by a government – often in conjunction with business and industry within its own country, or with other countries – to accelerate mitigation and adaptation measures. Examples of policies are carbon or other energy taxes, fuel efficiency



standards for automobiles, etc. Common and co-ordinated or harmonised policies refer to those adopted jointly by parties.” (IPCC 2007)

**Policy evaluation** “Policy evaluation is a scientific analysis of a certain policy area, the policies of which are assessed for certain criteria, and on the basis of which recommendations are formulated.” (Crabbe & Leroy 2008)

**Qualified majority mechanism** “In the Council of Ministers, each member state is allocated a number of votes according to its population, with extra weight given to the smaller member states. Since 1 January 2007 the threshold for a qualified majority has been set at 255 votes of 345 (73.91 per cent). A qualified majority decision also requires a favourable vote from the majority of member states (i.e. at least fourteen member states). In addition, a member state may request verification that the qualified majority includes at least 62 per cent of the European Union's total population.” (Ellerman et al. 2010)

**Removal Unit (RMU)** One of the four types of credits recognized under the Kyoto protocol that can be used instead of AAUs. They can be accessed “on the basis of land use, land-use change and forestry (LULUCF) activities such as reforestation” (UNFCCC 2011b).

**Security** “An instrument representing ownership (stocks), a debt agreement (bonds) or the rights to ownership (derivatives). It is essentially a contract that can be assigned a value and traded. Examples of a security include a note, stock, preferred share, bond, debenture, option, future, swap, right, warrant, or virtually any other financial asset.” (Investopedia 2011)

**Stern Review (The Stern Review on the Economics of Climate Change)** “Published by the UK Treasury in 2007, the principal author was the economist and banker Sir Nicholas Stern. Its main messages were that there is still time to avoid the worst impacts of climate change, if we take strong action now, and that the costs of stabilising the climate are significant but manageable.” (Newell & Paterson 2010)

**Sustainable development** “The concept of sustainable development was introduced in the World Conservation Strategy (IUCN 1980) and had its roots in the concept of a sustainable society and in the management of renewable resources. Adopted by the WCED in 1987 and by the Rio Conference in 1992 as a process of change in which the exploitation of resources, the direction of investments, the orientation of technological development, and institutional change are all in harmony and enhance both current and future potential to meet human needs and aspirations. SD integrates the political, social, economic and environmental dimensions.” (IPCC 2007)

**Tax** “A carbon tax is a levy on the carbon content of fossil fuels. Because virtually all of the carbon in fossil fuels is ultimately emitted as carbon dioxide, a carbon tax is equivalent to an emission tax on each unit of CO<sub>2</sub>-equivalent emissions. An energy tax - a levy on the energy content of fuels - reduces demand for energy and so reduces carbon dioxide emissions from fossil fuel use. An eco-tax is designed to influence human behaviour (specifically economic behaviour) to follow an ecologically benign path. An international carbon/emission/energy tax is a tax imposed on specified sources in participating countries by an international agreement. A harmonised tax commits participating countries to impose a tax at a common rate on the same sources. A tax credit is a reduction of tax in order to stimulate purchasing of or investment in a certain product, like GHG emission reducing technologies. A carbon charge is the same as a carbon tax.” (IPCC 2007) Green taxes are a “range of fiscal and economic instruments used to internalise externalities, making the polluter pay for emissions. Examples include carbon taxes and taxes on aviation.” (Newell & Paterson 2010)



**Top-down models** “Top-down models apply macroeconomic theory, econometric and optimization techniques to aggregate economic variables. Using historical data on consumption, prices, incomes, and factor costs, top-down models assess final demand for goods and services, and supply from main sectors, like the energy sector, transportation, agriculture, and industry. Some top down models incorporate technology data, narrowing the gap to bottom up models.” (IPCC 2007)

**Tradable permit** “A tradable permit is an economic policy instrument under which rights to discharge pollution – in this case an amount of greenhouse gas emissions – can be exchanged through either a free or a controlled permit-market. An emission permit is a non-transferable or tradable entitlement allocated by a government to a legal entity (company or other emitter) to emit a specified amount of a substance.” (IPCC 2007)

**United Nations Framework Convention on Climate Change (UNFCCC)** “Signed at the Rio Summit in 1992 by over 150 countries, sets an overall framework for intergovernmental efforts to tackle the challenge posed by climate change. Its ultimate objective it is the ‘stabilisation of greenhouse gas concentration in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system’. The Convention now enjoys near universal membership, with 192 countries having ratified it.” (Newell & Paterson 2010)

**Voluntary action** “Informal programmes, self-commitments and declarations, where the parties (individual companies or groups of companies) entering into the action set their own targets and often do their own monitoring and reporting.” (IPCC)

**Voluntary Emissions Reductions (VERs)** “Carbon credits developed by carbon offset providers. Through these schemes, industries and individuals voluntarily compensate their emissions or provide an additional contribution to mitigating climate change.” (Newell & Paterson 2010)

**20-20-20 targets** Series of demanding climate and energy targets set by the EU government: at least 20% reduction of EU greenhouse gas emissions below 1990 levels, 20% of EU energy consumption to come from renewables and a 20% reduction in primary energy use compared with projected levels, to be achieved by improving energy efficiency. EU leaders offered to increase emission reduction targets to 30% provided the creation of a global climate agreement. (European Commission 2010)



## Annex II Document Extracts

---

- a. Extract of the Agreements of the Report of the Conference of the Parties on its fifteenth session, held in Copenhagen from 7 to 19 December 2009 related to climate change targets and Annex I parties commitments (UNFCCC 2010)

1. We underline that climate change is one of the greatest challenges of our time. We emphasise our strong political will to urgently combat climate change in accordance with the principle of common but differentiated responsibilities and respective capabilities. To achieve the ultimate objective of the Convention to stabilize greenhouse gas concentration in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system, we shall, recognizing the scientific view that the increase in global temperature should be below 2 degrees Celsius, on the basis of equity and in the context of sustainable development, enhance our long-term cooperative action to combat climate change. We recognize the critical impacts of climate change and the potential impacts of response measures on countries particularly vulnerable to its adverse effects and stress the need to establish a comprehensive adaptation programme including international support.

2. We agree that deep cuts in global emissions are required according to science, and as documented by the IPCC Fourth Assessment Report with a view to reduce global emissions so as to hold the increase in global temperature below 2 degrees Celsius, and take action to meet this objective consistent with science and on the basis of equity. We should cooperate in achieving the peaking of global and national emissions as soon as possible, recognizing that the time frame for peaking will be longer in developing countries and bearing in mind that social and economic development and poverty eradication are the first and overriding priorities of developing countries and that a low-emission development strategy is indispensable to sustainable development.

4. Annex I Parties commit to implement individually or jointly the quantified economy wide emissions targets for 2020, to be submitted in the format given in Appendix I by Annex I Parties to the secretariat by 31 January 2010 for compilation in an INF document. Annex I Parties that are Party to the Kyoto Protocol will thereby further strengthen the emissions reductions initiated by the Kyoto Protocol. Delivery of reductions and financing by developed countries will be measured, reported and verified in accordance with existing and any further guidelines adopted by the Conference of the Parties, and will ensure that accounting of such targets and finance is rigorous, robust and transparent.

12. We call for an assessment of the implementation of this Accord to be completed by 2015, including in light of the Convention's ultimate objective. This would include consideration of strengthening the long-term goal referencing various matters presented by the science, including in relation to temperature rises of 1.5 degrees Celsius.

- b. EU legislation concerning the EU ETS, extract from the Regulatory Impact Analysis of the Revised EU Emissions Trading Scheme Directive from the Climate Policy Section, Department of the Environment, Community and Local Government of Ireland (Government of Ireland 2011)

1. **Decision No 280/2004/EC** establishes a mechanism for monitoring and reporting greenhouse gas emissions and for implementing the Kyoto Protocol.

2. The EU-wide cap for the third trading period is set out in **Commission Decision (2010/384/EU)** of 9 July 2010 on the Community-wide quantity of allowances to be issued under



the EU Emission Trading Scheme for 2013. However, that cap was amended and details were published in the Commission Decision (2010/634/EU) of 22 October 2010 adjusting the Union-wide quantity of allowances to be issued under the Union Scheme for 2013 and repealing Decision (2010/384/EU).

3. The Commission's harmonised free allocation rules are set out in **Commission Decision (2011/278/EU)** of 27 April 2011 determining transitional Union-wide rules for harmonised free allocation of emission allowances pursuant to Article 10a of the Directive 2003/87/EC.

4. The Carbon Leakage List is outlined in **Commission Decision (2010/2/EU)** of 24 December 2009 determining, pursuant to Directive 2003/87/EC, a list of sectors and subsectors, which are deemed to be exposed to a significant risk of carbon leakage.

5. The Commission's Auctioning Regulation is set out in **Commission Regulation (EU) No 1031/2010** of 12 November 2010 on the timing, administration and other aspects of auctioning of greenhouse gas emission allowances pursuant to Directive 2003/87/EC.

6. The modalities for financing the demonstration projects for NER 300 are outlined in **Commission Decision (2010/670/EU)** of 3 November 2010 laying down criteria and measures for the financing of commercial demonstration projects that aim at the environmentally safe capture and geological storage of CO<sub>2</sub> as well as demonstration projects of innovative renewable energy technologies under the scheme for greenhouse gas emission allowance trading within the Community established by Directive 2003/87/EC.

7. The Commission's Monitoring and Reporting Guidelines are set out in **Commission Decision (2007/589/EC)** of 18 July 2007 establishing guidelines for the monitoring and reporting of greenhouse gas emissions pursuant to Directive 2003/87/EC, as amended by Commission Decision (2009/73/EC) of 17 December 2008 as regards the inclusion of monitoring and reporting guidelines for emissions of nitrous oxide, by Commission Decision (2009/339/EC) of 16 April 2009 as regards the inclusion of monitoring and reporting guidelines for emissions and tonne-kilometre data from aviation activities, and by Commission Decision (2010/345/EU) of 8 June 2010 as regards the inclusion of monitoring and reporting guidelines for greenhouse gas emissions from the capture, transport and geological storage of carbon dioxide. A further Commission Decision about new activities and gases has been concluded but not yet published.

8. The technical and operational requirements concerning the standardised and secured registries system are governed by **Commission Regulation (EC) No 2216/2004** as amended by Commission Regulation (EC) No 916/2007, Commission Regulation (EC) No 994/2008, and Commission Regulation (EU) 920/2010. Further amendments were recently approved by the Climate Change Committee and have been submitted to the European Parliament and Council for scrutiny before adoption by the Commission. The purpose of these amendments is to implement urgent security provisions and other provisions relating to the operation of the Union Registry from 2012.

9. The Commission's restrictions on industrial gas credits is set out in **Commission Regulation (EU) No 550/2011** of 7 June 2011 on certain restrictions applicable to the use of international credits from projects involving industrial gases.

c. Extract of Article 30 'Review and further development' of the EU ETS Directive (European Parliament and Council 2009a)

4. By 1 December 2014 the Commission shall, on the basis of monitoring and experience of the application of this Directive, review the functioning of this Directive in relation to aviation activities in Annex I and may make proposals to the European Parliament and the Council pursuant



to Article 251 of the Treaty as appropriate. The Commission shall give consideration in particular to:

- (a) the implications and impacts of this Directive as regards the overall functioning of the Community scheme;
- (b) the functioning of the aviation allowance market, covering in particular any possible market disturbances;
- (c) the environmental effectiveness of the Community scheme and the extent by which the total quantity of allowances to be allocated to aircraft operators under Article 3c should be reduced in line with overall EU emissions reduction targets;
- (d) the impact of the Community scheme on the aviation sector, including issues of competitiveness, taking into account in particular the effect of climate change policies implemented for aviation outside the EU;
- (e) continuing with the special reserve for aircraft operators, taking into account the likely convergence of growth rates across the industry;
- (f) the impact of the Community scheme on the structural dependency on aviation transport of islands, landlocked regions, peripheral regions and the outermost regions of the Community;
- (g) whether a gateway system should be included to facilitate the trading of allowances between aircraft operators and operators of installations whilst ensuring that no transactions would result in a net transfer of allowances from aircraft operators to operators of installations;
- (h) the implications of the exclusion thresholds as specified in Annex I in terms of certified maximum take-off mass and number of flights per year performed by an aircraft operator;
- (i) the impact of the exemption from the Community scheme of certain flights performed in the framework of public service obligations imposed in accordance with Council Regulation (EEC) No 2408/92 of 23 July 1992 on access for Community air carriers to intra-Community air routes (2);
- (j) developments, including the potential for future developments, in the efficiency of aviation and in particular the progress towards meeting the Advisory Council for Aeronautics Research in Europe (ACARE) goal to develop and demonstrate technologies able to reduce fuel consumption by 50 % by 2020 and whether further measures to increase efficiency are necessary;
- (k) developments in scientific understanding on the climate change impacts of contrails and cirrus clouds caused by aviation with a view to proposing effective mitigation measures.

The Commission shall then report to the European Parliament and the Council.

- d. Extract of Evaluation standards related to evaluation design and conduction (European Commission 2002)

### C) Designing Evaluations

Evaluation design must provide clear and specific objectives, and appropriate methods and means for managing the evaluation process and its results.

1. Save in duly justified cases, a steering group must be set up for each evaluation to advise on the terms of reference, support the evaluation work and take part in assessing the quality of the evaluation at the appropriate regularity; its composition must be adjusted to the specific needs and circumstances of each evaluation and the evaluation function must be advised thereon.
2. Terms of reference must be established for each external evaluation and a corresponding document/mandate must be established for each internal evaluation, which must at least specify the following points: purpose and objectives, key questions, scope, expected outputs, deadlines, and quality criteria.



3. Issues of relevance to all services concerned must be considered for the terms of reference.

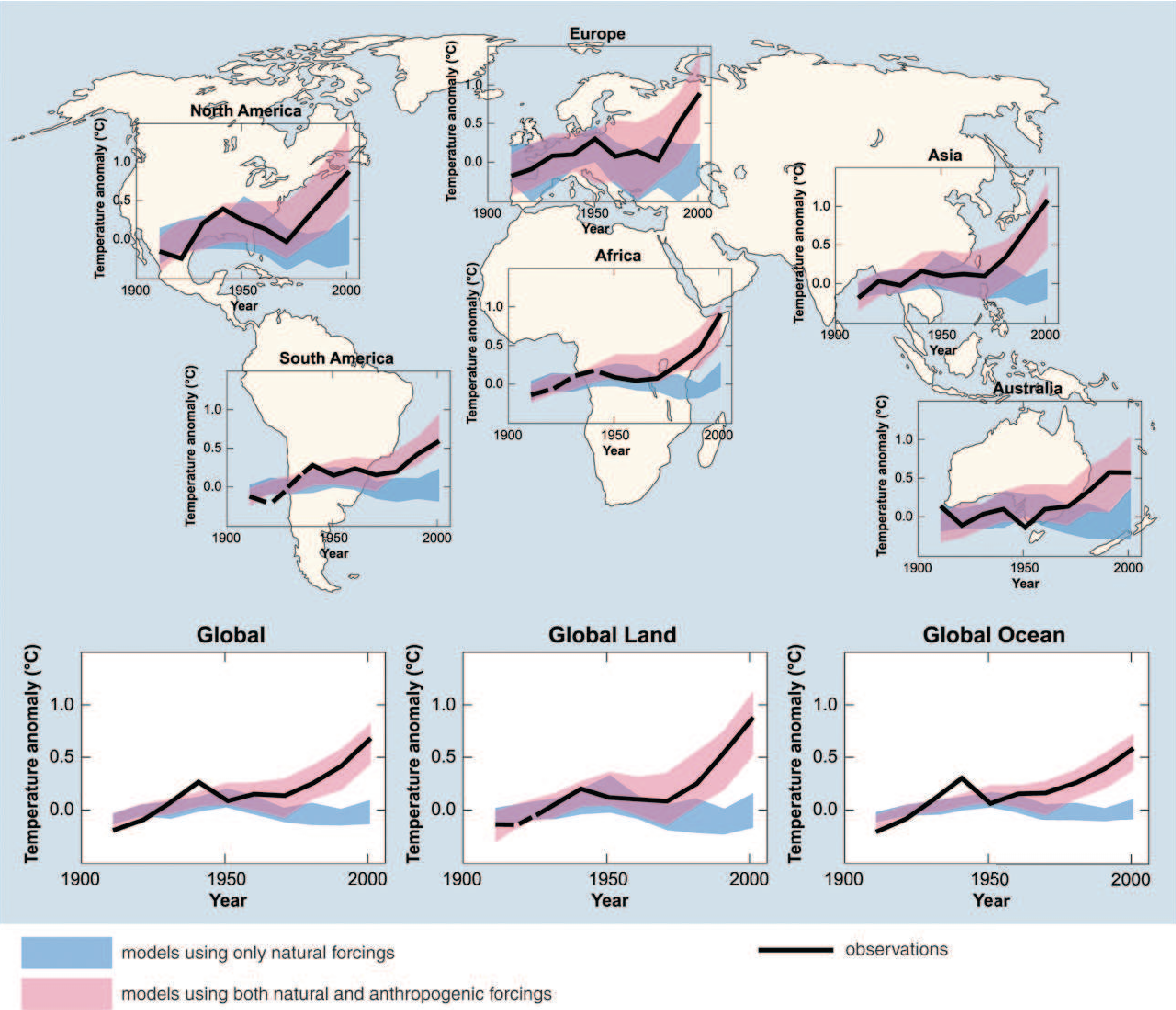
#### D) Conducting Evaluations

Evaluation activities must be conducted to provide reliable, robust and complete results.

1. The evaluation must be conducted in such a way that the results are supported by evidence and rigorous analysis.
2. All actors involved in evaluation activities must comply with principles and rules regarding conflict of interest.
3. Evaluators must be free to present their results without compromise or interference, although they should take account of the steering group's comments on evaluation quality and accuracy.
4. The final evaluation reports must as a minimum set out the purpose, context, objectives, questions, information sources, methods used, evidence and conclusions.
5. The quality of the evaluation must be assessed on the basis of the pre-established criteria throughout the evaluation process and the quality criteria must as a minimum relate to relevant scope, appropriate methods, reliable data, sound analysis, credible results, valuable conclusions and clarity of the deliverables.

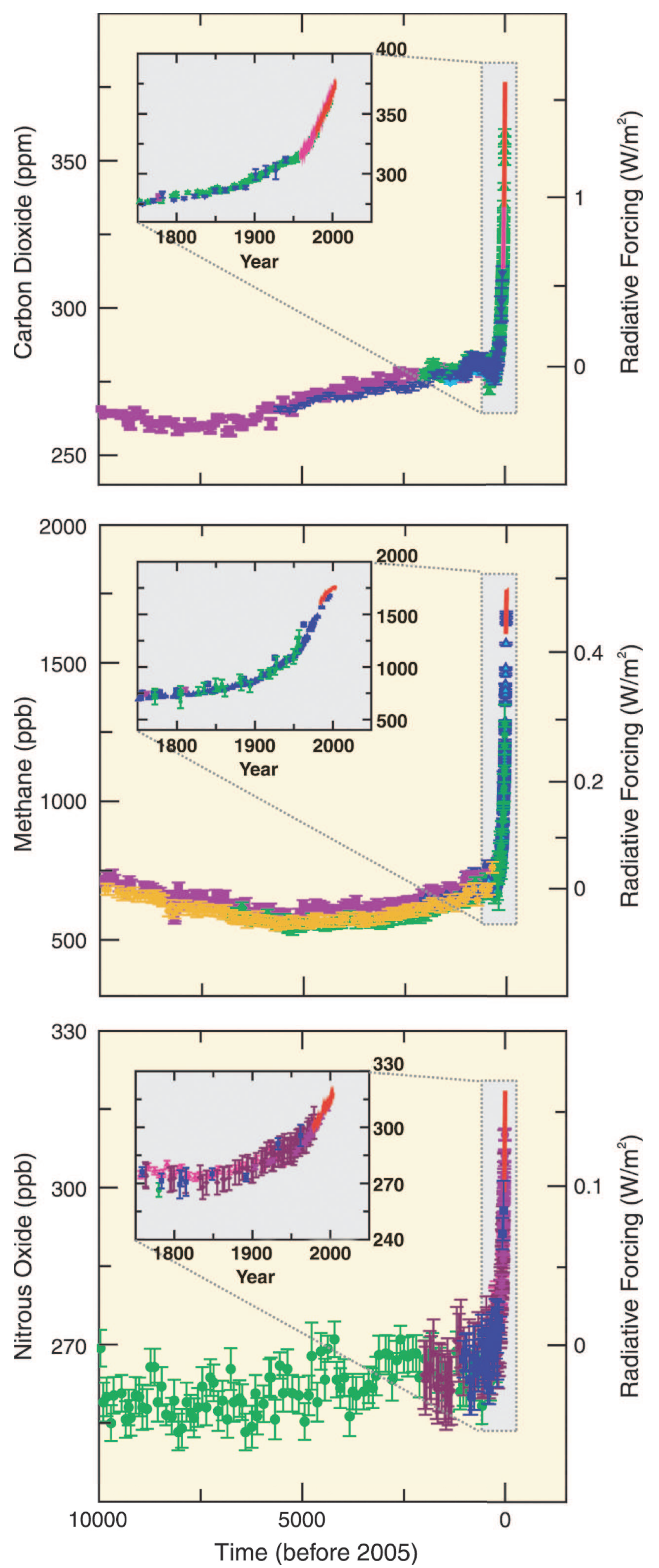


Annex III    Figures and Tables



**Figure 4 Comparison of observed changes in surface temperature with results simulated by climate models using either natural or both natural and anthropogenic forcings (IPCC 2007)**





**Figure 5 Atmospheric concentrations of CO2, CH4 and N2O over the last 10,000 years (large panels) and since 1750 (inset panels) (IPCC 2007)**



**Table 4 Conferences attended (classified by date)**

<b>27/10/2010 to 28/10/2010</b>	<b>Seminar on the science and politics of climate controversies organised by the ULB and Sciences Po Paris</b>	
Jean-Michel Decroly	Professor at the ULB	Introduction: Enjeux scientifiques, sociaux et politiques des controverses climatiques (quelques balises pour un colloque)
Edwin Zaccai	Professor at the ULB	Introduction: Enjeux scientifiques, sociaux et politiques des controverses climatiques (quelques balises pour un colloque)
Claude Henry	President of the Scientific Board at the IDDRI of Sciences Po Paris	Introduction: Incertitude scientifique et incertitude fabriquée
Naomi Oreskes	Professor at the University of California, San Diego	Introduction: Merchants of doubt (how and why a handful of scientists obscured the truth on climate change)
Jean-Pascal van Ypersele	Vice-Chair of the IPCC, Université Catholique de Louvain	Scientific convergences and divergences: Comment le GIEC gère-t-il les incertitudes scientifiques?
Hervé Le Treut	CNRS, Director of the Institute Pierre-Simon Laplace	Scientific convergences and divergences: Changement climatique d'origine anthropique (enseignements des observations et modèles)
Valérie Masson-Delmotte	CNRS, Research laboratory of climate and environment studies	Scientific convergences and divergences: Quelles sont les incertitudes qui font débat?
Frank Pattyn	Professor at the ULB	Scientific convergences and divergences: Les incertitudes des prévisions de hausse du niveau des océans
James Hoggan	Hoggan & Associates, Vancouver	The actors at the core of the debate: Climate cover-up, the crusade to deny global warming
Paul Edwards	Professor at the University of Michigan	The actors at the core of the debate: Climate controversies in the United States (the politics of data)
Olivier Godard	Research Director at the CNRS	The actors at the core of the debate: Ce qui distingue expertise et controverses scientifiques de la campagne climate-sceptique en France
Francois Gemenne	IDDRI of Science Po Paris	The actors at the core of the debate: Les experts face aux controverses (une lecture politique)
Sylvestre Huet	Science reporter at Libération	Communication and mediatization: Les journalistes confrontés au "streetfight" climatique



Jean-Baptiste Comby	Professor at IFP-CARISM / Université Paris II	Communication and mediatisation: Médiatisation des controverses climatiques (une approche sociologique)
Clive Hamilton	Professor at Charles Sturt University, Australia	Perceptions and social representations: Why we resist the truth about climate change
Jean-Paul Bozonnet	Maitre de conferences at Sciences Po Grenoble	Perceptions and social representations: La réception du climato-scepticisme dans la population européenne
Jean-Marc Nollet	Vice-President of the Wallonia Region	Political consequences: Les effets des controverses climatiques sur les politiques régionales et locales
Samuele Furfari	Lecturer at the ULB and Employee in the DG Energy and Transport at the European Commission	Political consequences: Controverses climatiques et politiques de l'énergie
Etienne Hannon	Lecturer at the ULB and Advisor for SPF Environment in the Climate change Unit of Belgium	Political consequences: Négociations internationales sur le climat (obstacles et controverses)
Amy Dahan	Research Director at the CNRS, Centre Alexandre Koyré	Political consequences: Blocage des négociations climatiques, et rôles des controverses à cet égard

Other participants: Camille Pisani (Director of the IRSNB), Evelyne Huytebroeck (Minister for the Environment – Region of Brussels Capital), Jean-Louis Tison (Professor at the ULB and Joint Director of the Glaciology Research Laboratory), Pierre Regnier (Professor – ULB), Francois Reniers (Vice-President for research at the ULB), Eric Remacle (Professor at the ULB), Francois Heinderickx (Professor at the ULB)

Public roundtable on climate, controversies and the media, participants: Francois Gemenne (IDDRI and Sciences Po Paris), Jean-Jacques Jespers (Professor and Director of the School of Journalism at the ULB), David Adam (Editor of Nature), Michel De Mulenaere (Le Soir), Sylvestre Huet (Libération), Hervé Kempf (Le Monde), Oliver Morton (The Economist), Gilles Toussaint (La Libre Belgique), Clive Hamilton (Charles Sturt University), James Hoggan (Hoggan & Associates, Vancouver), Naomi Oreskes (University of California, San Diego), Jean-Louis Tyson (ULB)

15/12/2010	Debriefing COP Cancun Climate organised by etopia, a development and research centre for political ecology	
Phillipe Henry	Minitres wallon de l'Environnement	Comment s'est déroulé la COP de Cancun? Quels enseignements peut-on en tirer? Quelles sont les conséquences sur le processus de negotiations? A quand un grand accord international?
Etienne Hannon	Service changements climatiques – SPF Environnement	
Arnaud Collignon	Greenpeace	
Eric Jadot	Deputé fédéral ECOLO	
07/02/2011	Expert seminar 'From Cancun to Durban, State of play of the climate negotiations' organised by EGMONT, the Royal Institute for International Relations (an independent think-tank)	
Jean-Pascal VAN YPERSELE	Vice President, IPCC; Professor, Université Catholique de Louvain (UCL)	An IPCC perspective on the Future International Climate Framework
Louis BONO	Counsellor for Energy, Environment, Science & Technology, US Mission to the EU	A US perspective on the Future International Climate Framework
Xiangfeng LI	First Secretary, Political Section, Mission of the People's Republic of China to the EU	A Chinese Perspective on the Future International Climate Framework
Elina BARDRAM	Deputy Head of Unit Climate	An EU perspective on the Future



	Finance and Deforestation, DG Climate Action, European Commission	International Climate Framework
Artur RUNGE-METZGER	Director 'International and Climate Strategy', DG Climate Action, European Commission	An EU perspective about the Financing of Climate Change in the Short and Long Term
Peter WITTOECK	Head of Climate Change Section, FPS Health Food Safety and Environment	A Belgian perspective about the Financing of Climate Change in the Short and Long Term
Tim GORE	Chair, Climate Change Policy Advisor, Oxfam UK	An NGO perspective about the Financing of Climate Change in the Short and Long Term
Other participants: Marc Trenteseau (Director General of EGMONT), Jaroslaw Pietras (Director General, Climate Change, Environmental and Health, Council of the European Union), Clémentine d'Oultremont (Research fellow, EGMONT)		
<b>10/02/2011</b>	<b>Debriefing post-Cancun organised by The <i>Institute for Environmental Management and Land-use Planning</i> of the Free University of Brussels (ULB)</b>	
Etienne Hannon	Maître de conférences ULB et Conseiller SPF Environnement – Service changements climatiques	Les avancées réalisées à Cancun, les défis à venir ainsi que le rôle joué par la Belgique dans le contexte de la présidence de l'UE
Véronique Rigot	Chargée de recherche Environnement et Développement – CNCD	Le rôle des ONG : sont elles écoutées ou juste entendues ?
Ben Matthews	Professeur à l'Institut d'astronomie et de géophysique – UCL	Le rôle des ONG : sont elles écoutées ou juste entendues ?
René Audet	Sociologue de la mondialisation et de l'environnement – CEDD-ULB/UQAM	Analyse sociopolitique des résultats de Cancun et du cycle de négociations.
<b>11/02/2011 to 08/04/2011</b>	<b>Conference series on 'the legal and financial instruments of the fight against global warming' organised by The Perelman Centre for Legal Philosophy of the Free University of Brussels (ULB)</b>	
Benoît Frydman	ULB	Les permis de polluer échangeables : de la théorie à la pratique
Arnaud Van Waeyenberge	ULB	Les marchés européens du carbone
Annie Vallée	Université de Paris-Est Créteil	Efficacité vs Equité : les dispositifs de lutte contre le réchauffement
Christian de Perthuis	Université Paris Dauphine	Prix du carbone et croissance économique
François Gemenne	Science Po Paris/ULB	Géopolitique du changement climatique
Simone Ruiz	IETA	Le marché du carbone : le point de vue des entreprises
Sandrine Maljean-Dubois	Université Paul Cézanne Aix-Marseille III/CNRS	L'enjeu du contrôle de la mise en oeuvre des obligations internationales



**Table 5 General findings about performances of policies for mitigating climate change (IPCC 2007)**

<b>Regulations and standards</b>	Generally provide some certainty about emission levels. They may be preferable to other instruments when information or other barriers prevent producers and consumers from responding to price signals. However, they may not induce innovations and more advanced technologies.
<b>Tradable permits</b>	Will establish a carbon price. The volume of allowed emissions determines their environmental effectiveness, while the allocation of permits has distributional consequences. Fluctuation in the price of carbon makes it difficult to estimate the total cost of complying with emission permits.
<b>Taxes and charges</b>	Can set a price for carbon, but cannot guarantee a particular level of emissions. Literature identifies taxes as an efficient way of internalising costs of GHGs emissions.
<b>Financial incentives (subsidies and tax credits)</b>	Are frequently used by governments to stimulate the development and diffusion of new technologies. While economic costs are generally higher than for the instruments listed above, they are often critical to overcome barriers.
<b>Voluntary agreements</b>	Between industry and governments are politically attractive, raise awareness among stakeholders and have played a role in the evolution of many national policies. The majority of agreements have not achieved significant emissions reductions beyond business as usual. However, some recent agreements, in a few countries, have accelerated the application of best available technology and led to measurable emission reductions.
<b>Information instruments (e.g. awareness campaigns)</b>	May positively affect environmental quality by promoting informed choices and possibly contributing to behavioural change, however, their impact on emissions has not been measured yet.
<b>Research, development and demonstration (RD&amp;D)</b>	Can stimulate technological advances, reduce costs and enable progress toward stabilisation.



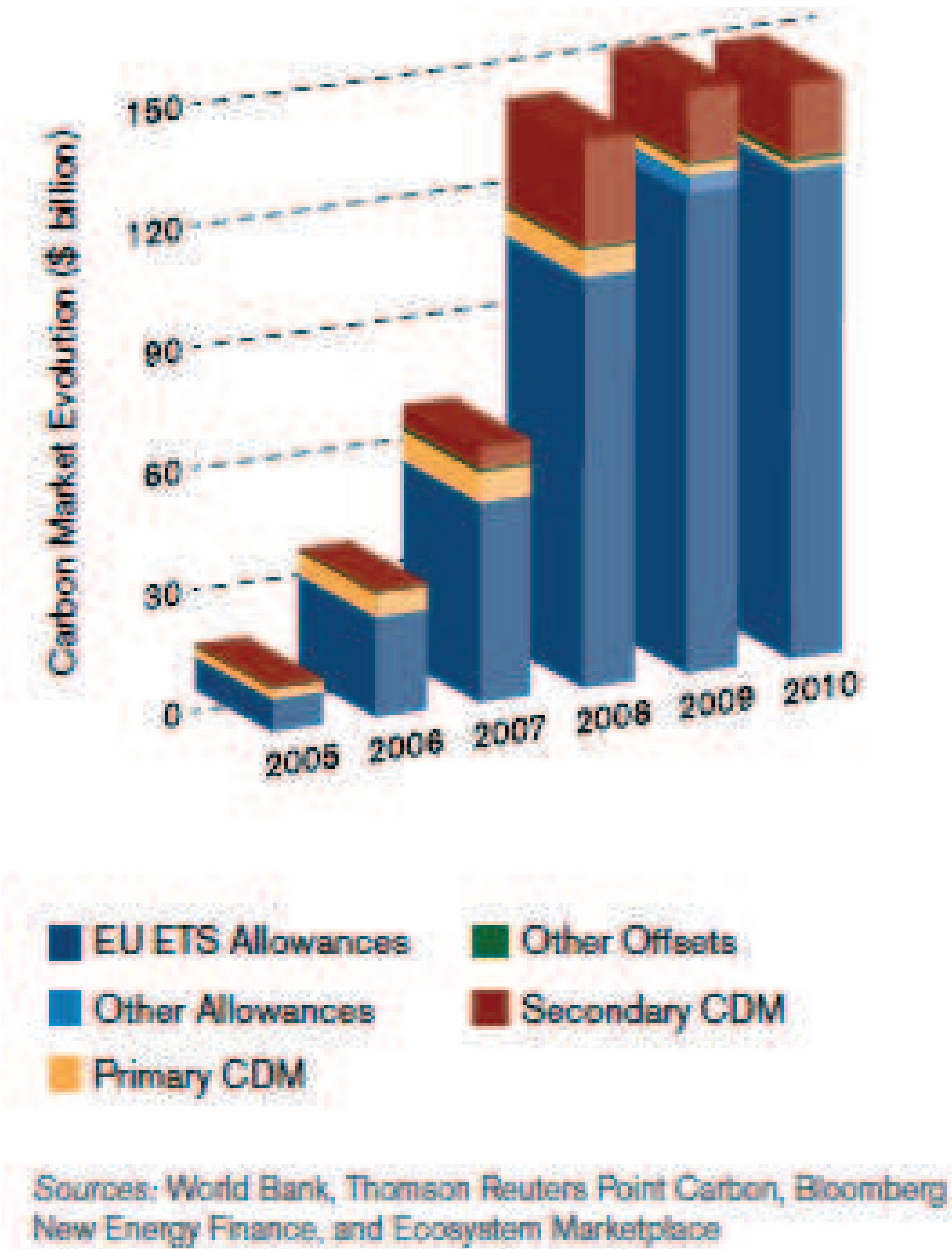


Figure 6 Carbon markets at a glance (World Bank 2011)



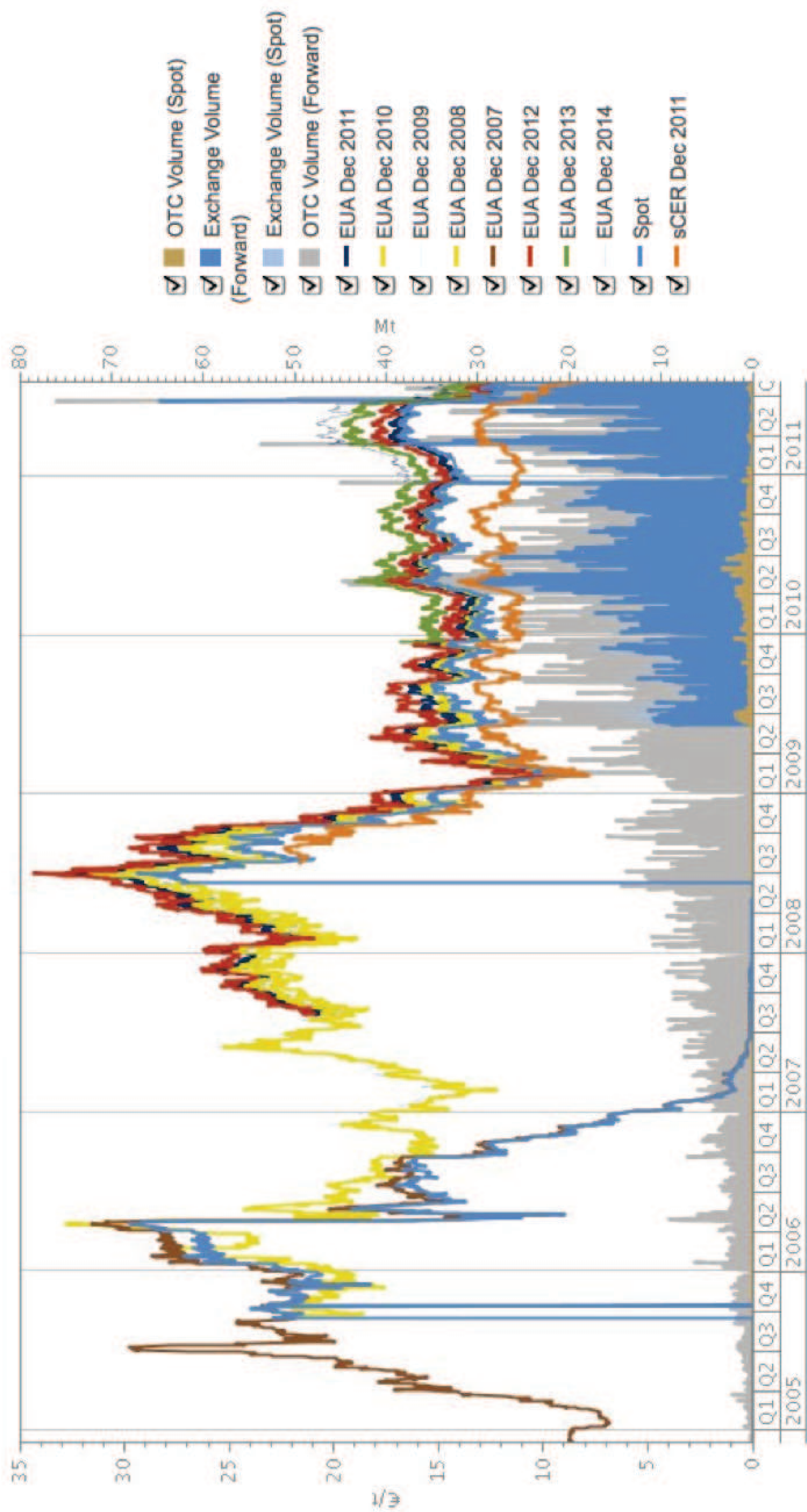


Figure 7 EUA over-the-counter (OTC) assessment (Reuters 2011f)



**Table 6 Approaches to (environmental) policy evaluation (Crabbe & Leroy 2008)**

Approach	What?	When?
Needs analysis	“Do the policy objectives as policy –makers have set them address actual policy needs?” – Assessment of the policy relevance, by confronting results with expected outcomes	Ex ante (determination of policy goals)
Programme theory evaluation	Is the policy able to attain the goals set and are those corresponding to the needs, what are the side effects? – The evaluation is guided by a “model of how the programme causes the intended or observed outcomes”	Ex ante or ex post
Case study evaluation	Which policy alternative is the most appropriate? – Research method that allows the identification of the causal links between a policy intervention and effects achieved	All phase of the policy cycle
Experiment	What is the correlation between policy interventions and anticipated effect? – Experimentation during which “variables are manipulated and their effects upon other variables observed”	Ex post
Formative / developmental evaluation	Is the policy effective and does it attain its goals? – It aims at “formulating recommendations on the basis of which policy can be adjusted”	All phase of the policy cycle
Goal-free evaluation	“Is this policy ‘right’?” – The evaluator takes no account of the objectives the study is supposed to serve, keeping the scope of evaluation as broad as possible	Ex post
Impact assessments	Social: “Does the policy have a positive or a negative impact upon particular societal processes and with what consequences?”	Ex ante
	Environmental: “Which environmental changes will occur as a result of the implementation of a policy?”	
	Regulatory: “What are the possible side effects of regulatory measures?”	
Cost analyses	Cost-effectiveness: “What are the costs and effects of various policy alternatives?”	Ex ante, ex nunc or ex post
	Cost-benefit: “Do the costs of the policy weigh its benefits, effects or added value?”	
Logframe method	“Does the formulation of the policy objectives pay sufficient attention to monitoring and evaluating the policy performance at a later stage?” – It offers a technique for project planning and a starting point for evaluating policy projects	All phase of the policy cycle
Multi-criteria analysis	Which policy strategy alternative is the best given a specific set of criteria? – Method used for weighing up alternatives in a “complex policy context” where effects are not expressed in monetary terms but in measurements units	Ex ante (policy formation)
Realistic evaluation	“Does a policy have positive or negative impacts upon societal processes and with which consequences?” –	Ex post



This method for evaluating the effects of a policy, is based on the assumption that “effects are the products of the interaction between a mechanism and its context”.



**Table 7 Approaches for designing evaluation research (Crabbe & Leroy 2008)**

Approach	What?	When?
Advocate-adversary evaluation	“How should one go about assessing a contested evaluation study in a manner that allows both opponents and proponents to have their say?” – Based on the idea that evaluation should be done by several actors to avoid biases	Applied only under specific conditions e.g. policy affect a large group of people
Context, input, process and product evaluation model	“How should one go about making a policy evaluation that covers a policy domain in general?” – A policy framework that guides through different decision-making stages	Systemic approach used at different global levels
Connoisseurship and criticism	How do external experts assess a specific policy and in which way policy-makers respond to it? – An approach that takes advantage of unbiased connoisseurs	Applied only under specific conditions e.g. need for ethical appraisal
Constructivist evaluation	How can an evaluation encourage policy-makers to reconsider their policy-making cycle? – “The central purpose is to acquire insight into the perception of the policy by its stakeholders	Useful when key policy players have opposing opinions
Deliberate democratic evaluation	How can one engage in conflict mediation through evaluation? – An “approach that obliges evaluators to apply democratic principles when drawing evaluative conclusions on policy”	Useful when there are conflicts regarding policy goals for example
Empowerment evaluation	How can stakeholders involved be empowered and assisted in self-evaluation? – Evaluation here is a mean of achieving self-development	Ex ante, ex nunc or ex post
Evaluability assessment	Is there a demand for evaluation and are the circumstances adequate to conduct an evaluation? – It is made prior to evaluation in order to establish “whether a policy can be evaluated” and what are the barriers	After ex ante and before ex nunc
Meta-evaluation	“How should evaluation studies, systems or tools themselves be evaluated?” – Based either on making an evaluation on the basis of other studies or on the evaluation of evaluation studies themselves	Usually ex post as requires the outcomes of other studies
Mixed-method evaluation	“How should one carry out a policy evaluation when applying a broad mix of analysis techniques?” – Combination of quantitative and qualitative methods	Broadly applicable
Responsive evaluation	How to organise an evaluation in which the stakeholders assist the evaluator throughout the evaluation process? – The approach deals with issues that are “deemed essential by those involved in the policy implementation process”	Any phase of the policy cycle
Utilisation-focused evaluation	“How can one set up an evaluation that satisfies the knowledge and evaluation needs of policy-makers?” – The aim is to “enhance the target-oriented utilisation of the evaluation by its target group”	Any phase of the policy cycle, mostly ex post



Annex IV      Survey

a. Evaluation grid

Evaluation grid			Topics	Criteria		
				1	2	3
Issues	Setting out	Allocation	(1) Allocation methods: decision level (centralised vs. national) and procedure (grandfathering vs. benchmarking)			
			(2) Allocation amounts: free vs. auctioning wrt windfall profits and carbon leakage and initial price signal			
		Cap	(3) Cap setting: applicability (per year/period) wrt over-allocation and banking (between periods)			
			(4) Offsetting limits: local vs. foreign abatement			
	Implementation	Infrastructure	(5) Adaptability and transparency: access to information and consultation			
			(6) Controls measures: monitoring and enforcement			
			(7) Profits: provisions for utilisation			
		Mechanisms	(8) System security: market reliability wrt fraud			
			(9) System resilience market reliability wrt distortions and price volatility			
	Prospects	Time horizon	(10) Future: credibility			
		Coverage	(11) Sector coverage: more or less			
			(12) Geographical coverage: linkage to other carbon markets and international climate agreements			



b. Interviewees (listed alphabetically)

Interviewees	Organisation and Role
Thomas Bernheim at the DG CLIMA of the European Commission	The European Commission, one of the three main institutions involved in the EU's decision-making process together with the European Parliament and the Council of the European Union, seeks to uphold the interests of the Union as a whole by proposing new laws and implementing them. Within the EC, there are three different units dealing with different aspects of emission trading, all grouped under the Directorate of European and International Carbon Markets of the Directorate General Climate Action since its separation from DG Environment in 2010: (1) Implementation of ETS (dealing with the general issues including the management of the EU ETS, the auctioning regulation, oversight and security of the whole ETS market); (2) Benchmarking; (3) International Carbon Market, Aviation and Maritime. DG CLIMA’s objective is to develop and implement international and domestic climate action policies and strategies, lead international negotiations on climate, implement the EU ETS, monitor the implementation of Member States' emission reduction targets in the sector outside the EU ETS and promote low carbon and adaptation technologies. (European Commission 2011f; European Commission 2011e)
	Policy officer in the International Carbon Market, Aviation and Maritime Unit of the Directorate for European and International Carbon Markets in the Directorate General for Climate Action ("DG CLIMA"). His main responsibility is to support the development of the CDM and the links between the EU ETS and the Kyoto flexible mechanisms (JI/CDM). He is also responsible for the development of new mechanisms, sectorial mechanisms, which differ from offsets at individual project level by setting baselines for emissions at sectorial level. This type of mechanisms could allow developing countries themselves to provide a contribution towards emissions reduction, provided that the benchmark is set below BAU. He has been involved in establishing a European burden sharing agreement for the post 2012 period, notably by preparing for the review of the EU ETS. He is also an alternate member of the UN Executive Board of the Clean Development Mechanism, which involves assisting 12 one-week meetings per year. (Bernheim 2011a)
Arnaud Brohe (ULB – CEDD) at CO2logic	CO2logic is a consultancy that provides environmental services aiming at raising public awareness on the impacts of greenhouse gas emissions and encouraging corporate responsibility with regards to those emissions into the atmosphere. They provide solutions for participants (e.g. Deloitte and KBC) to measure and cancel out their CO <sub>2</sub> emissions. CO2logic provide support for the four following methods of emissions mitigation: (1) reduction of the activities causing the emissions (2) pollution reduction at the source by improving technology used (3) alternative or lower carbon energy raw material substitution (4) emissions offsetting by participating in carbon projects (e.g. in Africa). (C02logic 2011)  The Centre for Studies on Sustainable Development (CEDD) “carries out multidisciplinary studies on various aspects of environmental policies and strategies concerning sustainable development. It deals with the design and evaluation of these policies and actions, as well as their relationships



	<p>with the technical, socio-economic or philosophical context of sustainable development.” It is part of the “Institut de Gestion de l’Environnement et de l’Aménagement du Territoire” (IGEAT) of the Université Libre de Bruxelles. (IGEAT 2011)</p>
	<p>Managing partner at CO2logic and external scientific collaborator at the CEDD. Within CO2logic he contributes towards the realisation of small volume carbon compensation schemes for participants seeking projects with a social value. He is notably a consultant for European technological enterprises (e.g. wind farm developers) who wish to invest outside of Europe in order to obtaining carbon credits which is a source of finance for part of their projects. He helps them achieving this goal and puts them in contact with the major actors of the carbon market (e.g. banks). He also participates in the helpdesk put in place by the Walloon region to prepare enterprises for answering the legal requirements of the EU ETS. (Brohé 2011)</p>
Bas Eickhout from the Greens/European Free Alliance in the European Parliament	<p>The European Parliament is “the only directly-elected body of the European Union”. Its members are there to represent the citizens of the EU and play an active role in drafting legislation on environmental protection and climate change, for example. (European Parliament 2011) The Greens/EFA is the fourth group in the European Parliament with 56 MEPs from 15 countries. It is “made up of Greens and representatives of stateless nations and disadvantaged minorities”. From 2009 to 2014, the main task of elected members is to promote and vote for the measures that are necessary to deliver the Green New Deal. (Greens/EFA Group 2011)</p>
	<p>Member of the Greens/EFA group in the European parliament, originally from the GroenLinks party of the Netherlands. He is a politician who is involved in the legislation of the EU ETS, among others. He is thus one of the decision makers on the future of climate change instruments. (Eickhout 2011)</p>
Folker Franz at BUSINESSEUROPE	<p>BUSINESSEUROPE is the main horizontal business organisation at European level. It is an umbrella federation (confederation) assembling 41 member federations, such as the Federation of Enterprises in Belgium and the European Chemical Industry Council and Cembureau, representing 20 million companies from 35 countries on all business issues dealt with by the European Union. “Its main task is to ensure that companies' interests are represented and defended vis-à-vis the European institutions with the principal aim of preserving and strengthening corporate competitiveness. BUSINESSEUROPE is active in the European social dialogue to promote the smooth functioning of labour markets.” Moreover, as a result of “EU’s far-ranging competences in environmental affairs” and in response to the environmental challenges currently faced by the world, BUSINESSEUROPE is very active on most climate and environmental policy areas. Indeed, although those challenges can represent global market opportunities for European companies, they require smart policies in order to foster global competitiveness. “For companies it is essential to operate in a predictable EU policy framework which integrates climate protection, energy security as well as competitiveness concerns”. The Industrial Affairs Department</p>



	essentially follows EU policies in the areas of environment, climate and energy, as well as research and technology. (BUSINESSEUROPE 2011)
	Director of Industrial Affairs dealing with dossier on air pollution, climate change, eco-label platform, energy, environment, integrated product policy and sustainable development. He is in charge of analysing the European Institutions' proposed legislation, specifically in the fields of the environment and climate change and represents the views of European industry in political discussions. He coordinates the positions of BUSINESSEUROPE's members in order to come up with a common European position and to communicate those positions to the European Institutions. He thus represents the consolidated view of very different categories of business actors, from providers of monitoring equipment to the largest industrial emitters. (Franz 2011)
Etienne Hannon (ULB) at the Federal Public Service	<p>The Federal Public Service of Belgium is constituted of different Directorate General, amongst which one deals with environmental issues notably the Belgian federal Climate Change section. This section holds all information about climate change, its causes, impacts and solutions, the climate policy at different levels, financial support, and the actions that can be undertaken. The Climate change Service plays a central role in the development of international, European, national and federal politics. It works towards the realisation of Belgium's commitments under the Kyoto Protocol for the prevention of climate change in the respect of the environment. The service, composed of multidisciplinary workforces, achieves this by conceiving and insuring an integrated and preventive ecological federal politic. (FPS 2011; Service federal Changement climatiques 2011) It is important to note that the application of the EU ETS is a regional competence in Belgium.</p> <p>Head of political and monitoring cell of the climate change service under the directorate general environment of the federal public service of health, food chain safety and environment. He is responsible for the coordination of activities relating to the monitoring of international negotiations and EU and national climate policy documents. He is also lecturer at the ULB. (Hannon 2011)</p>
Mark Looman at the Federal Public Service	<p>Idem first row for Etienne Hannon</p> <p>Expert in climate policies and head of the national registry cell of the climate change service under the directorate general environment of the federal public service of health, food chain safety and environment. He manages the national registry of greenhouse gas emissions, and advises politicians, notably the Climate Minister, concerning ETS and registry policies. He also represents Belgium during European negotiations. (Looman &amp; Hannon 2011)</p>
Julia Michalak at Climate Action Network Europe	Climate Action Network Europe is Europe's leading network working on climate and energy issues, representing and coordinating the work of 141 member organisations (NGOs) in 25 European countries. Amongst others, they represent: Friends of the Earth, Greenpeace, WWF, the Institute for Environmental Policy and Sandbag (the main contact point of CAN Europe when dealing with the EU ETS). The network works to "prevent dangerous climate change and promote sustainable energy and environment policy in



	<p>Europe". Its mission is to "support and empower civil society organisations to influence the design and development of an effective global strategy to reduce greenhouse gas emissions and ensure its implementation at international, national and local levels in the promotion of equity and sustainable development." (CAN Europe 2011)</p> <p>EU Climate Policy Officer working in the secretariat, where the main task is to coordinate what CAN Europe's members are doing. They are also covering some specific thematic issues, and she is mainly covering the achievement of a 30% climate ambition, the EU ETS and more specifically the implementation of Article 10c of the EU ETS' Directive on optional transitional free allocation for power sectors in new member states. (Michalak 2011)</p>
<p>Anne Panneels at the European Trade Union Confederation</p>	<p>The European Trade Union Confederation represents the common interests of workers at European level, representing 83 trade union organisations (e.g. the General Labour Federation of Belgium) in 36 European countries and 12 industry-based federations (e.g. the European Mine, Chemical and Energy Workers' Federation). It is one of the European social partners that work in a number of specific policy areas at European level. Its objectives is the promotion of the European Social Model and the development of a united Europe of peace and stability "where working people and their families can enjoy full human and civil rights and high living standards". "It is involved in economic and social policy-making at the highest level, working with all the EU institutions", and negotiated with employers at European level through the European social dialogue. It holds the maintenance of a healthy environment for working people and their families as one of its social priority. ETUC sees climate change as one of the most serious threats faced by the planet. It thus calls for an ambitious European policy with a new European framework for tripartite dialogue allowing the involvement of the social partner in order to manage the potential impacts of climate change policies on jobs and working conditions. (ETUC 2011)</p> <p>Political advisor of the environment division at the ETUC. She deals with the analysis of the latest developments regarding practices, policies and technologies related to the environment, energy, sustainable development and climate at European level and their linkages at the national and international levels. One of her objectives is to help the ETUC to develop political positions with respect to the European institutions with their sectorial, national and European trade union federations, notably in the view of the European position at international level in the climate debates, another objective is the sharing of political and technological measures and good practises between countries in order to allow industries to develop faster and learn from the success or avoid the mistakes of others. She is also involved in the accompanying committee for scientific studies that tries to better understand sectorial issues, obstacles and opportunities with respect to climate policies when there is a lack of information to be able to decide on an adequate political positioning. Finally, once political positions are adopted she is involved in the establishment of their defence strategy notably in the view of ETUC's participation to conferences. (Panneels 2011)</p>



Simone Ruiz at the International Emission Trading Association	<p>The International Emission Trading Association is a non-profit business organisation comprising more than 155 leading international companies from OECD and non-OECD countries across the carbon trading cycle (business organizations and affiliated national and regional trading associations). It has formed several partnerships including the World Bank, GDF Suez and California Climate Action Registry, among others. Its objective is to help combating climate change by establishing “a functional international framework for trading in greenhouse gas emission reductions”. It works towards improving the functioning of the EU ETS, ensuring at the same time that regulators take into account the concerns of market participants in each policy action such that to create predictability and fairness. (IETA 2011a)</p>
	<p>EU policy director and head of the Brussels office. She informs members on the developments in the EU ETS, which implies closely following regulatory developments. She is responsible for communicating issues of concerns to the European Commission and writing position papers. She represent IETA in conferences around the world, trying to promote emission trading as the main instrument to reduce greenhouse gas emissions and as the main objective to preventing climate change. (Ruiz 2011)</p>

Note on interviewees:

As the result of time and scope restrictions, as well as availability of individuals it was not possible to realise more interviews. However if it were possible the following people/organisations would have been part of a larger selection process: the Centre for European Policy Studies (Christian Egenhofer), the Institute for European Environmental Policy (Patrick ten Brink or Marc Pallemmaerts), the Climate Group (Luc Bas), l’Agence Wallonne de l’Air et du Climat (Stéphane Cools), the Committee on the Environment, Public Health and Food Safety at the European Parliament (Edwin Koekkoek), the European Environmental Bureau (Catherine Pearce), the European Environmental Agency (Andreas Barkman) and someone responsible for complying with the legal requirements of the EU ETS in and industry (e.g. GDF Suez).



c. Survey**I. Presentation**

My name is Judith Saragossi and I am completing a master degree in environmental management at the “Institut de Gestion de l’Environnement et de l’Aménagement du Territoire” (IGEAT) at the Université Libre de Bruxelles. I previously studied environmental engineering for four years at University College London.

I am currently writing my master's dissertation on “the conditions for success of the EU ETS”, under the supervision of Tom Bauler and Rene Audet (CEDD, Centre d'études du développement durable). After having taken stock of the literature on the origins of the European carbon market, I went on to research issues and assessments of Phase I and II, as well as the existing projections for Phases II and III. I am investigating the adequacy of the modifications made to EU ETS Directive and would like to obtain your (and/or your institution's) views, as part of my evaluation is based on the analysis of positions of actors at European level. The assessment is based on the analysis of selected issues previously encountered by the EU ETS against three typical evaluation criteria.

Research topic: Do the modifications and additions made, foreseen or currently in discussion to the EU ETS Directive address the problematic issues raised by the early implementation years? Are they sufficient to reach the goals aimed by the policy? In other words have we learned from history with regard to the early implementation mistakes?

Hypothesis: There exist diverging views on the success (in terms of efficiency, effectiveness and equity) of the EU ETS and its conditions. However, if some actors remain very critical with respect to its achievements in terms of emission reductions even when looking at the second and third Phases, it is important to remember that environmental efficiency is not the only aim of this instrument, which should be used in combination with different instruments in order to attain these goals.

Precisions & Objectives: It is possible to find diverse opinions on the early success of the EU ETS, some stating that the rules constraining emission trading are not sufficient<sup>1</sup>, others that judgements on its success are premature considering its novelty<sup>2</sup>.

→ From these diverging opinions it is interesting to assess the modifications made or foreseen to the current and future Phases of the EU ETS.

→ The objective is to provide a new and fresh evaluation model and set of criteria in retrospective of the implementation of Phase I and beginning of Phase II, and to use the theory for evaluating environmental public policies.

Structure: I will structure the questionnaire in three categories that correspond to dimensions under which fall emission-trading issues. My aim is for you to assess or evaluate those against three criteria (typically used in environmental policy evaluations and as set by the goals to be met by the European legislation in place):

(1) Environmental effectiveness i.e. reach targeted GHGs emissions reductions

(2) Economical efficiency i.e. at the lowest possible costs

(3) Social equity i.e. with a fair burden sharing between various actors at different levels

I will then conclude the interview by asking you more general questions.

---

<sup>1</sup> Sandbag Climate Campaign, 2011. Sandbag - Real action on climate change. Available at: <http://www.sandbag.org.uk/> [Accessed February 17, 2011].

<sup>2</sup> Ellerman, A.D., Convery, F.J. & Perthuis, C. de, 2010. Pricing Carbon: The European Union Emissions Trading Scheme 1st ed., Cambridge University Press.



II. Grid-related questions

Survey			Questions	Criteria		
				1	2	3
Issues – Problématiques	Setting out – Mise en place	Cap & Allocation Limite et Allocation	(1) Do the methods of allowance allocation (wrt <sup>3</sup> considering national and free allocation distribution methods) address the issues of fair and effective distribution?  Les méthodes d’allocation de quotas (en considérant le niveau de décision des attributions ainsi que les méthodes d’allocation gratuites) sont-elles justes et efficaces?	x	x	x
			(2) Are the proportions of auctioning and free allocation of allowances, for the different sectors, adequate to avoid issues of competitiveness (wrt carbon leakage) and profit making (wrt windfall profits)?  Les objectifs de mise aux enchères et d’allocations gratuites (en fonction des acteurs) sont-ils suffisants pour éviter les problèmes de compétitivité et de réalisation de profits?	x	x	x
			(3) Should the cap be adjusted in order to be more effective (wrt over-allocation) and what is your opinion on the provisions for banking between trading periods?  Pensez-vous que les limites d’émissions devraient être ajustées pour être plus effectives tout en considérant les problèmes de sur-allocation et quelle est votre opinion sur les possibilités de mise en réserve entre les périodes d’échanges?	x	x	x
			(4) Are use limits and provisions for offsetting adequate?  Les possibilités d’utilisation de compensation carbone sont-elles adéquates?	x	x	x
	Implementation – Mise en oeuvre	Infrastructure & Mechanisms Infrastructure et Mécanismes	(5) Is the system adaptable and transparent, both taking into account stakeholder consultations and access to information?  Le système est-il flexible et transparent, cad prend-il en compte les enquêtes auprès des différents intervenants et assure-t-il le libre accès à l’information?	x	x	x
			(6) Are the control measures sufficient to support effective and fair monitoring and enforcement?  Les mesures de contrôle sont-elles suffisantes pour permettre une surveillance et une pénalisation juste et effective?	x	x	x

<sup>3</sup> wrt = with respect to



Prospects – Perspectives		<p>(7) Are the profits made from auctioning used in the way to support the success of the carbon market and do they correspond to climate policies objectives?</p> <p>Les plans de réinvestissements des revenus du marché sont-ils aptes à soutenir le développement du marché lui-même et correspondent-ils aux objectifs de la politique climatique européenne?</p>	x	x	x
		<p>(8) Is the system reliable and secure (wrt fraud)?</p> <p>Le système est-il fiable et sécurisé (concernant la fraude)?</p>	x	x	x
		<p>(9) Is the market reliable and resilient with respect to distortions and volatility of the carbon credit price?</p> <p>Le marché peut-il être considéré comme fiable et résilient en ce qui concerne les aspects de distorsions et volatilité du prix du quota de carbone?</p>	x	x	x
	Time horizon Horizon temporel	<p>(10) Do you believe that the projected evolutions for the future of the EU ETS after 2020 are sufficiently transparent for providing enough credibility?</p> <p>Pensez-vous que les prévisions concernant l’évolution du marché après 2020 suffisent et sont suffisamment transparente pour assurer suffisamment de crédibilité?</p>	x	x	x
	Coverage Couverture	<p>(11) Do you think that the coverage of energy intensive sectors is adequate and will the latest additions of sectors (i.e. aviation) be successful considering their complexity?</p> <p>Pensez-vous que la couverture des secteurs intensifs en énergie est suffisante et que l’addition des secteurs ‘retardataires’ ne mettra pas en péril la réussite du programme en considérant leur complexité?</p>	x	x	x
		<p>(12) What might be the impacts of poor or no linkage to external (non-EU) carbon markets and of the potential end to international climate agreements?</p> <p>Quels pourraient être les impacts de la faiblesse voire de l’absence de liens avec des marchés de carbone externes (hors Europe) et de la fin possible des négociations internationales sur le climat?</p>	x	x	x



### III. General questions

#### a) Issues – Problèmes

Is there any **other important problem that might jeopardise the success of Phases II and III** (encountered during the scheme's earlier years or not) that we did not discuss during this interview?

Selon vous, y-a-t-il d'autres problèmes importants que nous n'avons pas abordés lors de cet entretien et qui pourraient mettre en péril le succès des deux Phases restantes du programme?

→ If you had to choose **the/three most problematic** issue(s), which occurred during Phase I, what would it/they be?

Si vous deviez citer la ou/les trois plus grosse(s) problématique(s) rencontrée(s) lors de la Phase I quelles serai(en)t-elle(s)?

→ According to you, what is the **main barrier** for the success of the scheme?

Selon vous, quel est le plus gros obstacle de la réussite du marché du carbone européen?

#### b) Criteria – Critères

Do you see any **other important criteria** other than efficiency, effectiveness and equity that the EU ETS should be assessed against?

Selon vous, y a t il un autre critère de réussite important par rapport auquel le marché du carbone devrait être évalué?

→ According to you, what is the **most difficult criterion** to meet?

Selon vous, quel est le critère le plus dur à remplir?

#### c) Evaluations – Evaluations

What do you think of **evaluations made by extra/intra institutional organisations**?

Que pensez-vous des évaluations faites par les organismes intra/extra institutionnels?

→ Are they **useful** (reflection of reality) and are they **used**?

Sont-elles utiles (représentation de la réalité) et sont-elles utilisées?

→ What do you think of **this one**?

Que pensez-vous de celle-ci?

#### d) Futur – Future

What do you think might happen to the EU ETS **after 2020**?

Que pensez-vous qu'il adviendra du marché du carbone européen après 2020?

→ Do you think the EU ETS will be **taken as an example** for the development of similar schemes elsewhere?

Pensez-vous que le marché du carbone européen sera utilisé comme exemple pour le développement de programmes similaires ailleurs dans le monde?

#### Note on the questionnaire:

During the interview process, the questionnaire was revised almost after each interview, either because of recommendations made by the interviewees themselves or resulting from an improved understanding of the issues concerning the EU ETS. Several questions were abandoned and sometimes rephrased or merged.

Below is a list of questions that were removed for irrelevancy:

(1) According to you, what is the most adequate length of a trading period?

Selon vous, quelle est la longueur la plus adéquate pour une période d'échange de quotas?

(2) Does the market cover all the relevant greenhouse gas?

Le marché couvre-t-il tous les gaz à effet de serre approprié?



The following are the questions that were added during the course of the interview process. It is important to observe that these issues were discussed even during the early interviews even though they were not part of the survey at the time:

(1) Are the profits made from auctioning used in the way to support the success of the carbon market and do they correspond to climate policies objectives?

Les plans de réinvestissements des revenus du marché sont-ils aptes à soutenir le développement du marché lui-même et correspondent-ils aux objectifs de la politique climatique européenne?

(2) Are use limits and provisions for offsetting adequate?

Les possibilités d'utilisation de compensation carbone sont-elles adéquates?